2007 Ohio State University Combined Research and Extension Annual Report

Status: Accepted
Date Accepted: 05/14/08

2007 Ohio State University Combined Research and Extension Annual Report

I. Report Overview

1. Executive Summary

The Ohio Agricultural Research and Development Center (OARDC) and Ohio State University Extension Service (OSUE) have worked throughout 2007 to accomplish the land grant mission of The Ohio State University and meet stakeholder demands while supporting federal, state, and local agendas. OARDC and OSU Extension leverage federal base funding provided through CSREES to conduct both basic and applied research, and to manage a comprehensive statewide extension effort in program research, development, delivery, and evaluation. Federal, state, and local resources are combined with extramural funds, and with in-kind and volunteer support, to make the Ohio program truly stakeholder-based. Stakeholders though are not limited to Ohio. Both entities lead national and international efforts within their mission. As reported herein, OARDC continues to contribute to immediate research needs throughout the state as well as leading well-planned long- and short-term basic and applied research initiatives. Immediate consultations to help poultry producers deal with an immediate threat of a virus to long-term studies of genome mapping characterize the breadth of the OARDC research agenda. Topics such as enhanced food safety is calculated to have the potential to save between $260 and $532 million in economic losses to Ohio on an annual basis and prevent between 132,000 and 492,000 Ohioans from getting foodborne illnesses. The OARDC- Food Science and Technology program lead this research effort. New and enhanced crop varieties are critical to Ohio. Since 1991, for example, OARDC has released 17 new varieties of tomato germplasm for adoption by Ohio producers through the Tomato Genetics and Breeding Program. This contributed to growing the Ohio tomato industry from $40 million dollars in 1998 to well over $100 million dollars today. On an annual basis soybeans produced through OARDC discoveries generated $191 million in Ohio economic output, created $67 million in income for Ohioans, and support over 4000 jobs. OARDC is a major leader in new technologies research such as biobased fuels and other products. To date the program has received in excess of $20 million of funding in this area. OARDC is nationally ranked in the top ten programs in research cited, has the largest and most comprehensive agricultural research facility in the United States, and is credited with more than 30% of all royalty income for The Ohio State University. In 2007 OARDC collaborated with over 130 businesses and industries, and with multiple federal, state, local, civic, and support entities to insure our research is based on demand. Programs within OARDC and OSU Extension have shown a substantial annual increase in grants and industry support over the past year. Independent external reviewers calculate that OARDC is a generator of more than $1 billion of annual economic impact and cost savings to Ohio and the United States annually. All OARDC research is closely coordinated with the OSU Extension science based program that is dedicated to rapidly moving research knowledge into society.

Ohio State University Extension (OSUE) connects with people in all stages of life, from young children to older adults. OSUE works with families and children, farmers and business owners, community leaders and elected officials to build better lives, better businesses, and better communities to make Ohio great. OSU Extension delivers targeted, relevant, research-backed information and programs to meet the needs of Ohioans at a local level and address emerging issues. OSUE works with farmers to strengthen their businesses, adopt new technology, and improve efficiency while protecting the environment. Educators and specialists teach nutrition, food safety, and other life choice skills to help Ohioans live healthy lives. OSUE works to help build strong families by offering programs and information to all Ohioans on childcare, parenting, family life, adult development and aging, and balancing life, jobs, and families. OSUE also teaches people to manage money and prepare for retirement. The Ohio 4-H Youth Development program is part of a community of young people across America who learn about leadership, citizenship, and life skills. More than 300,000 Ohio youth, aged 5 to 19, experienced hands-on learning in this OSU Extension effort through clubs, camps, and after-school programs in urban, suburban, and rural communities statewide. OSUE helps to grow Ohio's important green industry by creating jobs, improving workforce skills, and enriching the knowledge of professionals in turfgrass management, landscaping, and nursery companies. OSUE job readiness training improves the skill level of potential employees and works with communities to attract new businesses and encourage retention and expansion among current employers. OSUE enhances communities and neighborhoods by partnering with businesses, current and emerging community leaders, and elected and appointed officials. OSUE informs residents, leaders, and entrepreneurs regarding local development issues and increase the knowledge base for individual and community decisions. OSUE protects Ohio's natural environment by working with landowners in managing woodlands and preserving streams and other water resources, such as Lake Erie.

Collectively, OARDC and OSU Extension are central to managing the food, agricultural, and environmental portfolio of Ohio and the nation. Both organizations, under the College of Food, Agricultural, and Environmental Sciences, and the Office of the Vice President, Agriculture, are well- positioned to continue to provide leadership at local, state and national levels.

Total Actual Amount of professional FTEs/SYs for this State

Year:2007	Extension		Research	
	1862	1890	1862	1890
Plan	250.0	0.0	75.8	0.0
Actual	879.0	0.0	72.4	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Internal University Panel
- External Non-University Panel
- Combined External and Internal University External Non-University Panel
- Expert Peer Review

2. Brief Explanation

IN 2007, OARDC and OSU Extension utilized their advisory committees to provide input on matters as specific as annual report format to more expansive issues such as our stategic plans. Small internal competitive grants were peer reviewed by an internal panel of faculty and administrators representing all academic departments within the College. Some of the larger competitive grants were reviewed by panels of faculty and administrators and leading stakeholders who have expertise in the area of the award, e.g. agbioscience grants. On occassion, faculty from outside the College were used a reviewers. Combined panels of academics and non- academics were used to help define research programs that can more readily move into the marketplace. All OARDC and OSU Extension publications were either blind peer-reviewed or peer reviewed/juried before publications either go to print or distributed via electronic media. OSU Extension continues to develop long range program plans through a process involving Extension personnel from throughout the system, input of lay leaders in communities, incorporating data about Ohio's population, and through collaboration with other agencies, institutions and organizations. Each of the four program areas within OSU Extension conducts long range strategic planning to prioritize programming. Specialists from academic disciplines provided insight from research trends while county Extension personnel provide insight from local communities. Systematic prioritization processes, such as Delphi, were used. Program area personnel worked together to identify key issues that cut across disciplines. Special task forces or teams then collaborate to identify priority program efforts to address these issues. Funding is then allocated to support program priorities. Programmatic resources such as personnel or materials reflect the program priorities. In addition, these priorities direct from what sources grant funds are sought. There is a continual review of all plans to include the ability to be responsive to unanticipated issues. The system provides flexibility for educators to address these issues. In situations where grant monies were obtained, staff with specific, short-term employment contracts were hired to assist in meeting priority needs. Educator specialization is a way for the system to provide subject matter expertise close to local communities. Educators determine a subject matter specialization that relates to needs in their geographical area of the state. They received additional training to remain on the cutting edge of their field. They continue to be encouraged to work with other educators in their region to address local needs in a timely manner. In addition, educators remained linked to state specialists in the same discipline to enable the rapid dissemination of new information or the development of appropriate programming to address critical needs.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public
- Other (focus groups, public information booths at local gatherings,)

Brief Explanation

The Ohio Agricultural Research and Development Center, OSU Extension, and most academic departments/schools within the College of Food, Agricultural and Environmental Sciences have used their external advisory committees as a sounding board this year to discuss current programs and gather their input for future direction, e.g. the 2007 strategic planning process. All county Extension offices have an overall advisory committee as well as focused committees providing input for program planning, implementation and evaluation. OARDC gathers input in many one on one situations while it is working with a private business or industry on a project, or with a commodity or civic group. In 2007 Battelle, a private research and development firm, reported to OARDC its most recent study of the economic and social impacts of our programs. The Battelle study team interviewed stakeholders about impact of OARDC research. Earlier assessments by Battelle were so comprehensive and stakeholder-informed that OARDC and OSU Extension jointly received new funding for competitive grants in the areas of: Youth-Our Future: 4-H Youth Development, Ag Bioscience, Research Enhancement Competitive Grants Program, ATECH- Food and Agricultural Technology Commercialization and Economic Development Program, and funding to support two agricultural research stations. Stakeholders report that they appreciate this opportunity to make input. In addition to the series of Battelle studies, each program area within OSU Extension conducted strategic plans to identify statewide priority programs. The process involved educators meeting with local advisory committees, reviewing data about demographic, economic and social trends in Ohio, and prioritization processes. As a result, each program area has focused teams composed of campus and center specialists as well as county educators who will develop curriculum and evaluation strategies for statewide programs. In many cases, these teams have identified specific target audiences from whom they regularly involve in evaluating programs and educational materials and engage in planning. Some of the program teams include members from external organizations (statewide agencies, organizations, commodity groups) who are appropriate partners to enhance program outreach and delivery. OSU Extension Administration also identified several issues of critical interest to Ohioans based upon existing information. These are the focus for interdisciplinary and multidisciplinary programs and we are offering competitive funding for new programmatic initiatives and partnerships. County Extension Advisory Committees as well as the State Extension Advisory Committee have been engaged in reviewing the themes and prioritizing them as they relate to local communities. All programs at Ohio State University are developing strategic plan in 2008 that address among other points stakeholders. In addition OSU Extension has a very in-depth strategic planning process in place that is more comprehensive in scope than other programs on campus and is heavily vested in stakeholder input. Multiple levels of stakeholders, due to their long history of engagement with OSU Extension and OARDC, maintain a strong commitment to making input into our programs and participating in both formative and summative assessments.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys
- Other (one on one interactions with existing and new stakeholders)

Brief Explanation

The institution utilizes faculty and staff, and associates from support organizations and political leaders to help identify individuals and groups with whom we should be interacting. As new contacts are made, they are asked as to others who need to be included. Formal needs assessments and targeted surveys, as well as an annual statewide telephone survey, help to identify individuals, groups, issues, and needs. One on one sessions at the state fair, local fairs, special event such as our BiOhio, and active participation by faculty and staff in community group processes and business/professional meetings expand the institution's clientele list and knowledge of needs. These contacts are logged and maintained in the College's Unified Reporting System. Local committee members are identified by the Extension personnel in that county. They are expected to have a constitution and bylaws that identify the makeup of the committee. The membership of committees is reviewed during annual on-site and self study diversity reviews to insure that involvement is sought from a representative group of local citizens. Educators are encouraged to reach out to new and underserved target audiences to identify specific needs to be addressed. This occurs at the campus level as well. For example, in Horticulture and Crop Sciences, a faculty member had her graduate assistant have conducted extensive needs assessments with Hispanic workers in the horticultural industry. Resulting programs have addressed both professional development needs and family issues impacting these workers. More educational materials are being written and programs taught in Spanish. Several statewide program teams, such as the Agronomic Crops team conduct program evaluation and needs assessment directly with users of their web based resources to determine what information they need during the growing season and how they want to receive it to maximize use. Program evaluations have determined that the information delivered in a timely manner from the Crop Observation Reporting Network (CORN) resulted in a savings of over $11 million in pesticide use. OSU Extension has added a market research position to the Program Development and Evaluation unit to conduct research with potential target audiences and to coach teams of educators, specialists and researchers in using sound market research to design and delivery programs.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public
- Other (focus group interviews, unobtrusive observation, qualitative dat)

Brief Explanation

Each faculty and staff member, department and school, and various research and extension groups within the institution have stakeholder lists that serve as the foundational membership list. In turn there are business and industrial partners, fellow research and extension institutions and support organizations who are part of the list. Federal, state, regional and local governments and agencies as well as advisory committees and friends groups, commodity groups, and special interest groups also add to the list of stakeholders to whom we seek input in the initial planning and execution phases of our programs and who provide both formative and summative assessment of outputs and impacts. Multiple methods, both formal and informal, are used to engage these stakeholders.

3. A statement of how the input was considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities
- Other (Business management practices, culture of organization)

Brief Explanation
Throughout 2007, both OARDC and OSU Extension have continued stakeholder activities that reinforces that our organizational culture is customer centered, customer focused. The institution advances both basic and applied research and builds and tests advance models for extension programming that meets clients' needs. Client needs and their input are critical in the state level budget process. Likewise their input continues to inform the Plan of Work for federal base funding in that meeting client needs is key to fulfilling the land grant mission and demonstrating that stakeholder support exists for programs that fulfill society's needs and contributes to national well-being. State, federal, and extramural supporters must see constituency benefits in order to justify funding decisions. It is the field level interactions with stakeholders and scientist expertise that jointly identify the majority of emerging issues. While strong theoretical academic insight is critical, food, agriculture and environmental issues manifest themselves in field research and in our clients' daily work and social lives. Clients remain our true partners joining with faculty and staff to identifying emerging issues. Issues and needs originating from producers, processors/manufacturers, distributors, and consumers have and will continue to redirect both extension and research programs. It is such issues that provide the scientists with the study questions. Once answered, the response is framed for the clients and other interested parties. The response includes intervention to effect change and assess impact. These have and will continue to influence faculty and staff hiring, shifts in priorities and resource allocation, and strategic/ action planning. Likewise stakeholder input has and continues to influence how our College positions itself in the marketplace and conducts business. Stakeholder input has transformed the corporate culture in that as a public institution, it is imperative for society to see our organization reflecting their aspirations. Input is considered at many levels of the organization. The Administrative Cabinet of OSU Extension reviews input from surveys and strategic planning processes to determine funding and staffing needs. The State Extension Advisory Committee and the OARDC Advisory Committee have met multiple times this year to provide input on programmatic needs and proposed priorities. Cooperative Extension administrators (Director, Associate Director) and others with statewide program leadership responsibility have initiated a departmental accountability process with all campus units receiving Extension funding. This process involves meetings to discuss shared priorities, surveys of internal and external stakeholders about their satisfaction with the content and expertise delivered from that unit, and review of documented impacts. This process is directly linked to annual funding for the campus departments. Locally, Extension Advisory Committees and other programmatic committees assist educators in prioritizing programs annually. They review information about local needs, capacity of Extension to deliver programs and guide the overall local programmatic vision. Across all levels of administration, as well as at all program levels, stakeholder input has and continues to prove most valuable. Both OSU Extension and OARDC are engaged with federal and state officials. Most often stakeholders join with the organization to facilitate communication. The stakeholders voice and needs are central to setting our agendas and meeting our mission.

Brief Explanation of what you learned from your Stakeholders
Collectively OSU Extension and OARDC have had specific input from stakeholders on the following topics that informed decisions made in 2007: Personnel hires made New facilities planned and retrofitting of existing facilities Strategic planning Organizational changes Program expansion and program reduction Budgetary matters Content and format of publications Relations with elected officials Research grants and awards Program content and delivery strategies Structure and role of advisory committees

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
10068790	0	10359263	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	8627381	0	6019770	0
Actual Matching	13058547	0	10817543	0
Actual All Other	1430642	0	0	0
Total Actual Expended	23116570	0	16837313	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous years				
Carryover	1539248	0	0	0

V. Planned Program Table of Content

Program #1

V(A). Planned Program (Summary)

1. Name of the Planned Program

Soil, Water and Air Systems-OARDC Led

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	10%		10%	
102	Soil, Plant, Water, Nutrient Relationships	40%		30%	
111	Watershed Protection and Management	20%		20%	
112	Watershed Protection and Management	20%		20%	
133	Pollution Prevention and Mitigation	0%		10%	
141	Air Resource Protection and Management	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	6.9	0.0
Actual	0.0	0.0	6.8	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	657462	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	852488	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Outputs within this planned program are/will be: 1) online and in print research-based publications targeted to: (a) specific stakeholder groups, (b) support publics such as fellow agencies, political entities, (c) targeted populations, and (d) the broader general public, including mass media releases; 2) peer-reviewed journal articles; 3) commercialized techniques/inventions; 4) non-commericalized techniques/inventions that are distributed to those in need without costs (e.g. wetland construction techniques); 5) intellectual properties; 6) consultation services; 7) meetings with stakeholders and supporters; 8) facilitation of training programs/workshops for other scientists and for specific groups of stakeholders, including international visitors; and 9) planning meetings with advisory groups to communicate findings and plan new research.

2. Brief description of the target audience

Targeted audiences are, but not limited to: 1) Specific individuals or groups who have expressed a need for certain information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature. Often those requests are communicated to OARDC by an intermediary such as a staffer at ODNR or a county extension agent; 2) Fellow agencies or support organizations that will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; 3) Populations who have not requested the information but will likely benefit from that information, e.g. immigrant populations; 4) Other scientists and scientific groups; 5) Political entities; 6) Extension personnel; 7) Students from pre-school to post doctorate studies; 8) News organizations; and 9) Business groups such as chambers of commerce and community coalitions.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	44	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- •peer-reviewed publications will be tracked in terms of name and tier of journal, as well as record of citations of the article;

Year	Target	Actual
2007	12	44

Output #2

Output Measure

- •commercialized techniques will be tracked as to purchaser, number of adoptions, and by whom;

Year	Target	Actual
2007	1	0

Output #3

Output Measure

- •non - commercialized techniques will be tracked as to number of adoptions, and by whom;

Year	Target	Actual
2007	1	0

Output #4

Output Measure

- •patents by number and who partnered/purchased/commercialized;

Year	Target	Actual
2007	0	0

Output #5

Output Measure

- ,•consultations by recipients and in what areas;

Year	Target	Actual
2007	25	20

Output #6

Output Measure

- •training program by how many of what type of stakeholder participated in what type of program; what non-OARDC organization helped to lead the training;

Year	Target	Actual
2007	100	300

Output #7

Output Measure

- •planning meeting participation as to who(non-OARDC) participated at what level to help take a research project to the next level;

Year	Target	Actual
2007	3	6

Output #8

Output Measure

- • number of graduate students completed, their research areas, and the positions of employment they hold.

Year	Target	Actual
2007	2	8

Output #9

Output Measure

- x

Year	Target	Actual
2007	{No Data Entered}	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Continue to advance soil, water, nutrient, and plant research to ensure Ohio continues to be one of the top five states in corn and soybean production and has knowledge to support growing niche market agriculture, organic farming and biobased products.
2	Provide the necessary research finding (scientific knowledge and techniques) to support stakeholders,' compliance with Ohio and federal EPA regulations, and future regulations, regarding odors and other air quality issues in ag production and processing.
3	Expand watershed and ecosystem level modeling to the extent that scientific data and watershed management protocols can bring all streams effected by agriculture and natural resource runoff into compliance with Ohio EPA standards.
4	Through the provisioning of watershed specific data, support the creation of and conservation action of community-based watershed networks in each major watershed in Ohio.
5	Advance the basic knowledge contribution so that Ohio continues to be viewed as a center of excellence in terms of soils and water sciences, and associated extension programming.
6	Track publications, developed techniques, consultations, OARDC sponsored training, and other forms of OARDC outputs for stakeholder use to assess level of adoption and impact with a goal of shifting more sectors into early adoption.
7	Develop all research projects with external input with a clear goal of commercialization of findings and job growth/economic activity for each project; where not possible, develop for non ,– commercial early adoption by one or more stakeholders/groups.
8	Support the mapping of county level soils with a target of three new counties per year
9	Provide the necessary soil and water research, in conjunction with actions in other planned programs KA (e.g. IPM), to permit continued adoption of conservation tillage practices in the face of problems such as climatic changes, pest, etc.
10	Advance carbon sequestration research to the point that Ohio farmers can enter the carbon trading market.
11	Knowledge of understanding and mitigating the bioavailability of heavy metals in soil and water is of major concern to a cross section of society from agriculture industries, to regulators, to the consumer.
12	Application of biosolids to landscapes has been practiced for centuries. Federal and state guidelines, policies, and laws evolved in the mid to late 20th century that provided for safe application of biosolids. Continued research is needed to inform regulatory decisions and assess impacts.

Outcome #1

1. Outcome Measures

Continue to advance soil, water, nutrient, and plant research to ensure Ohio continues to be one of the top five states in corn and soybean production and has knowledge to support growing niche market agriculture, organic farming and biobased products.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1. Vermicompost impact on the growth and yields of food crops as well as impacts in reducing pests and pathogens are alternatives to traditional fertilizers and pest and pathogen controls that show great promise in sustainable agriculture systems.
2. Availability of nitrogen and sulfur determine in great part grain yields.

What has been done

1. OARDC scientists have conducted research into the effects of three types of vermicomposts on the growth and yields of peppers, strawberries and petunias. They have accumulated further evidence that interactions between earthworms and microorganisms in the production of vermicomposts produced plant growth hormones, that become adsorbed on to humates, and released into soil relatively slowly so as to continuously promote plant growth.
2. OARDC scientists studied the nitrogen sulfur strategies in maize production as a meaning of creating costs savings and reducing environmental impact.

Results

1. The continued application of solid cattle, paper, and food waste vermicomposts, in the main field experiment, continued to increase the rates of growth, flowering and yields of the three experimental field crops: strawberries, peppers and petunias. The studies have confirmed the data obtained in previous seasons on the chemical, physical and biological changes in vermicomposts and on the effects of vermicomposts on field soils. In the vermicompost-treated soil there was more NO3-N, soluble P and exchangeable Ca and Mg. Overall, microbial biomass and microbial seasonal activity continued to increase, in response to the repeated treatments with vermicomposts since the project began. The effects of the vermicomposts on microbial communities were greatest in increasing soil fungal activity, including antagonists of pathogens but had little effects on bacterial communities. The studies have now yielded considerable data on the effects of annual treatments with vermicomposts on the growth, flowering and fruiting of peppers for four seasons and that of strawberries and petunias for three seasons. The significantly increased yields have been achieved at relatively low costs and with considerable increases in potential economic returns to the grower. Overall, over the period that the field experiment has been running there were very significant and consistent increases in flowering and yields of the crops in response to all three types of low vermicomposts at both of the low application rates used. In regard to the incidence of plant diseases and pest arthropods in response to vermicomposts on the three crops, data illustrated significant suppression of bacterial wilt, early blight, powdery mildew and verticillium wilt by all of the vermicomposts, compared to that of crops in plots receiving only inorganic fertilizers. There was also significant suppression of attacks by caterpillars, red spider mites and aphids, in response to the vermicomposts, compared with the attacks on plants receiving only inorganic fertilizers. The suppression of aphids by vermicomposts has positive implications for suppression of viruses which they transmit. The study also included research in to the effects of aqueous extracts (teas) from vermicomposts on the growth, flowering and yields of all three crops and on suppression of plant pathogens and pest arthropods. The teas were more effective in growth and pest suppression when they were produced in commercial brewing equipment with aeration than without aeration. They performed best when used soon after preparation. The most effective dilutions of vermicomposts to water were 1:20, 1:10 and 1:5 (v/v). These findings are important because vermicompost aqueous solutions are easier to apply to crops for a broader range of problems.
2. An OARDC experiment that analyzed long term data in 2007 has resulted in the identification of a new metric for evaluating corn nitrogen response using remote sensing. This new metric has been used to develop a new sensor-based algorithm that will be further evaluated this coming spring in on-farm and on-station research. The project scientists also found corn grain yields were (statistically) significantly increased by nitrogen fertilizer addition from 2003-2005. Sulfur addition also significantly increased average yield of corn in 2002 and 2003. A nitrogen by sulfur interaction for corn yield was observed in 2005. Sulfur application at 33 kg/ha significantly increased corn yield at the intermediate nitrogen rate of 133 kg/ha, and showed a general tendency to increase yield at lower nitrogen rates in 2004 and 2005. Nitrogen and sulfur concentrations in corn grain were increased by application of 200 kg nitrogen/ha, and sulfur concentration was increased by sulfur application in 2005. These results suggest that application of sulfur fertilizer, with nitrogen, can promote the uptake of nitrogen by corn in sulfur-responsive soils.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
111	Watershed Protection and Management
101	Appraisal of Soil Resources

Outcome #2

1. Outcome Measures

Provide the necessary research finding (scientific knowledge and techniques) to support stakeholders,' compliance with Ohio and federal EPA regulations, and future regulations, regarding odors and other air quality issues in ag production and processing.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Runoff water from drainage ditches in agricultural ecosystems pose a potential threat of negatively impacting streams.

What has been done

The OARDC study sought to evaluate how fluvial processes influence the recovery and geomorphology of incised agricultural channels; evaluate the ability of biogeochemical processes operating in agricultural drainage ditches to reduce nitrate loads, and the influence of different land management practices; and evaluate how aquatic biota and ecological processes are related to fluvial features and processes. Scientists sampled geomorphological and ecological data at multiple spatial scales.

Results

One important question addressed is at what spatial scale and asked if land use can be meaningfully linked to stream water quality in the TMDL process? Often, TMDL studies produce 'science-relevant' instead of 'decision-relevant' data, which limits their usefulness to make land management decisions. TMDL studies usually lack adequate consideration of instream processes that can have a significant influence on water quality. Research can lead to better identification of factors to consider in TMDL studies and how to do these studies. Outcomes from this agricultural ditch research has the potential to reduce maintenance needs and to help reduce nutrient loadings to rivers and receiving water resources. The results suggest that more quantifiable variables and consideration of spatial location of a stream reach within a watershed system should incorporate standard data into stream monitoring programs to identify impairments that, while biologically limiting, are not fully captured or elucidated using current bioassessment methods. This research is developing new assessment techniques for small streams which will have the potential to recommend new BMPs for small watersheds in agroecosystems. Results have led to several two-stage channel modifications being implemented and streamway setback concepts being adopted throughout the nation. Some of these concepts have been included in the recently published USDA-NRCS National Engineering Handbook Part 654 Stream Restoration Design.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Watershed Protection and Management
112	Watershed Protection and Management

Outcome #3

1. Outcome Measures

Expand watershed and ecosystem level modeling to the extent that scientific data and watershed management protocols can bring all streams effected by agriculture and natural resource runoff into compliance with Ohio EPA standards.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The ability to predict nitrate movement through a soil profile is important for both retaining nitrogen as a fertilizer and preventing the pollution of water resources by nitrogen compounds from agricultural and urban landscapes.

What has been done

Transient, unsaturated horizontal column experiments were conducted to assess clay mineralogy impacts on electrostatic processes affecting nitrate mobility. Soil organic carbon (SOC) retention is a function not only of climate, vegetation, drainage, and management interactions but also of intrinsic soil properties such as texture, mineralogy, and structure.

Results

Nitrate from fertilizer applications to farm fields is commonly responsible for the contamination of shallow aquifers. The transport of nitrates is through the soil profile where nitrate mobility is governed by electrostatic interactions between nitrate anions (negatively charged) and charged surface sites (+ or -) on soil clay minerals and organic matter. Anion adsorption occurs when nitrate ions become attached to positively charged sites on soil particles; whereas, anion exclusion occurs when nitrate ions are repelled from soil particle surfaces and move at a faster rate than the overall pore water. Unsaturated horizontal column experiments were conducted to assess the impacts of clay mineralogy (type of clay) on electrostatic processes affecting nitrate mobility in artificial sand-clay mixtures and natural soil materials. Data from these experiments confirmed that computer modeling programs are capable of predicting nitrate movement through the soil profile, especially if such programs are improved by incorporating nitrate adsorption and exclusion processes under unsaturated flow conditions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
111	Watershed Protection and Management
112	Watershed Protection and Management

Outcome #4

1. Outcome Measures

Through the provisioning of watershed specific data, support the creation of and conservation action of community-based watershed networks in each major watershed in Ohio.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
111	Watershed Protection and Management

Outcome #5

1. Outcome Measures

Advance the basic knowledge contribution so that Ohio continues to be viewed as a center of excellence in terms of soils and water sciences, and associated extension programming.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Other researchers, companies interested in developing biological controls and/or biopesticides, and farmers interested in sustainable management of plant diseases have need for advancing understanding of molecular ecology of plant pathogens and their natural antagonists.

What has been done

The project provided for multiple applications of molecular ecology of plant pathogens and their natural antagonists. First, molecular tools were applied to understand the diversity and distribution of Ralstonia solanacearum isolates. Second, methods to statistically analyze microbial community profiles and establish their role in soilborne disease suppression were refined. Lastly, those tools were applied to develop several collections of novel microbes from which new biopesticides may be developed.

Results

Knowledge about the diversity of bacterial pathogens was refined. More significantly, a complete methodology for identifying and then recovering bacteria positively associated with soilborne disease suppression was developed and implemented. Specifically identified were a series of soils that differed in their capacity to suppress endogenous and introduced oomycetes pathogens, used terminal restriction fragment length polymorphism (TRFLP) analyses to compare the bacterial community structure and generate molecular tags useful for the directed isolation of novel biocontrol bacteria. Additionally, OARDC scientists have investigated the distribution and activities of B. subtilis and B. pumilus, generating selective isolation protocols and a refined screening procedure for biopesticidal activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships

Outcome #6

1. Outcome Measures

Track publications, developed techniques, consultations, OARDC sponsored training, and other forms of OARDC outputs for stakeholder use to assess level of adoption and impact with a goal of shifting more sectors into early adoption.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
141	Air Resource Protection and Management
101	Appraisal of Soil Resources
111	Watershed Protection and Management
133	Pollution Prevention and Mitigation
112	Watershed Protection and Management

Outcome #7

1. Outcome Measures

Develop all research projects with external input with a clear goal of commercialization of findings and job growth/economic activity for each project; where not possible, develop for non ,– commercial early adoption by one or more stakeholders/groups.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
141	Air Resource Protection and Management
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
111	Watershed Protection and Management

Outcome #8

1. Outcome Measures

Support the mapping of county level soils with a target of three new counties per year

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources

Outcome #9

1. Outcome Measures

Provide the necessary soil and water research, in conjunction with actions in other planned programs KA (e.g. IPM), to permit continued adoption of conservation tillage practices in the face of problems such as climatic changes, pest, etc.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Long term tillage/drainage practice and soil compaction research informs both agricultural production decisions and environmental mitigation actions in agroecosystems.

What has been done

This study reports finding of long term tillage/drainage research plots and compaction research plots in Ohio.

Results

The long term tillage study plots continue to show the value of surface and sub-surface drainage for poorly drained soils, increasing corn yields at least 20 percent and soybean yields about 5 percent. No-till soybeans in narrow rows continue to yield as well as tilled, using plow or subsoiling. For corn, there was no difference in yield among no-till, strip-till and subsoiling, all of which were slightly better than plowing. Based on yields for the past ten years, there is no economic value of an additional tillage pass for strip-till or subsoiling. Rotation with soybeans increased corn yields about 15 percent. For soybeans, rotation had no significant effect. The compaction plots were switched to no-till after the fall 2002 compaction. In the five seasons since, the 20-ton plot soybean yields averaged about 10 percent less than control and corn yields averaged 8 percent less than control. The effect of subsoiling on corn and soybean yield changed after adopting no-till practices. In 2007, as in the previous 4 years, subsoiling decreased yields compared to no-till. Only one year in five did soybean yields increase, and none for corn. The 5-year average loss by annual subsoiling was 3 percent for soybeans and 9 percent for corn. In the years prior to no-till, subsoiling consistently increased yields slightly. The past two years, one subsoiling treatment was delayed until late January, compared to the usual November date. For both corn and soybeans, there has been no effect on yield the following season. The improved soil structure resulting from no tillage appears to resist subsequent compaction better than tilled (subsoiled) ground. Carbon sequestration is reduced by soil compaction. While total carbon had insignificant differences, a measurement of microbial biomass carbon showed about 30 percent more on control plots compared to the 20-ton compacted plots. Compaction reduced active carbon 5 percent. There was also a significant (15%) increase in microbial biomass carbon in the no-till compaction plots (both control and 20-ton) compared to subsoiling. These changes in carbon fractions, measured in the top 12 inches of soil, give an early indication of longer-term changes in total carbon.
The yield results comparing no-till to subsoiling, with intentional compaction applied every 3 years, showed that the improved soil structure with continuous no-till can resist the pressure from a 20-ton axle load better than soil that has been tilled every year or two. The analysis of carbon fractions showed the need to look at more than just total carbon and organic matter changes in comparing soil treatments. The significant increase in microbial biomass carbon and other carbon fractions demonstrates how these measurements can be used as an early indicator of more good things to come. The reduction in carbon in compacted soil adds one more benefit to a controlled traffic system, which typically avoids heavy traffic on 60 to 80 percent of a field surface. Permanent lanes are convenient to establish and maintain with the aid of an accurate auto-steering system. On the tillage/drainage research plots only light tractors, combines and equipment are used. In this situation continuous no-till yields about the same as strip-till, subsoiling or chisel plowing. The absence of compaction likely contributes to this positive result. When considered in combination with results from the compaction plots, a system with continuous no-till and controlled traffic seems to offer many advantages for farmers today.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
101	Appraisal of Soil Resources

Outcome #10

1. Outcome Measures

Advance carbon sequestration research to the point that Ohio farmers can enter the carbon trading market.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As ethanol demand increases, corn stover as a source of energy is becoming more popular. However OARDC studies have shown that removing residual from the soil surface can cause carbon loss to the atmosphere. The demand for bioenergy from agricultural products and the need to retain carbon in the soil are both societal needs that require scientific assessment to inform decision making. Companion research is addressing the value of carbon credits to farmers.

What has been done

OARDC scientists have identified soil conditions where removing of corn stover will have minimal impact. Additionally they have generated new knowledge relating to the value of carbon credits to farmers.

Results

The project reported that clay soils having on flat terrain are minimally impacted in terms of carbon loss due to corn stove removal. Conversely, removal of just 25 percent of corn stover over a one year period from silt loam soils with an undulating terrain can cause soil erosion and carbon loss. OARDC agricultural economists have quantified the costs of providing carbon credits to informs farmer decision making regarding adoption of carbon saving strategies, i.e. carbon farming.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
111	Watershed Protection and Management
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management

Outcome #11

1. Outcome Measures

Knowledge of understanding and mitigating the bioavailability of heavy metals in soil and water is of major concern to a cross section of society from agriculture industries, to regulators, to the consumer.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Heavy metal bioavailability to humans and all life forms is an area that begs for greater inquiry, both to advance science and to protect against consumption.

What has been done

Research studies were conducted to determine the ability of chemical speciation methods to measure heavy metal bioavailability to human and ecological receptors and secondly to determine the effect of soil chemical properties on chemical speciation and heavy metal bioavailability in contaminated soil. The study used soil chemical extraction methods and spectroscopic methods in tandem to characterize various pools and species of bioavailable arsenic in soil.

Results

OARDC scientists reported novel findings on methods to assess the human risk from arsenic in soil. Results from this work suggest the % Asox and scorodite fractions represent the non-bioavailable portion of As in these soils. Arsenic (V) speciation by EXAFS and select chemical extraction methods can estimate bioavailable As in these smelter contaminated soils. Project scientists have identified methods that can estimate bioavailable As and measure oral bioaccessibility of arsenic in contaminated soil. These methods can be used to assess public health risks associated with exposure to arsenic-contaminated soils. Hazardous effects of environmental contaminants on non-human receptors are the focus of ecological risk assessments. Soil matrix properties can mitigate hazardous effects of contaminants through soil chemical sequestration and should be considered when evaluating ecological risk from terrestrial contamination. Also reported is a novel statistical approach, the plant contaminant sensitivity index (PCSI), to quanity the ability of soil to sequester contaminants and reduce phytotoxicity. Empirical models that quantify relationships between chemical/physical properties of soils and hazardous effects of contaminants, such as toxicity, can improve the accuracy of ecological risk assessments. Adjustment of ecotoxicity parameters by PCSI is a promising approach to quantify the modifying effects of soil properties on phytotoxicity endpoints.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Watershed Protection and Management
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
101	Appraisal of Soil Resources
133	Pollution Prevention and Mitigation

Outcome #12

1. Outcome Measures

Application of biosolids to landscapes has been practiced for centuries. Federal and state guidelines, policies, and laws evolved in the mid to late 20th century that provided for safe application of biosolids. Continued research is needed to inform regulatory decisions and assess impacts.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Any addition of materials to the environment should be assessed to assure that all impacts are within safe parameters as set by appropriate regulatory bodies.

What has been done

OARDC research focused on the ability of in situ amendments to reduce the gastrointestinal bioavailability of lead and the long-term bioavailability and toxicity of trace elements in biosolids-amended agricultural soils. In this study, lead (Pb) was sorbed to a model soil mineral, birnessite, and was placed in a simulated gastrointestinal tract (in vitro) to simulate the possible effects of ingestion of a soil contaminated with Pb.

Results

Results showed that trace element bioavailability to Lolium perenne (i.e., perennial ryegrass) and Eisenia andrei (i.e., earthworms) was low in the biosolids-treated soils. Several findings summarized in the report are: Biosolids increased soil Cd, Cr, Cu, Mo, Pb, and Zn content. Soil metal levels at the high biosolids application rate (300 Mg/ha) were well below the U.S. EPA Part 503 limits but were at or slightly above the Canadian regulatory limits. Most of the biosolids metal (<1%) is not present in an easily extractable or readily bioavailable form. Biosolids application affects soil properties important in metal bioavailability to ecological receptors (i.e., soil pH, organic carbon content, reactive Fe oxide). Biosolids increased plant nutrients in soil including N, P, Fe, Cu, and Zn. Sustained increase of plant nutrients after 14 years shows this is a long-term benefit associated with land application of biosolids. Biosolids increased ryegrass dry matter growth. These increases were due to increased plant available N in soil. Biosolids application did not result in ryegrass phytotoxicity. Tissue metal levels were below levels that may result in phytotoxicity. Total and DTPA chemical extraction methods were more predictive than calcium nitrate extraction for ryegrass tissue Cu and Zn. Soil extraction methods used for highly contaminated soils may not be accurate for biosolids-treated soils and visa-versa. Earthworms (Eisenia andrei) exposed in the laboratory to biosolids-amended soils from Waterman Farm plots accumulated metals from the soils. The most marked observation was that Cd bioaccumulation was directly proportional to Cd concentration (i.e., linear dose-accumulation curve). Cd levels in earthworms (Lumbricus rubellus, L. terrestris) collected from the field plots were similar to those found in worms (Eisenia andrei) exposed to soils amended with biosolids (300 Mg/ha) at 56 days. Results from our long-term biosolids field study shows that land application of biosolids improved plant nutrition and did not result ecotoxicity to plants or earthworms. Soil analysis suggests most of the organic fraction of the biosolids had decomposed suggesting reaction of biosolids with soil was essentially complete. Biosolids improved soil properties and plant growth and did not have a negative ecosystem effect. These results suggest land application of biosolids is a sustainable practice.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Watershed Protection and Management
133	Pollution Prevention and Mitigation
112	Watershed Protection and Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)
- Other (extramural funding)

Brief Explanation

Weather and economy, including extra mural funding had the most impact.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Case Study
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #2

V(A). Planned Program (Summary)

1. Name of the Planned Program

Natural Resources and Environmental Systems-OARDC Led

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	0%		5%	
123	Management and Sustainability of Forest Resources	25%		25%	
124	Urban Forestry	0%		5%	
133	Pollution Prevention and Mitigation	20%		10%	
135	Aquatic and Terrestrial Wildlife	40%		35%	
136	Conservation of Biological Diversity	15%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	0.0	0.0	4.0	0.0
Actual	0.0	0.0	3.8	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		**Research**	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	269251	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	549053	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Outputs within this planned research program are/will be: - online and in print research-based publications targeted to (a) specific stakeholder groups, (b) support publics such as fellow agencies, political entities, (c) targeted populations, and (d) the broader general public, including mass media releases; - peer-reviewed journal articles; - non-commercialized techniques that are distributed to those in need without costs (e.g. wildlife depredation mitigation techniques); - consultation services and meetings with agencies/organizations, stakeholders and supporters; - facilitation of training programs/workshops for other scientists, support organizations such as ODNR and for specific groups of stakeholders, including international visitors; and - planning meeting with advisory groups to communicate findings and to plan new research.

2. Brief description of the target audience

Targeted audiences are, but are not limited to: - specific individuals or groups who have expressed a need for natural resources and environmental research knowledge that is to be derived through new research, extracted from on-going research, or is derived from scientific literature. Often those requests are communicated to OARDC by an intermediary such as a staffer at USDA, ODNR, or a county extension agent; - related agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change, e.g. fish and wildlife clubs; - populations who have not requested the information but will likely benefit from that information, e.g. people who fish for recreation; - other scientists and scientific groups; - political entities; - extension personnel; - students from pre-school to post doctorate studies; - news organizations; and - business groups such as Ohio Farm Bureau and community collations such as watershed collations.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	24	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- •peer-reviewed publications will be tracked in terms of name and tier of journal, as well as record of citations of the article

Year	Target	Actual
2007	20	24

Output #2

Output Measure

- •online and print research-based publications will be tracked in terms of number of hits on the web site and the numbers and sites for distribution of printed materials

Year	Target	Actual
2007	25	28

Output #3

Output Measure

- •online and print research-based publications will be tracked in terms of number of hits on the web site and the numbers and sites for distribution of printed materials;

Year	Target	Actual
2007	20	28

Output #4

Output Measure

- •non - commercialized techniques will be tracked as to number of adoptions, and by whom

Year	Target	Actual
2007	1	1

Output #5

Output Measure

- •number of consultations regarding research findings with stakeholders/groups requesting the research and in what areas of knowledge desired

Year	Target	Actual
2007	10	14

Output #6

Output Measure

- ,•training programs by how many, what type of stakeholder participated in what type of program and what non-OARDC organization helped to lead the training

Year	Target	Actual
2007	3	7

Output #7

Output Measure

- •planning meeting participation as to who(non-OARDC) participated and at what level to help take a research project to the next level

Year	Target	Actual
2007	3	3

Output #8

Output Measure

- •number of graduate students graduated and professional positons they hold

Year	Target	Actual
2007	3	12

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	• In conjunction with companion agencies and organizations, advance research in forest biology and ecology to promote (a) best management practices on private forest land in Ohio with an incremental gain of 5% of lands each year
2	(b) improve the flow of forest raw materials to the extent it meets the needs of Ohio industries within ten years
3	(c) increase the production of oak and reduce maple to eventually achieve a balance equivalent to forest with natural fire regimes
4	(d) meet federal and state needs for research data related to Ohio forest systems as the demand arises
5	(e) and increase the flow of environmental services through conservation actions commensurate with regional demand, i.e. Buffer zones in forest riparian zones, reforestation, CREP, carbon sequestration in forests and grassland biomass
6	,• Advance research knowledge, both basic and applied, in the areas of silviculture and horticulture to existing and emerging industry and consumer demand regarding forest genetics, forest biology, seed production, nutrition, and related topics
7	• Meet ODNR, USDA, USDI, local, commodity groups, community, and other stakeholder demands for scientific knowledge to inform existing and emerging issues related to human wildlife use/conflicts and human to human conflicts related to wildlife and use
8	•To contribute to the theoretical knowledge base within this planned program to ensure that where possible all applied research can be grounded in the best science and evaluation available
9	A continued flow of pollution prevention and mitigation research will be generated to support sustainable agriculture systems and healthy ecosystems.
10	Provide urban forest research commensurate with need and demand within Ohio.

Outcome #1

1. Outcome Measures

• In conjunction with companion agencies and organizations, advance research in forest biology and ecology to promote (a) best management practices on private forest land in Ohio with an incremental gain of 5% of lands each year

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Biological indicators such as birds can provide meaningful information for managing agroecosystems and urban landscapes in a sustainable manner.

What has been done

OARDC scientists studied riparian forests bordered by agricultural and urban communities as to diversity and abundance of Neotropical migratory birds, deemed as indicators of ecosystem health.

Results

Research results has lead to the conclusion that conservation and restoration of riparian forests in Midwestern landscapes must undergo a paradigm shift away from a near-exclusive focus on width (or extent) of habitat along waterways towards explicit consideration of land uses surrounding habitats. Results show that riparian forests bordered by agriculture supported greater diversity and abundance of Neotropical migratory birds, including species of conservation concern, than forests bordered by residential development. Also exotic, invasive plants may play an important role in determining the consequences of urbanization to wildlife communities. Forest remnants within urbanizing landscapes were six times more likely to have their forest understory dominated by exotic shrubs, such as Amur honeysuckle. Birds nesting in exotic shrubs are over 25% more likely to have nests depredated than birds nesting in native plants. Exotic plants alter predator-prey interactions and exacerbate high rates of predation that birds already face in fragmented landscapes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
124	Urban Forestry

Outcome #2

1. Outcome Measures

(b) improve the flow of forest raw materials to the extent it meets the needs of Ohio industries within ten years

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
136	Conservation of Biological Diversity
135	Aquatic and Terrestrial Wildlife
133	Pollution Prevention and Mitigation
123	Management and Sustainability of Forest Resources
124	Urban Forestry

Outcome #3

1. Outcome Measures
(c) increase the production of oak and reduce maple to eventually achieve a balance equivalent to forest with natural fire regimes

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ecosystems science must integrate multiple variables to understand cause, effect, and impact in management for select species, ecological communities, commodities and ecosystem services

What has been done

OARDC scientists investigated the impacts of the various shelterwood harvest intensities on forest structure, and how this influences the quality of bat habitat.

Results

This research examined the effects of two retention harvests (50% of stocking and 70% of stocking) aimed at regenerating oak species on bat populations in southern Ohio oak-hickory forests. The overall response of the bat population to these harvests was positive. Activity rates were much higher in harvested versus unharvested areas. Between the two harvests, there was no difference in the amount of bat activity suggesting the preferred treatment for restoring oak species be determined by the success of oak regeneration. Bats generally preferred a less cluttered, open understory for ease of flight and prey capture. Examination of individual species also displayed a preference to the retention harvests. Big brown, silver-haired, and red bats were detected most in habitats suited to their morphology and echolocation call design. Myotis species and eastern pipistrelles displayed a more generalist nature, suggesting an appreciation for multiple habitats.

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity
123	Management and Sustainability of Forest Resources
135	Aquatic and Terrestrial Wildlife

Outcome #4

1. Outcome Measures

(d) meet federal and state needs for research data related to Ohio forest systems as the demand arises

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1. Large tracts of southern Ohio forests are federal and state owned. Timber management on these lands impact birds populations, both song and game birds. Both have substantial positive economic and ecological impacts thus forest management must include management of birds in their overall management plans.
2. Due to decades of steep population declines, Cerulean Warblers have been receiving tremendous national and international attention. The Ohio Hills are thought to contain the highest global concentration of Cerulean Warblers; this has placed Ohio in the national spotlight for Cerulean Warbler conservation.

What has been done

1. OARDC scientists have investigated the regenerating of clearcuts in southern Ohio and impacts on shrubland birds.
2. OARDC scientists have conducted comparative studies of the Cerulean Warbler in both Ohio and in wintering grounds in South America as a means of informing international conservation efforts regarding this species.

Results

1. OARDC wildlife researchers have shown that the regenerating clearcuts in southern Ohio provides evidence that shrubland birds avoid habitat edges and, to a lesser extent, may be area-sensitive. Thus, small or narrow harvests may not provide optimal habitat for this suite of declining species, and managers should consider options to minimize edge and provide larger patches of shrubland habitats. Recent work also demonstrates that regenerating clearcuts are used heavily by mature-forest birds during the post-breeding period. Not only were most species known to breed in surrounding mature forests captured in regenerating clearcuts during the post-breeding period, but many species commonly regarded as 'forest interior' or 'area sensitive' were among the most numerous captures. These results highlight an important opportunity for forest management and suggest thast forested landscapes containing a mosaic of successional stages may hold the most conservation promise for forest birds.
2. . In the first study to focus both on breeding (Ohio Hills) and non-breeding grounds (Venezuelan Andes), OARDC scientists have (1) identified key features that Cerulean Warblers require for successful breeding, showing that 'old forest' features promote nest success and (2) document high densities and overwinter persistence of Cerulean Warblers in shade-grown coffee plantations that retain a diversity of canopy tree species. Both of these finding are important to international management protocols for species protection.

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity
123	Management and Sustainability of Forest Resources
135	Aquatic and Terrestrial Wildlife

Outcome #5

1. Outcome Measures

(e) and increase the flow of environmental services through conservation actions commensurate with regional demand, i.e. Buffer zones in forest riparian zones, reforestation, CREP, carbon sequestration in forests and grassland biomass

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
135	Aquatic and Terrestrial Wildlife
124	Urban Forestry
136	Conservation of Biological Diversity
123	Management and Sustainability of Forest Resources
133	Pollution Prevention and Mitigation

Outcome #6

1. Outcome Measures

,• Advance research knowledge, both basic and applied, in the areas of silviculture and horticulture to existing and emerging industry and consumer demand regarding forest genetics, forest biology, seed production, nutrition, and related topics

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
136	Conservation of Biological Diversity
123	Management and Sustainability of Forest Resources

Outcome #7

1. Outcome Measures

• Meet ODNR, USDA, USDI, local, commodity groups, community, and other stakeholder demands for scientific knowledge to inform existing and emerging issues related to human wildlife use/conflicts and human to human conflicts related to wildlife and use

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1.Production of fish for as both food and sport fish requires a sophisticated level of understanding, not the least in the area of nutrition.
2. Multiple agencies and stakeholder groups are concerned about carrying capacity, hunting opportunities, and wildlife conservation/population restoration on conservation lands and agroecosystems for wildlife populations.

What has been done

1.OARDC scientists used triplicate groups of juvenile rainbow trout that were fed four experimental gelatin-casein based diets containing different fatty
acid levels for 8 weeks.
2. Field work was completed in 2007 on a series of studies designed to meet federal and state agency needs for an estimate of the carrying capacity of weltand habitats and adjacent agricultural areas for spring-migrating waterfowl and shorebirds, a hunter satisfaction study, and a wildlife habitat restoration study.

Results

1. The results indicate that compounds such as soybean phospholipids provided at very high levels, never tested before, have growth enhancing effects in rainbow trout juveniles. The compounds of interest would have high polarity and can be added to starter diets possibly in many other fish species. In a followup experiment with indispensable amino acid imbalanced diets the scientists demonstrated feed intake enhancing effect and consequently growth promoting results of a new feeding strategy that encompass switching diets with imbalanced amino acids. The scientists continued to explore the function of lipoic acid, a substance with enormous potential in fish feeds because this compound has an antioxidant capacity that might prevent deterioration of many susceptible dietary compounds and consequently increase resistance against stress and/or diseases. The study provided the first evidence that lipoic acid might be conditionally indispensable in young fish diets.
2. Results of the waterfowl and shorebird spring migration ecology study objective are being used by Ducks Unlimited, Inc. and the Upper Mississippi River Joint Venture (U.S. Fish and Widlife Service) to develop and implement strategic plannning of wetland habitat conservation efforts in the upper Mississippi River and Great Lakes region. The wood duck nesting ecology study results are similarly being used to investigate changes in tree cavity avaiability, and for habitat conservation planning in the Upper Mississippi and Great Lakes region. Results of the waterfowl and shorebird spring migration ecology study objective are being used by Ducks Unlimited, Inc. and the Upper Mississippi River Joint Venture (U.S. Fish and Widlife Service) to develop and implement strategic plannning of wetland habitat conservation efforts in the upper Mississippi River and Great Lakes region. The wood duck nesting ecology study results are similarly being used to investigate changes in tree cavity avaiability, and for habitat conservation planning in the Upper Mississippi and Great Lakes region. The deer hunter satisfaction/attitude project results were used by the Ohio Division of Wildife to make changes in deer hunting seasons to increase hunter participation while the models of sandhill crane and barn owl habitat relationships are also being used by Ohio Division of Wildife Management to restore and enhance breeding populations of these two species. All three studies inform agency policy and practices and advance wildlife science.

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity
135	Aquatic and Terrestrial Wildlife
112	Watershed Protection and Management

Outcome #8

1. Outcome Measures

•To contribute to the theoretical knowledge base within this planned program to ensure that where possible all applied research can be grounded in the best science and evaluation available

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Substantial effort in recent years has been invested in developing monitoring protocols and indicators for assessing the health of coastal wetlands of the Great Lakes. Most efforts have collected data exclusively in Great Lakes coastal wetlands and have not evaluated coastal wetland indicator development in the context of other wetland types in the state, province, or region. 'Inland' freshwater wetlands are also subject to multiple hydrologic cycles of differing time scales and in some landscape contexts may be as hydrologically variable as Great Lakes coastal wetlands.

What has been done

The Ohio Environmental Protection Agency in conjunction with The Ohio State University, School of Environment and Natural Resources, developed a Vegetation Index of Biotic Integrity (VIBI) for wetlands based on vascular plants as the indicator taxa group. The extension of the VIBI to Lake Erie coastal marshes was evaluated.

Results

The analysis of data from this Ohio coastal wetlands study, with a larger inland reference data set, shows the advantages of treating Great Lakes coastal wetlands as a type of freshwater wetland and working toward indicator development in the context of an overall state or provincial wetland classification and assessment program. Least impacted Lake Erie marshes did not have significantly lower (or higher) scores ($p < 0.001$) although the upper 75th percentile of coastal wetland scores was not as high as the upper 75th percentile of inland wetland VIBI scores. Significant correlations ($p < 0.01$) were observed with two different human disturbance gradients in a combined data set of inland and coastal wetlands. Simultaneous metric evaluation using Principal Components Analysis showed some separation in metric performance between inland and coastal wetlands but also clear overlap, especially between reference-quality inland and coastal systems. Ordination of species presence and abundance data revealed similar patterns with some separation between inland and coastal wetlands but considerable overlap in species composition. Lake Erie coastal marshes represent another type of emergent marsh system. With minor modifications, the VIBI, developed with inland wetland data sets, worked well for assessing Lake Erie coastal wetlands in Ohio.

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity
135	Aquatic and Terrestrial Wildlife
112	Watershed Protection and Management

Outcome #9

1. Outcome Measures

A continued flow of pollution prevention and mitigation research will be generated to support sustainable agriculture systems and healthy ecosystems.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Nonmetabolizable contaminants such as PCBs are a major threat to ecosystems and their environmental services and to food, agricultural and environmental commodities derived from those systems. All sectors of society are impacted by such contaminants. Hazard assessment and how to measure these environmental contaminants are needed.

What has been done

OARDC scientists assessed whether critical body residues for persistent, nonmetabolizable contaminants such as PCBs could be assessed as the sum of all PCB congeners or whether there was differential mortality for each congener.

Results

The studies indicated that body residues for mortality were in the range 2-6 mMol/kg regardless of whether the lethal residue was calculated for a single PCB or the sum of all PCBs. Hazard assessment of environmental contaminants is typically performed by basing assessments on levels of contaminants measured in key environmental media, e.g., soil or water. The hazard to biological systems is extrapolated from these levels. However, a variety of factors, such as temperature, pH, soil type, organic carbon levels and organism type can affect bioavailability of the contaminants, often by 100-1,000 fold. Thus, hazard assessment based on contaminant levels in environmental media can be wildly inaccurate. Our work has shown that measuring body residues within organisms can be tied to specific biological effects. Hazard assessment can be based upon measurement of contaminant levels in organisms where bioavailability is not a factor. This means that hazard assessment will be more accurate, giving a more precise forecast of hazard and that regulated industries can have their effluents regulated based on data that are more precise. Both environmental safety and the cost of ensuring it benefit as a result.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation

Outcome #10

1. Outcome Measures

Provide urban forest research commensurate with need and demand within Ohio.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Toledo, Ohio continues the process of removing some 5,000 street trees with more than 1000 removed last year in response to Emerald Ash Borer (EAB). The loss of urban trees have both documented aesthetic and economic costs. Ohio communities are faced with potential losses estimated to range from 1.8 (median based) to 7.6 (mean based) billion dollars from EAB. Community losses include the loss in landscape value, tree stump removal, and replacement with a two-inch tree.

What has been done

In the face of such costs, communities have begun to plan for a future with EAB. Communities must update existing inventories or create new ones to effectively plan. Individual Tree analyses, earlier, of four Toledo streets and the Ohio communities of Xenia, Bucyrus and Monclova were conducted using the STRATUM engine. The project was planned and directed by OARDC scientists. Data were collected by citizen volunteers from and for their respective communities.

Results

Values for 1,804 public trees in Xenia, OH were calculated and included carbon sequestration, energy savings, storm water retention, air quality benefits as well as aesthetic benefits. The average tree in Xenia contributed 102 dollars in environmental benefits per tree for a total of $184,300. If you assume a budget of $2 per capita as suggested for Tree City USA status this would yield a budget of $48,000 and a yield of 280% for citizen investment in the urban forest. Community leaders increasingly require justification in order to fund urban forestry programs in the face of competing needs such as public safety. The iTree suite can assist in demonstrating economic benefits for environmental services. Citizen volunteers can then show the economic benefits of urban forestry programs in a fashion that can be understood by community leaders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

Environmental factors, but not natural disasters, had the greater inpact to limiting time doing field research.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Case Study
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #3

V(A). Planned Program (Summary)

1. Name of the Planned Program

Plant Systems-OARDC Led

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	10%		10%	
202	Plant Genetic Resources	15%		15%	
204	Plant Product Quality and Utility (Preharvest)	30%		20%	
205	Plant Management Systems	10%		10%	
206	Basic Plant Biology	0%		5%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		5%	
212	Pathogens and Nematodes Affecting Plants	5%		5%	
213	Weeds Affecting Plants	5%		5%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		5%	
215	Biological Control of Pests Affecting Plants	0%		5%	
216	Integrated Pest Management Systems	15%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	23.4	0.0
Actual	0.0	0.0	24.1	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	2054605	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	2993925	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Outputs within this planned program are/will be: - online and in print research based publications targeted to (a) specific stakeholder groups, (b) support publics such as fellow agencies, political entities, (c) targeted populations, and (d) the broader general public, including mass media releases; - peer-reviewed journal articles; - commercialized techniques; - non-commericalized techniques that are distributed to those in need without costs (e.g. wetland construction techniques); - limited number of patents; - consultation services and meetings with stakeholders and supporters; - facilitation of training programs/workshops for other scientist and for specific groups of stakeholders, including international visitors; and - planning meeting with advisory groups to communicate findings and plan new research.

2. Brief description of the target audience

Targeted audiences are, but are not limited to: - specific individuals or groups who have expressed a need for plant systems information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature. Often those requests are communicated to OARDC by an intermediary such as a staffer at a USDA office, NRCS, or a county extension agent; - fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; - populations who have not requested the information but will likely benefit from that information, e.g. home gardeners; - other scientists and scientific groups; - political entities; - extension personnel; - students for pre-school to post doctorate studies; and - news organizations;

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	0	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	123	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- •online and print research-based publications will be tracked in terms of number of hits on the web site and the numbers and sites for distribution of printed materials;

Year	Target	Actual
2007	0	108

Output #2

Output Measure

- ,•peer-reviewed publications will be tracked in terms of name and tier of journal, as well as record of citations of the article

Year	Target	Actual
2007	40	123

Output #3

Output Measure

- •commercialized techniques will be tracked as to purchaser, number of adoptions, and by whom;

Year	Target	Actual
2007	0	0

Output #4

Output Measure

- ,•patents by number and who partnered/purchased/commercialized;

Year	Target	Actual
2007	0	0

Output #5

Output Measure

- •non - commercialized techniques will be tracked as to number of adoptions, and by whom;

Year	Target	Actual
2007	0	1

Output #6

Output Measure

- ,•consultations with recipients and in what areas;

Year	Target	Actual
2007	15	20

Output #7

Output Measure

- •training program by how many of what type of stakeholder participated in what type of program; what non-OARDC organization helped to lead the training;

Year	Target	Actual
2007	5	12

Output #8

Output Measure

- •planning meeting participation as to who(non-OARDC) participated at what level to help take a research project to the next level.

Year	Target	Actual
2007	0	5

Output #9

Output Measure

- ,•number of graduate students graduated and professional positions they hold

Year	Target	Actual
2007	12	29

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Meet or exceed the demand of fellow scientists and stakeholders within the next ten years for materials relating to plant genetics and plant breeding technologies, including identification of molecular markers for elite germplasms
2	Provide at minimum one new contribution annually to the body of literature that will positively advance plant genetics, e.g. molecular techniques and materials to aid in low temperature plant tolerance research
3	Advance germplasm science over the next ten years to the extent that the genetic resources targeted for acquisition are preserved and can be considered secure in terms of systems preservation, e.g. short season crops or for studying rice pathogens
4	Enrich the gene pool and knowledge thereof, to meet identified stakeholder needs, with incremental needs fulfillment by stakeholders in at least 25% of the areas annually-turf needs for nutrient uptake efficient materials, turf with greater traction, etc.
5	Enrich the gene pool and knowledge thereof…… in at least 25% of the areas annually for -greater disease/pest resistance, e.g. rust, ash borer, develop glyphosate ready material, increase quantity and quality yield in crops such as soybeans
6	Enrich the gene pool and knowledge thereof,…,…,… in at least 25% of the areas annually for - disease resistance of rootstocks such as for apple trees and green industry
7	Enrich the gene pool and knowledge thereof,…,…,… in at least 25% of the areas annually for resistance to plant stresses, e.g. discoloration in products such as tomatoes reducing a $60 million loss annually in tomato industry
8	Enrich the gene pool and knowledge thereof…… in at least 25% of the areas annually for molecular studies to better understand how immune systems in plants in inhibit diseases and how bacteria perturb the immune system
9	Enrich the gene pool and knowledge thereof…… in at least 25% of the areas annually for gene recombination and interaction studies to inform decisions on importing new genetic stock, e.g. soybeans from northern China
10	Enrich the gene pool and knowledge thereof,…,…,… in at least 25% of the areas annually for - developing longer lasting cultivars in terms of disease resistance such as in alfalfa
11	Annually provide adequate preharvest research findings, including field trial data, to support Ohio's status as a top soybean and corn producer
12	Release or support release by others of one special cultivar annually, e.g. grapes to replace tobacco in southeastern Ohio, low maintenance turf grass, nitrogen uptake efficient crops including foliar based fertilization, field crop cultivars
13	Promote and participate annually in at least one type of stakeholder participatory research initiative, e.g. sentinel plots on farms for soybean rust
14	Continually participate in and promote the development and timely release of modeling/forecasting programs that are cost effective and cost efficient for producers, e.g. WEEDCAST
15	Continually promote the full integration of all plant and animal pests, including microbes, into IPM planning and execution
16	Annually contribute to and report a basic or applied understanding of IPM, including all physical, biological, and chemical components of the plant system, to reduce environmental stresses, improve production, and lower costs when employed
17	Organic farming is a significant contributor to plant systems science and requires research inputs equivalent to it's current output with consideration given to future potential for increased outputs.
18	Advance knowledge of integrated pest management for species that affect agriculture and non-agriculture structures
19	Advance knowledge and practice change within the green industry commensurate with the industry and consumer needs.
20	Contribute to the development of laboratory techniques and equipment that will further advance the field.
21	Advance knowledge and practice related to bacteria that naturally suppress plant pathogens.
22	Advance knowledge about the relationships among genomics, pathogens and food crops of the world.

Outcome #1

1. Outcome Measures

Meet or exceed the demand of fellow scientists and stakeholders within the next ten years for materials relating to plant genetics and plant breeding technologies, including identification of molecular markers for elite germplasms

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Tomatoes are the model in this emerging field of fruit morphology studies. OARDC scientists are trying to understand what kind of genes caused the enormous increase in fruit size and variation in fruit shape as tomatoes were domesticated. Once scientists know all the genes that were selected during that process, they will be able to piece together how domestication shaped the tomato fruit — and gain a better understanding of what controls the shape of other very diverse crops, such as peppers and the cucumber and squash family. This finding has implications for the vegetable and fruit production industry. Being able to control and modify fruit shape could lead to the development of new varieties, helping growers to serve specialty markets and processors to reduce costs.

What has been done

OARDC crop scientists have cloned a gene that controls the shape of tomatoes, a discovery that could help unravel the mystery behind the huge morphological differences among edible fruits and vegetables as well as provide new insight into mechanisms of plant development.

Results

The gene, dubbed SUN, is only the second ever found to play a significant role in the elongated shape of various tomato varieties., The research OARDC team found that SUN encodes a member of the IQ67 domain of plant proteins, called IQD12, which they determined to be sufficient — on its own — to make tomatoes elongated instead of round during the plant transformation experiments. IQD12 belongs to a family of proteins whose discovery is relatively new in the world of biology. So new that IQD12 is only the second IQ67 protein-containing domain whose function in plants has been identified. The other one is AtIQD1, discovered in the plant model Arabidopsis thaliana, which belongs to the same family as broccoli and cabbage. In Arabidopsis, AtIQD1 increases levels of glucosinolate, a metabolite that Ohio State food and medical researchers are studying in broccoli for its possible role in inhibiting cancer. The discovery was reported, as the cover article, in the March 14, 2008 issue of SCIENCE.

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources
204	Plant Product Quality and Utility (Preharvest)
201	Plant Genome, Genetics, and Genetic Mechanisms
205	Plant Management Systems

Outcome #2

1. Outcome Measures

Provide at minimum one new contribution annually to the body of literature that will positively advance plant genetics, e.g. molecular techniques and materials to aid in low temperature plant tolerance research

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Breeding plants such as alfalfa having superior freezing tolerance provides both an economic gain for producers and an increased food supply for the world.

What has been done

OARDC scientists have provided research that will lead to the breeding alfalfa having superior freezing tolerance. Using a large segregating population consisting of 3,698 gametes, these scientists created a high-resolution genetic map of the barley CBF gene cluster.

Results

In the temperate-climate cereals barley, wheat, and rye, two loci, Frost Resistance-1 and FR-2, play key roles in the acquisition of freezing tolerance. OARDC scientists have found that FR-2 encompasses a large cluster of at least 13 CBF (C-Repeat Binding Factor) transcription factors. (Arabidopsis thaliana homologs of these CBFs are known to play a key role in effecting cold acclimation and freezing tolerance.) Using a large segregating population consisting of 3,698 gametes, createing a high-resolution genetic map of the barley CBF gene cluster. Six recombination events were detected within the CBF cluster allowing us to partition the cluster into seven sub-clusters. This region spans 0.81 cM. Additional genetic analyses are being conducted to identify the gene or genes conferring the difference in freezing tolerance between the parent barley types. We have also found that the second locus, FR-1 acts in part to negatively regulate expression of the CBF genes at FR-2. These findings will greatly facilitate the identification of barley, wheat, and rye genotypes having superior freezing tolerance. In alfalfa, Medicago sativa ssp. falcata, the project discovered that the promoters of the CAS (cold acclimation specific) genes, which are likely targets of the CBF transcription factors, have an unorthodox structure. CAS gene promoters are comprised of modules proximal and distal to the coding sequence. CAS15, a highly cold responsive gene, harbored numerous CBF binding sites, but only in the distal module which was more than 2.5 kb distal to the CAS transcriptional start site. Additional freezing and molecular genetic analyses experiments with plant species in the Medicago genus indicated that M. truncatula survived to -4oC but did not cold acclimate, whereas M. falcata cold acclimated and survived to -14oC. Expression analyses indicated that the M. truncatula CAS31 gene was not low temperature responsive while CAS30, the M. falcata homolog of Mt-CAS31 was robustly low temperature responsive. Sequencing the Mt-CAS31 and Mf-CAS30 promoter regions revealed that the Mf-CAS30 promoter harbored numerous pairs of closely-space CBF binding sites, whereas the Mt-CAS31 promoter lacked one partner of the closely-space CBF partner pair binding sites. This data suggests that positioning of CBF binding sites in close proximity to one another is important for regulatory output. M. falcata also possessed additional CAS30 homologs in comparison to the single CAS31 gene in M. truncatula. These data suggest that the differences in CRT/DRE copy numbers in CAS30/CAS31 upstream regions combined with differences in gene copy numbers may be a factor in determining differences in low temperature tolerance between M. truncatula and M. falcata. These findings provide avenues for breeding alfalfa having superior freezing tolerance.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources

Outcome #3

1. Outcome Measures

Advance germplasm science over the next ten years to the extent that the genetic resources targeted for acquisition are preserved and can be considered secure in terms of systems preservation, e.g. short season crops or for studying rice pathogens

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The effects of different viral suppressors of silencing in plant genetics in most important to both advancing science and in supporting growth and change within the food plant industry.

What has been done

The effects of different viral suppressors of silencing were evaluated for their ability to stabilize transient transgene expression.

Results

Transgenic soybean containing different soybean promoters directing expression of the jellyfish green fluorescent protein were produced. Major efforts were placed on the characterization of the Glycine max polyubiquitin promoter (Gmubi), which is unusually strong in most soybean tissues. Truncated versions of the Gmubi promoter led to reduced expression. The promoter shows high levels of expression in roots, leaves, embryos and flowers. The effects of different viral suppressors of silencing were evaluated for their ability to stabilize transient transgene expression using a lima bean transient expression system, developed in the laboratory. HCPro and P19 both showed good potential to stabilize GFP expression. Stably-transformed P19-containing soybean showed an altered leaf morphology, with large numbers of trichomes and downturned leaves. The morphological change may be due to an alteration of the native leaf developmental processes through expression of the suppressor. Promoter analysis and gfp expression in soybean will increase our overall knowledge of gene expression. Gmubi promoter evaluation will allow fine control of the expression of transgenes. This is one of the few soybean promoters that is available and this work will provide different native soybean promoters for use in both basic and applied research. The promoter was sent to colleagues from eight different laboratories this past year and one of these laboratories has asked to publish their research results with introduction of the Gmubi promoter into Arabidopsis. The Gmubi promoter has also been incorporated into numerous constructs with colleagues who wish to silence various genes using this strong soybean promoter. A provisional patent was filed but a full patent has not yet been pursued.

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources

Outcome #4

1. Outcome Measures

Enrich the gene pool and knowledge thereof, to meet identified stakeholder needs, with incremental needs fulfillment by stakeholders in at least 25% of the areas annually-turf needs for nutrient uptake efficient materials, turf with greater traction, etc.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources
201	Plant Genome, Genetics, and Genetic Mechanisms

Outcome #5

1. Outcome Measures
Enrich the gene pool and knowledge thereof…… in at least 25% of the areas annually for -greater disease/pest resistance, e.g. rust, ash borer, develop glyphosate ready material, increase quantity and quality yield in crops such as soybeans

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1. Our research continues to show an increasing occurrence of glyphosate resistance in Ohio. Glyphosate resistance in horseweed now occurs in most counties in the western half of Ohio, and some of these are also resistant to herbicides that inhibit acetolactate synthase (ALS). Control of the latter can require a very specific combination of herbicides and the appropriate application timing, and failure of growers to properly implement control measures is likely to result in poor control and soybean yield loss.
2. Continued research is required in the area of effects of silencing a series of defense related genes in order to protect food crops such as soybean, tomatoes, and wheat.

What has been done

1. OARDC is monitoring and tracking the spread of glyphosate resistance problematic weeds in soybean fields and projecting the future problems that must be planned for by growers and those who supply herbicides.
2.  Experiments on the effects of silencing a series of defense related genes were conducted on a series of 20 soybean lines with different genes for race-specific or partial resistance to Phytophthora sojae. The defense genes examined included those for isoflavone synthase, chalcone isomerase, pathogenesis related proteins PR-1a and PR-2, a multidomain metallothionein gene (MMT), and two homologs of the NPR1 signal transduction gene. The soybean lines with race-specific resistance contained alleles at the Rps 1, 2, 3, 4 and 5 loci. Experiments were also performed on the effects of allelopathic chemicals on the induction of soybean defense responses. These included a series of commercially available allelopathic chemicals as well as unidentified chemicals in extracts of allelopathic plants.

Results

1. OARDC researchers have confirmed the occurrence of glyphosate resistance in several giant ragweed populations in Ohio. The development in additional growers' fields of lambsquarters and giant ragweed biotypes with a low level of resistance to glyphosate should occur with increasing frequency in the near future. Control of these biotypes is possible with modifications to glyphosate-based herbicide programs, but will increase the cost of growers' weed management programs. Glyphosate resistance in giant ragweed could be extremely problematic due to the widespread occurrence of ALS resistance in this weed, and the development of multiple resistance will result in relatively few options for control.
2.  A major discovery this year included the finding that the PR-2 gene,which encodes an elicitor releasing endoglucanase, is critical to all forms of resistance in soybean to Phytophthora sojae. Thus, it is a master gene. This finding may lead to future genetic engineering efforts aimed at 'priming' soybean plants for enhanced pathogen resistance. Another major discovery was the finding of several new allelopathic chemicals that induce defense responses in soybean. These are currently being evaluated for their efficacy in inducing soybean resistance. If these tests are successful, the chemicals will be tested in additional plant pathogen interactions in tomato and wheat. They will also be tested for their efficacy against insects and as herbicides.

4. Associated Knowledge Areas

KA Code	Knowledge Area
213	Weeds Affecting Plants
201	Plant Genome, Genetics, and Genetic Mechanisms
212	Pathogens and Nematodes Affecting Plants

Outcome #6

1. Outcome Measures

Enrich the gene pool and knowledge thereof,…,…,… in at least 25% of the areas annually for - disease resistance of rootstocks such as for apple trees and green industry

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants

Outcome #7

1. Outcome Measures

Enrich the gene pool and knowledge thereof,…,…,… in at least 25% of the areas annually for resistance to plant stresses, e.g. discoloration in products such as tomatoes reducing a $60 million loss annually in tomato industry

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
205	Plant Management Systems

Outcome #8

1. Outcome Measures

Enrich the gene pool and knowledge thereof…… in at least 25% of the areas annually for molecular studies to better understand how immune systems in plants in inhibit diseases and how bacteria perturb the immune system

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

How plants detect and respond in sophisticated and dynamic ways to the signal compounds that bacteria use to communicate with each other and to regulate their gene expression is an important question in advancing new methods of plant protection and for reducing risk in all sectors of the plant industry.

What has been done

OARDC scientists engaged in a series of studies that identified how plants detect and respond in dynamic ways to the signal compounds that bacteria use to communicate with each other and to regulate their gene expression. In order to characterize the global responses of Medicago truncatula to N-acyl homoserine lactone (AHL) quorum sensing (QS) signals from bacteria, a proteome analysis of the time course of responses to AHLs was conducted.

Results

The time course study of protein-level responses in Medicago truncatula roots to low levels of AHL QS signal revealed that, while the number of differentially accumulated proteins remained roughly constant (30-40) between 3 h and 48 h, the specific proteins showing responses to AHLs changed with time. These results provide the first evidence that the plant's responses to bacterial QS signals are transient, reflecting a sophisticated and dynamic program of adaptation to AHL-producing bacteria. This may lead to applications involving manipulation of plant responses in the field through application of low levels of specific AHL QS compounds at specific times. The chemotactic responses of C. elegans to bacterial AHL QS signals is consistent with the notion that this bacteria-eating nematode uses AHLs diffusiing from bacteria as one means of locating its prey. The diverse protein-level changes in C. elegans in response to AHL exposure provides the first evidence that animals as well as plants make global responses to bacterial QS signals. This is of considerable importance as a caution to the currently pursued therapeutic uses of AHLs to manipulate immune systems, heart disorders, etc in humans. The studies provide the first chemical identification of a eukaryotic metabolite (lumichrome) that stimulates quorum sensing-regulated gene expression in bacteria. Quorum sensing agonists produced by eukaryotic hosts are of general interest based on their potential as novel therapeutic agents and to serve as important determinants of host-bacterial interactions. More importantly, our identification of lumichrome has led to the discovery that AHL QS receptors can recognize two structurally different kinds of biological signal molecules, adding a major new dimension to the complexity and sophistication of quorum sensing biology. The studies show that both lumichrome and riboflavin are potent quorum sensing agonists or signals. This provides the first link between quorum sensing regulation and vitamin production/secretion/uptake in bacteria and opens a promising new area for exploration. Earlier studies had shown that nanomolar concentrations of lumichrome, secreted by many rhizosphere bacteria, were able to stimulate seedling development, plant growth and root respiration in both legumes and cereal crops. The studies provide the first evidence that these physiological levels of lumichrome induce a dynamic pattern of gene expression changes in plants, similar to the dynamic pattern of changes in root protein accumulation induced by AHLs. Together, the results indicate that plants readily detect and respond in sophisticated and dynamic ways to the signal compounds that bacteria use to communicate with each other and to regulate their gene expression.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms

Outcome #9

1. Outcome Measures

Enrich the gene pool and knowledge thereof…… in at least 25% of the areas annually for gene recombination and interaction studies to inform decisions on importing new genetic stock, e.g. soybeans from northern China

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources
201	Plant Genome, Genetics, and Genetic Mechanisms

Outcome #10

1. Outcome Measures

Enrich the gene pool and knowledge thereof,…,…,… in at least 25% of the areas annually for - developing longer lasting cultivars in terms of disease resistance such as in alfalfa

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources
201	Plant Genome, Genetics, and Genetic Mechanisms

Outcome #11

1. Outcome Measures

Annually provide adequate preharvest research findings, including field trial data, to support Ohio's status as a top soybean and corn producer

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Evaluation data for grain performance nationwide yield billions of dollars of profit annually by helping growers make informed decisions.

What has been done

In 2007, 237 corn hybrids representing 35 commercial brands, were evaluated in the Ohio Corn Performance Test. Testing was conducted in three regions of Ohio - Southwestern/West Central (SW/WC); Northwestern (NW); and North Central/Northeastern (NC/NE), with three test sites established within each region. Testing was also conducted at Coshocton, an area with high gray leaf spot incidence. Entries in the regional tests were planted in either an early or full season maturity trial. These test sites provided a range of growing conditions and production environments. Soybean and wheat performances were also studied.

Results

OARDC scientists calculated the average grain yield ranged was 12.5 Mg/ha. Grain moisture content at harvest averaged 19.5%. 23.4%. Grain oil content averaged 3.9% while protein ranged from 8.1% to 8.7%. Stalk lodging was negligible. Over 36,000 copies of the Ohio Corn Performance Test report were distributed. The results were also disseminated via the web at http://www.oardc.ohio-state.edu/corn2007/. The research: 1. Increased farmer access to research-based information on corn hybrid performance across a range of environmental conditions in Ohio. 2. Increased ability of growers to apply research based information in hybrid selection. 3. Enhanced grain yield and quality and increased income of corn growers. 4. Assisted seed companies in positioning corn hybrids where best adapted for production in Ohio based on environmental conditions. 5. Increased demand and use of performance test results. Ohio soybean peformance data from OARDC assisted producers in selecting more productive varieties for their fields resulting in an estimated yield increase of 14 kg/ha over 1.55 million hectares worth $5,800,000. Ohio winter wheat production and performance data from OARDC assisted producers in selecting more productive varieties for their fields resulting in an estimated yield increase of 10 kg/ha over 0.45 million hectares worth $1,500,000. 1000 copies of a performance bulletin were distributed and the bulletin was placed on the Internet for producers use.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #12

1. Outcome Measures

Release or support release by others of one special cultivar annually, e.g. grapes to replace tobacco in southeastern Ohio, low maintenance turf grass, nitrogen uptake efficient crops including foliar based fertilization, field crop cultivars

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Research support is needed if grapes are to replace tobacco in southeastern Ohio. Developing a marketable product from those is required.

What has been done

The processing of grapes into juice that meets food safety standards, consumer demands, and at the same time can be marketed as food with special public health benefit, as well as an filling the economic void left by the loss of the cash crop tobacco are the broader focal areas. More specifically, the key factor that needs immediate researcher input is pasteurization.

Results

Based on this OARDC research, pasteurization at 73C for 12 sec has been recommended to Ohio growers as a means to comply with new federal and state regulations concerning the treatment of fresh grape juices. Pasteurization will benefit consumers as it appears to effectively reduce bacterial contamination without dramatically affecting juice quality characteristics. Our sensory data and the microbiological data of Cornell Univ. scientists, suggest UV-sterilization to be suitable for apple cider. These OARDC studies and those of Univ. of TN scientists indicate the currently recommended ozonation time of 45-60 minutes may be too short for consistently effective bacterial kill. OARDC research, conducted in partnership with the Appalachian Ohio Grape Producer's group, indicated the commercial potential for high quality specialty grape juice products with enhanced health benefits made from novel table and wine grape varieties. Development and marketing of such products may contribute to improved public health and may ultimately help to reduce society's health care burden. New agriculturally based industries such as this are encouraged for southern Ohio as a means to transition from the current tobacco-based agricultural economy.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #13

1. Outcome Measures

Promote and participate annually in at least one type of stakeholder participatory research initiative, e.g. sentinel plots on farms for soybean rust

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Soybean rust and other similar pathogens that may become resistant to current treatments have major economic loss potential to the industry and potential negative impacts in terms of world food supply.

What has been done

Monitoring for soybean rust continues throughout Ohio in collaboration with scientists and stakeholders in a broad national network.

Results

Stakeholders were advised that no soybean rust was identified in Ohio during the 2007 season in Ohio. No fungicides were recommended for soybean rust. Frogeye leaf spot was reported in mid June in the western part of the state and then numerous counties shortly thereafter. During 2007, there were three positive finds of soybean rust spores in rainfall spore traps as well as one positive 'rust-like' spore in a Syngenta trap. Extensive sampling following these finds indicated that no infections occurred. Extensive sampling during mid-October failed to find any leaves with soybean rust in Ohio along Route 30. During the springs of 2004 and 2005, 112 isolates of F. graminearum were recovered from diseased corn and soybean seedlings from 30 locations in 13 Ohio counties. These isolates were evaluated in an in vitro pathogenicity assay on both corn and soybean seed, and 28 isolates were tested for sensitivity to the seed treatment fungicides azoxystrobin, trifloxystrobin, fludioxonil, and captan. All of the isolates were highly pathogenic on corn seed, and moderately to highly pathogenic on soybean seed. Fludioxonil was the only fungicide that provided sufficient inhibition of mycelial growth, however several fludioxonil resistant mutants were identified during the sensitivity experiments. These results indicate that F. graminearum is an important pathogen of both corn and soybean seeds and seedlings in Ohio, and that continued use of fludioxonil may potentially select for less sensitive isolates of F. graminearum. Partial resistance to P. sojae in soybeans is effective against all the races of the pathogen and is a form of incomplete resistance in which the level of colonization of the root is reduced following inoculation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
201	Plant Genome, Genetics, and Genetic Mechanisms
205	Plant Management Systems

Outcome #14

1. Outcome Measures

Continually participate in and promote the development and timely release of modeling/forecasting programs that are cost effective and cost efficient for producers, e.g. WEEDCAST

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Understanding how and when fungicides are effective is a critical decision factor for growers. Research leading to forecasting of needed actions is one role of agriculture experiment stations and is provided for through base funding.

What has been done

This OARDC study provides information on the relative usefulness of currently available fungicides for use in curative fungicide programs based on predicted infection events from a disease forecasting system for Phomopsis cane and leaf spot that was developped in Ohio.

Results

Results in 2007 showed that none of the currently available fungicides had sufficient curative activity for use in post-infection fungicide programs for Phomopsis cane and leaf spot;thus, Thus growers were informed that they need to continue use protectant fungicide programs in order to control this disease. This information aided growers in controlling this potentially destructive disease of grape, potentially protecting large sectors of the industry in Ohio from substantial economic losses.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants

Outcome #15

1. Outcome Measures

Continually promote the full integration of all plant and animal pests, including microbes, into IPM planning and execution

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1 and 2 . To foster sustainable agriculture practices and reduce environmental impact, as well as reducing costs, all sectors of food plant industry, including consumers, are interested in alternatives to conventional pesticides.
3. In order to advance the understanding of naturally occurring entomopathogenic nematodes, scientists need to better understand and be able to identify the habitat characteristics needed for persistence of entomopathogenic nematode (EPN) populations in agroecosystems.
4. Likewise research scientists in this area need basic genetics research relating to entomopathogenic nematodes and bacteria (EPNs-EPBs)
5.. A recent survey of lawn care and golf course turf managers found that nearly 80% are now using preventive, multiple-target strategies for insect control. Often those strategies often require multiple applications, thus increasing application costs over what a single application would costs in terms of labor. There is stakeholder demand for a single application. treatment.

What has been done

1. The parasitic nematode study was initiated to determine if the commercially available GPS11 strain of H. bacteriophora would provide favorable control of the subterranean grape pest the grape root borer, Vitacea polistiformis and to determine how long the GPS11 strain would persist in the soil as a viable biological control agent.
2. Preliminary work on entomopathogenic nematodes, naturally occurring biological control agents for soil-dwelling insect pests, was conducted in a vegetable and grape production systems. Naturally occurring populations were surveyed and initial attempts were made to explain the habitat characteristics associated with their distribution and abundance.
3. This project involved novel ecological research to identify the habitat characteristics needed for persistence of entomopathogenic nematode (EPN) populations in agroecosystems. To determine how these factors influence EPN persistence, individually and particularly in combination, we conducted a systematic survey for naturally occurring nematode populations in an Ohio vegetable production landscape with sample sites chosen to achieve gradients in a wide range of biotic and abiotic environmental conditions.
3. An OARDC project involved novel ecological research to identify the habitat characteristics needed for persistence of entomopathogenic nematode (EPN) populations in agroecosystems. To determine how these factors influence EPN persistence, individually and particularly in combination, we conducted a systematic survey for naturally occurring nematode populations in an Ohio vegetable production landscape with sample sites chosen to achieve gradients in a wide range of biotic and abiotic environmental conditions.
4. We have obtained and compared Heterorhabditis bacteriophora TTO1 expressed sequence tags (ESTs) to the ESTs and proteins of animal-parasitic, human-parasitic, plant-parasitic, and free-living nematodes using BLAST algorithms. A total of 27,380 ESTs have been generated and analyzed.
5.OARDC scientists have joined with an industrial partner to bring acelepryn, a single application treatment, to market.

Results

1. Results demonstrated a reduction in the number of emerging adult GRB's in the nematode treated areas. The rate of reduction was equal to or greater than what has been achieved with conventional pesticides. GPS11 also established a viable presence in the soil profile for an extended period of time after the initial application. These positive results have confirmed that entomopathogenic nematodes do provide a workable alternative to conventional pesticides for control of the grape root borer and may also work well on other soil dwelling vineyard pests.
2, 3. Preliminary results on habitat charactersitcs and ecological modeling for naturally occurring entomopathogenic nematodes led to competitive grant funding and more detailed community level research. The results have led to a shift in research emphasis on these biological control agents from their production and use as biological pesticides to conservation biological control efforts. A number of new formulations and crop protection chemistries were identified as having value for Ohio vegetable production. Results of this research allowed Great Lakes vegetable producers to control insects more efficiently, with less insecticide use than would otherwise be possible.
3. Naturally occurring entomopathogenic nematodes were confirmed in 43 of the 600+ samples, representing all but the vegetable crop habitats and with the greatest number of positive sites in minimally maintained grassy areas. Data on nematode species and environmental conditions have been analyzed by canonical correspondence analysis, specifically designed to estimate the relative importance of a number of environmental conditions in explaining variation in abundance or occurrence of multiple species at a number of sample sites. Approximately 80% of the variation in the species-environment relationship could be explained by the combination of environmental variables. The variables identified as being the most important in shifting from the vegetable field conditions to those present in the grassy borders were increased structure and enrichment in the soil food web, lower carbon:nitrogen ratios, increased K and decreased P. EPN's occupied a very different profile of soil conditions from other species of free-living nematodes. EPN populations varied over time, with detection occurring at least once in 56 of the 144 sites, but only in 3 of the 144 sites for all 7 sample dates. Patterns of occurrence in time and space are consistent with metapopulation dynamics. Principal response curve analysis demonstrated greater arthropod abundance of diverse arthropod taxa in EPN positive than negative sites, and association with arthropod detritivores more so than herbivores.
4. This project will revolutionize research on entomopathogenic nematode and bacteria (EPNs-EPBs) in over 100 laboratories worldwide. Apart from its significance to biological control and agriculture, H. bacteriophora genome sequence will have a large impact on biological sciences and the society particularly due to the following: 1. H. bacteriophora is a unique model for the study of parasitism and pathogenicity 2. H. bacteriophora serves as a tractable model for the study of mutualism 3. H. bacteriophora genome sequence will serve as a bridge between C. elegans and more distantly related nematode parasites.
5. OADC pioneering work with acelepryn with an industrial partner has shown that this insecticide can be used at relatively low rated in April and May to completely control a wide variety of turf-infesting insects (white grubs, billbugs, chinch bugs, cut worms and sod webworms) for an entire season. This product is expected to receive registration in early 2008 and its use by turfgrass managers will be able to cut annual insecticide use in half while using a much reduced risk (LD50<5000) compound. This virtually eliminates the need for additional applications of insecticides, especially pyrethroids

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants

Outcome #16

1. Outcome Measures

Annually contribute to and report a basic or applied understanding of IPM, including all physical, biological, and chemical components of the plant system, to reduce environmental stresses, improve production, and lower costs when employed

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1.Moths in the Heliothis/Helicoverpa comlex are notorious as pests in a wide range of agricultural crops. The cost from these pest is a major economic impact in all sector of the producer to consumer chain.
2.IPM programs are needed to address problems such as slugs that are a major pest in cropping systems and especially in systems that are using no till practices. Stakeholders have requested assistance.

What has been done

This OARDC study has addressed the capacity for dormancy (diapause), a key to their overwintering survival, and the discovery of a hormone that can break this diapause offers an interesting potential for population manipulation. Specifically, this project was designed to understand the role of diapause hormone (DH), a neuropeptide, in the regulation of the overwintering pupal diapause in the agriculturally important Heliothis/Helicoverpa complex.
2.OARDC scientists have studied the size and weight of slugs combined with planting date and crop emergence in an effort to create a model resulting in more suitable IPM practices for controlling slugs than previously existed.

Results

The study has cloned the gene encoding DH in several members of this complex and have determined its amino acid sequence. The core sequence and essential amino acids were determined by bioassays using modified and truncated analogs. The identification of a number of diapause hormone agonists and antagonists suggests the possibility that these tools could be used for pest management.
2.Knowledge of the size and weight of slugs combined with planting date and crop emergence have lead to more suitable IPM practices for controlling slugs. An IPM approach to slug management was developed that includes fall scouting of slugs to identify problem fields, use of early tillage and practices that encourage quick crop emergence and growth, and the use of the baits when significant injury occurs. Growers using conservation tillage practices have been able to continue using these environmentally friendly practices having been able to get their slug problems under control. While saving themselves money by preventing yield losses, the continued use of conservation tillage practices prevents soil and land erosion, improves water quality, and is helps to sequester carbon in the soil.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
212	Pathogens and Nematodes Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants

214	Vertebrates, Mollusks, and Other Pests Affecting Plants

Outcome #17

1. Outcome Measures

Organic farming is a significant contributor to plant systems science and requires research inputs equivalent to it's current output with consideration given to future potential for increased outputs.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1. Organic farming has gained momentum during the past 10 years, employes a significant number of workers, has a important role in feeding the world, has considerable economic value, and demand for organic products is steadily growing.
2. Scientific evidence of yields of organically grown crops in comparison to non organically grown crops is critical to adoption decisions.

What has been done

1. Dynamics of soil bulk density, organic matter, microbial biomass, nitrogen, and nematode communities were assessed for a period of four years in field plots transitioning from conventional to organic farming practices.
2. . Study 2 evaluated the performance of corn hybrids with varying levels of ear determinacy and prolificacy in organic cropping systems. Hybrid performance was assessed in on-farm production systems that use low input organic production. The experiment considered organically and conventionally produced hybrids with varying genetic backgrounds. Evaluations were conducted at three university research station locations in Ohio, Iowa, and Wisconsin that have certified organic or transitional organic land available. Each variety entry in the trials was evaluated using three replications per site in a randomized complete block design.Research was performed at OARDC research farms at Wooster Ohio and various on-farm sites in collaboration with Ohio chapters of the Organic Crop Improvement Association.

Results

1. Conventional system had more N in the mineral pools as indicated by higher NO3--N whereas organic system had higher N in the microbial biomass indicating shifts in nitrogen pools between the two systems. Bacterivore nematodes were more abundant in the organic than the conventional system for most of the study period. In contrast, the conventional system had significantly higher populations of the root lesion nematode, Pratylenchus crenatus, than the organic system after completion of the rotation cycle (transition period) in spring 2004. The scientists concluded that transition from conventional to organic farming can increase soil microbial biomass-N and populations of beneficial bacterivore nematodes while simultaneously reducing the populations of predominant plant-parasitic nematode, P. crenatus. Findings also underscore the potential benefits of reducing tillage for the development of a more mature soil food web.
1.Organic farming has gained momentum during the past 10 years. This study has indicated how the inclusion of organic amendments including compost and grassy cover crops in crop rotation during transition from conventional to organic farming help build the the soil food web and reduce the populations of harmful plant-parasitic nematodes. The results also demonstrate that we need to reduce tillage in the organic farming systems where mechanical weed control can have a negative impact on the structure and function of the soil food web.
2.Organically produced hybrid performance was comparable to that of conventionally produced hybrids. No effects of ear type on grain yield were evident.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

212	Pathogens and Nematodes Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants

Outcome #18

1. Outcome Measures

Advance knowledge of integrated pest management for species that affect agriculture and non-agriculture structures

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Environmentally-friendly insecticides such as termite baits will provide alternatives to the broad-spectrum organophosphate termiticides that have been restricted by the Food Quality Protection Act. Efficacy data on commercially available bait products will provide consumers with a variety of products to choose for termite control.

What has been done

Research efforts directed toward the management of subterranean termites are in progress. During 2007, a field study to assess the effectiveness of the Exterra system, an environmentally-friendly insecticides for controlling structural infestations of the eastern subterranean termite, Reticulitermes flavipes, was monitored in central Ohio.

Results

OARDC data show that termites quickly infested Exterra monitoring stations at all six test structures, with the percentage of infested stations ranging from 9 to 69% after just one month. Termites subsequently consumed large amounts of Labyrinth AC termite bait. At five of the six structures, termites were eliminated within 3 months and no further evidence of termites has been observed during a 1-year post-inspection period. Multiple colonies were present at one structure, so it took ~15 months until the structure was free of termites. These field trials indicate that the Exterra system effectively controlled subterranean termites. Field data for other termite baits, including Sentricon and Advance, also have indicated that they are efficacious.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #19

1. Outcome Measures

Advance knowledge and practice change within the green industry commensurate with the industry and consumer needs.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1.Expanding knowledge and practice of the molecular regulation of flower senescence is important to advancing the green industry. The ability to delay flower senescence will have an important impact on the floriculture industry by extending the postproduction shelf life of cut flowers, flowering potted plants, and bedding plants.
2.Scientist and the green industry seek to identify specific pathways to enhance disease and insect resistance in forest and landscape trees and to adopt rational horticultural and forestry management approaches.

What has been done

1.OARDC scientists have utilized a proteomic approach to identify important regulators of the senescence process in flowers. Two dimensional electrophoresis followed by tandem mass spectroscopy was used to identify protein changes during pollination-induced corolla senescence.
2. OARDC scientists studied the roles of defense proteins in plants to identify specific pathways to enhance disease and insect resistance in forest and landscape trees.

Results

1.Fifty three proteins were identified that were down-regulated and 89 proteins were up-regulated during senescence. A majority of the proteins that increased in abundance during the progression of senescence encode enzymes involved in breaking down cellular constituents. These include a number of proteases and endonucleases that are believed to function in the large scale degradation of proteins and nucleic acids. The catabolism of macromolecules during the later stages of petal senescence allows the plant to remobilize nutrients before the corolla is shed. While many genes involved in macromolecule degradation have been cloned and characterized, much less in known about nutrient remobilization. This study was designed to determine which nutrients are remobilized during pollination-induced corolla senescence and to determine how this process is controlled by plant hormones. Senescence in petunia flowers is associated with corolla wilting. While unpollinated flowers do not show senescence symptoms until approximately 8 days after opening, pollination accelerates corolla senescence and wilting is observed on day 2. Macronutrients and micronutrients were measured from corollas at various times after pollination. The senescence of pollinated flowers was associated with a decrease in the dry weight of the corolla, indicating that nutrients were being remobilized. C levels decreased by approximately 35% due to C recycling or tissue respiration. When comparing corollas on the day of flower opening to those that were completely wilted (very late senescence stage), the largest decreases were observed in the P and N content. P levels were reduced by 82% and N levels were reduced by 67%. Reductions of around 30% were detected for Fe, K and S, while the levels of Mg, Mo and Zn decreased by only 11-14%. This research contributes to our understanding of the molecular regulation of flower senescence. The ability to delay flower senescence will have an important impact on the floriculture industry by extending the postproduction shelf life of cut flowers, flowering potted plants, and bedding plants.
2.OARDC scientists found that fungal induction led to systemic accumulation of lignin, phenolic glycosides and stilbenes, whereas insect defoliation led only to an increase in germacrene D concentration in branch phloem. N availability affected the concentrations of only the phenolic glycosides. The experimental manipulation of the phenolic and terpenoid metabolic networks achieved in that study by biotic induction and differences in nutrient availability suggested that lignin, phenolic glycosides and stilbenes are important biochemical factors in the expression of SIR against the pathogen. Finally, in both years, total soluble protein content of foliage and phloem declined with increasing fertility while defensive protein activities (peroxidase, polyphenol oxidase, chitinase, b-1,3-glucanase) generally increased. When measured 3 weeks after induction, both insect damage and fungal infection systemically induced polyphenoloxidase activity in the phloem, but systemic chitinase activity declined with fungal infection. Additionally, fungal infection induced increases in total soluble protein content of the phloem. The roles of these defense proteins as evidenced by correlations between defense protein activities and fungal and insect performance were less clear, and were certainly influenced by the timeframe of our single sampling event. These finding will allow research scientist and the green industry to advance research in how to identify specific pathways to enhance disease and insect resistance in forest and landscape trees and to adopt rational horticultural and forestry management approaches.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
212	Pathogens and Nematodes Affecting Plants

Outcome #20

1. Outcome Measures

Contribute to the development of laboratory techniques and equipment that will further advance the field.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Petri dish is a standard laboratory item. All scientists need new and improved products to aid in gains in efficiency and effectiveness.

What has been done

A new Petri dish lid design was developed, to reduce condensation on the lids of the dishes, leading to easier visualization of the contents of the Petri dish.

Results

These lids will be useful for image collection and analysis work, and for general observation of the dish contents. Four different polymers and glass were evaluated. With the exception of glass, all polymers of sufficient thickness, led to reduction in condensation, which was quantified via image analysis. Thicker lids acted to buffer the dish lid from large temperature changes, which otherwise led to formation of condensation. The Petri dish lids may have a large general impact on the scientific community, if the technology is licensed and plates with the modified lids are manufactured. A full patent was filed for the new Petri dish lid design.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources

Outcome #21

1. Outcome Measures

Advance knowledge and practice related to bacteria that naturally suppress plant pathogens.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Information on the diversity, distribution, activity, and ecology of a group of bacterial that naturally suppress plant pathogens is most important to other researchers, companies interested in developing biological controls and/or biopesticides, and farmers, especially organic farmers who have limited seed treatment options.

What has been done

The OARDC project generated information on the diversity, distribution, activity, and ecology of a group of bacterial that naturally suppress plant pathogens.

Results

The work transformed understandings of the ecology of biocontrol bacteria. In one study a low-cost formulation for use as a corn and/or soybean seed treatment was developed and field tested. First, the work detailed the distribution of DAPG-producing pseudomonads on corn and soybeans grown throughout Ohio. It showed that multiple genotypes of DAPG can inhabit a single field, that the D-genotype throughout Ohio, that some minor genotypes tend to be crop specific, relative dominance persists regardless of the prevailing soil and climatic conditions, but that relative abundance can vary dramatically over time and space. Second, the project revealed that the response of native populations of biocontrol bacteria to farm management was reproducible from year to year, indicating that it may be possible to predict the influence of various cropping practices on beneficial soil microbes in much the same ways as the effects of such practices on pathogenic populations is already described. Third, compelling evidence that native populations of DAPG-producers naturally contribute to crop health was generated, filling a crucial gap in our understanding about when and how biocontrol occurs. The project also resulted in the generation of a low-cost seed treatment that provided substantial improvements in corn and soybean yields. This formulation is currently being assessed for commercial use.
Analyses of various additional field experiments indicate that the incidence and relative abundance of root-colonizing phlD+ Pseudomonas spp. were influenced by crop rotation, tillage, organic amendments, and chemical seed treatments in subtle but reproducible ways. In no-till corn plots, two-year rotations with soybeans resulted in plants with approximately two-fold fewer phlD+ pseudomonads per gram of root, but three-year rotations with oats and hay led to population increases of the same magnitude. Interestingly, tillage inverted these observed effects of cropping sequence in two consecutive growing seasons, indicating a complex but reproducible interaction between rotation and tillage on the rhizosphere abundance of DAPG-producers. Amending conventionally-managed sweet corn plots with dairy manure compost improved plant health and also increased the incidence of root colonization when compared to non-amended plots. Soil pH was negatively correlated to rhizosphere abundance of phlD pseudomonads in no-till and non-amended soils, with the exception of the continuous corn treatments. Chemical seed treatments intended to control fungal pathogens and insect pests on corn also led to more abundant populations of phlD in different tilled soils. But, increased root disease severity was generally associated with elevated levels of root colonization by phlD+ pseudomonads in no-till plots. Interestingly, within a cropping sequence treatment, correlations between the relative abundance of phlD and crop stand or yield were generally positive in corn plots and the strength of those correlations were greater in plots experiencing more root disease pressure. In contrast, such correlations were generally negative in soybeans, a difference that may be partially explained by difference in application of N fertilizers and soil pH. Our findings indicate that farming practices can alter the relative abundance and incidence of phlD+ pseudomonads in the rhizosphere and that practices that reduce root disease severity (i.e. rotation, tillage, and chemical seed treatment) are not universally linked to increased root colonization by DAPG-producers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
206	Basic Plant Biology
201	Plant Genome, Genetics, and Genetic Mechanisms
215	Biological Control of Pests Affecting Plants
205	Plant Management Systems

Outcome #22

1. Outcome Measures

Advance knowledge about the relationships among genomics, pathogens and food crops of the world.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1.Rice is the staple food for over half of the world population and the model plant for cereal functional genomics. Diseases caused by pathogens are a major threat to food security world-wide.
2. Understanding the molecular basis of host defense suppression by Phytophthora will result in basic conceptual advances in plant-microbe interactions that will facilitate novel sustainable strategies for the management of plant diseases.

What has been done

1. A thorough understanding of the molecular basis of the defense response to pathogens is essential for designing effective strategies to control the rice diseases. In this study, OARDC scientists conducted gene expression profiling of a set of 10 defense-related mutants using the rice 20K oligo arrays.
2. This OARDC study explored the interplay between host proteases of diverse catalytic families and pathogen inhibitors as a general defense-counterdefense process in plant-pathogen interactions.

Results

1. Comprehensive microarray analyses of the mutants led to classification of related mutants in several subgroups and identification of a set of novel genes that play important roles in disease resistance. The microarray information generated from this project is systematically cataloged and deposited on the NCBI-GEO database for public dissemination. The optimized array-based deletion detection method opens the door for development of rice mutants rapidly and cheaply. It can be also used as a means to characterize mutants that underlay a QTL. The outreach program has received wide attention on the CSU campus which be linked to other such programs to make them more effective and productive.
2. This study identified a novel class of molecules, protease inhibitors, that are secreted by Phytophthora during infection to disable host defense proteases. We also identified the tomato proteases that are targeted by these pathogen effectors. We showed that at least one these tomato proteases is important for defense against the late blight pathogen Phytophthora infestans. The study found that this protease is targeted by phylogenetically unrelated eukaryotic pathogens confirming a prediction of the guard hypothesis. Understanding the molecular basis of host defense suppression by Phytophthora will result in basic conceptual advances in plant-microbe interactions that will facilitate novel sustainable strategies for the management of plant diseases.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
212	Pathogens and Nematodes Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

By varying degrees each of the external factors had some impact on one or more research projects in this program.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Case Study
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #4

V(A). Planned Program (Summary)

1. Name of the Planned Program

Animal Systems-OARDC Led

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	20%		20%	
302	Nutrient Utilization in Animals	20%		20%	
303	Genetic Improvement of Animals	10%		10%	
304	Animal Genome	10%		10%	
307	Animal Management Systems	10%		10%	
308	Improved Animal Products (Before Harvest)	20%		20%	
311	Animal Diseases	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	13.5	0.0
Actual	0.0	0.0	12.5	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	1057427	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	2649943	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Outputs within this planned program are/will be: - online and in print research based publications targeted to (a) specific stakeholder groups, (b) support publics such as fellow agencies, political entities, (c) targeted populations, and (d) the broader general public, including mass media releases; - peer-reviewed journal articles; - commercialized techniques; - non-commericalized techniques that are distributed to those in need without costs (e.g. wetland construction techniques); - limited number of patents; - consultation services and meetings with stakeholders and supporters; - facilitation of training programs/workshops for other scientist and for specific groups of stakeholders, including international visitors; and - planning meeting with advisory groups to communicate findings and plan new research.

2. Brief description of the target audience

Targeted audiences are, but are not limited to: - specific individuals or groups who have expressed a need for food animal systems information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature. Often those requests are communicated to OARDC by an intermediary such as a staffer at a USDA office, NRCS, Ohio Department of Agriculture, or a county extension agent; - fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; - populations who have not requested the information but will likely benefit from that information, e.g. small or hobby farmers; - other scientists and scientific groups; - political entities; - extension personnel; - students for pre-school to post doctorate studies; - news organizations; and - business groups such as Farm Bureau or from commodity groups

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

NA

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	76	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- online and print research-based publications will be tracked in terms of number of hits on the web site and the numbers and sites for distribution of printed materials;

Year	Target	Actual
2007	12	14

Output #2

Output Measure

- peer-reviewed publications will be tracked in terms of name and tier of journal, as well as record of citations of the article;

Year	Target	Actual
2007	24	76

Output #3

Output Measure

- commercialized techniques will be tracked as to purchaser, number of adoptions, and by whom;

Year	Target	Actual
2007	0	0

Output #4

Output Measure

- non - commercialized techniques will be tracked as to number of adoptions, and by whom;

Year	Target	Actual
2007	1	1

Output #5

Output Measure

- patents by number and who partnered/purchased/commercialized;

Year	Target	Actual
2007	0	0

Output #6

Output Measure

- consultations with recipients and in what areas;

Year	Target	Actual
2007	5	7

Output #7

Output Measure

- training programs by how many of what type of stakeholder participated in what type of program; what non-OARDC organization helped to lead the training;

Year	Target	Actual
2007	3	5

Output #8

Output Measure

- planning meeting participation as to who(non-OARDC) participated at what level to help take a research project to the next level.

Year	Target	Actual
2007	2	8

Output #9

Output Measure

- Number of graduate students graduated and professional positions held

Year	Target	Actual
2007	6	23

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Improve reproduction efficiency and enhanced application of new technologies over the next five years to fully meet the competitive demands faced by OARDC,'s stakeholders in areas such as early maturation, estrus, fertility, and ovulation
2	Provide research finding within ten years that are needed to reverse the fertility decline in animal populations such as dairy
3	Increase nutrition utilization for the purpose of increased growth and quality of products commensurate with consumer demand
4	Improve nutritional utilization, performance, and efficiency to the point that savings will off-set increases in costs of animal food stocks
5	Show incremental gains annually in dietary research to increase utilization of food stocks (e.g. via better understanding of protozoal ecology), increase bioavailability of nutrients including trace minerals, and protect animal and human health
6	Meet the demand of fellow scientists and stakeholders within ten years for materials relating to genetics and breeding, including id of molecular markers for improved animal health and reproductively, and increased quality and quantity of products
7	Provide at minimum one new contribution annually to the body of literature that will positively food animal genetics, e.g. molecular techniques and materials to aid in identifying genetic codes of bacteria in that breaks down cellulose in cattle
8	Improve management for multiple animal farm types, including organics, that will produce higher yields for and lower costs to the producer and consumer and will allow the farmer to profit within a reasonable business plan
9	Annually advance modeling, decision-making, & alternative strategies to provide greater flow of needed information to food animal farmers to ensure business stability, including forage based cattle and niche market demands
10	Advance preharvest research over five years to the extent that new technologies are being adopted and showing profitability in area such as improved muscle growth, quality of meat, tenderness, lower fat in dairy products, etc.
11	Animal disease researchers will continue to serve on first responder teams when stakeholders have an immediate disease problem
12	Animal disease researchers will provide the necessary research to inform producers in a timely manner how to protect against known and present diseases, e.g. bovine mastitis
13	Animal disease researchers will advance the research frontiers in emerging disease investigations to the extent that OARDC continues to serve as a center for excellence
14	Reduce environmental impacts of the food animal industry.
15	Alternative nutrition strategies have the potential to impact business decisions in the animal industry.
16	Animal disease research and impacts on human health will be advanced.
17	Interventions to promote animal health and welfare will be advanced though scientific inquiry.

Outcome #1

1. Outcome Measures

Improve reproduction efficiency and enhanced application of new technologies over the next five years to fully meet the competitive demands faced by OARDC,'s stakeholders in areas such as early maturation, estrus, fertility, and ovulation

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Questions related to the impact of utilization of products such as serum insulin-like growth factor I (IGF-I) concentration in cattle have potential to improve both industry returns on investment and consumer supply of quality meat.

What has been done

A divergent selection experiment involving serum insulin-like growth factor I (IGF-I) concentration in Angus cattle was initiated in 1989 at the OARDC Eastern Agricultural Research Station with final reporting in 2007.

Results

Results of these studies demonstrate that high serum IGF-I concentration is associated with decreased age of heifers at first calving, increased calving rates in heifers and cows, and increased scrotal circumference and percentage of motile sperm cells in yearling bulls. Therefore, genetic improvement in reproductive traits of cattle can be enhanced by including serum IGF-I concentration in selection programs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
304	Animal Genome

Outcome #2

1. Outcome Measures

Provide research finding within ten years that are needed to reverse the fertility decline in animal populations such as dairy

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Research that critically investigates factors which are limiting to the success of the presently available programs and developing modifications of these programs to increase fertility of the synchronized ovulation/estrus are needed by the industry.

What has been done

There are several estrous synchronization systems available to beef producers who wish to incorporate AI into their management practices. If these estrous synchronization programs are used on cows appropriate for the specific program, most will result in pregnancy rates of 45 to 60%. Therefore, our research relative to this objective has focused on critically investigating factors which are limiting the success of the presently available programs and developing modifications of these programs to increase fertility of the synchronized ovulation/estrus.

Results

OARDC scientists have demonstrated that shortening the interval from follicle wave emergence to regression of the CL (or withdrawal of an exogenous progestin) and extending the interval to timed AI increases timed AI pregnancy rate by greater than 10% in beef cows. It has been hypothesized that this is due to greater gonadotropic support of the ovulatory follicle leading to increased steroidogenesis by the ovulatory follicle and resulting CL. Subsequent research will continue to target the overall objective of investigating factors which are limiting the fertility in presently available estrous synchronization programs. The results of these experiments have led to development of a more effective estrous synchronization program that is being adopted in the beef cattle industry.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals

Outcome #3

1. Outcome Measures

Increase nutrition utilization for the purpose of increased growth and quality of products commensurate with consumer demand

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The effects of breed, weaning age and post-weaning diet on cattle health, growth rate, efficiency of gain, and carcass characteristics are areas of inquiry that is needed by stakeholders.

What has been done

A series of cattle feeding experiments have been conducted at OADC to assess the effects of breed, weaning age and post-weaning diet on cattle health, growth rate, efficiency of gain, and carcass and characteristics. Two completed studies have looked at the differences in growth rate, efficiency of growth, carcass characteristics, and meat fat content and tenderness attributes.

Results

Results of the experiment to determine the effects of weaning age and post-weaning diet and management with Angus steers showed that if Angus cattle are marketed on a live weight basis, there may be benefits from marketing cattle that have been placed into the feedlot as yearlings, compared with Angus steers weaned at 100 days of age or 205 days of age and immediately started on a high-grain feedlot diet, if forage costs from weaning until feedlot entry are minimal with the yearling feedlot entry steers. This is due to the reduction in total pounds of concentrate required to finish the cattle to harvest weight and the increase in harvest weight as cattle are placed into the feedlot at an older age. The major decision points regarding age-at-weaning and the management of Charolais x Anguscalves should be cost of feed, expected harvest weight, and expected date of harvest as carcass prices vary by month in a relatively predictable manner.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
307	Animal Management Systems

Outcome #4

1. Outcome Measures

Improve nutritional utilization, performance, and efficiency to the point that savings will off-set increases in costs of animal food stocks

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Improvements in the swine industry are key to maintaining optimally priced, high quality food for US consumption and for export.

What has been done

Barrows and gilts of two genetic lines were used to evaluate differences in phenotypic, body tissue weights, and body composition differences between these animals from 20 to 125 kg body weight. The body composition and tissue weight data from barrrows and gilts as well as the two genetic lines (low and high lean pigs) generated data using some of the common genetic materials available today in the swine industry

Results

These findings provides valuable data for modeling pig growth and nutrient requirements at various stages of the pig from 20 to 125 kg body weight. The published work (collaborative with NCCR042) conducted with B vitamin supplemental levels demonstrated that excess vitamins are not necessary for the modern high lean pig. Most feed industry personnel and many university extension personnel have recommended levels of 200 to 1000% over NRC requirements. This research clearly shows that such levels are unnecessary but are costly. Implementation of this research will save the swine producers millions of dollars annually.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
308	Improved Animal Products (Before Harvest)

Outcome #5

1. Outcome Measures

Show incremental gains annually in dietary research to increase utilization of food stocks (e.g. via better understanding of protozoal ecology), increase bioavailability of nutrients including trace minerals, and protect animal and human health

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Protozoal ecology is a major determinant of the efficiency of conversion of dietary protein into microbial protein produced in the rumen and then flowing to the small intestine for absorption of amino acids for subsequent metabolism by the cow's tissues. All sectors of the industry and the scientific community need science based information on this subject.

What has been done

Because protozoa can promote excessive wastage of dietary protein and recycling of microbial protein in the rumen, OARDC development of a novel procedure to quantify protozoa allows researchers to evaluate dietary factors influencing both the synthesis and outflow of microbial protein in the rumen.

Results

This study has demonstrated that changing the culture conditions to hasten cell division and protein synthesis supports our contention that protozoa are less detrimental to efficient conversion of dietary protein to metabolizable amino acids than thought previously. Ultimately, this information will improve the accuracy and precision of computer models to better meet the cow's needs for absorbed amino acids while reducing the amount of dietary protein fed and without affecting profitability of production of milk protein and butterfat.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
308	Improved Animal Products (Before Harvest)

Outcome #6

1. Outcome Measures

Meet the demand of fellow scientists and stakeholders within ten years for materials relating to genetics and breeding, including id of molecular markers for improved animal health and reproductively, and increased quality and quantity of products

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

All sectors of the poultry industry from producers to consumers are interested in higher quality, competitively priced products.

What has been done

Forty generations of selection has been completed in the line (F) of turkeys selected long-term for increased 16-wk body weight and the base population (RBC2) has been maintained along with the F line as a random bred control.

Results

Recent studies have shown that the major gains in performance by the turkey industry is due to genetic improvement such as the improvements demonstrated in this OARDC study. Current OARDC research has shown that muscle growth is regulated by genetics leading to breeding birds that grow faster with the desired meat qualities. The value to the poultry industry in
Ohio is $3.3 billion.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
308	Improved Animal Products (Before Harvest)

Outcome #7

1. Outcome Measures
Provide at minimum one new contribution annually to the body of literature that will positively food animal genetics, e.g. molecular techniques and materials to aid in identifying genetic codes of bacteria in that breaks down cellulose in cattle

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Increased understanding of gene encoding of protozoal ribosomal RNA is important to both basic science and to better inform the industry as to potential efficiencies.

What has been done

OARDC scientists have developed a procedure to quantify copies of the gene encoding protozoal ribosomal RNA.

Results

The study resulted in a harvesting method to obtain a protozoal standard that reduced non-associated bacterial contamination by 33 fold compared with a conventional method. This resulted in a 93 and 95% reduction in the contamination of bacterial RNA and nitrogen (N), respectively, in fractions that concentrate protozoa for chemical analysis. Using this novel assay plus the most common assay (total RNA) as microbial markers, the study derived a novel procedure to quantify duodenal flow of protozoal N separate from bacterial N. The study documented how increasing passage rate (which occurs with increased feed intake) and decreasing pH in the rumen (which occurs when more grain is fed) increases the outflow of these trans intermediates in continuous culture. Also noted were similar trends in dairy cattle fed soybean oil but especially fish oil. In a production trial with 60 lactating dairy cows, the study documented that processing of whole cottonseed depresses milk fat production, which was associated with increased concentration of trans 10 isomers. In another study, coconut oil suppressed protozoal populations by 90% but also depressed feed intake by 20% and did not improve the efficiency of microbial protein synthesis in the rumen.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals

Outcome #8

1. Outcome Measures

Improve management for multiple animal farm types, including organics, that will produce higher yields for and lower costs to the producer and consumer and will allow the farmer to profit within a reasonable business plan

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Aquaculture is a growing food animal sector that has great economic promise, as well as increased commodity supply potential, if production efficiencies can be made.

What has been done

OARDC has advanced the genetic improvement program of yellow perch; approximately 800 best fish were selected from 24,000 fish of 2005 year-class families as broodfish of the next generation. Genotyping for selected broodfish from the 2005 year-class was completed using microsatellite analysis. Combined genetic relatedness analysis of selected 2004 and 2005 class fish was completed and a large color-coded chart of relatedness was constructed in spring 2007.

Results

By crossing selected broodfish of 2004 and 2005 year-class based on the chart, five improved lines with approximately 105,000 fingerlings were achieved. The selected first generation of superior broodfish consolidated the foundation for a marker-assisted breeding program for yellow perch. A superior growth rate of 25-54% of improved lines vs. controls shows a great promise for the breeding program and potential impact on the yellow perch industry. Additional research into commercially grown bluegill demonstrated that the establishment of XY female bluegill population will allow development of a YY-male broodstock population. Progeny from this broodstock will be entirely male and are expected to grow 30-50% faster than mixed-gender population. From both studies aquaculturalists are adapting the new findings to their industry.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals

307	Animal Management Systems

Outcome #9

1. Outcome Measures

Annually advance modeling, decision-making, & alternative strategies to provide greater flow of needed information to food animal farmers to ensure business stability, including forage based cattle and niche market demands

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Production of fish for as both food and sport fish requires a sophisticated level of understanding, not the least in the area of nutrition.

What has been done

OARDC scientists used triplicate groups of juvenile rainbow trout that were fed four experimental gelatin-casein based diets containing different fatty acid levels for 8 weeks.

Results

The results indicate that compounds such as soybean phospholipids provided at very high levels, never tested before, have growth enhancing effects in rainbow trout juveniles. The compounds of interest would have high polarity and can be added to starter diets possibly in many other fish species. In a followup experiment with indispensable amino acid imbalanced diets the scientists demonstrated feed intake enhancing effect and consequently growth promoting results of a new feeding strategy that encompass switching diets with imbalanced amino acids. We continued to explore the function of lipoic acid, a substance with enormous potential in fish feeds because this compound has an antioxidant capacity that might prevent deterioration of many susceptible dietary compounds and consequently increase resistance against stress and/or diseases. The study provided the first evidence that lipoic acid might be conditionally indispensable in young fish diets.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
302	Nutrient Utilization in Animals
301	Reproductive Performance of Animals

Outcome #10

1. Outcome Measures

Advance preharvest research over five years to the extent that new technologies are being adopted and showing profitability in area such as improved muscle growth, quality of meat, tenderness, lower fat in dairy products, etc.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Pork is a major component within the American diet and is an important export food commodity. Growing the knowledge base regarding selection
criteria for pork quality is important to the producer decision frame.

On another front discovering strategies or markers for the meat tenderness and quality has the potential to significantly advance the food animal industry.

What has been done

To help inform this issue, data from generation three of the Landrace pork quality selection experiment were collected and analyzed to determine the
effect of the selection project. Generation four progeny within the two replications were farrowed in 2007.

OARDC has identified proteins/peptides associated with and predictive of beef carcass tenderness, processed meat quality and the mechanisms underpinning skeletal muscle growth, development, and meat quality.

Results

Landrace swine produced as a function of selection of parents based on Estimated Breeding Values for Pork Color showed an improvement in loin
color when compard with progeny from control, non-selectd progeny. However, concommittant with the improved color (darker color), the progeny from the selected line had greater levels of backfat and had less loin muscle area than the control line progeny. These data indicate an antagonistic relationship between carcass lean content and quality in Landrace swine.

OARDC studies have demonstrated a strategy capable of identifying protein/peptide bands associated with and predictive of beef carcass tenderness and the quality of processed meat products. In addition, these same results demonstrate that the strategy is able to associate bovine myosin heavy chain/bovine light chain isoform composition with tenderness. We have demonstrated the role of myosin light chain 1 in the 3-dimensional structure of postmortem muscle as it relates to the proteolytic events causing resolution of rigor. Strategies developed as a result of this funding has been employed to investigate the mechanisms of poultry muscle growth and development. Our data also shows that different populations of adipocytes from the surface of muscle seems to exert strong control over the growth of both myocytes and other classes of adipocytes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
308	Improved Animal Products (Before Harvest)
301	Reproductive Performance of Animals

Outcome #11

1. Outcome Measures

Animal disease researchers will continue to serve on first responder teams
when stakeholders have an immediate disease problem

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Increased animal production and decline in the numbers of producers in the U.S. have led to megascale livestock operations. The confinement of animals on relatively small land areas has resulted in the accumulation and need for disposal of large amounts of animal wastes worldwide. Among the most common causes of viral infectious diarrhea in pigs, porcine noroviruses (PoNoVs), porcine sapoviruses (PoSaVs), and rotaviruses [(RVs)-group A, B and C] are of particular concern because of their environmental stability, resistance to disinfectants and prolonged infectivity in feces. With a greater opportunity for horizontal spread of infectious agents among closely confined animals, manure contains pathogens that can be transmitted to other animals, to farm workers or to the public via contaminated meat products, vegetables or water sources.

What has been done

Storage and treatment of animal waste before land application are typically done in wastewater lagoons. Several alternative candidate Environmentally Superior Technologies (ESTs) for animal waste treatment have been developed for treatment of animal wastes to reduce their impact on the environment, the food supply and public health. We collaborated with researchers at NC State University, to characterize swine enteric viruses (PoNoV, PoSaV, RV-A, B and C) in fresh feces or manure and evaluate the effects of different candidate ESTs for animal waste treatment on their detection. Untreated manure and samples collected at different stages during and after treatment were obtained from swine farms with conventional waste management (CWM) and 5 different candidate ESTs: Aerobic Up Flow Biofiltration System (AUFBS), Constructed Wetland System (CWS), Super Soil System (SSS), High Rise House System (HRHS), and In Ground Ambient Temperature Anaerobic Digester System (ATAD).

Results

RNA from porcine enteric viruses was detected by RT-PCR and cell-culture inmunofluorescence (CCIF) and inoculation of Gnotobiotic (Gn) pigs were used to determine RV-A/C infectivity in post-treatment samples. PoSaV, RV-A and RV-C were detected in 83%, 70% and 51% of pre-treatment samples, respectively. The PoSaV and RV-A were detected in pre-treatment samples from each farm, whereas PoNoV and RV-C were detected in pre-treatment feces from 3/5 or 4/5 candidate ESTs, respectively. After treatment PoSaV RNA was only detected in the CWM, and not from the candidate ESTs. Rotavirus-A and C RNA was detected in 4/5 and 3/4 candidate ESTs after treatment (not detectable from ATAD samples), but infectious particles were not detected by CCIF, nor were clinical signs or seroconversion detected in inoculated Gn pigs. These results indicate that only RV-A/C RNA, but no viral infectivity was detected after treatments.

Our findings address a public health concern regarding environmental quality surrounding swine production units. Although only one candidate EST (ATAD) reduced virus concentrations to undetectable levels as evaluated by molecular techniques, all the technologies tested were effective in reducing virus infectivity as evaluated by virus infectivity assay (CCIF) and Gn pig inoculation. However these findings should also be evaluated in consideration of the ability of each technology to reduce the impact of other factors (organic and inorganic residues, bacterial pathogens, ammonia volatilization, etc) on the environment.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
307	Animal Management Systems

Outcome #12

1. Outcome Measures

Animal disease researchers will provide the necessary research to inform producers in a timely manner how to protect against known and present diseases, e.g. bovine mastitis

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Infectious bursal disease virus (IBDV) is a major threat to the US food system and to certain food exports.

What has been done

Twenty flocks of chickens were sampled for infectious bursal disease virus (IBDV) and served as the study sample.

Results

All the samples were found to be positive for infectious bursal disease virus (IBDV) by reverse transcriptase-polymerase chain reaction (RT-PCR). he study results demonstrate that pathogenic IBDV was isolated from layer chicken flocks and the molecular data indicates these viruses are classic strains. Isolation of these viruses from layer chicken flocks that had been vaccinated for the classic antigenic strain suggests the vaccination programs or vaccine delivery was not effective. Genetic sequences and phylogenic analysis indicated that three of the viruses were similar to classic IBDV vaccine strains. Although there is a potential risk that live-attenuated IBD vaccines can revert to a virulent phenotype, more work is needed to determine if the viruses isolated in this study evolved from a vaccine strain. The results indicate when monitoring chicken flocks for pathogenic IBDV strains, those viruses with vaccine-like genotypes should be tested in vivo for virulence.

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
311	Animal Diseases

Outcome #13

1. Outcome Measures

Animal disease researchers will advance the research frontiers in emerging disease investigations to the extent that OARDC continues to serve as a center for excellence

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Pathogens within food animals have potential to impact both the animal industry and the consumer.

What has been done

Multi-disciplinary (Food Science, Veterinary Medicine, Bacterial Ecology, Plant Pathology, Horticulture and Crop Science, Human Behavoir, etc) teams were formed to address complex issues continually emerging in food safety.

Results

. Pathogens that contaminate the food supply have been better characterized. Specifically, these studies provide insight in to the emergence and evolution of pathogens in the food chain. For example, we have identified that antibiotic resistance genes may be transferred by bacteriophage among strains of Salmonella, that not Escherichia coli O157 are of equal pathogenic potential, and that management factors (antibiotic use, stocking density) on farms may impact the prevalence of Salmonella in pigs. In addition the distribution of pathogenic organisms in wildlife was reported. European starlings can readily acquire E. coli O157 from bovine sources and subsequently serve as a vector for dissemination of this pathogen to cattle farms, and possibly also to fields were crops are grown.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
308	Improved Animal Products (Before Harvest)

Outcome #14

1. Outcome Measures

Reduce environmental impacts of the food animal industry.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Environmental impacts from the food animal industry have both economic and social costs; reduction of such impacts benefits both the industry and society as a whole.

What has been done

This OARDC experiment showed that changing from a high alfalfa diet to a diet high in corn silage could reduce manure output by dairy cows by more than 10%.

Results

Increasing the concentration of starch from 22 up to 30% of the diet would reduce manure production by an additional 9%. These two factors were independent, thereby increasing corn silage and increasing starch could reduce manure output by almost 20%. As expected the amount of ammonia produced from manure increased as cows were fed more protein but we found that by feeding a diet just adequate in protein plus high starch and high alfalfa the amount of ammonia produced from manure (on a per cow basis) could be reduced by almost 50% with no effect on milk production. Since increasing alfalfa was associated with increased manure output, to reduce ammonia produced from manure the farmer will have to compromise and formulate diets that probably will lead to an increase in total manure output (the increase was entirely water). Overall this experiment clearly showed that the environmental impact of dairy farming could be reduced substantially with no effect on milk production an virtually no effect on feed costs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
307	Animal Management Systems

Outcome #15

1. Outcome Measures

Alternative nutrition strategies have the potential to impact business decisions in the animal industry.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alternative nutrition strategies have the potential to impact business decisions in the animal industry yielding higher profitability, healthier animals, and or improved product and pricing.

What has been done

The objectives were to add Liquid Feed (LF) at two concentrations while reducing non-fiber carbohydrate (NFC) concentration to optimize the use of LF in dairy rations. Diets had 30% corn silage, 15 % chopped alfalfa hay, and 8% whole cottonseeds (21% forage NDF, neutral detergent fiber). A control was balanced for 40% NFC. Two diets with 3.25% LF (dry matter basis) had 40 or 37 % NFC. Two more 37% NFC diets had 6.5% LF, but the second also had R at 11.5 g/909kg of dry matter in the diet. Diets contained similar crude protein to formulations (17.3%). Treatments lasted 12 wk after an initial 2-wk covariate period.

Results

Liquid feeds (LF) reduce forage particle sorting, improve palatability, and increase energy density of TMR. However, excess sugars could promote rumen acidosis or could reduce milk fat production, particularly if combined with Rumensin (R). Liquid feeds containing molasses help reduce sorting behavior by dairy cows. Therefore, more cows in a group consume the components of the total diet more uniformly in between feedings, which helps to reduce rumen acidosis and metabolic problems. However, over consumption of sugars (a major component of liquid feeds) can negate these benefits and cause rumen acidosis. Decreasing rumen pH can depress milk fat percentage, and a combination of low pH with supplemental unsaturated fat plus Rumensin can further exacerbate milk fat depression. The liquid feed used in our trial did not promote milk fat depression when the dietary non-fiber carbohydrates were diluted, even when Rumensin was fed. In fact, liquid feeds improved palatability of the diets and promoted feed intake, which increased milk fat production. These findings can be used by nutrition advisors in the dairy sector to improve feed efficiency and profitability because milk fat depression can decrease profit margin by up to one-third.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
307	Animal Management Systems

Outcome #16

1. Outcome Measures

Animal disease research and impacts on human health will be advanced.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Campylobacter jejuni is the leading cause of food-borne bacterial gastroenteritis in humans in the US. Infectious bursal disease virus (IBDV) causes an immunosuppressive disease in young chickens

What has been done

The goal of this project is to analyze a possible role of IBDV-induced immunosuppression in colonization and shedding of C. jejuni in chickens. Understanding the mechanism of C. jejuni infection in poultry is critical to eliminating the risk to public health. It is crucial to develop strategies for C. jejuni prevention and/or eradication at the farm level. A second goal is to advance research techniques with the specific objectives of 1) To generate a bioluminescent strain of C. jejuni for in vivo real-time pathogenesis, and 2) To determine C. jejuni pathogenesis temporally in real-time in chickens.

Results

Control of IBDV infections in chickens may be an advantageous step in the prevention/eradication process of foodborne bacteria such as Campylobacter spp and Salmonella spp. Devising an approach to reduce the threat of immunosuppressive agents may be necessary to control and prevent C. jejuni infection and shedding in poultry. The results of these studies demonstrated that IBDV infection exacerbated colonization and shedding of C. jejuni, presumably through the immune suppression this virus causes in chickens. It highlights the need for further investigation into the role of immunosuppression in preharvest control strategies for foodborne disease causing agents. Specific research techniques have been investigated. Currently there are no effective methods available to control Campylobacter in poultry. Understanding the pathophysiology of Campylobacter in chickens is an important first step towards developing rational control measures. We hypothesize that use of bioluminescent C. jejuni coupled with real-time imaging will provide a rational and unabridged approach to study C. jejuni colonization in chickens. The proposed work would enable us to visualize temporally in real-time the 1) dynamics of C. jejuni association with different parts of intestinal tissues in chickens; particularly, the nature of its survival within the intestinal tissues (lumen or mucus layer of crypts or epithelial cells) and 2) dynamics of C. jejuni colonization of extra-intestinal tissues; whether, colonization of C. jejuni in extra-intestinal tissues serves as a source for re-infection of the intestinal tract thus leading to its persistence and shedding. Towards this end we have generated number of plasmid constructs to deliver the bioluminescence encoding lux genes into campylobacter. This would enable us to isolate a C. jejuni strain that constitutively exhibits strong bioluminescence, colonizes, persists and sheds similar to its parental strain in chickens.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

Outcome #17

1. Outcome Measures

Interventions to promote animal health and welfare will be advanced though scientific inquiry.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A commercial vaccine strain of H3N2 influenza virus was found to be antigenically and genetically very different from H3N2 viruses currently circulating in commercial turkeys. Field evidence has indicated lack of protection from egg production drops in flocks vaccinated with that vaccine when the birds were naturally exposed to field challenge with the H3N2 virus. Produces, distributors, consumers, and the scientific community benefit from this knowledge.

What has been done

A commercial vaccine strain of H3N2 influenza virus was found to be antigenically and genetically very different from H3N2 viruses currently circulating in commercial turkeys. Field evidence has indicated lack of protection from egg production drops in flocks vaccinated with that vaccine when the birds were naturally exposed to field challenge with the H3N2 virus.

Results

In 2006, OARDC scientists reported on the interspecies transmission of A/turkey/OH/ 313053 strain between turkeys and swine, and its lack of transmissibility to chickens and lack of infectivity to ducks. To follow up, scientists examined the intraspecies transmissibility of the A/turkey/OH/ 313053 in turkeys. The virus replicated in 90% of the inoculated turkeys and transmitted to more than 70% of the contact turkeys. One strain (A/turkey/OH/313053/04) was rescued using the reverse genetic techniques. All the genes of two other strains (A/swine/North Carolina/03 and A/turkey/North Carolina/03) were cloned into the transcriptional vector PHH21 and the rescuing experiments are under way. Six genes (PB2, HA, NP, NA, M and NS) of the A/turkey/Illinois/04 were cloned into PHH21 and the work is being continued to clone the rest of the genes (PB1 and PA). These finding are fundamental to advancing knowledge in this area and protecting this sector of the food supply.

The results point to the importance of using live virus strains that are antigenically similar to circulating field strains. The A/turkey/OH/313053 virus is highly infectious and transmissible in turkeys. Hence, producers should be aware of the possible impact of that virus. Using reverse genetics, a better understanding of genetic basis for the virus important biological activities will be gained and development of vaccines will be facilitated.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

Economy is the primary external factor, primarily lack of base funding to support experiment station scientists who are available 24/7 to followup and assist producers when unforeseen infections occur.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Case Study
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #5

V(A). Planned Program (Summary)

1. Name of the Planned Program

Food, Agricultural, and Biological Engineering Systems-OARDC Led

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
401	Structures, Facilities, and General Purpose Farm Supplies	20%		20%	
402	Engineering Systems and Equipment	30%		30%	
403	Waste Disposal, Recycling, and Reuse	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	4.0	0.0
Actual	0.0	0.0	4.1	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	321581	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	529040	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Outputs within this planned program are/will be: - online and in print research based publications targeted to (a) specific stakeholder groups, (b) support publics such as fellow agencies, political entities, (c) targeted populations, and (d) the broader general public, including mass media releases; - peer-reviewed journal articles; - commercialized techniques; - non-commericalized techniques that are distributed to those in need without costs (e.g. wetland construction techniques); - limited number of patents; - consultation services and meetings with stakeholders and supporters; - facilitation of training programs/workshops for other scientist and for specific groups of stakeholders, including international visitors; and - planning meeting with advisory groups to communicate findings and plan new research.

2. Brief description of the target audience

Targeted audiences are, but not limited to: - specific individuals or groups who have expressed a need for engineering information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature. Often those requests are communicated to OARDC by an intermediary such as a staffer at a USDA office, NRCS, Ohio Department of Agriculture, Soil and Water Conservation Districts or a county extension agent; - fellow academic units that rely on engineers to create systems and processes needed to support not only the research, but also the adoption of the research findings by stakeholders - fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; - populations who have not requested the information but will likely benefit from that information, e.g. recreational large animal owners; - other scientists and scientific groups; - political entities; - extension personnel; - students for pre-school to post doctorate studies; - news organizations; and - business groups such as small town administrators, county commissioners, or commodity groups

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	17	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- •number of graduate students graduated and professional positions held

Year	Target	Actual
2007	2	18

Output #2

Output Measure

- •online and print research-based engineering publications will be tracked in terms of number of hits on the web site and the numbers and sites for distribution of printed materials;

Year	Target	Actual
2007	3	3

Output #3

Output Measure

- •peer-reviewed publications will be tracked in terms of name and tier of journal, as well as record of citations of the article

Year	Target	Actual
2007	7	17

Output #4

Output Measure

- •commercialized engineering techniques will be tracked as to purchaser, number of adoptions, and by whom;

Year	Target	Actual
2007	0	0

Output #5

Output Measure

- •non - commercialized engineering techniques will be tracked as to number of adoptions, and by whom;

Year	Target	Actual
2007	1	2

Output #6

Output Measure

- •patents by number and who partnered/purchased/commercialized;

Year	Target	Actual
2007	0	0

Output #7

Output Measure

- ,•consultations with recipients and in what areas;

Year	Target	Actual
2007	5	7

Output #8

Output Measure

- •training programs by how many of what type of stakeholder participated in what type of program; what non-OARDC organization helped to lead the training;

Year	Target	Actual
2007	3	5

Output #9

Output Measure

- ,•planning meeting participation as to who(non-OARDC) participated at what level to help take a research project to the next level.

Year	Target	Actual
2007	2	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	- provide appropriate facilities and engineering processes commensurate with stakeholders demand to the extent that they have all the information necessary for making adoption decisions
2	- provide appropriate facilities and engineering processes commensurate with fellow research units demands necessary to inform their research efforts in a timely manner
3	- develop enhanced systems to support integrated plant growth systems that will annually result in increased productivity at reduced costs for the industry
4	- improve systems to that will permit small farmers to take advantage of alternatives to traditional commodity crops at a rate commensurate with demand, with an expectation of at least three economically successful adoptions per year
5	- improve mechanical devices and instrumentation needed by stakeholders to the extent that no less than one patent is awarded within each five year period
6	- develop improved systems to aid in meeting new or yet to emerge or novel needs and annually demonstrate progress to at least one stakeholder group or publish a peer-reviewed journal article of the results
7	- advance development of state of the art integrated waste management systems to the extent that OARDC and Ohio are viewed as one of the top ten programs/states in this area nationally
8	- advance the knowledge of ecological based engineered systems for waste management to the extent within five years that, where cost effective and appropriate, they will be adopted over mechanical systems
9	- aid rural stakeholders through research and extension with onsite waste disposal systems to the extent that within ten years 95% of all rural Ohio onsite waste management systems meet state standards -

Outcome #1

1. Outcome Measures

- provide appropriate facilities and engineering processes commensurate with stakeholders demand to the extent that they have all the information necessary for making adoption decisions

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Biological pesticides are receiving increased attention as benevolent alternatives to conventional chemical pesticides. In contrast to chemical pesticides, biopesticides are living systems, which introduce additional challenges with respect to formulation and delivery because the biological agents must remain viable during the application process to be effective.

What has been done

OARDC scientists have improved the delivery system of these biological agents to the extent that they do remain viable during the application process and are effective.

Results

During passage through the different equipment components of a conventional agricultural spray application system, a suspension will experience constricted flow. The objective of the study was to study important physical factors within a conventional agricultural spray system to begin identifying the equipment characteristics and operating conditions that are least detrimental to a benchmark biological pesticide, entomopathogenic nematodes (EPNs). Results show that extensive recirculation of the tank mix can cause considerable increases in the liquid temperature. Diaphragm and roller pumps (low-capacity pumps) are better suited for use with biopesticides compared to the centrifugal pump, which was found to contribute significant heat to the spray system. Dissemination of this information to communities of interest has been done through presentations at international conferences (ASABE, International Crop Protection Conference, Beijing), and at in-service training programs for County Extension Educators in Ohio. Findings from this research will help applicators of biological pesticides identify the proper nozzle size and type, proper sprayer pump, and the maximum spray pressures that will be best for four types of biological pesticides (entomopathogenic nematodes).

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment

Outcome #2

1. Outcome Measures

- provide appropriate facilities and engineering processes commensurate with fellow research units demands necessary to inform their research efforts in a timely manner

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

For animal science research and the animal industry to prosper, ammonia impacts on air quality must be understood and mitigated.

What has been done

OARDC scientists have developed a tool based on an innovative mass balance approach to predicting ammonia -nitrogen (NH3-N) emissions from livestock facilities

Results

Baseline air quality and emission information about Ohio animal facilities have helped to resolve the rising air quality issues and concerns. The data from this study will also help regulatory agency to form appropriate regulations on air quality and air emission from animal feeding operations. The ammonia estimation tool will supply the Ohio livestock industries with a powerful on-farm NH3 management tool with which will lead to efficient management of NH3 emissions, adoption of management practices and mitigation technologies, reduction of environmental and health impacts of the industries, increased manure value, and viable and sustainable production operations.

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
401	Structures, Facilities, and General Purpose Farm Supplies

Outcome #3

1. Outcome Measures

- develop enhanced systems to support integrated plant growth systems that will annually result in increased productivity at reduced costs for the industry

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse

Outcome #4

1. Outcome Measures

- improve systems to that will permit small farmers to take advantage of alternatives to traditional commodity crops at a rate commensurate with demand, with an expectation of at least three economically successful adoptions per year

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse

Outcome #5

1. Outcome Measures

- improve mechanical devices and instrumentation needed by stakeholders to the extent that no less than one patent is awarded within each five year period

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
401	Structures, Facilities, and General Purpose Farm Supplies
403	Waste Disposal, Recycling, and Reuse
402	Engineering Systems and Equipment

Outcome #6

1. Outcome Measures
- develop improved systems to aid in meeting new or yet to emerge or novel needs and annually demonstrate progress to at least one stakeholder group or publish a peer-reviewed journal article of the results

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
402	Engineering Systems and Equipment
401	Structures, Facilities, and General Purpose Farm Supplies

Outcome #7

1. Outcome Measures

- advance development of state of the art integrated waste management systems to the extent that OARDC and Ohio are viewed as one of the top ten programs/states in this area nationally

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1. Wastewater from animal processing facilities can pose an environmental hazard and without economical and ecological acceptable processing facilities, the industry is at risk.
2. Mixing gypsum with dairy manure or biosolids and nitrogen release during composting appear to be associated and have merit for improving composting, thus reducing environmental impact.

What has been done

1. The feasibility of treating turkey processing wastewater using fixed film column bioreactors that contained either sand layers or a combination of sand and textile layers were evaluated.
2.Impact of mixing gypsum with dairy manure or biosolids on nitrogen release during composting was investigated.

Results

1. OARDC scientists, in order to assess a new wastewater bioreactor treatment technology, passed wastewater samples initially containing 1,010-2,360 mg COD/L and 463-1,250 mg BOD5/L through bioreactors at 1.5 gallons/ft2/day. The bioreactors reached >95% and >99% removal of COD and BOD5, respectively, within one month of operation. The stable performance data showed that biofilm microorganisms in the bioreactors maintained their activity for over ten months of operation. There was no evidence for clogging of the bioreactors during this study. The first pilot treatment plant in Ohio was constructed and put into operation at a turkey processing plant in Harrison, Ohio. The OSU design was used and results mirror the laboratory findings. Planning is underway to construct a full size treatment plant. This research effort kept the plant from closing saving 130 jobs in rural Ohio.
2.Results showed loss of ammonia-N was essentially complete after seven days and ranged from 6.4% for the zero rate control to 2.6-2.8% for the gypsum treatments of 0, 6%, 13% and 23% (dry weight, w/w). Further studies conducted in 210-liter stainless steel vessels over a 28-day period using dairy manure and biosolids treated with or without 17% gypsum (dry weight, w/w) revealed the amount of N lost, as a percentage of that originally present in the compost mix, was 7.27% and 15.6% without gypsum for dairy manure and biosolids, respectively, and 3.62% and 13.6% with gypsum. The difference between the dairy manure and biosolids results is attributed primarily to a lower C:N ratio of the biosolids compared to the dairy manure. Reduced risk of nitrogen loss during composting of animal manures or biosolids by showing that addition of gypsum could be effective as an ammonia control agent.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
402	Engineering Systems and Equipment

Outcome #8

1. Outcome Measures

- advance the knowledge of ecological based engineered systems for waste management to the extent within five years that, where cost effective and appropriate, they will be adopted over mechanical systems

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ecological based engineer systems hold great promise for supporting the goals of sustainable agriculture.

What has been done

Natural treatment systems, including anaerobic digesters, can reduce nutrient levels from many types of ecosystems. Multiple stategies have been explored.

Results

OARDC scientists in this area of study have (1) determined which plant species best encourage nitrogen removal in low-cost ecological systems treating waste water; (2) determined how low-cost ecological treatment systems can effectively reduce pathogens in livestock wastewater; and
(3) demonstrated how low-cost anaerobic biodigesters can use livestock wastewater as a feedstock to provide renewable energy (methane).This project will improve the environment of watersheds, steams, and rivers, and improve the economic viability of farms by using wastestreams to produce energy.

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse

Outcome #9

1. Outcome Measures

- aid rural stakeholders through research and extension with onsite waste disposal systems to the extent that within ten years 95% of all rural Ohio onsite waste management systems meet state standards -

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
401	Structures, Facilities, and General Purpose Farm Supplies

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

Government regulations, policies and incentives as well as available funds to invest in newly engineered products are the greatest external factors.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Case Study
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #6

V(A). Planned Program (Summary)

1. Name of the Planned Program

Food Systems-OARDC Led

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	40%		40%	
502	New and Improved Food Products	20%		20%	
702	Requirements and Function of Nutrients and Other Food Components	15%		15%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.	5%		5%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	20%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	9.2	0.0
Actual	0.0	0.0	8.5	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	530281	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	1754091	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Outputs within the Food Systems planned program are/will be: - online and in print research based publications targeted to (a) specific stakeholder groups including industrial partners, (b) support publics such as fellow agencies, political entities, (c) targeted populations, and (d) the broader general public, including mass media releases; - peer-reviewed journal articles; - commercialized techniques; - non-commercialized techniques that are distributed to those in need without costs (e.g. enhanced preservation methods for home food canning); - limited number of patents; - consultation services and meetings with stakeholders and supporters; - facilitation of training programs/workshops for other scientist and for specific groups of stakeholders, including international visitors; and - planning meeting with advisory groups to communicate findings and plan new research.

2. Brief description of the target audience

Targeted audiences are, but not limited to: - specific individuals or groups who have expressed a need for food processing and product information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature; - fellow academic units that partner with food scientists to create systems and processes needed to support not only the research, but also the adoption of the research findings by stakeholders - fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; - populations who have not requested the information but will likely benefit from that information, e.g. persons who engage in home canning of food; - other scientists and scientific groups; - political entities; - extension personnel; - students from pre-school to post doctorate studies; - news organizations; and - business and industrial groups.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	35	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- ,•peer-reviewed publications will be tracked in terms of name and tier of journal, as well as record of citations of the article;

Year	Target	Actual
2007	16	35

Output #2

Output Measure

- •online and print research-based engineering publications will be tracked in terms of number of hits on the web site and the numbers and sites for distribution of printed materials;

Year	Target	Actual
2007	0	5

Output #3

Output Measure

- •commercialized food science techniques will be tracked as to purchaser, number of adoptions, and by whom;

Year	Target	Actual
2007	0	1

Output #4

Output Measure

- ,•non - commercialized techniques will be tracked as to number of adoptions, and by whom;

Year	Target	Actual
2007	1	2

Output #5

Output Measure

- •patents by number and who partnered/purchased/commercialized;

Year	Target	Actual
2007	0	0

Output #6

Output Measure

- ,•consultations with recipients and in what areas;

Year	Target	Actual
2007	16	20

Output #7

Output Measure

- •training programs by how many of what type of stakeholder participated in what type of program; what non-OARDC organization helped to lead the training; and

Year	Target	Actual
2007	0	20

Output #8

Output Measure

- ,•planning meeting participation as to who (non-OARDC) participated at what level to help take a research project to the next level.

Year	Target	Actual
2007	0	10

Output #9

Output Measure

- Number of students receiving graduate degrees.

Year	Target	Actual
2007	{No Data Entered}	33

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Advance processing techniques, e.g. electrostatic coating, to achieve the desired traits requested by industrial partners, that are manifested in consumer demand studies, or that are novel technologies that may meet latent needs
2	Contribute to the advancement of food packaging technologies, e.g. ultrasonic sealing, controlled environment packaging, to the extent that, annually, the risk of contamination due to packaging is reduced measurably.
3	Participate in the creation of a standardized model and protocols for studying functional foods within five years for the purpose of providing consumers with more informed functional choices that are currently available
4	Advance the study of stacking functional foods that have a lower than expected societal demand (e.g. soy) with more desirable foods such as tomato products as a means of providing consumers with more access than is currently present.
5	Expand utilization of products with known functionality or nutraceutical value and give consumers greater informed consumer choice, including the bioavailability of the desire substance in the food, than they presently have.
6	Reduce health risk by releasing at least one major study each five years demonstrating nutritional health benefits, e.g. carotenoids and cataracts, anthocyanins and colon cancer or as a substitute for artificial dyes.
7	Reduce health risk by releasing at lest one major study each five years demonstrating negative nutritional side effects, fatty acids and obesity or obesity-related hepatic stealosis or prostate cancer.
8	Advance the understanding of the potential role of trace minerals such as selenium's protection against breast cancer or copper's protecting against cardiovascular diseases to that extent society can make science–based choices.
9	Annually document a contribution regarding how to reduce food borne pathogens in the food supply chain.
10	Expand the knowledge base for contamination detection within packaged foods by developing or refining technologies such as magnetic resonance or infrared spectroscopy that will, within ten years, eliminate the problem.
11	- inform the process of collecting, storing, processing, and distributing waste products from plant and animal agriculture to the extent that there are demonstrated gains among multiple outcomes annually
12	Processing technology research such as pulse electronic field, high pressure, ohmic heating, and microwave will provide processors with a set of alternatives leading to efficiency and quality gains within economic realities annually.
13	Processing technology research will improve and optimize equipment and processing of food in such manner as meet consumer demand as or before that demand emerges.
14	Reduce through research and development the negative processing impacts on physio-chemical or molecular properties of food within varying parameters to make foods more acceptable and higher quality commensurate with demand.
15	Research to detect and protect against pesticides is an outcome target commensurate with need and demand.

Outcome #1

1. Outcome Measures

Advance processing techniques, e.g. electrostatic coating, to achieve the desired traits requested by industrial partners, that are manifested in consumer demand studies, or that are novel technologies that may meet latent needs

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1. Advance processing techniques such as electrostatic coating are demand by the industry and based on consumer demand. Economics, shelf life, nutrition, quality and consumer acceptance are key factors in growing the knowledge of advanced food coating processes.
2. Soybean oil, having a value of over $140 billion dollars worldwide as a food product, has been vexed with the problem of flavor reversion or reverted back to a less flavorful product after packaging. Given that soybean oil represents 71 percent of the food oil consumed worldwide , flavor reversion effects all sectors of the industry and the consuming public.

What has been done

1.Advanced electrostatic studies were conducted on various food products that require coating before packaging.
2. OARDC scientists, and other collaborating scientists, discovered a method for preventing flavor reversion in soybean oil.

Results

1.Electrostatic powder coating increased the adhesion of most food powders onto most food targets. Some correlation was found between effectiveness of the process and resistivity or oil content of the target, resistivity of the powder, and particle size. At low relative humidities, electrostatic adhesion lasted for several weeks, long enough to be valuable. Microwaving was faster than frying which was faster than baking. Non-electrostatic transfer efficiency increased to a maximum before leveling-off with increasing particle size. Electrostatic transfer efficiency either decreased or increased then decreased with increasing particle size. Powders became more free flowing as particle size increased. Since transfer efficiency increases as powders become more free flowing, transfer efficiency increased with particle size for both nonelectrostatic and electrostatic coating. For electrostatic coating, the effect of charge decreases with increasing particle size. Transfer efficiency increased as particle size, density or charge increased or as air velocity decreased. Evenness increased as particle size or density decreased, as velocity increased, or as charge increased to a peak. Electrostatic coating produced higher transfer efficiency and evenness than nonelectrostatic coating. Improvement in transfer efficiency and evenness due to electrostatics increased as NaCl size, density, charge or air velocity decreased. Powder mixtures did not separate by size during coating but did separate by density and charge. Powders were coated non-electrostatically and using negative and positive polarity corona electrostatically. There was no solution pH effect on transfer efficiency or adhesion for most powders. Negative and positive corona produced the same results for most powders, with no solution pH effect. All of the gelatin-coated fresh meat products showed a reduction in purge by acting as a barrier to water loss. There was a reduction in color deterioration by acting as a barrier to oxygen. No change in lipid oxidation was seen with any of the gelatin-coated meat products. Sensory analysis of beef tenderloins confirmed that color deterioration was reduced, and flavor was not affected by application of a gelatin coat. Chips with high surface oil had the highest adhesion of salt. Decreasing chip temperature decreased surface oil and adhesion. Increasing time between frying and coating reduced adhesion for low surface oil chips, but did not affect high and no surface oil chips. Changing oil composition did not affect adhesion. Increasing salt size decreased adhesion. For high and low surface oil chips electrostatic coating did not change adhesion of small size crystals but decreased adhesion of large salts. For no surface oil content chips electrostatic coating improved adhesion for small salt sizes but did not affect adhesion of large crystals.
2. The OARDC scientists and other colleagues resolved the problem of flavor reversion in soybean oil by creating a filtering process using diatomaceous earth, a natural filtration medium.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
502	New and Improved Food Products

Outcome #2

1. Outcome Measures

Contribute to the advancement of food packaging technologies, e.g. ultrasonic sealing, controlled environment packaging, to the extent that, annually, the risk of contamination due to packaging is reduced measurably.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1. The improvement of stability and shelf life of fluid milk can contribute to the distribution and marketing capabilities of milk processing plants that is important to processors and consumers.
2. Pressure-assisted thermal processing (PATP) is a promising emerging technology for production of commercially-sterile low-acid shelf-stable foods with minimal thermal impact on product quality that is important to processors and consumers.
3.Moderate Electric Field (MEF) treatments hold promise for food sterilization and new knowledge is needed by processors to better utilize this technology.

What has been done

1. It was reported that that ultrapasteurized milk packed in light-protected polyethylene terephthalate (PET) bottles had a refrigerated shelf life of 90 days without detectable changes in flavor and milk. This knowledge was confirmed and industry personnel were engaged with the new findings.
2. The inactivation and recovery of PATP-treated Bacillus amyloliquefaciens spores in selected low-acid foods (egg patty mince and green pea puree) during extended storage was studied. The study increased the knowledge of the dairy industry personnel.
3.Kinetics of bacterial growth during Moderate Electric Field (MEF) treatments was studied. The intention is to determine kinetic parameters for verification of an in-package sterilization process.

Results

1. Dairy industry personnel learned that depending on the processing temperature-time combination, endogenous (from the cow) and exogenous (from psychrotrophic bacteria) enzymes can be reactivated during storage. Active enzymes under refrigeration, plasmin and lipoprotein lipase (LPL), are considered the most important endogenous enzymes responsible for milk protein and lipid degradation over the product shelf life. Unless the bacteria count exceeds 106 CFU/mL, it was found that psychrotrophic bacterial enzymes do not significantly contribute to lipolyisis and proteolysis of milk components. Therefore, the above mentioned processing, packaging and storage conditions significantly slowed the rate at which this chemical changes occur in food systems. The results of the study showed that milk samples were chemically stable, and thus bitter off flavors in milk as a result of proteolysis, could have been avoided. Ultra high temperature processing combined with light-protected PET bottles can further improve the shelf life of skim and 3.25% milk. The improvement of stability and shelf life of fluid milk can contribute to the distribution and marketing capabilities of milk processing plants.
2. The study found that pressure (700 MPa) treatment in combination with heat (105-121C) beyond selected pressure holding times decreased B. amyloliquefaciens populations to undetectable levels by the enrichment procedure. In-situ properties (thermal conductivity, reaction volume and density) of food materials under pressure were studied. Thermal conductivity and density of all samples increased as a function of pressure. Among the products tested, carrot had the highest thermal conductivity at 700 MPa and 75C, while chicken fat had the lowest k under similar conditions. pH change from 0.1 to 400 MPa was -0.48 for citric acid, -1.09 for phosphoric acid, 0.28 for MES, and -0.01 for sulfanilic acid. The efficacy of pressure treatment in preserving selected instrumental quality attributes of carrots was studied. In comparison to TP, PATP better retained color of carrot samples. During TP, carotene content decreased from 17.7 to 13.2 mg/100g, however, in case of PATP (700 MPa-105C) carotene content decreased from 17.7 to 14.1 mg/100g. Both PATP and TP completely inactivated natural flora present in the samples. Under comparable process temperatures (up to 105C), PATP protected carrot quality attributes better than TP samples. Microscopic examination revealed that possibly due to thermal damage, TP samples had shown tissue softening. Whereas, PATP (700 MPa, 105C, 5 min) caused lesser damage to cell structure. These data are an important step in knowledge generation and have utility for both researchers in this line of inquiry and for processors.
3.Heat transfer and electric field models have been used for package optimization, and to determine cold spots in containers to assist in sterilization calculations. A piezometer was developed for in situ measurement of P to V to T relationships, and to determine such data for select foods. Thermal and electrical conductivities of foods were measured under pressures up to 700 MPa. OARDC scientists have found that lag phase reduction is associated with pure sinusoidal waves at low frequency with no harmonics. However, the presence of harmonics can result in increased bacteriocin production. A device has been developed for measurement of thermal inactivation kinetics under ohmic and conventional heating. A new, third-generation package has been developed for food sterilization, and is being tested with respect to heat transfer and microbiology. A package that can accomplish ohmic heating can improve earth-based thermal processes, and provide a viable food warming and sterilization alternative for NASA's Mars mission.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
502	New and Improved Food Products

Outcome #3

1. Outcome Measures

Participate in the creation of a standardized model and protocols for studying functional foods within five years for the purpose of providing consumers with more informed functional choices that are currently available

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Functional foods and the accuracy we can measure the functional substance is critical to fairly marketing the product and its contents.

What has been done

OARDC scientists measured thousands of samples in order to derive an improved understanding of the instrumentation and of the outcome(s).

Results

OAEDC scientists have shown the potential of an ATR-IR protocol for the rapid (5 min) accurate and reliable quantification of lycopene and beta-carotene in tomato samples with minimal sample preparation. The development of varieties with increased phytochemicals is possible through direct selection in structured populations and through molecular assisted strategies, but efficient selection requires the ability to measure these compounds in thousands of samples. Current assay methods are time consuming, expensive, and use hazardous organic solvents. The ATR-IR technique will contribute to the development of simple and rapid protocols that will lead to improved processes for products with enhanced bioactivity as functional foods that would meet industry and consumer demands and safety regulations of government. Furthermore, the ATR-IR information will be used to further the understanding of the factors affecting release of phytochemicals from the food matrix and degradation processes during processing and storage.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
702	Requirements and Function of Nutrients and Other Food Components

Outcome #4

1. Outcome Measures

Advance the study of stacking functional foods that have a lower than expected societal demand (e.g. soy) with more desirable foods such as tomato products as a means of providing consumers with more access than is currently present.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Anthocyanin-based colorants may protect against chronic diseases and therefore they may become valuable ingredients for functional foods.

What has been done

This OARDC study investigated what anthocyanins may be selected for application in functional foods and crop and cultivar selection when looking for health benefits.

Results

Study results provide insight into what anthocyanins may be selected for application in functional foods and crop and cultivar selection when looking for health benefits. In addition, the structure/function study should provide structural targets to study behind mechanisms that enable anthocyanins to exhibit their chemoprotection. This study provides important information that may increase the market value of anthocyanin-containing commodities. Identification of health promoting components in anthocyanin extracts would increase the demand of these commodities by consumers and the food industry expanding the market of fresh and processed anthocyanin-containing foods. Additionally, incorporation of these compounds in more foods as part of the regular diet may help improve health. The added value of these commodities would open a new window of opportunities for use of these extracts in a variety of food application.

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products
702	Requirements and Function of Nutrients and Other Food Components

Outcome #5

1. Outcome Measures

Expand utilization of products with known functionality or nutraceutical value and give consumers greater informed consumer choice, including the bioavailability of the desire substance in the food, than they presently have.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Soft, chewy candies such as gummies are a large part of the US confectionery industry. Starch-set gummies offer an alternative to gelatin but are associated with shortness, a texture fault in gummy candies. In another study the issue of gluten free bread is studied. Gluten is a structural protein found in wheat and provides the viscoelastic properties of dough. It is critical for adequate hydration and application of shear to cause the proteins to crosslink and form an interconnected protein film. For gluten-sensitive individuals, gluten generates an autoimmune response that causes atrophy of the jejunal mucosa lamina and reduces nutrient absorption. The only form of treatment for this disorder is strict adherence to a gluten-free diet. As a result, food product developers have introduced several gluten-free alternatives to a variety of bakery products. However, these products are lower quality and have poor texture. Gluten-free grains and starches, such as rice flour, can not form a protein matrix like wheat does. Gluten-free food matrix forms batter rather then dough.  This project is designed to target consumers looking for foods that provide nutrients beyond those found in the typical foods.

What has been done

Two projects eminating from this line of inquiry are 1) gummy confections made with fruit juice concentrate (grape, pomegranate and strawberry have been used thus far), with soy protein isolate substituting half of the wheat starch, and 2) gluten-free bread with the high quality of traditional wheat breads.

Results

Soft, chewy candies such as gummies are a large part of the US confectionery industry. Starch-set gummies offer an alternative to gelatin but are associated with shortness, a texture fault in gummy candies. This study has resulted in discovering how to make gummy confections using fruit juice concentrate such as grape, pomegranate and strawberry along with soy protein isolate substituting half of the wheat starch. This nutritionally enhanced product provides anthocyanins, isoflavones, and soy protein. Oral health can also be targeted with these gummies and further product development and human clinical trials are planned to ascertain their effectiveness. An invention disclosure, fruit juice and soy gummy confection, has been filed at OSU's Office of Technology Licensing and Commercialization. For the soy bread study, OARDC scientists have collaborated with a bakery in Columbus, Ohio to develop the gluten-free bread. Gluten-free food matrix, per se, forms batter rather then dough. To increase structural integrity of the batter, many ingredients such as gums, protein, and lipids have been utilized. While these ingredients improve the gluten-free bread structure, the bread is still inferior to wheat bread. Until recently, there has been little research on the rheological study of gluten-free batter. By using dynamic rheometry and thermo-analytical techniques, the changes due to shear and temperature can be ascertained. Those that suffer from gluten intolerance will benefit from a baked product that is highly acceptable yet gluten-free.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
502	New and Improved Food Products
702	Requirements and Function of Nutrients and Other Food Components

Outcome #6

1. Outcome Measures

Reduce health risk by releasing at least one major study each five years demonstrating nutritional health benefits, e.g. carotenoids and cataracts, anthocyanins and colon cancer or as a substitute for artificial dyes.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1.Consumption of fruits and vegetables has been associated with reduced incidence of chronic disease. Animal, clinical and in vitro studies provide compelling evidence that commodities rich in polyphenolics (such as anthocyanins and isoflavones) are powerful antioxidants and may be chemoprotective. 2. Likewise a variety of berries have been identified as having chemoprotective benefits.

What has been done

1.With more than 5000 flavonoid structure present in nature, and close to 600 different structures among anthocyanins alone, there is a need to increase understanding structure/function relationships. OARDC scientists have been focused on increasing the understanding of the role that non-volatile compounds from fruits and vegetables play on health promotion.
2. This study investigates black raspberries (BR) and subsequent clinical preparations and processed products as chemopreventive agents for various forms of aero-digestive cancers. As part of an interdisciplinary, interdepartmental and inter-institutional team, we continue to develop procedures for identifying the bioactive components of black raspberries via a metabolomics-based approach using high-field NMR spectroscopy and statistical modeling

Results

1. OARDC scientists have characterized new plant materials, and determined content and profiles of anthocyanins and other phenolics. They have found a new berry, Berberis boliviana, with a pigment content comparable to that of commercial color extracts. A berry with such high concentration offers great potential to the food industry as it would not require color extraction to be applied into food systems. Berries were incorporated into foods typically colored with synthetic dyes, and representing challenging applications for natural pigments: yogurt and candy. The study shows that these foods can be successfully enriched with polyphenolics with acceptable stability for commercial applications. The in vitro and in vivo studies are providing compelling evidence of the chemoprotective effects of anthocyanin-rich extracts against colon cancer. Anthocyanin rich extracts (AREs) from different plant materiasl were evaluated. Purple corn, chokeberry, bilberry, purple carrot, grape, radish, and elderberry were tested for growth inhibition using a human colorectal adenocarcinoma (HT29) cell line. All AREs suppressed HT29 cell growth to varying degrees. Purple corn ARE showed the highest growth inhibition (GI50~14 microg/mL as cy-3-glucoside equivalent), followed by chokeberry and bilberry. Elderberry and radish AREs showed the lowest growth inhibition (GI50:~130 microg/mL; ~108 microg/mL). ACN played a major role in AREs' chemoprotection and exerted an additive interaction with OPF. AREs at these concentration ranges and under similar conditions had little effect on NCM460 normal colon cells. Statistical analyses demonstrated that type of anthocyanin aglycone, glycosylation, and/or acylations affected growth inhibition activity. These findings should be considered for development of anthocyanin applications in functional foods and/or during crop and cultivar selection. Also, the effect of chemical structure of different anthocyanins was evaluated on their chemoprotection in this system. Additive, synergistic or antagonistic effects between anthocyanins with other phenols were also evaluated. It is possible to increase consumption of polyphenolics with potential health benefits at the same time that we increase the appeal of food products. Anthocyanins provide an excellent source of polyphenols, and can improve the visual appeal of foods being an alternative to the use of synthetic dyes.
2. In 2007, OARDC scientists confirmed the validity of the approach by modeling relationships between anthocyanin and phenolic contents and NMR spectra of individual anthocyanins and quercetin derivatives.

Aero-digestive cancers account for a significant percentage of all diagnosed cancers; colon cancer alone is the second leading cause of death due to cancer in the US. The development of food-based approaches to reduce the incidence, extent and severity of cancer and other degenerative diseases of aging will have a positive effect for US citizens, and may lower society's health care cost burden. The successful demonstration of our metabolomics-based approach to modeling the interactivity of BR bioactive compounds may aid oncology scientists as they delineate the human physiological mechanisms by which BR is chemoprotective and may offer interdisciplinary teams a mechanism to study other phytonutrient-rich fruits or vegetables.

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products
702	Requirements and Function of Nutrients and Other Food Components

Outcome #7

1. Outcome Measures

Reduce health risk by releasing at lest one major study each five years demonstrating negative nutritional side effects, fatty acids and obesity or obesity-related hepatic stealosis or prostate cancer.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components

Outcome #8

1. Outcome Measures

Advance the understanding of the potential role of trace minerals such as selenium's protection against breast cancer or copper's protecting against cardiovascular diseases to that extent society can make science–based choices.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components

Outcome #9

1. Outcome Measures

Annually document a contribution regarding how to reduce food borne pathogens in the food supply chain.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Despite strict regulations and new technologies in the food industry, foodborne illnesses are still a major challenge, resulting in more than 300,000 hospitalizations and 5,000 deaths each year in the US. Food pathogens create an enormous social and economic burden on communities and their health systems. It is estimated that the yearly cost of all foodborne diseases in this country is 5 to 6 billion dollars in direct medical expenses and lost productivity. Infections with the bacteria Salmonella alone account for $1 billion yearly in direct and indirect medical costs. Recent outbreaks of foodborne illnesses have raised consumer concerns about food safety hazards.

What has been done

OARDC researchers developed a rapid and cost-effective techniques for effective microbial surveillance of our food supply to ensure food safety.

Results

This project has developed an infrared sensing protocol to isolate and identify foodborne pathogenic bacteria, specifically Salmonella enterica serovars and Bacillus spp., from foods by using immunomagnetic separation or hydrophobic grid membranes (HGM) and infrared spectroscopy. Our optical sensing technology is based on unique spectral signature profiles that permit the chemically based classification of intact microbial cells and produce complex biochemical patterns or 'fingerprints' that are reproducible and distinct for different bacteria, making it possible to discriminate between signals from the target microorganism and signals from cross-reacted sample constituents. Pattern recognition models developed form infrared spectra of affinity-captured target organisms correctly predicted the presence of Salmonella at species and serovar levels.

The outcome of this project will provide the food industry with efficient and effective detection techniques for processed foods with regard to contamination by pathogenic microorganisms. Implementation of rapid testing by the industry and regulatory agencies would help to streamline food safety and quality assurance and will prevent the widespread and growing public health problem of foodborne diseases that creates an enormous social and economic burden on our health systems. This technology can provide the food industry with means to reduce microbial contamination by detecting and removing potential food safety hazards from the processing, packaging and distribution stream. Combining microbial separation techniques such as immunomagnetic beads and/or hydrophobic grid membranes (HGM) with infrared spectroscopy and with multivariate analysis provide fast, accurate and sensitive information to allow identification of pathogenic bacteria in contaminated food matrices and minimize false-positive results due to cross-reactions. The method is rapid and simple to perform and requires minimal sample preparation. We are currently developing spectral libraries for most common foodborne pathogens to make infrared spectroscopy a standard typing tool.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #10

1. Outcome Measures

Expand the knowledge base for contamination detection within packaged foods by developing or refining technologies such as magnetic resonance or infrared spectroscopy that will, within ten years, eliminate the problem.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1. Annually large numbers of people in the US are impacted marketed foods, fresh and packaged, that have some level of contamination.
2.The terrorist attack of 9/11 highlighted the need to develop rapid detection systems that can identify potential sources of harm before they could injure us.

What has been done

1.This OARDC study looked a an array of retail foods and assessed for contamination.
2. This research investigated the use of magnetic resonance imaging (MRI) as a tool for non-destructive detection of bacterial contamination in sealed packages. This system is also useful for the detection of microorganisms in cases of unintentional contamination.

Results

1.OARDC results revealed for the first time that our retail foods, including many ready-to-eat, generally considered 'healthy' items, are heavily contaminated with antibiotic resistant bacteria and these bacteria are transmitted to human through daily food intake. Commensal organisms in the food chain not only can serve as a resistance gene reservoir but an enhancer for the transmitting of resistance genes. Our results illustrated a potentially very important avenue in the dissemination of antibiotic resistance genes in the general public, and likely will have enormous impact on food safety and public health. Besides the contribution to scientific understanding, this research also has significant impact on food industry. In the US alone, this research affects the annual production of 20 million pounds of fermented dairy products business. Worldwide, the number is much larger. Its impact on the even larger fresh produce business is yet to be evaluated.
2. The results of this research shows that the presence of microorganisms could be detected within a sealed package without opening the container. Since beginning this research, the literature has reported on research into the use of electronic portable devices that are capable of detecting the presence of bacteria without the need to perform time consuming laboratory analyses. These devices are simple to operate and do not need highly trained operators in order to interpret the output they produce at the end of a test. These device are much lower in cost when compared with traditional MRI machines. There is still a need to optimize these devices, but the fact that they exist is a step in the right direction.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #11

1. Outcome Measures

- inform the process of collecting, storing, processing, and distributing waste products from plant and animal agriculture to the extent that there are demonstrated gains among multiple outcomes annually

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #12

1. Outcome Measures
Processing technology research such as pulse electronic field, high pressure, ohmic heating, and microwave will provide processors with a set of alternatives leading to efficiency and quality gains within economic realities annually.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1. Processors and regulators demand an improved understanding of the safety of pressure treated products.
2. Techniques to enable the development of better quality, safe foods that are shelf-stable and do not require refrigeration are needed by clinets ranging from the US military to communities needing food aid.

What has been done

1. In-situ properties of food materials under pressure were studied to provide needed information sought by both processors and regulators. Thermal conductivity (k) of selected foods (carrot, guacamole, cheddar cheese, chicken breast and fat) as a function of pressure (0.1-700 MPa) and temperature (25-75C) was measured. Pressure-volume relationships at 25C were measured for sucrose solutions, apple juice, honey, soybean oil, clarified butter, chicken fat, soy protein isolate solutions, guacamole, carrot, cheddar cheese, chicken breast. Reaction volumes between selected buffering agents (citric acid, phosphoric acid, 2-(N-morpholino) ethanesulfonic acid (MES) and sulfanilic acid) and NaOH solutions were measured to 400 MPa at 25C. A polycarbonate sample holder with piston arrangement allowed sensor placement and pressure transmission. Use of custom-made pressure equipment enabled in-situ temperature, voltage, and current and impedance measurements. The experimentally determined values of calibration material were compared against published literature to establish probe specific calibration factor.
2. Electrical conductivity of a wide variety of foods has been characterized, both in the fresh form, and after diffusion with salt via a short blanching treatment to increase electrical conductivity.

Results

1. In-situ properties of food materials under pressure are useful for modeling heat transfer and temperature distribution during high-pressure sterilization and pasteurization. While k under pressure increased with increase in moisture and temperature, it decreased with increasing fat content. Among the products tested, carrot had the highest k at 700 MPa and 75C (0.90 W/mC), while chicken fat had the lowest k (0.43 W/mC) under similar conditions. Density of all samples increased as a function of pressure. Compressibility of sucrose and protein solutions decreased as a function of increasing concentration. At 700 MPa, all samples, except ethanol, reduced in volume by 13-16%. pH change from 0.1 to 400 MPa was -0.48 for citric acid, -1.09 for phosphoric acid, 0.28 for MES, and -0.01 for sulfanilic acid.  Results of the study will be helpful in the process characterization of pressure treated low-acid shelf stable foods. The study will provide improved understanding of role thermal process uniformity during high pressure processing. Improved knowledge on thermal effects under pressure will help food processors and regulators in the safety assessment of pressure treated products.
2. OARDC scientists have documented clearly, the enhancing effect of electric fields on diffusivity of ionic species. Electrical conductivity data are now available for a wide range of food products that were not previously studied; and show the influence of salt infusion on electrical conductivity and heating uniformity. Major parameters affecting safety in ohmic processing have been identified. Scientists are adapting this approach to the current product. This work will enable the development of better quality, safe foods that are shelf-stable and do not require refrigeration. We also expect that processes such as extraction may be improved by our findings on diffusion enhancement. The influence of various parameters, such as flow rate and solids loading is being studied. The model will be experimentally evaluated using microbiological methods. Once determined to be safe, product will be shipped for shelf-life evaluation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #13

1. Outcome Measures

Processing technology research will improve and optimize equipment and processing of food in such manner as meet consumer demand as or before that demand emerges.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Salmonella-free market shell eggs is an objective of the US Egg Safety Action Plan. This plan calls for complete eradication of Salmonella from market shell eggs. Salmonella causes a serious food-transmitted disease, and incidence of salmonellosis is the highest among food borne diseases in the US. Ohio is the second in the nation in egg production, and the national action plan has a major impact on Ohio egg producer and processors, and on the State's economy.

What has been done

OARDC scientists have established a successful collaboration with a consortium of Ohio egg producers and equipment manufacturers to optimize an ozone-based technology for eradication of Salmonella in fresh eggs.

Results

Nationally, there are 700,000 cases of salmonellosis and $1.1 billion in losses annually from contaminated foods. Ohio State researchers have developed a system that utilizes ozone and thermal treatment to kill Salmonella inside shell eggs while protecting quality. EggTech LLC, a partnership of researchers and businesses, plans to implement this patented technology in Ohio egg-producing plants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #14

1. Outcome Measures

Reduce through research and development the negative processing impacts on physio-chemical or molecular properties of food within varying parameters to make foods more acceptable and higher quality commensurate with demand.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.

Outcome #15

1. Outcome Measures

Research to detect and protect against pesticides is an outcome target commensurate with need and demand.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

USEPA establishes legal tolerances for pesticides in the human food supply. Regulators, producers, processors, and consumers benefit from advance knowledge of these limits.

What has been done

Experiments were conducted to generate data on terminal residues of candidate pesticides in food products. This data is required by the USEPA to establish legal tolerances for pesticides.

Results

The program and the data generate on terminal residues of candidate pesticides in food products have enormous positive impact on maintaining the competitiveness of Ohio's speciality crop industries. This has been acheived primarily through research that has led to EPA registration of crop protectants needed by Ohio farmers and the level that those protectants can be in processed foods for human consumption.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

Weak economy and government regulations are two factors that most effect outcomes.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Case Study
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #7

V(A). Planned Program (Summary)

1. Name of the Planned Program

Bio-based Non-Food Value Chains-OARDC Led

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
511	New and Improved Non-Food Products and Processes	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.0	0.0
Actual	0.0	0.0	0.4	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	52575	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Outputs within bio-based non-food planned program are/will be: - commercialized products and processes (primary focus); - number of patents; - planning meeting with advisory groups to communicate findings and plan new research; - online and in print research –based publications targeted to (a) specific stakeholder groups including industrial partners, (b) support publics such as fellow agencies, political entities, (c) targeted populations, and (d) the broader general public, including mass media releases; - peer-reviewed journal articles; - non-commercialized techniques that are distributed to those in need without costs; - consultation services and meetings with stakeholders and supporters; and - facilitation of training programs/workshops for other scientist and for specific groups of stakeholders, including international visitors.

2. Brief description of the target audience

Targeted audiences are, but are not limited to: - business and industry that have expressed a need for biobased product information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature; - other stakeholders, with particular focus on consumers; - fellow academic units that partner with program scientists to create systems and processes needed to support not only the research, but also the adoption of the research findings by industrial partners; - fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; - populations who have not requested the information but will likely benefit from that information, e.g. general public; - other scientists and scientific groups; - political entities; - extension personnel; - students from middle school to post doctorate studies; and - news organizations.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	3	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- - commercialized products and processes (primary focus);

Year	Target	Actual
2007	0	0

Output #2

Output Measure

- - number of patents;

Year	Target	Actual
2007	0	0

Output #3

Output Measure

- - planning meeting with advisory groups to communicate findings and plan new research;

Year	Target	Actual
2007	5	35

Output #4

Output Measure

- - online and in print research –based publications targeted to (a) specific stakeholder groups including industrial partners, (b) support publics such as fellow agencies, political entities, (c) targeted populations, and (d) the broader general public

Year	Target	Actual
2007	5	3

Output #5

Output Measure

- - peer-reviewed journal articles;

Year	Target	Actual
2007	0	0

Output #6

Output Measure

- - non-commercialized techniques that are distributed to those in need without costs;

Year	Target	Actual
2007	0	0

Output #7

Output Measure

- - consultation services and meetings with stakeholders and supporters;

Year	Target	Actual
2007	2	20

Output #8

Output Measure

- - facilitation of training programs/workshops for other scientist and for specific groups of stakeholders, including international visitors

Year	Target	Actual
2007	2	5

Output #9

Output Measure

- - number of graduate students graduated and the professional positions they hold

Year	Target	Actual
2007	0	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Programs in this area will develop strategies to engage and include producers, industrial partners, and consumers groups over a 5-year period resulting in effective leadership-oriented partnerships.
2	The program will build scientist/stakeholder cores to guide/provide biological, chemical, physical, engineering, and social research necessary to create new and improved processes and products commensurate with demand.
3	Annually the program will report, in conjunction with industrial partners, non-proprietary research gains made to the consuming public to garner interest in adoption of new products and processes when released.
4	Maintain an ongoing needs assessment program to identify yet to be determined needs of society for bio-based products as crude oil and natural gas supplies decline, as well as assessing impacts from other external factors.
5	By 2011, the program will contribute at least one alternative to a petroleum-based product or process that meets client needs with an acceptable point of purchase price.
6	Support, though research, the building of biobased development that annually, beginning in 2011, utilizes Ohio and the region's plentiful supply of biomass, including waste steam materials in such manner as to improve the economy.
7	Support, though research, the building of biobased development that annually, beginning in 2011, effectively utilizes agriculture's production capacity to produce plants that have the desired attributes for manufacturing.

Outcome #1

1. Outcome Measures

Programs in this area will develop strategies to engage and include producers, industrial partners, and consumers groups over a 5-year period resulting in effective leadership-oriented partnerships.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes

Outcome #2

1. Outcome Measures

The program will build scientist/stakeholder cores to guide/provide biological, chemical, physical, engineering, and social research necessary to create new and improved processes and products commensurate with demand.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes

Outcome #3

1. Outcome Measures

Annually the program will report, in conjunction with industrial partners, non-proprietary research gains made to the consuming public to garner interest in adoption of new products and processes when released.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes

Outcome #4

1. Outcome Measures

Maintain an ongoing needs assessment program to identify yet to be determined needs of society for bio-based products as crude oil and natural gas supplies decline, as well as assessing impacts from other external factors.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Understanding needs and conducting assessments within related industries is an important step in positioning experiment station research within the marketplace

What has been done

OARDC has established a new program with over 20 million dollars of extramural funding in the past three years that have now resulted in institutional arrangement around this research platform.

Results

Results today are surrogate measures for impact in that wide ranging institutional arrangements have been made with business, industrial, ag producers, ad scientific partners paving the way for a robust reseach and development agenda.

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes

Outcome #5

1. Outcome Measures

By 2011, the program will contribute at least one alternative to a petroleum-based product or process that meets client needs with an acceptable point of purchase price.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes

Outcome #6

1. Outcome Measures

Support, though research, the building of biobased development that annually, beginning in 2011, utilizes Ohio and the region's plentiful supply of biomass, including waste steam materials in such manner as to improve the economy.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes

Outcome #7

1. Outcome Measures
Support, though research, the building of biobased development that annually, beginning in 2011, effectively utilizes agriculture's production capacity to produce plants that have the desired attributes for manufacturing.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)
- Other (Supply and cost of crude oil)

Brief Explanation

This program is new thus true impacts are not reportable this year. The growth of infrastructure and institutional arrangements at OARDC and across the University are positioning this program to make major contributions to state and national agendas over the next decade.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Case Study

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #8

V(A). Planned Program (Summary)

1. Name of the Planned Program

Human Health and Safety-OARDC Led

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
721	Insects and Other Pests Affecting Humans	25%		25%	
722	Zoonotic Diseases and Parasites Affecting Humans	50%		50%	
723	Hazards to Human Health and Safety	25%		25%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.4	0.0
Actual	0.0	0.0	0.6	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	50255	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	204239	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Outputs within Human health and safety planned program are/will be: - online and in print research based publications targeted to (a) specific stakeholder groups including industrial partners, (b) support publics such as fellow agencies, political entities, (c) targeted populations, and (d) the broader general public; - peer-reviewed journal articles; - commercialized techniques; - non-commercialized techniques that are distributed to those in need without costs; - limited number of patents; - consultation services and meetings with stakeholders and supporters; - facilitation of training programs/workshops for other scientist and for specific groups of stakeholders, including international visitors; and - planning meeting with advisory groups to communicate findings and plan new research

2. Brief description of the target audience

Targeted audiences are, but are not limited to: - specific individuals or groups who have expressed a need for health and safety information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature; - fellow academic units that depend on scientists in this program for support information and for new health and safety technologies and approaches/measures - fellow agencies or support organizations who will not only use the information but will also extend that information; - populations who have not requested the information but will likely benefit from that information; - other scientists and scientific groups; - political entities; - extension personnel; - students from pre-school to post doctorate studies; - news organizations; and - business and industrial groups.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	35	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- •non - commercialized techniques such as for farm safety will be tracked as to number of adoptions, and by whom;

Year	Target	Actual
2007	0	0

Output #2

Output Measure

- •consultations with recipients and in what areas;

Year	Target	Actual
2007	5	7

Output #3

Output Measure

- •training programs by how many of what type of stakeholder participated in what type of program; what non-OARDC organization helped to lead the training;

Year	Target	Actual
2007	2	2

Output #4

Output Measure

- •online and print research-based publications will be tracked in terms of number of hits on the web site and the numbers and sites for distribution of printed materials;

Year	Target	Actual
2007	3	5

Output #5

Output Measure

- •peer-reviewed publications will be tracked in terms of name and tier of journal, as well as record of citations of the article;

Year	Target	Actual
2007	2	35

Output #6

Output Measure

- •commercialized safety related techniques and processes would be tracked as to purchaser, number of adoptions, and by whom;

Year	Target	Actual
2007	0	0

Output #7

Output Measure

- ,•patents by number and who partnered/purchased/commercialized; and

Year	Target	Actual
2007	0	0

Output #8

Output Measure

- ,•planning meeting participation as to who (non-OARDC) participated at what level to help take research projects and practices to the next level.

Year	Target	Actual
2007	2	4

Output #9

Output Measure

- •number of graduate students graduated and professional positions they hold

Year	Target	Actual
2007	0	10

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Annually release studies on insects, ticks, and mites to protect human health that will provide a set of alternatives leading to health gains with lowered risks, and within economic realities, for the affected populations.
2	Advance the understanding of means and methods related to transmission of zoonotic diseases to humans, including prevention, that meets consumer demand/health threat, as or before such emerges.
3	Reduce through research, development, and outreach the negative impact of farm-, recreation-, or industry-related accidents within agriculture and natural resources.
4	Reduce through research, development, and outreach the exposure to biohazards, pathogens, and similar to the extent that annually such are reduced per capita with an overall time and economic savings to those who may be affected.
5	Reduce health risk by releasing at least one major study each five years demonstrating techniques, procedures, or products that lessen the chance of contacting, or the impact if contacted, zoonotic diseases.
6	Reduce safety risk by releasing at least one major study to either manufacturers and/ or consumers that will reduce or prevent work or play. related accidents.
7	Increased knowledge in health education impact is important if medical interventions are to provide maximum benefit.
8	Increased knowledge of interventions to improve human health is critical area research needed to advance the national health care system.

Outcome #1

1. Outcome Measures

Annually release studies on insects, ticks, and mites to protect human health that will provide a set of alternatives leading to health gains with lowered risks, and within economic realities, for the affected populations.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Control of indoor pests, particularly those that contribute to allergies and asthma, is challenging because those patients tend to be very sensitive to chemicals and odors associated with insecticides.

What has been done

This OARDC research addressed nonchemical methods of pest management indoors with emphasis on the use of ultraviolet light.

Results

Research on dust mites has demonstrated their sensitivity to a brief exposure of UV-C. OARDC experiments suggest that flea eggs and larvae are very susceptible to a dose of UV-C as well. Further research is being conducted on bed bugs and various insect and mite pests for their susceptibility to UV-C.

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans

Outcome #2

1. Outcome Measures

Advance the understanding of means and methods related to transmission of zoonotic diseases to humans, including prevention, that meets consumer demand/health threat, as or before such emerges.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #3

1. Outcome Measures

Reduce through research, development, and outreach the negative impact of farm-, recreation-, or industry-related accidents within agriculture and natural resources.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

Outcome #4

1. Outcome Measures

Reduce through research, development, and outreach the exposure to biohazards, pathogens, and similar to the extent that annually such are reduced per capita with an overall time and economic savings to those who may be affected.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
722	Zoonotic Diseases and Parasites Affecting Humans
723	Hazards to Human Health and Safety
721	Insects and Other Pests Affecting Humans

Outcome #5

1. Outcome Measures
Reduce health risk by releasing at least one major study each five years demonstrating techniques, procedures, or products that lessen the chance of contacting, or the impact if contacted, zoonotic diseases.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #6

1. Outcome Measures

Reduce safety risk by releasing at least one major study to either manufacturers and/ or consumers that will reduce or prevent work or play. related accidents.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

Outcome #7

1. Outcome Measures

Increased knowledge in health education impact is important if medical interventions are to provide maximum benefit.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Increased knowledge in health education impact, in areas such as diabetes, is important if medical interventions are to provide maximum benefit to the individual.

What has been done

The purpose of the study was to determine the association between glycemic control and self-management skills and to identify specific areas of educational need based on gender, age, insulin delivery method, level of diabetic control and years since diagnosis.

Results

KA 703 The revised Diabetes Self-Management Profile was used to measure self-management practices. Glycemic control was assessed as Hemoglobin A1C. Additional information was obtained from medical records. Mean HbA1c levels for male and female subjects were above the American Diabetes Association guidelines for children and adolescents. Lower scores on the rDSMP and multiple daily injection insulin delivery, or individual items on the rDSMP were predictive of higher HbA1c levels. Conclusions and Implications: Youth need encouragement to practice good self-management skills in order to maintain recommended HbA1c level. Those with longer duration of disease may particularly need support and advice to be compliant with skills they have already been taught.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

Outcome #8

1. Outcome Measures

Increased knowledge of interventions to improve human health is critical area research needed to advance the national health care system.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Prostate and bladder cancers are significant health problems. Prostate cancer represents the most common malignancy and the second leading cause of cancer death in US men. Bladder cancer is the fourth most common malignancy in men and the ninth most common type of cancer in women in the US.

What has been done

An OARDC study of enzymatic synthesis of prostaglandins was undertaken as basic research to assess if further studies are warranted.

Results

KA 702 New data from this study show that the enzymatic synthesis of prostaglandins does have a pivotal role in bladder carcinogenesis by regulating the expression of specific patterns of gene expression. Because dietary fatty acids play an important role in the modulation of prostaglandin synthesis, they may affect bladder carcinogenesis. Whether dietary intervention with the anti-inflammatory activity of fish oil inhibits bladder carcinogenesis in BK5.COX2 mouse model warrants evaluation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)
- Other (Equipment design)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #9

V(A). Planned Program (Summary)

1. Name of the Planned Program

Agricultural, Environmental, and Development Economics-OARDC Led

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management	20%		15%	
602	Business Management, Finance, and Taxation	20%		15%	
603	Market Economics	15%		15%	
604	Marketing and Distribution Practices	0%		5%	
605	Natural Resource and Environmental Economics	15%		15%	
606	International Trade and Development	15%		15%	
608	Community Resource Planning and Development	0%		5%	
610	Domestic Policy Analysis	15%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	7.9	0.0
Actual	0.0	0.0	7.7	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	713884	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	747303	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Outputs within the Food, Agricultural and Economics Development planned program are/will be: - online and in print research based publications targeted to (a) specific stakeholder groups including industrial partners, (b) support publics such as fellow agencies, political entities, (c) targeted populations, and (d) the broader general public; - peer-reviewed journal articles; - non-commercialized techniques that are distributed to those in need without costs; - consultation services and meetings with stakeholders and supporters; - facilitation of training programs/workshops for other scientist and for specific groups of stakeholders, including international visitors; and - planning meeting with advisory groups to communicate findings and plan new research.

2. Brief description of the target audience

Targeted audiences are, but are not limited to: - specific individuals or groups who have expressed a need for economic findings related to some aspect of human capital that is to be derived through new research, extracted from on-going research, or is derived from scientific literature; - fellow academic units that depend on scientists in this program for support information and for the approaches/measures they generate; - fellow agencies or support organizations who will not only use the economic information but will also extend that information; - populations who have not requested the information but will likely benefit from that information; - other scientists and scientific groups; - political entities; - extension personnel; - students from junior high school to post doctorate studies; - news organizations; and - business and industrial groups.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

none

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	30	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- •online and print research-based publications will be tracked in terms of number of hits on the web site and the numbers and sites for distribution of printed materials;

Year	Target	Actual
2007	0	31

Output #2

Output Measure

- ,•peer-reviewed publications will be tracked in terms of name and tier of journal, as well as record of citations of the article;

Year	Target	Actual
2007	14	30

Output #3

Output Measure

- ,•non - commercialized techniques such as methods for tracking specific programs and who received those programs and what was the impact;

Year	Target	Actual
2007	0	0

Output #4

Output Measure

- •number of consultations with recipients and in what areas;

Year	Target	Actual
2007	0	5

Output #5

Output Measure

- •training programs by how many of what type of stakeholder participated in what type of program; what non-OARDC organization helped to lead the training;

Year	Target	Actual
2007	0	4

Output #6

Output Measure

- • planning meeting participation as to who (non-OARDC) participated at what level to help take research projects and practices to the next level; and

Year	Target	Actual
2007	0	4

Output #7

Output Measure

- • number of graduate students completed, their research areas, and the positions of employment they hold.

Year	Target	Actual
2007	0	24

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	New knowledge of production variations in markets that help producers, processors, and distributors have requisite information for enhanced decision making leading to decreased costs of inputs and an increase in profits/outputs.
2	Advanced knowledge of how to market and manage quality attributes of commodities leading to demonstrated value added/ profits for producers, processors, and distributors, and reported satisfaction/needs attainment among consumers.
3	Business management knowledge in targeted areas, e.g. risk management, weather insurance, impacts of land use shifts, grant management that are necessary for and result in increased profitability for stakeholders.
4	Research findings on novel programs such as pollution trading, carbon trading, conservation programs, cooperatives, etc. that results in enhanced profits, new sources of income, and/or prevention of loss of profits or loss of other resources, e.g. soil.
5	Relational contracting theory and practice information that will contribute to reduction of risks, improving profits, and adding stability to the system that meet stated stakeholder needs.
6	Stakeholders will have the necessary models that will improve on the forecasting of risk, demand, and prices in various commodity sectors leading to enhanced decision making, increased profits, and reductions in uncertainly.
7	Resultant management models that explain potential impacts of new/emerging trends e.g. trade agreements, bio-terrorism threats, and renewable fuels requirements, on specific agriculture sectors to the extent that negative impacts can be mitigated in a timely manner.
8	Market economies and efficiencies studies relating to factors such as pricing, finance, supply and demand, etc. ensuring that stakeholders are informed and their identified needs, e.g. lower operating costs, become more attainable.
9	Research finding on valuing environmental resources, e.g. wetlands, river restoration, and how it applies to stakeholder needs for demonstrated gains in profits, resources sustained, and/or actions mitigated.
10	Biocomplexity analysis to understand human-nature interactions at the landscape level that informs human enterprises, leading to demonstrated profitability, environmental protection, and/or improvements in quality of stakeholders' lives.
11	Increase profitability, reduce environmental impact, and/or improve quality of stakeholders' lives through bio-resource utilization efficiency and effectiveness research such as biomass to energy, nitrogen utilization, biocides, etc.
12	Market and non-market valuation of environmental resources, e.g. steelhead trout fishing, open space, that have often lacked economic justification that meets client needs, and informs individual, group, and government decision making.
13	Advance knowledge of vertical markets in developing counties that when applied leads to documented increased trade with the US.
14	Exchange rate, trade policy, and similar uncertainties research findings that lead to documented mitigation for stakeholders of certain negative effects of international trade.
15	New policy analysis research that informs policy development and fosters demonstrated gains for stakeholders in areas such as conservation programs, farmland protection, Farm Credit System resources, etc.
16	Increased understanding of society's willing to pay for services.

Outcome #1

1. Outcome Measures

New knowledge of production variations in markets that help producers, processors, and distributors have requisite information for enhanced decision making leading to decreased costs of inputs and an increase in profits/outputs.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

An empirical gravity equation has been applied to US bilateral trade data for fresh fruit over the period 1976-99 for a panel of 26 countries in order to analyze the effect of exchange rate uncertainty. Issues of economic uncertainty are critical in decisions of producers, exporters, importers, distributors, and consumers.

What has been done

Based on fixed and random effects panel estimation methods, and using the Peree and Steinheer (1989) measure of exchange rate uncertainty, results show that US bilateral fresh fruit trade has been negatively affected by exchange rate uncertainty.

Results

While short-term exchange rate risk can be hedged in financial markets, uncertainty beyond a one-year time horizon cannot be hedged at low cost. This results of this research indicate that as global integration of markets increases, it is important to establish whether it is short-run or long-run movements in exchange rates that matter for international trade in agricultural sector.

4. Associated Knowledge Areas

KA Code	Knowledge Area
606	International Trade and Development
603	Market Economics

Outcome #2

1. Outcome Measures

Advanced knowledge of how to market and manage quality attributes of commodities leading to demonstrated value added/ profits for producers, processors, and distributors, and reported satisfaction/needs attainment among consumers.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
603	Market Economics
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures
Business management knowledge in targeted areas, e.g. risk management, weather insurance, impacts of land use shifts, grant management that are necessary for and result in increased profitability for stakeholders.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Insures, consumers and regulators are interested in research to identify a more accurate method for rating crop insurance in high-risk regions of the USA.

What has been done

OARDC scientists have addressed this issue through a variety of studies.

Results

In research to identify a more accurate method for rating crop insurance in high-risk regions of the USA, a deeper understanding of the geographical distribution of benefits from the US crop reinsurance program has been provided for insurers, regulators and those who are insured. Additionally improved methods for the actuarial rating of crop insurance products in high-risk regions of the USA have been articulated and empirical evidence of the causes of moral hazard in the US crop insurance program have been defined. These findings permit greater efficiency and efficacy in the program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
610	Domestic Policy Analysis

Outcome #4

1. Outcome Measures

Research findings on novel programs such as pollution trading, carbon trading, conservation programs, cooperatives, etc. that results in enhanced profits, new sources of income, and/or prevention of loss of profits or loss of other resources, e.g. soil.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
603	Market Economics

Outcome #5

1. Outcome Measures

Relational contracting theory and practice information that will contribute to reduction of risks, improving profits, and adding stability to the system that meet stated stakeholder needs.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Economists, business oriented social scientists and legal scholars generally believe that contracts that include all relevant verifiable terms to a transaction are preferable to 'incomplete' contracts that omit many relevant terms thereby reducing the ability of a court or arbitrator to enforce the contract.

What has been done

The economic models and experiments developed in this project suggest that incomplete contracts may lead to higher productivity in repeat trading environments where people develop relationships by trading repeatedly over time with a small group of known trading partners.

Results

The findings are consistent with what is observed in the real world where contracts tend to be highly incomplete. Specifically, agricultural contracts often include payment terms for some performance factors but omit other important terms. Standard theory cannot explain the prevalence of incomplete contracts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
610	Domestic Policy Analysis
602	Business Management, Finance, and Taxation

Outcome #6

1. Outcome Measures

Stakeholders will have the necessary models that will improve on the forecasting of risk, demand, and prices in various commodity sectors leading to enhanced decision making, increased profits, and reductions in uncertainly.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
603	Market Economics

Outcome #7

1. Outcome Measures

Resultant management models that explain potential impacts of new/emerging trends e.g. trade agreements, bio-terrorism threats, and renewable fuels requirements, on specific agriculture sectors to the extent that negative impacts can be mitigated in a timely manner.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

One OARDC study illustrates how proximity to urban areas affects housing location, economic activity, population retention and rural poverty, an important issue for government and communities.

What has been done

This research is fundamental in nature due to the broad consideration of the influence of urbanization on differing types of rural communities and rural outcomes.

Results

The fundamental research has produced a new methodology for evaluating how proximity to small to very large urban areas influences rural population and economic growth. In particular, this research illustrates the proximity to urban areas matter not just for the nearest urban area, but also for potentially more distant, but larger urban areas. This research shows the rich nature that urban proximity affects rural conditions and illustrates that urban proximity plays a much larger role than previously expected, especially compared to factors such as amenities and land use planning (especially related to sprawl). This knowledge has helped support the development of the policy briefs describing the need for regionalization and understanding encroaching urbanization at the rural-urban interface.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation

Outcome #8

1. Outcome Measures

Market economies and efficiencies studies relating to factors such as pricing, finance, supply and demand, etc. ensuring that stakeholders are informed and their identified needs, e.g. lower operating costs, become more attainable.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Dairy farmers, dairy cooperative management, dairy firm owners, and public policy officials, and extension educators require forecasts on key dairy price variables.

What has been done

This research produced a forecast model using the Bayesian Vector Autoregession modeling technique.

Results

The forecasts model is used to plan for futures levels of milk supply and demand. This forecast is also beneficial to those in the Ohio and U.S. dairy industry as an additional source of economic information that can be incorporated into strategic pricing plans.

4. Associated Knowledge Areas

KA Code	Knowledge Area
603	Market Economics

Outcome #9

1. Outcome Measures

Research finding on valuing environmental resources, e.g. wetlands, river restoration, and how it applies to stakeholder needs for demonstrated gains in profits, resources sustained, and/or actions mitigated.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A number of researchers have suggested that benefit cost analysis does not apply when there are concerns about irreversibility, such as species extinction. Such research is of concern to policy makers, other researchers and the conservation community.

What has been done

This research shows that benefit-cost analysis can be undertaken when threshholds or irreversibilities exist.

Results

Estimates of the benefits of USDA conservation programs will be useful to policy makers for many purposes including improved targeting of these programs. For example, a conjoint survey reveals that local citizens would be willing to contribute up to $5 per person per year for 30 years to obtain improved environmental amenities in a local watershed. An analysis of southern U.S. forests shows that large areas of hardwood forests are being converted to softwood plantations and reveals the payments that would be necessary to maintain biological diversity in hardwood stands.

4. Associated Knowledge Areas

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics

Outcome #10

1. Outcome Measures

Biocomplexity analysis to understand human-nature interactions at the landscape level that informs human enterprises, leading to demonstrated profitability, environmental protection, and/or improvements in quality of stakeholders' lives.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics

Outcome #11

1. Outcome Measures
Increase profitability, reduce environmental impact, and/or improve quality of stakeholders' lives through bio-resource utilization efficiency and effectiveness research such as biomass to energy, nitrogen utilization, biocides, etc.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics

Outcome #12

1. Outcome Measures

Market and non-market valuation of environmental resources, e.g. steelhead trout fishing, open space, that have often lacked economic justification that meets client needs, and informs individual, group, and government decision making.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Land use conversion is a critical issue in decision making by both agriculature and non-agriculture sectors because economic implications, lost opportunity costs and impacts on rural communities.

What has been done

OARDC researchers have demonstrated that where there is high prospect of land use conversion from agricultural to other uses arising from urban development, the land's implicit call option tends to increase in value, reflecting future land price increases due to uncertainty, which is realized through the mechanism of increasing cash flow/rent volatility.

Results

Increasing volatility translates into a tendency towards an increasing real option value. Therefore, development plays a crucial role in determining farmland values through the real option value of land. In turn, option values can shape the performance and structure of agriculture in a region. In regions with higher option values, capital investments in farm real estate are higher, and greater proportions of farmland are owned by off farm landlords. Furthermore, cash rents and current returns to investments in agriculture are lower, and capital gain returns are higher. With development pressure, local agricultural economics are less sustainable, i.e., parcels are less accessible and smaller, drainage systems are often adversely affected, farm supply stores disappear, and so forth. Low current returns to agricultural investments, changing ownership of farmland, and a faltering local agricultural businesses are not signs of a failing agricultural economy, but rather they are signs of a local economy in transition.

4. Associated Knowledge Areas

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics
602	Business Management, Finance, and Taxation

Outcome #13

1. Outcome Measures

Advance knowledge of vertical markets in developing counties that when applied leads to documented increased trade with the US.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
606	International Trade and Development

Outcome #14

1. Outcome Measures
Exchange rate, trade policy, and similar uncertainties research findings that lead to documented mitigation for stakeholders of certain negative effects of international trade.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
606	International Trade and Development

Outcome #15

1. Outcome Measures

New policy analysis research that informs policy development and fosters demonstrated gains for stakeholders in areas such as conservation programs, farmland protection, Farm Credit System resources, etc.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Policy makers require scientific assessments of policy alternatives to make informed decisions.

What has been done

Research was conducted to evaluate a proposal developed for reworking U.S. farm policy, entitled the Farm Revenue Proposal.

Results

A version of the Integrated Farm Revenue Proposal, the Average Crop Revenue Program, has been incorporated into the Senate's version of the 2007 Farm Bill, the Food and Energy Security Act of 2007.

4. Associated Knowledge Areas

KA Code	Knowledge Area
606	International Trade and Development

Outcome #16

1. Outcome Measures

Increased understanding of society's willing to pay for services.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A group of US respondents were presented with a hypothetical government-sponsored food safety program used to elicit their willingness to pay for the program. Food safety programs and where the costs are recovered is a central economic question in the food industry, among regulators and within society.

What has been done

Discrete choice regression techniques were used to analyze the hypothetical product choice data collected in the survey. Initial findings suggest that individual consumers are willing to pay a small but statistically significant premium for hamburgers and hotdogs that are treated to reduce the probability of acquiring foodborne illness and that this willingness to pay scales proportionately with the perceived improvement in this probability.

Results

Scientists point out that when aggregating this willingness to pay across respondents, an aggregate willingness to pay to reduce foodborne illness may be significantly larger than current USDA estimates of the value of reducing foodborne illness. USDA estimates use a different methodology that does not take into consideration the value that consumers may place on the pain, suffering and worry that accompany the contraction of a foodborne illness.

4. Associated Knowledge Areas

KA Code	Knowledge Area
610	Domestic Policy Analysis
603	Market Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

Weak economy and government regulations are two factors that most effect outcomes.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Case Study

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #10

V(A). Planned Program (Summary)

1. Name of the Planned Program

Human and Community Resource Development-OARDC Led

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	15%		15%	
803	Sociological and Technological Change Affecting Individuals, Families and Communities	40%		40%	
901	Program and Project Design, and Statistics	10%		10%	
902	Administration of Projects and Programs	15%		15%	
903	Communication, Education, and Information Delivery	20%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	5.5	0.0
Actual	0.0	0.0	3.9	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	365024	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	484886	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Outputs within the Human and Community Resource Development planned program are/will be: - online and in print research based publications targeted to (a) specific stakeholder groups including industrial partners, (b) support publics such as fellow agencies, political entities, (c) targeted populations, and (d) the broader general public; - peer-reviewed journal articles; - non-commercialized techniques that are distributed to those in need without costs; - consultation services and meetings with stakeholders and supporters; - facilitation of training programs/workshops for other scientist and for specific groups of stakeholders, including international visitors; and - planning meeting with advisory groups to communicate findings and plan new research.

2. Brief description of the target audience

Targeted audiences are, but not limited to: - specific individuals or groups who have expressed a need for information related to some aspect of human capital that is to be derived through new research, extracted from on-going research, or is derived from scientific literature; - fellow academic units that depend on scientists in this program for support information and for approaches/measures; - fellow agencies or support organizations who will not only use the social information but will also extend that information; - populations who have not requested the information but will likely benefit from that information; - other scientists and scientific groups; - political entities; - extension personnel; - students from pre-school to post doctorate studies; - news organizations; and - business and industrial groups.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

NA

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	17	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- ,•online and print research-based publications will be tracked in terms of number of ,hits, on the web site and the numbers and sites for distribution of printed materials;

Year	Target	Actual
2007	0	0

Output #2

Output Measure

- ,•peer-reviewed publications will be tracked in terms of name and tier of journal, as well as record of citations of the article;

Year	Target	Actual
2007	12	17

Output #3

Output Measure

- •non - commercialized techniques such as methods for tracking specific programs and who received those programs and what was the impact;

Year	Target	Actual
2007	0	0

Output #4

Output Measure

- •consultations with recipients and in what areas;

Year	Target	Actual
2007	0	5

Output #5

Output Measure

- •training programs by how many of what type of stakeholder participated in what type of program; what non-OARDC organization helped to lead the training; and

Year	Target	Actual
2007	0	6

Output #6

Output Measure

- •planning meeting participation as to who (non-OARDC) participated at what level to help take research projects and practices to the next level.

Year	Target	Actual
2007	0	0

Output #7

Output Measure

- •number of gradaute studnets gradauted, their research area, and placement in the profession

Year	Target	Actual
2007	3	8

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Advance human capital and sociological studies that will inform strategies for expanding and strengthening the agricultural workforce leading to improved quality and quantity of jobs in rural areas yielding demonstrated economic growth.
2	Advance human capital and sociological studies that will inform strategies for strengthening individual and family well-being, and community stability, e.g. grandmother daycare in single head households.
3	Develop a more complete understanding of the relationship between learning style and cognitive abilities of Ohio agricultural students to inform teaching –learning leading to gain score increases within and a better-educated workforce.
4	Conduct statewide survey research to better understand public attitudes, perceptions, opinions, and behaviors related to select topics in agriculture, annually documenting how those data impact decision-making, e.g. public policy, industrial decisions.
5	Investigate shifts in rural-urban interface, land use, immigration, and similar changes to determine if community policies and/or levels of social capital in the community can shape the future of agriculture in face of urbanization pressures.
6	Improve through research the understanding of and skill development for decision-making by local farmers that will result in improved farm viability and competitiveness at the rural-urban interface.
7	Develop a conceptual framework within five years that will inform programming for developing statewide leadership characteristics, skills, and attitudes in a core of present and future leaders in order to advance a more socially responsible industry.
8	Study rural educational systems relative to educational resources, curriculum, instructional delivery, and student learning to the extent necessary to inform decision-makers how to improve rural education systems as requested.
9	Investigate the social implications of structural changes in agriculture and their economic implications, documenting challenges and opportunities for rural individuals, families, groups and communities, including business and government.
10	Investigate project formulation and administration to the extent that the findings help the institution to document gains in creativity, productivity, partnerships, collaboration, and proficiency within five years.
11	Advance understanding of communication, education and information services to show gain scores in the teaching and learning process within related agriculture and natural resources programs.
12	Human and community resource development and family wellbeing is rooted in decisions made by various groups regarding credit use, retirement/emergency fund savings, and investment. Understanding of variations among ethnic groups across the three constructs is necessary in order to ensure equal access.

Outcome #1

1. Outcome Measures

Advance human capital and sociological studies that will inform strategies for expanding and strengthening the agricultural workforce leading to improved quality and quantity of jobs in rural areas yielding demonstrated economic growth.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #2

1. Outcome Measures

Advance human capital and sociological studies that will inform strategies for strengthening individual and family well-being, and community stability, e.g. grandmother daycare in single head households.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Issues related to rural family wellbeing is central to rural community stability and has implications for the food, agriculture and environmental science enterprises.

What has been done

The goals of the work this year were to understand better how rural families manage resources and maintain their well being.

Results

OARDC scientists presented research findings and applications to 150 OH Extension nutrition educators in two trainings. Food security was linked to mental and physical health, income, and employment; however, cluster analysis of well being revealed that the poorest mothers were more food secure. They had more material support from agencies and their parents. Well-being was linked to health of self and partner. Researchers concluded that at least for the rural poor, use of poverty measures alone is inadequate as an indicator of well being.. Routine grandmother care was found to afford mothers a number of benefits: optimal flexibility that is often needed by working poor mothers, relative little financial cost, and a much broader and deeper relationship among caregiver, mother and child. Because of the ongoing relationship and financial need, intergenerational care can also be stressful for caregiver and mother of the child. Daughters may be unable to objectively judge quality of care. Research, educational, and policy implications were developed. Training of child care providers should acknowledge the enduring relationship between adult daughters and their mothers, make connections to community agencies to increase social capital, and take into account the family's resources. Professionals working with low income rural families should recognize that extended families provide vital support and often enhance their well being.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #3

1. Outcome Measures

Develop a more complete understanding of the relationship between learning style and cognitive abilities of Ohio agricultural students to inform teaching – learning leading to gain score increases within and a better-educated workforce.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #4

1. Outcome Measures

Conduct statewide survey research to better understand public attitudes, perceptions, opinions, and behaviors related to select topics in agriculture, annually documenting how those data impact decision-making, e.g. public policy, industrial decisions.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #5

1. Outcome Measures
Investigate shifts in rural-urban interface, land use, immigration, and similar changes to determine if community policies and/or levels of social capital in the community can shape the future of agriculture in face of urbanization pressures.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #6

1. Outcome Measures

Improve through research the understanding of and skill development for decision-making by local farmers that will result in improved farm viability and competitiveness at the rural-urban interface.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #7

1. Outcome Measures

Develop a conceptual framework within five years that will inform programming for developing statewide leadership characteristics, skills, and attitudes in a core of present and future leaders in order to advance a more socially responsible industry.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families and Communities
802	Human Development and Family Well-Being

Outcome #8

1. Outcome Measures

Study rural educational systems relative to educational resources, curriculum, instructional delivery, and student learning to the extent necessary to inform decision-makers how to improve rural education systems as requested.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
903	Communication, Education, and Information Delivery

Outcome #9

1. Outcome Measures

Investigate the social implications of structural changes in agriculture and their economic implications, documenting challenges and opportunities for rural individuals, families, groups and communities, including business and government.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #10

1. Outcome Measures
Investigate project formulation and administration to the extent that the findings help the institution to document gains in creativity, productivity, partnerships, collaboration, and proficiency within five years.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
902	Administration of Projects and Programs

Outcome #11

1. Outcome Measures

Advance understanding of communication, education and information services to show gain scores in the teaching and learning process within related agriculture and natural resources programs.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
903	Communication, Education, and Information Delivery

Outcome #12

1. Outcome Measures

Human and community resource development and family wellbeing is rooted in decisions made by various groups regarding credit use, retirement/emergency fund savings, and investment. Understanding of variations among ethnic groups across the three constructs is necessary in order to ensure equal access.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Household saving decisions, namely credit use, retirement/emergency fund savings, and investment decisions, is most important to family wellbeing and community stability.

What has been done

An OARDC study related to three basic themes of household saving decisions, that of credit use, retirement/emergency fund savings, and investment decisions were conducted across ethnic group data.

Results

While focusing on racial/ethnic differences, there is a wealth disparity between Whites and minority groups, especially Black and Hispanic households. Credit attitudes and credit behavior may limit the ability of some Black and Hispanic households to accumulate wealth. Our analysis shows that Black households are more likely to have had problem credit behavior than White households, but even after controlling for behaviors, income, and other factors, Black and Hispanic households were more likely to have been rejected for credit than White households. A paper on racial/ethnic differences in risky asset ownership won the Best Paper award at the Academy of Financial Services conference in 2007, and showed that if Blacks and Hispanics had the same risk tolerance, income, and other characteristics as White households, they would have approximately the same risky asset ownership rates, so would have the opportunity to accumulate wealth at a faster rate. However, research that was completed at the end of 2007 shows that Black and Hispanic households are less likely to spend less than income than are otherwise similar White households, so progress may be slow. The long-term practical impact of all of these studies will depend on incorporation into financial education and policy related measures such as default options for employer-sponsored retirement plans.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)
- Other (Trends and fads)

Brief Explanation

Limited research funding in this area is a limitations, as it is in most social sciences.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Case Study
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #11

V(A). Planned Program (Summary)

1. Name of the Planned Program

Building Human Capital (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	95%		95%	
806	Youth Development	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	20.0	0.0	0.0	0.0
Actual	18.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
577385	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
779955	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
262008	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- The total number of workshops and educational sessions conducted
- The total number of newsletters created
- The total number of newsletters distributed
- The total number of new curricula developed

2. Brief description of the target audience

- parents of children ages birth to 18, including, but not limited to: teen, step, adoptive, foster, single, divorcing, incarcerated, fathers who may not have yet established paternity, and grandparents
- youth aged 13 to 18
- adults in, or thinking about entering, intimate relationships
- child care providers
- older adults and those who care for them
- social service professionals

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	15000	15000	10000	0
2007	22685	45323	10000	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	4	0	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Total number of participants in the program/project.

Year	Target	Actual
2007	0	32865

Output #2

Output Measure

- Total number of volunteers participating in the planning and implementation of the program (e.g., committee members, teachers/trainers, unpaid staff, etc.)

Year	Target	Actual
2007	0	666

Output #3

Output Measure

- Number of educational sessions held with two or more participants.

Year	Target	Actual
2007	0	2057

Output #4

Output Measure

- Number of participants attending presentations and/or demonstrations.

Year	Target	Actual
2007	0	20628

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	# of participants who learned new information from the program.
2	# of participants who plan to adopt one or more recommended practices as a result of the education program/session(s)
3	# of participants who actually adopt one or more recommended practices as a result of this education program/session(s)

Outcome #1

1. Outcome Measures

# of participants who learned new information from the program.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	20654

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Improved knowledge is the first step in bringing about behavior change.

What has been done

Relevant programs designed and offered.

Results

Participants indicate they learned new information.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development
802	Human Development and Family Well-Being

Outcome #2

1. Outcome Measures

# of participants who plan to adopt one or more recommended practices as a result of the education program/session(s)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Intentions are the strongest predictors of behaviors, planning to adopt is a measure of intention.

What has been done

Consubstantiation occurred.

Results

Participants indicate intentions to change behavior.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

Outcome #3

1. Outcome Measures

# of participants who actually adopt one or more recommended practices as a result of this education program/session(s)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Adopting new behaviors is the ultimate goal of the educational programs.

What has been done

Participants have internalized educational objectives.

Results

Behaviors have changed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development
802	Human Development and Family Well-Being

V(H). Planned Program (External Factors)

External factors which affected outcomes

•

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #12

V(A). Planned Program (Summary)

1. Name of the Planned Program

Nutrition Education and Behavior (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	50.0	0.0	0.0	0.0
Actual	18.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
577385	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
779955	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
262008	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Expanded Food and Nutrition Program (EFNEP)

• Series of Classes • Newsletter • Youth curriculum • Training provided for EFNEP staff by state personnel • Collaborations with agencies including Women Infants and Children, Local Health Departments, Metropolitan Housing, Jobs & Family Services, Help Me Grow and related organizations

Family Nutrition Program (FNP)

• Series of Classes • Individual Classes • Newsletter • Summer Day Camps in select counties • Training provided for FNP staff by state personnel and regional specialists • Collaborations with agencies to offer programming including Jobs and Family Services, Women Infants and Children, Local Health Departments, Help Me Grow, Food Banks and Pantries, Senior Centers and related organizations

Dining with Diabetes (DWD)

• Series of four classes offered in participating counties • Newsletters written by the Dining With Diabetes (DWD) Team • Training for program team provided by statewide Dining with Diabetes Team and invited speakers • Curriculum revisions of three powerpoint lessons developed by DWD Team • Collaborations with agencies to offer programming include Registered Dietitians,Certified Diabetes Educators, Health Professionals and support at the State level from the Ohio Department of Health • Media releases to promote programming

General Nutrition Education

• Individual workshops and/or series of classes offered in counties to address needs of local clientele. • Newsletters, press and radio releases • Collaborations with agencies to offer programming include Senior Centers, community clubs and organizations, health departments, schools and other community groups

2. Brief description of the target audience

The target audience varies by program;

Expanded Food and Nutrition Education and Family Nutrition program are targeted to reach low-income audience homemakers with children from birth to 18 years of age

Family Nutrition Program targets food stamp recipients with mothers as the priority target.

The Dining with Diabetes Program targets individuals with diabetes and their caregivers/family support members.

General nutrition programming is specifically designed for the audience. For example school programming is age appropriate whereas programs at Senior Centers are targeted to individuals living alone or with one other person in terms of food preparation.

The end result is a program that has the potential to encompass all residents of the county.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	35000	5000	11000	0
2007	46357	269860	28005	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	7	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of classes and participants/class

Year	Target	Actual
2007	0	35264

Output #2

Output Measure

- Number of newsletters for EFNEP, FNP, DWD, and general nutrition programs

Year	Target	Actual
2007	0	35264

Output #3

Output Measure

- Collaborations formed/maintained

Year	Target	Actual
2007	0	270

Output #4

Output Measure

- Curriculum revised/created for DWD and EFNEP

Year	Target	Actual
2007	0	7

Output #5

Output Measure

- Number of day camps/campers

Year	Target	Actual
2007	0	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	% of participants who demonstrate the ability to plan menus and choose foods using the Dietary Guidelines and My Pyramid.
2	% of participants who indicate an intent to adopt one or more healthy food/nutrition practices.
3	% of participants who indicate an intent to begin or increase physical activity.
4	% of participants who demonstrate adoption of healthy eating practices by: Improved lifestyle practices based on the Dietary Guidelines and My Pyramid Improved intake of food group servings (increased intake of vegetables, fruits and low calorie dairy items; reduced intake of calories and fat)
5	% of participants who demonstrate adoption of increased time spent in physical activity Implementing regular physical activity Increased participation in games involving physical activity Reduction in sedentary activities such as watching TV and playing video games
6	% of participants who have achieved/maintained a healthy body weight as measured by BMI
7	% of individuals who have achieved compression of morbidity (increased number of healthy years during life span)
8	Decreased number of chronic disease factors
9	Decreased number of chronic disease complications
10	Decreased number of participants who are overweight or obese
11	Increased number of individuals who have achieved/maintained a healthy body weight (as measured by BMI)
12	Increased number of individuals who maintain a moderately active lifestyle (60 minutes a day, most days of the week)

Outcome #1

1. Outcome Measures

% of participants who demonstrate the ability to plan menus and choose foods using the Dietary Guidelines and My Pyramid.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	5000	50903

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Over 650,000 Ohioans have been diagnosed with diabetes. It is the 5th leading cause of death in Ohio.

What has been done

A series of DWD has been conducted in 32 Ohio counties.

Results

Over 1,700 individuals participated in DWD classes and learned strategies to manage their diabetes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #2

1. Outcome Measures

% of participants who indicate an intent to adopt one or more healthy food/nutrition practices.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	29900

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #3

1. Outcome Measures

% of participants who indicate an intent to begin or increase physical activity.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

Included in another outcome listed below

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #4

1. Outcome Measures

% of participants who demonstrate adoption of healthy eating practices by:
Improved lifestyle practices based on the Dietary Guidelines and My Pyramid
Improved intake of food group servings (increased intake of vegetables, fruits and low calorie dairy items; reduced intake of calories and fat)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	41

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #5

1. Outcome Measures

% of participants who demonstrate adoption of increased time spent in physical activity Implementing regular physical activity Increased participation in games involving physical activity Reduction in sedentary activities such as watching TV and playing video games

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #6

1. Outcome Measures

% of participants who have achieved/maintained a healthy body weight as measured by BMI

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

See External Factors...

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #7

1. Outcome Measures
% of individuals who have achieved compression of morbidity (increased number of healthy years during life span)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

See External Factors Section

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #8

1. Outcome Measures
Decreased number of chronic disease factors

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

See External Factors Section...

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #9

1. Outcome Measures

Decreased number of chronic disease complications

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

See External Factors Section...

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #10

1. Outcome Measures

Decreased number of participants who are overweight or obese

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

See External Factors Section...

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #11

1. Outcome Measures

Increased number of individuals who have achieved/maintained a healthy body weight (as measured by BMI)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

See External Factors Section...

4. Associated Knowledge Areas

KA Code	Knowledge Area

703	Nutrition Education and Behavior

Outcome #12

1. Outcome Measures

Increased number of individuals who maintain a moderately active lifestyle (60 minutes a day, most days of the week)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

Included in activity outcome measure listed above

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Public Policy changes
- Other (unrealistic measures)

Brief Explanation

Many outcomes were not tracked in 2007 as a realization that either the data could not be gathered or was too intrusive to participants (e.g. BMI).

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Comparisons between program participants (individuals,group,organizations) and non-participants

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #13

V(A). Planned Program (Summary)

1. Name of the Planned Program

Financial Security (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	38.0	0.0	5.0	0.0
Actual	7.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
224538	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
303316	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
101892	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

#9633; Conduct savings and investment workshops focused on reaching long-term goals

#9633; Develop and distribute curriculum, fact sheets, media releases, and web resources focused on saving for future needs and wants

#9633; Meetings with partners and stakeholders

2. Brief description of the target audience

Baby boomers, especially women

New employees

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	2500	5000	0	0
2007	3600	6381	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # web page hits

Year	Target	Actual
2007	0	6381

Output #2

Output Measure

- # classes conducted

Year	Target	Actual
2007	0	0

Output #3

Output Measure

- # classes conducted

Year	Target	Actual
2007	0	0

Output #4

Output Measure

- # fact sheets distributed

Year	Target	Actual
2007	0	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	# of people gaining knowledge or planning to adopt behaviors
2	# of people utilizing recommended financial management practices
3	# of people initiating or increasing contributions to a retirement plan
4	# of people who establish or revise investment goals

Outcome #1

1. Outcome Measures

# of people gaining knowledge or planning to adopt behaviors

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	2314

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #2

1. Outcome Measures

# of people utilizing recommended financial management practices

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	906

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area

801 Individual and Family Resource Management

Outcome #3

1. Outcome Measures

# of people initiating or increasing contributions to a retirement plan

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	343

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #4

1. Outcome Measures

# of people who establish or revise investment goals

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	243

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Public Policy changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #14

V(A). Planned Program (Summary)

1. Name of the Planned Program

Financial Stability (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	38.0	0.0	5.0	0.0
Actual	8.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
256615	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
346647	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
116448	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Provide in-class training in basic money management

Development materials to accompany instruction

Provide in-service training for educators on strategies to enable participants to change their behavior

Work with stakeholders and partners to leverage resources

2. Brief description of the target audience

Bankruptcy filers

Young adults

Debt-burdened individuals and couples

Limited-resource families

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	2500	5000	0	0
2007	10000	6072	2000	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	1	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of classes and participants in basic money management training sessions

Year	Target	Actual
2007	0	11511

Output #2

Output Measure

- Curriculum developed

Year	Target	Actual
2007	0	1

Output #3

Output Measure

- # of state-level in-services and educators trained

Year	Target	Actual
2007	0	75

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	65% of participants will identify at least 1 financial goal and plan to adopt recommended financial management practices
2	60% of participants will increase their savings
3	60% of participants organized their financial records for quick retrieval
4	70% of participants set aside money for occasional expenses
5	End of class evaluation of concepts learned and behavior changes planned

Outcome #1

1. Outcome Measures

65% of participants will identify at least 1 financial goal and plan to adopt recommended financial management practices

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	65

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

65% of participants learned recommended financial management practices

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #2

1. Outcome Measures

60% of participants will increase their savings

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	60

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #3

1. Outcome Measures

60% of participants organized their financial records for quick retrieval

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	60

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #4

1. Outcome Measures

70% of participants set aside money for occasional expenses

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	70

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #5

1. Outcome Measures

End of class evaluation of concepts learned and behavior changes planned

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	5737

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

5737 indicated behavior changes planned at the end of class evaluation

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Public Policy changes
- Government Regulations

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #15

V(A). Planned Program (Summary)

1. Name of the Planned Program

Volunteer Education & Training (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	25.0	0.0	0.0	0.0
Actual	50.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1528498	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2540096	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
58846	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct county-based required volunteer orientation for all new volunteers serving in the youth development program focusing on principles of positive youth development, organizational policies, procedures, and best practices.

- Conduct annual statewide volunteer conference focusing on project specific knowledge and skills and leadership development for adult volunteers who work directly with youth.

- Hold an annual volunteer academy for paid staff and selected key leader volunteers focusing on societal changes that impact volunteerism and the changes necessary in the organization.

- Conduct continuing professional education opportunities for volunteers on the local, regional and statewide level focusing on youth development principles and subject matter content.

- Develop web-based training and education modules for volunteers and build library of resources for Educators to use when conducting training/education programs for volunteers locally.

- Establish methods to document knowledge and skills gained and identify the extent of impact training, education, and service has on volunteers.

2. Brief description of the target audience

Adult volunteers, over the age of 18 and not current 4-H members, who are currently serving the 4-H youth development program or who potentially will be serving the 4-H youth development program.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	10000	10000	0	200000
2007	8132	1747	0	342657

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- County-based volunteer training and education programs will be held each year engaging adult volunteers serving community clubs, after-school programs, residential and day camps, and special interest programs. County Educators will report the number of training and/or educational programs conducted and volunteers attending through a year-end evaluation.

Year	Target	Actual
2007	0	0

Output #2

Output Measure

- Conduct annual statewide volunteer conference for 1,200 adult volunteers who may select from 100 educational workshops focusing on project specific knowledge and skills and leadership development for adult volunteers who work directly with youth.

Year	Target	Actual
2007	0	1166

Output #3

Output Measure

- Hold an annual volunteer academy for 40 paid staff and selected key leader volunteers with three focused breakout sessions related to societal changes that impact volunteerism and the changes necessary in the organization.

Year	Target	Actual
2007	0	0

Output #4

Output Measure

- Conduct 250 continuing professional education programs for 15,000 volunteers on the local, regional and statewide level focusing on youth development principles and subject matter content.

Year	Target	Actual
2007	0	175

Output #5

Output Measure

- Develop three new web-based training and education modules focusing on youth development principles, youth/adult partnerships, and conflict management for volunteers and build library of resources that includes over 100 curriculum pieces for Educators to use when conducting training/education programs for volunteers locally.

Year	Target	Actual
2007	0	0

Output #6

Output Measure

- Establish methods to document knowledge and skills gained and identify the extent of impact training, education, and service has on volunteers as measured by volunteer responses to mailed survey.

Year	Target	Actual
2007	0	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	10,000 adult volunteers will increase their awareness of the principles of positive youth development by attending at least one county-based volunteer training/education program during the year.
2	75% of current volunteers participating in county-based, statewide, and/or web-based training will increase their knowledge and understanding of 4-H youth development program policies, procedures and best practices.
3	50% of volunteers that have participated in county-based, statewide, and/or web-based education/training programs will adopt and apply at least two new strategies for engaging young people in programs and activities.
4	35% of volunteers currently serving as volunteers with a community club, after-school program, residential/day camp or special interest program will transfer the skills, knowledge and attitudes they have learned and apply to other programs or situations in their local communities as measured by volunteer responses to mailed survey.
5	Ohio 4-H Youth Development will increase the number of caring adults from 20,000 to 30,000 serving in the 4-H Youth Development program who are providing safe and positive environments for hands-on learning as defined by youth participants and parents/guardians.

Outcome #1

1. Outcome Measures

10,000 adult volunteers will increase their awareness of the principles of positive youth development by attending at least one county-based volunteer training/education program during the year.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	10000	2864

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

New and Continuing volunteer education is an important component to ensure that positive role models are working with youth.

What has been done

County 4-H professionals conduct mandatory new volunteer training and education programs for all new adult volunteers and Ohio 4-H hosted the annual Ohio Volunteer Conference and Bob Evans Recognition Luncheon.

Results

78% of volunteers attending the 2007 Ohio 4-H Volunteer Conference indicated, in a post-program survey, that they would use new information gained by sharing with their club members.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #2

1. Outcome Measures

75% of current volunteers participating in county-based, statewide, and/or web-based training will increase their knowledge and understanding of 4-H youth development program policies, procedures and best practices.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #3

1. Outcome Measures

50% of volunteers that have participated in county-based, statewide, and/or web-based education/training programs will adopt and apply at least two new strategies for engaging young people in programs and activities.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #4

1. Outcome Measures

35% of volunteers currently serving as volunteers with a community club, after-school program, residential/day camp or special interest program will transfer the skills, knowledge and attitudes they have learned and apply to other programs or situations in their local communities as measured by volunteer responses to mailed survey.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	5000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #5

1. Outcome Measures
Ohio 4-H Youth Development will increase the number of caring adults from 20,000 to 30,000 serving in the 4-H Youth Development program who are providing safe and positive environments for hands-on learning as defined by youth participants and parents/guardians.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	5000	1698

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Recruiting new volunteers to serve in the organization is important as society continues to change and evolve.

What has been done

County 4-H Educators and volunteers are implementing new strategies to recruit new adult volunteers in short & long term roles.

Results

1,698 new adult volunteers were recruited to serve as community club advisors, after-school leaders, and special interest volunteers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes
- Competing Programmatic Challenges
- Other (Faculty vacancies)

Brief Explanation

Over the past two years, significant changes have taken place with regards to the focus on volunteer education within the Ohio 4-H Youth Development program.

•Changes in administrative leadership of the 4-H program has resulted in fewer FTEs at the state level; individuals supporting volunteerism in Ohio 4-H are now in administrative positions. •Reduced FTE appointment to research and evaluation (at the state level) that would have supported evaluation initiatives related to volunteer education, thus not able to focus these efforts. •Not successful in securing funds to conduct significant volunteer administration academies that were desired.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #16

V(A). Planned Program (Summary)

1. Name of the Planned Program

Ohio 4-H Teen Leadership (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
806	Youth Development	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	0.0
Actual	31.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
947669	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1574860	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
36485	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- 4-H Leadership Projects

4-H projects are planned experiences in which youth develop knowledge, attitudes, skills, and aspirations related to a specific topic. Information and research results are disseminated to youth through 4-H projects. The 12 4-H leadership projects will be updated and new ones developed.

- 4-H Club Officer And Committee System

4-H members become leaders through real-life responsibilities as club officers and committee members. Officer and committee resources and workshops will be provided.

- Junior/Teen Leadership Programs

Resources and education in County 4-H Junior/Teen Leadership programs will enable teens to develop advanced leadership among peer leaders.

- 4-H Camp Counselor Opportunities

Teens will develop advanced leadership abilities by serving as 4-H camp counselors, student assistants and in similar roles. Teens will receive training, supervised internships, and practical experience in these roles.

- 4-H Teen Boardsmanship / Youth in Governance

By serving on 4-H boards and representing 4-H on boards of partner organizations, teens gain real-life leadership experience. Resources and workshops will be provided to strengthen teen board leadership opportunities.

- 4-H Ambassadors & Spokesperson Opportunities

Ohio 4-H Ambassadors will develop leadership as 4-H youth spokespersons throughout the state. Also, county programs such as Awareness Teams, Public Relations Corps and other leadership opportunities will be offered.

- 4-H CARTEENS, 4-H TAP, and other 4-H Leadership Emphasis Programs

Teens will develop leadership through special emphasis 4-H leadership programs such as the 4-H CARTEENS program and the 4-H Teen Action Partnership (TAP) (in which 4-H teen leaders peer-teach violence prevention and personal safety). Resources and workshops will be provided.

- 4-H Service Leadership

Ohio 4-H members will develop leadership abilities by planning, conducting, and evaluating 4-H service-learning programs and projects. Resources and education will be provided.

- 4-H Workforce Preparation

Integrated Extension and Research programming will enable 4-H teen participants (and stakeholders) to document high-value workforce abilities gained.

- State 4-H Leadership Camp

Leadership Camp is the epitome of a successful "learn by doing" approach to leadership development, and will be continued.

- Ohio 4-H Teen Conference

A strong leadership dimension will be incorporated into the annual Ohio 4-H Teen Conference, involving approximately 1000 teens per year.

2. Brief description of the target audience
Ohio teens age 13 and older

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

Year	Direct Contacts Adults Target	Indirect Contacts Adults Target	Direct Contacts Youth Target	Indirect Contacts Youth Target
Plan	2500	5000	25000	50000
2007	3049	6097	30440	60979

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	3	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Numbers of teens participating in Ohio 4-H teen leadership development program opportunities

Year	Target	Actual
2007	0	30440

Output #2

Output Measure

- Types of roles in which 4-H teens and young alumni exercise leadership following participation in 4-H teen leadership development program opportunities

Year	Target	Actual
2007	0	10

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	250,000 Ohio youth learn to effectively exercise leadership through project experiences and group activities
2	20,000+ Ohio teens develop advanced leadership skills knowledge, attitudes and aspirations each year as a result of targeted 4-H teen leadership program activities
3	Ohio youth apply what they learn through 4-H in real-life leadership to make a positive difference in their clubs, communities, country and world.
4	4-H teens and young 4-H alumni effectively lead groups, programs, and activities in a variety of youth leadership roles.
5	Better lives, businesses, and communities for all citizens.
6	As adults, alumni of 4-H teen leadership programs are engaged as pro-active leaders in strengthening and determining the future of their communities, the nation, and the world.

Outcome #1

1. Outcome Measures

250,000 Ohio youth learn to effectively exercise leadership through project experiences and group activities

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	318956

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Youth leadership development is an important part of preparing youth for future adulthood

What has been done

More than 200 Ohio 4-H projects and dozens of different group leadership activities involved more than 300,000 4-Hers

Results

318,956 Ohio 4-Hers learned to effectively exercise leadership through project experiences and group activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

20,000+ Ohio teens develop advanced leadership skills knowledge, attitudes and aspirations each year as a result of targeted 4-H teen leadership program activities

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	30400

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The development of leadership KASA is a key element of youth leadership development

What has been done

Targeted 4-H teen leadership program activities were offered to youth throughout Ohio

Results

30,440 Ohio teens developed advanced leadership skills, knowledge, attitudes, and aspirations through 4-H leadership experiences.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Ohio youth apply what they learn through 4-H in real-life leadership to make a positive difference in their clubs, communities, country and world.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	156478

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The application of real life leadership is necessary for making a positive difference with others

What has been done

Youth were provided opportunities to use real life leadership in their clubs, communities, country and world

Results

More than 150,000 Ohio youth applied what they learned through 4-H in real-life leadership roles and responsibilities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #4

1. Outcome Measures

4-H teens and young 4-H alumni effectively lead groups, programs, and activities in a variety of youth leadership roles.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	30440

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

4-H teens and young alumni must learn to effectively lead groups, program and activities in various leadership roles

What has been done

4-H teens were provided opportunities to provide leadership in various leadership roles

Results

30,440 Ohio 4-H teens effectively lead groups, programs and activities as a result of Ohio 4-H opportunities

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #5

1. Outcome Measures

Better lives, businesses, and communities for all citizens.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	318956

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The development of youth leadership is important for the betterment of people's lives, businesses, and communities

What has been done

4-H program opportunities built around the goal of making the best better were offered to all Ohio 4-H youth.

Results

318,956 Ohio 4-H youth were involved in 4-H programs built around the goal of making the best better.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #6

1. Outcome Measures

As adults, alumni of 4-H teen leadership programs are engaged as pro-active leaders in strengthening and determining the future of their communities, the nation, and the world.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	1664

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Young adults must be engaged as pro-active leaders in strengthening their communities, country, and world.

What has been done

Post-high school age 4-Hers provided leadership through continued involvement in 4-H programs and opportunities.

Results

1,664 older 4-Hers became more pro-active as leaders for the future as a result of their 4-H experiences.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #17

V(A). Planned Program (Summary)

1. Name of the Planned Program

Community Development Leadership Development (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
602	Business Management, Finance, and Taxation	20%		20%	
608	Community Resource Planning and Development	20%		20%	
802	Human Development and Family Well-Being	20%		20%	
803	Sociological and Technological Change Affecting Individuals, Families and Communities	20%		20%	
805	Community Institutions, Health, and Social Services	20%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	4.2	0.0	0.0	0.0
Actual	3.2	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
127929	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
148730	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
22778	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Partner with local organizations
- Develop curriculum
- Conduct classes
- Evaluate results

2. Brief description of the target audience

- Elected and appointed officials
- Non-profit leaders
- Business leaders
- Community volunteer leaders
- Citizens who are thinking about running for public office
- Potential leaders

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

Year	Direct Contacts Adults Target	Indirect Contacts Adults Target	Direct Contacts Youth Target	Indirect Contacts Youth Target
Plan	800	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	{No Data Entered}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	{No Data Entered}	{No Data Entered}	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of classes held and number of participants

Year	Target	Actual
2007	0	36

Output #2

Output Measure

- Partnerships with local organizations

Year	Target	Actual
2007	0	15

Output #3

Output Measure

- number of curriculum developed

Year	Target	Actual
2007	0	16

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Increase in ethics knowledge by 70% of participants
2	Increase in willingness to step forward and be a leader 70% of participants
3	Increase by 70% of participants in knowledge about: Being responsible making wise choices inclusivity courage acting decisively collaborating humility compassion justice openness integrity
4	20% increase in calls by elected officials to the Ohio Ethics Commission
5	10% increase in large community meetings
6	5% increase in regional cooperation by elected officials
7	10% increase in community vision building
8	5% increase in participation in Ohio Community Leadership Development Programs
9	20% decrease in Ohio ethics court cases
10	5% increase in citizen participation in local government
11	5% decrease in community conflict and the need for mediation
12	5% increase in citizen trust of local government
13	1% increase in the number of people willing to step forward when asked to lead

Outcome #1

1. Outcome Measures

Increase in ethics knowledge by 70% of participants

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The citizens of Ohio expect ethical behavior from elected and appointed officials.

What has been done

Classes and a conference were held

Results

Citizens are not reading or hearing about ethics issues in the news as much

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families and Communities
802	Human Development and Family Well-Being
602	Business Management, Finance, and Taxation

Outcome #2

1. Outcome Measures

Increase in willingness to step forward and be a leader 70% of participants

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	1939

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Communities need leaders to step forward and perform leadership functions to operate democratically

What has been done

Leadership classes have been held

Results

More people are stepping forward to run for office

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #3

1. Outcome Measures

Increase by 70% of participants in knowledge about: Being responsible making wise choices inclusivity courage acting decisively collaborating humility compassion justice openness integrity

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	1939

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The residents of communities and the members of organizations in Ohio need quality leaders who can help them.

What has been done

Leadership classes have been held

Results

The quality of leadership in Ohio appears to be improving.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #4

1. Outcome Measures

20% increase in calls by elected officials to the Ohio Ethics Commission

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Ohio Ethics Commission wants elected officials to call them before they make ethically questionable decisions.

What has been done

As a part of leadership classes trainers from the Ohio Ethics Commission are invited to present

Results

The Governor of Ohio has created an executive order which mandates ethics training

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #5

1. Outcome Measures

10% increase in large community meetings

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The citizens is Ohio communities expect to have a voice in government beyond just voting

What has been done

Classes have been held to teach leaders how to hold large public meetings.

Results

More large public meeting are being held in Ohio

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #6

1. Outcome Measures

5% increase in regional cooperation by elected officials

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	35

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The citizens of Ohio expect both effective and efficient government which is improved by regionalism

What has been done

Leadership classes that teach the value and process of regionaqlism have been held

Results

There is more regional government cooperation in Ohio.

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families and Communities
602	Business Management, Finance, and Taxation
805	Community Institutions, Health, and Social Services
608	Community Resource Planning and Development
802	Human Development and Family Well-Being

Outcome #7

1. Outcome Measures

10% increase in community vision building

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Both residents and elected officials need clear visions to make positive change for the future

What has been done

Leadership classes that teach the value and process of visioning have been held

Results

More Ohio communities are creating shared visions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families and Communities
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services

Outcome #8

1. Outcome Measures

5% increase in participation in Ohio Community Leadership Development Programs

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	23

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Communities need educated leaders to sustain democracy

What has been done

Extension has provided organizational support and educational programs to Community Leadership programs in Ohio

Results

More people are participating in leadership programs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
608	Community Resource Planning and Development
802	Human Development and Family Well-Being
602	Business Management, Finance, and Taxation

Outcome #9

1. Outcome Measures

20% decrease in Ohio ethics court cases

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ohio residents expect ethical behavior from their elected and appointed officials

What has been done

Leadership classes with an ethic component and an ethics conference were held

Results

No data is collected on the number of ethics cases in Ohio but there is a decline of ethics violations stories in the news

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #10

1. Outcome Measures

5% increase in citizen participation in local government

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	138

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Without citizen participation in local government the quality of life eventually declines

What has been done

More Ohio communities are holding large public meeting and creating shared visions

Results

More citizens are participating in local government

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families and Communities
608	Community Resource Planning and Development
802	Human Development and Family Well-Being
805	Community Institutions, Health, and Social Services

Outcome #11

1. Outcome Measures

5% decrease in community conflict and the need for mediation

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ohio citizens expect local government to operate without excessive conflict and the constant need for mediation

What has been done

Leadership classes with a conflict resolution component have been held

Results

There is more collaboration in local government in Ohio

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families and Communities
608	Community Resource Planning and Development

Outcome #12

1. Outcome Measures

5% increase in citizen trust of local government

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The citizens of Ohio expect that their elected officials will serve with integrity and therefore can be trusted

What has been done

Leadership classes with an integrity component have been held

Results

Ohio citizens have increased their trust of local government

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #13

1. Outcome Measures

1% increase in the number of people willing to step forward when asked to lead

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	1939

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ohio needs leaders to take leadership responsibility

What has been done

Leadership classes have been held

Results

There has been an increase in the number of people stepping forward to lead

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families and Communities

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Public Policy changes
- Government Regulations

Brief Explanation

The reduced funding for Extension in Ohio led to an unfilled FTE which reduced the number of programs, participants and partners.The Ohio Ethics Commission does not keep records of the number of calls they receive or the number of ethics violations and therefore the data is unavailable.The depressed economy less funding for large community meetings and community building.It also led to fewer participants in Community Leadership Development programs.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #18

V(A). Planned Program (Summary)

1. Name of the Planned Program

Downtown Revitalization (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
602	Business Management, Finance, and Taxation	20%		20%	
603	Market Economics	15%		15%	
607	Consumer Economics	15%		15%	
608	Community Resource Planning and Development	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	4.0	0.0	2.0	0.0
Actual	3.5	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		**Research**	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
139922	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
162674	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
24914	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Organize and conduct meetings with local community members. This includes a core study group of community leaders interested in learning about their community and economic revitalization. This team will conduct the market analysis, make recommendations and develop a plan to implement the recommendations. Team members will learn how to collect and analyze market data by identifying and analyzing the community's trade area.

Facilitate development of a plan with input from local downtown committee

Train community members to conduct analysis planning

2. Brief description of the target audience

Participants are members of a local downtown market or economic development committee, local elected officials, residents and small business owners.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	250	1250	0	0
2007	250	1250	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- ___ number of people will attend ___ number of meetings.

Year	Target	Actual
2007	0	50

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Participants will develop an awareness and knowledge of community downtown revitalization. The participants will be able to identify assets of the community and economic and social areas of the community that need further development.
2	Identify and develop written plan for local downtown economic revitalization.
3	Participants will implement the plan written and developed by them that will allow their community to increase social and human capital through economic growth.

Outcome #1

1. Outcome Measures

Participants will develop an awareness and knowledge of community downtown revitalization. The participants will be able to identify assets of the community and economic and social areas of the community that need further development.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	80

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
607	Consumer Economics
603	Market Economics
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

Identify and develop written plan for local downtown economic revitalization.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics
608	Community Resource Planning and Development
602	Business Management, Finance, and Taxation
603	Market Economics

Outcome #3

1. Outcome Measures

Participants will implement the plan written and developed by them that will allow their community to increase social and human capital through economic growth.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- Time series (multiple points before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #19

V(A). Planned Program (Summary)

1. Name of the Planned Program

Business & Economic Development (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
602	Business Management, Finance, and Taxation	15%		15%	
603	Market Economics	5%		5%	
604	Marketing and Distribution Practices	10%		10%	
606	International Trade and Development	5%		5%	
608	Community Resource Planning and Development	60%		60%	
609	Economic Theory and Methods	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	0.0	0.0
Actual	6.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
239867	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
278870	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
42709	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

This program will involve one-on-one and group teaching using workshops, public meetings, and consultation. Written materials will supplement in-person teaching. Partnerships with state government and state association development officials as well as other local or regional development officials and organizations will be developed and maintained.

2. Brief description of the target audience

Development officials (chambers, CIC, downtown/main street, etc), Elected Officials (county commissioners, twp trustees), Businesses, Community members, Extension professionals

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	2000	90000	200	40000
2007	1244	60000	120	28000

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	6	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output targets measured in terms of number of: Workshop and educational program participants, workshops conducted, partnerships created, press releases published, reports created, studies performed, block grants awarded, tax incentives granted.

Year	Target	Actual
2007	0	1000

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Identify issues and develop plan of work for community officials engaged in economic development activities
2	Identify sales leakages & surpluses
3	Determine economic development strategies
4	Determine the economic impact of a proposed new or existing economic sector within a community or region (eg plant closing, or new industrial investment)
5	Improve relationships & develop linkages among community officials, residents, developers, state and regional development officials, etc
6	Diversify retail economies & strengthen retail bas
7	Develop economic clusters & improve regional economies

Outcome #1

1. Outcome Measures

Identify issues and develop plan of work for community officials engaged in economic development activities

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Community leaders have limited resources available for economic development strategies.

What has been done

Extension programs provide key information that helps communities identify specific strategies.

Results

Resulting development strategies are focused and more effective, leading to improved results.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

Identify sales leakages & surpluses

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices

Outcome #3

1. Outcome Measures

Determine economic development strategies

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
609	Economic Theory and Methods

Outcome #4

1. Outcome Measures

Determine the economic impact of a proposed new or existing economic sector within a community or region (eg plant closing, or new industrial investment)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

Informed community decisions have led to new coal mining and construction of a new coal-fired powerplant.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development

Outcome #5

1. Outcome Measures

Improve relationships & develop linkages among community officials, residents, developers, state and regional development officials, etc

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #6

1. Outcome Measures

Diversify retail economies & strengthen retail bas

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation

Outcome #7

1. Outcome Measures
Develop economic clusters & improve regional economies

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
603	Market Economics
609	Economic Theory and Methods

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Competing Public priorities

Brief Explanation

Limited and/or shifting resources and resulting changes in programmatic demands/needs resulted in less than anticipated outcomes for the following outcome measures:
Identification of sales leakages & surpluses

Determination of economic development strategies

Determination of economic impact of a proposed new or existing economic sector within a community or region

Improved relationships & development of linkages among community officials, residents, developers, state and regional development officials, etc

Diversification of retail economies & strengthening of retail base

Development of economic clusters & improvement in regional economies

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Case Study

Evaluation Results

Post program evaluation results indicate that local officials have taken steps to support the development of a new coal mining operation and a new coal-fired power plant to be operational within two years; and, development officials have begun to work with local financial institutions and retailers to target more diversified retail interests.

Key Items of Evaluation

Community economic development strategies.

Program #20

V(A). Planned Program (Summary)

1. Name of the Planned Program

Building Sustainable Communities (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
608	Community Resource Planning and Development	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	0.0	0.0
Actual	3.5	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
139922	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
162674	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
24914	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct regional workshops
- Conduct statewide conferences
- Build and facilitate regional sustainability networks
- Develop curriculum
- Partner and collaborate with other organizations/entities/colleges in the University
- Provide training in sustainable planning
- Develop curriculum and educational materials that can be offered through the web
- Develop additional products
- Promote sustainability through the media
- Conduct and share applied research
- Publish results

2. Brief description of the target audience

- Local elected and appointed officials
- Planning, Community Development & Economic Development Professionals
- Business leaders
- Community residents
- Existing and potential high-value entrepreneurs
- Community leaders
- Regional organizations
- Agricultural community
- Youth ages 13-17
- Environmental interests
- Extension colleagues

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	250	1000	100	250
2007	350	1220	80	225

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	2	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Establishment of web site, number of hits

Year	Target	Actual
2007	0	29095

Output #2

Output Measure

- Number of persons engaged in regional sustainability workshops

Year	Target	Actual
2007	0	100

Output #3

Output Measure

- Number of regional workshops and meetings held

Year	Target	Actual
2007	0	4

Output #4

Output Measure

- Number of statewide conferences

Year	Target	Actual
2007	0	0

Output #5

Output Measure

- Number of programs developed

Year	Target	Actual
2007	0	4

Output #6

Output Measure

- Number of programs conducted; number of participants

Year	Target	Actual
2007	0	845

Output #7

Output Measure

- Number of curriculum modules created, and delivered

Year	Target	Actual
2007	0	9

Output #8

Output Measure

- Number of applied research studies conducted; number published

Year	Target	Actual
2007	0	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	# of participants having a greater knowledge of sustainable development
2	Increase in awareness of OSU Extension as a source for sustainable development information
3	# of communities taking a sustainable approach to planning and development
4	# of regional sustainable development networks operating effectively
5	Increase in the number of communities using the Sustainable Development Center web site for information
6	Adoption and implementation of sustainable programs and policies by local, regional and state entities
7	Increase in number of communities achieving balanced sustainable development goals including a cleaner environment, healthier economy, and improved quality of life

Outcome #1

1. Outcome Measures

# of participants having a greater knowledge of sustainable development

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	3500

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Community residents, planning professionals and leaders care about creating a sustainable future for their community. Ag interests are interested in gaining knowledge about community sustainability strategies and techniques.

What has been done

Over 80 community residents, leaders and elected/appointed officials have gained knowledge about sustainability.

Results

Shared community visions were developed in two Ohio communities with over 1,600 residents sharing their hopes for the future.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

Increase in awareness of OSU Extension as a source for sustainable development information

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	29000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

People interested in sustainability seek reliable, practical information that will help them to understand characteristics of sustainability and how communities can adopt sustainable practices.

What has been done

The Sustainable Development web site has provided information on sustainable community development.

Results

During 2007, over 29000hits were recorded to the OSU Extension Sustainable Development web site, there was an average of 27 visitors per day, and the average length of time per visit was over 6 minutes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #3

1. Outcome Measures

# of communities taking a sustainable approach to planning and development

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Communities want to find balance among social, environmental and economic goals in their planning

What has been done

Curriculum designed to promote sustainable development and sustainable planning has been developed and for use in communities.

Results

Two Ohio cities and one Ohio County are developing comprehensive plans based on the cornerstones of sustainability.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #4

1. Outcome Measures

# of regional sustainable development networks operating effectively

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Opportunities to former regional networks for sustainability is desired by communities and organizations in order to share knowledge and best practices.within Northeast Ohio.

What has been done

Regional forums were developed and hosted.

Results

Two regional sustainability forums were held with 100 participants gaining information and participating in networks.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #5

1. Outcome Measures

Increase in the number of communities using the Sustainable Development Center web site for information

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Communities seek sources of information and programs on sustainability.

What has been done

A web site has been created with curriculum, resources and programs in sustainability.

Results

Three Ohio communities have successfully accessed needed information through the Sustainable Development Center website.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #6

1. Outcome Measures

Adoption and implementation of sustainable programs and policies by local, regional and state entities

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Unable to measure due to budget constraints.

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #7

1. Outcome Measures
Increase in number of communities achieving balanced sustainable development goals including a cleaner environment, healthier economy, and improved quality of life

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	3	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Community residents seek excellent quality of life and balance among social, economic and environmental sectors of their community.

What has been done

Regional workshops

Results

Three Ohio communities have begun to incorporate sustainable development goals into their comprehensive plans.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Case Study
- Comparisons between program participants (individuals,group,organizations) and non-participants

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #21

V(A). Planned Program (Summary)

1. Name of the Planned Program

Advancing Community Tourism (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
134	Outdoor Recreation	10%		10%	
604	Marketing and Distribution Practices	25%		25%	
605	Natural Resource and Environmental Economics	30%		30%	
607	Consumer Economics	10%		10%	
608	Community Resource Planning and Development	20%		20%	
805	Community Institutions, Health, and Social Services	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	6.5	0.0	0.0	0.0
Actual	6.5	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
259855	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
302109	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
46268	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct Advancing Community Tourism Conferences across the state.

- Continue and enhance The Spectrum e-newsletter for Extension audiences and expand to external readers.

- Revise existing Tourism Trails Fact Sheets, identify and develop additional fact sheet topics.

- Develop program modules/curriculum, market programs, teaching teams and presentations, for use by Extension Tourism team and other Extension educators (i.e. Nature based tourism, Hospitality training, Heritage based tourism).

- Continue representation/participation and involvement with local, regional and state tourism organizations, e. g. OAC, OHCHA and other heritage areas, Byways Alliance.

- Educate Extension personnel and external audiences about cooperatives, networks, and alliances as a tool for tourism based businesses and efforts including using tourism as an economic development strategy.

- Assist communities in assessing their readiness for tourism including the development of an asset inventory.

- Offer educational sessions in hospitality development and customer service for internal and external audiences.

- Provide tourism organization support through strategic action planning, feasibility studies, reaction panels, etc.

2. Brief description of the target audience

Internal – Extension Educators and other Extension staff; other related teams and OSU people

External – Persons involved with tourism organizations, initiatives and businesses; Farmers and farm organizations and landowners considering agri-tourism; community leaders; and public and elected officials; and regional and state economic development professionals interested in tourism as an economic development strategy; ODNR, Historical Society and related organizations; crafters, artists, small business operators, gift and museum shop operators, entrepreneurs; persons affiliated with or contemplating tourism sites, events, experiences, souvenir and gift products, etc.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	500	10000	100	200
2007	500	10000	100	200

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	1	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of fact sheets developed

Year	Target	Actual
2007	0	0

Output #2

Output Measure

- # invited presentations

Year	Target	Actual
2007	0	1

Output #3

Output Measure

- # Teaching modules completed, # of time utilized, audience reached

Year	Target	Actual
2007	0	0

Output #4

Output Measure

- # Advancing Community Tourism Conferences held, # of attendees

Year	Target	Actual
2007	0	0

Output #5

Output Measure

- # Print and radio media spots/ articles

Year	Target	Actual
2007	0	0

Output #6

Output Measure

- # of issues of The Spectrum e-newsletter distributed

Year	Target	Actual
2007	0	0

Output #7

Output Measure

- # of team members, # of specializations developed among team members

Year	Target	Actual
2007	0	10

Output #8

Output Measure

- # of members called upon as resource professionals

Year	Target	Actual
2007	0	0

Output #9

Output Measure

- # dollars awarded for tourism projects

Year	Target	Actual
2007	0	0

Output #10

Output Measure

- # Extension personnel involved in tourism projects/educational development

Year	Target	Actual
2007	0	10

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Local leaders and businesses perceive tourism as a viable economic development strategy for their community. Achieved through – Educational sessions/workshops (Advancing Community Tourism, presentations), educational materials (Tourism Trails, written, web, etc.), community asset inventory development, strategic planning. Measured by – survey, interview, policy development/implementation
2	Community building, pride and image developed, quality of life improved, increased civic involvement demonstrated across socio-economic lines. Achieved through - Educational sessions/workshops (Advancing Community Tourism, customer service/hospitality presentations), educational materials (Tourism Trails, written, web, etc.), community asset inventory development, strategic planning. Measured by – survey of changes in practice, community awards, community project completion, measured community change in perception.
3	Increased community economic vitality demonstrated. Achieved through - Educational sessions/workshops (Advancing Community Tourism, customer service/hospitality presentations), educational materials (Tourism Trails, written, web, etc.), community asset inventory development, strategic planning. Measured by - # jobs created (direct and indirect tourism), # tourism sites developed

Outcome #1

1. Outcome Measures

Local leaders and businesses perceive tourism as a viable economic development strategy for their community. Achieved through – Educational sessions/workshops (Advancing Community Tourism, presentations), educational materials (Tourism Trails, written, web, etc.), community asset inventory development, strategic planning. Measured by – survey, interview, policy development/implementation

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ohio's tourism industry continues to develop and present changing opportunities.

What has been done

The Ohio tourism team transitioned to new leadership and participated in OSU's high performance team training for a diverse statewide multi-institutional tourism team. The team collaboratively leverages resources to provide research and education focused on tourism.

Results

The team is positioned to refine and deliver the outputs and outcomes of the 5 year plan. There is a shift in focus from the entire general public to industry and economic development professionals.

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
607	Consumer Economics
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
134	Outdoor Recreation
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

Community building, pride and image developed, quality of life improved, increased civic involvement demonstrated across socio-economic lines. Achieved through - Educational sessions/workshops (Advancing Community Tourism, customer service/hospitality presentations), educational materials (Tourism Trails, written, web, etc.), community asset inventory development, strategic planning. Measured by – survey of changes in practice, community awards, community project completion, measured community change in perception.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ohio is rich in diversity with the northern lakefront to the Appalachian communities in the south and emerging immigrant populations in 15 metropolitan areas.

What has been done

A new industry gateway is just one of the projects the team will launch in 2008. Members of the tourism team and direct marketing team collaborate on special projects focused on emerging topics such as local foods & culinary tourism, heritage tourism, and agriculture & nature-based tourism.

Results

The team now has members representing various industry perspectives. Working groups are addressing education, research and outreach opportunities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
605	Natural Resource and Environmental Economics
604	Marketing and Distribution Practices
608	Community Resource Planning and Development
134	Outdoor Recreation
607	Consumer Economics

Outcome #3

1. Outcome Measures

Increased community economic vitality demonstrated. Achieved through - Educational sessions/workshops (Advancing Community Tourism, customer service/hospitality presentations), educational materials (Tourism Trails, written, web, etc.), community asset inventory development, strategic planning. Measured by - # jobs created (direct and indirect tourism), # tourism sites developed

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There is an opportunity to link tourism industry professionals with Extension specialists and academic researchers throughout the state.

What has been done

A new partnership is developing with the Ohio Division of Travel & Tourism, the Ohio Travel association, and various educational entities throughout the state.

Results

Through this partnership a joint educational event will be held in 2008 to link these groups to improve networking, resource development, and impacts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics
607	Consumer Economics
604	Marketing and Distribution Practices
134	Outdoor Recreation
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

Due to programmatic and personnel changes many outputs and outcomes were not able to be tracked and measured.Plans are in effect to re-establish forward progress in 2008.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Case Study
- Other (Qualitative, anecdotal, particip)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #22

V(A). Planned Program (Summary)

1. Name of the Planned Program

Direct Marketing Program (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
604	Marketing and Distribution Practices	50%		50%	
607	Consumer Economics	10%		10%	
608	Community Resource Planning and Development	40%		40%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	10.0	0.0	1.0	0.0
Actual	10.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
399778	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
464783	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
71182	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The plan of work for the OSU Direct Marketing team includes developing a more in-depth stakeholder database and assessing priorities of these target audiences; developing and delivering educational programming in a variety of formats; engaging in outreach activities with media, consumer groups and a diverse group of organizations.

Activities include providing convenient educational programs; innovative tools and resources; reliable technical assistance; and applied research. Primary activities include an Annual Direct Marketing conference, educational resource development and applied research to identify and report the profile, priorities and impacts of direct marketing.

We build individual and community capacity through new tools, training, technical assistance and networking opportunities for target audiences. We raise the visibility and standing of direct marketing ventures through a series of research reports and branded communications that strengthen the farmer-consumer-market-community connection.

2. Brief description of the target audience

Target audiences include 1) farmers, producers and other agripreneurs who are currently or not currently engaged in direct marketing; 2) intermediaries, such as educators, farmers' market managers, food system organizers; government agencies, industry associations, travel and tourism groups, economic development professionals and community organizations; 3) media, consumer groups and other collaborators interested in advancing farmer-consumer-market-community connections.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	500	1000	0	0
2007	500	1000	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	1	0	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output measures will be documented through event registration and evaluation forms; information request summaries; web statistics; media clips; and copies of research reports and educational resources. Milestones for specific activities are established and monitored through monthly team interaction. Evaluation methodology includes print and electronic quantitative surveys, as well as telephone and face-to-face interviews for qualitative evaluation.

Year	Target	Actual
2007	0	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	The primary long term outcome measure is the growth direct farm sales in Ohio as reported through the Census of Agriculture and other Direct Marketing team activities that provide insight into improved economic and social conditions.
2	increased awareness and knowledge of audiences engaged in the program; improved marketing practices of entrepreneurs; improved behavior that supports networking through agencies, associations and events; improved educational and promotional practices of educators and advocates.
3	increasing the connections between consumers-farmers-markets-communities.

Outcome #1

1. Outcome Measures

The primary long term outcome measure is the growth direct farm sales in Ohio as reported through the Census of Agriculture and other Direct Marketing team activities that provide insight into improved economic and social conditions.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Collaboration and local food program improves Ohio's food supply chain.

What has been done

MarketMaker, an easy-to-use web-based resource for all businesses in the food supply chain, is coming to Ohio through the collaboration of Ohio State University Extension and OARDC, the Ohio Department of Agriculture (ODA), Ohio Farm Bureau, and the Center for Innovative Food Technology (CIFT).

Results

Research indicates that direct marketing activity in Ohio is on the rise, with a growing number of farm markets, farmers markets, wineries linked to tourism, community supported agriculture programs, value-added enterprises, auctions, chef-grower networks, and farm-based garden centers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics
604	Marketing and Distribution Practices
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

increased awareness and knowledge of audiences engaged in the program; improved marketing practices of entrepreneurs; improved behavior that supports networking through agencies, associations and events; improved educational and promotional practices of educators and advocates.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Operators of small farms, with 1 - 179 acres, have grown to represent 75 percent of Ohio farms. For many small and medium-sized farms, traditional commodity marketing channels are no longer economically viable. By assisting farmers and other agripreneurs to retain a higher share of consumer expenditures, direct marketing of agricultural products and services, has proved to be a profitable alternative. Unique characteristics make Ohio an attractive place to 'Go Direct'.

What has been done

During 2007, more than 500 attendees participated in the Ohio Direct Agricultural Marketing conference.

Results

More than 96% of responding participants anticipated having a positive financial impact from this conference on their farm business.

4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics
608	Community Resource Planning and Development
604	Marketing and Distribution Practices

Outcome #3

1. Outcome Measures

increasing the connections between consumers-farmers-markets-communities.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ohio is rich in diversity with emerging immigrant populations in 15 metropolitan areas. While the state's population grew 5% between 1990 and 2000, some counties experienced growth rates as high a s 64%, with the immigrant population increasing by as much as 152%.

What has been done

To bridge cultural gaps between consumers and producers, the OSU Direct Marketing Team collaborated with OSU's Foreign Language Center and local stakeholders to develop web-based resources to improve cultural competency and multicultural marketing communications.

Results

While only 22.5 percent of responding survey participants at the 2007 Ohio Direct Agricultural Marketing Conference agreed or strongly agreed that they effectively marketed to ethnic populations, more than 60 percent agreed or strongly agreed that they would use new resources to learn to better communicate with ethnic audiences.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
607	Consumer Economics
608	Community Resource Planning and Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Case Study

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #23

V(A). Planned Program (Summary)

1. Name of the Planned Program

Land Use (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
608	Community Resource Planning and Development	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	3.8	0.0	0.0	0.0
Actual	4.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
159911	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
185913	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
28473	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Major educational areas of the Land Use Team

Land Use Tools

Sustainable Development

AEPP Program

Estate Planning

Farm Land Preservation

-Six (6) workshops a year totaling thirty (30) workshops from 2007 to 2011

-Twenty (20) team and committee meetings a year totaling one hundred (100) meetings from 2007 to 2011.

-Five (5) planning documents from 2007 to 2011.

-Five (5) curriculum modules from 2007 to 2011.

-Six (6) Fact sheets on land use issues from 2007 to 2011.

-One (1) Course curriculum.

-Upgraded interactive website.

-Maintain existing partnerships with the elected and appointed public officials throughout the state.

2. Brief description of the target audience

•Local appointed and elected public officials throughout Ohio. •Citizens •Planning Organizations. •Extension Educators •Extension personnel •Cities, Villages and Counties throughout Ohio

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	50	1800	0	0
2007	150	10000	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	3	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of workshops/participants

Year	Target	Actual
2007	0	15

Output #2

Output Measure

- # of committee meetings

Year	Target	Actual
2007	0	42

Output #3

Output Measure

- # of planning documents produced

Year	Target	Actual
2007	0	3

Output #4

Output Measure

- # of curricula

Year	Target	Actual
2007	0	1

Output #5

Output Measure

- # of fact sheets

Year	Target	Actual
2007	0	1

Output #6

Output Measure

- # of hits on upgraded website

Year	Target	Actual
2007	0	0

Output #7

Output Measure

- Partnerships maintained/developed with officials

Year	Target	Actual
2007	0	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Increase in Knowledge of Citizens of Ohio about land use issues
2	Communities engaging in the development or update of a Land Use Plan.
3	Implementation of Policies by government officials related to land use

Outcome #1

1. Outcome Measures

Increase in Knowledge of Citizens of Ohio about land use issues

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

Communities engaging in the development or update of a Land Use Plan.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A survey involving elected officials throughout Ohio indicated a significant need for land use education

What has been done

1)A state wide land use conference was held 2) Extension educators and specialists presented curriculumt statewide

Results

4 communities completed land use programs

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #3

1. Outcome Measures

Implementation of Policies by government officials related to land use

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Rural/Urban Interface is an issue throughout Ohio

What has been done

Land Use Education programs have been developed

Results

Comprehensive land use plans have been undertaken by communities

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration,new cultural groupings,etc.)
- Other (Security Issues; demographic cha)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Time series (multiple points before and after program)
- Case Study

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #24

V(A). Planned Program (Summary)

1. Name of the Planned Program

Preparing Communities for the Knowledge Economy (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
608	Community Resource Planning and Development	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	0.0	0.0
Actual	4.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
159911	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
185913	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
28473	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Creation and delivery of programs and curriculum including:

- Workshops
- Web pages and related media
- Capacity training
- Customized educational programs
- Community assessments
- Employment skill training
- Leadership skill development
- Collaboration, networking and partnership tools

2. Brief description of the target audience
Targeted audiences include:

- Local elected and appointed officials
- Business leaders
- Economic development professionals
- Community residents
- School officials and parents of school age children
- Support service providers (banks, advisors)
- Youth aged 13 – 17
- Lower skilled/traditional workforce
- Potential and existing entrepreneurs
- Unemployed/underemployed

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	480	2100	25	100
2007	500	1700	200	500

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	4	0	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Local elected and appointed officials

Year	Target	Actual
2007	0	2

Output #2

Output Measure

- Business leaders

Year	Target	Actual
2007	0	1

Output #3

Output Measure

- Economic development professionals

Year	Target	Actual
2007	0	4

Output #4

Output Measure

- Community residents

Year	Target	Actual
2007	0	0

Output #5

Output Measure

- School officials and parents of school age children

Year	Target	Actual
2007	0	0

Output #6

Output Measure

- Support service providers (banks, advisors)

Year	Target	Actual
2007	0	0

Output #7

Output Measure

- Youth aged 13 – 17

Year	Target	Actual
2007	0	15

Output #8

Output Measure

- Lower skilled/traditional workforce

Year	Target	Actual
2007	0	0

Output #9

Output Measure

- Potential and existing entrepreneurs

Year	Target	Actual
2007	0	0

Output #10

Output Measure

- Unemployed/underemployed

Year	Target	Actual
2007	0	0

Output #11

Output Measure

- number of communities reached

Year	Target	Actual
2007	0	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	-number of participants with a greater understanding of the knowledge economy
2	-development of networks of professionals to support knowledge economy initiatives

Outcome #1

1. Outcome Measures

-number of participants with a greater understanding of the knowledge economy

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	70	55

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Understanding of Knowledge Economy and why it is important for Ohio

What has been done

LOGIC Models for two Blended e-learning programs

Results

Preliminary results show greater understanding and need for more programming

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

-development of networks of professionals to support knowledge economy initiatives

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	20	40

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Networks of professionals are needed to create content, research and support the programming

What has been done

Addition of Extension personnel to teams around the Knowledge Economy

Results

Greater depth in availability of internal and external programming

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Competing Programmatic Challenges
- Other (2007 was a planning year)

Brief Explanation

The program is currently in its planning stages and will have increased outcomes in future years.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Retrospective (post program)
- During (during program)
- Time series (multiple points before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #25

V(A). Planned Program (Summary)

1. Name of the Planned Program

Community Based Watershed Program (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	6.5	0.0	0.0	0.0
Actual	6.5	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
216305	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
371622	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
16836	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Ohio Watershed Academy (OWA)

Conduct OWA (annual 4 month distance education course)

Conduct face-to-face meetings (three face to face meetings per course)

Develop modules and manual (on-line modules and manual updated annually)

Market program

Evaluations (one summative, one formative and on-going on-line evaluations annually)

Update website (GIS, land use, and project implementation modules to be added in 2006)

Ohio Watershed Leaders (OWLs)

Coordinate overnight facilities, guest speakers and facilitators

Conduct multi-agency program planning meetings

Market program

Develop and conduct evaluation (one summative evaluation)

Ohio Certified Volunteer Naturalist (OCVN)

Develop OCVN manual

Conduct OCVN trainings for potential volunteers

Develop marketing materials

Develop website

Develop and conduct evaluations

Organize and coordinate volunteers

2. Brief description of the target audience

Ohio Watershed Academy

Watershed group leaders

Graduate and undergraduate students

Natural Resource Professionals

Local public officials

Watershed group volunteers

Ohio Watershed Leaders

Watershed coordinators

Nonprofit coordinators

Natural resource professionals

Watershed group volunteers

Ohio Certified Volunteer Naturalists

Youth

Retirees

Park and natural area volunteers

Home and garden club members

Volunteers from various environmental organizations (e.g., watershed groups, land trusts)

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	105	0	10	0
2007	150	0	25	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	5	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Ohio Watershed Academy Number of Ohio Watershed Academy classes offered Number of manuals distributed Number of face-to-face meetings Number of promotional materials distributed Number of watershed plans Academy participants complete Number of on-line modules developed Number of guest instructors

Year	Target	Actual
2007	0	1

Output #2

Output Measure

- Ohio Watershed Leaders Number of workshops Number of materials distributed Number of workshop participants

Year	Target	Actual
2007	0	1

Output #3

Output Measure

- Ohio Certified Volunteer Naturalists Number of agency partners collaborating Number of trainings Number of manuals distributed Number of certified and trained volunteers Number of chapters formed Number of volunteer service hours completed

Year	Target	Actual
2007	0	5

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Ohio Watershed Academy Short Term Percentage of participant incremental increase in self reported knowledge assessment scores (offered pre and post Academy training) Percentage of participants expanding knowledge and skills in watershed planning and professional networks (self reported)
2	Ohio Watershed Academy Medium Term Percentage of participants implementing specific skills (e.g., stakeholder involvement, evaluation and/or outreach strategies) Percentage of participants taking on new leadership roles in watershed management
3	Ohio Watershed Academy Long term Improved watershed health (e.g., changes in water and habitat quality) Improved community and capacity for watershed protection in participant groups or organizations (percentage funding increase, new protection policies) Improved group organizational capacity (e.g., number of members, strategic plans created)
4	Ohio Watershed Leaders (OWLs) short term Percentage of participants increasing professional networks Percentage of participants increasing knowledge and skills
5	Ohio Watershed Leaders (OWLs) Medium term Percentage of participants cooperating or collaborating as a result of participation at OWLs Number of new partnerships or collaborations Percentage of participants implementing a new idea or skill gained from OWLs
6	Ohio Watershed Leaders (OWLs) long term Dollars saved or generated as a result of new partnerships and/or collaborations
7	Ohio Certified Volunteer Naturalists (OCVN) Short term Percentage of participants gaining knowledge and skills in local ecology, ecological systems, data collection, conservation, and interpretation Incremental increase in organizational capacity due to OCVN contributions (e.g., number of hours of interpretation offered, number of visitors reached)
8	Ohio Certified Volunteer Naturalists (OCVN) medium Percentage of participants applying conservation practices Percentage of participants involved in long-term monitoring and/or educational programs Percentage of OCVN volunteers participating in community service efforts beyond required service Percentage of OCVN who take on leadership roles (e.g., serve on the boards of directors of organizations serving the community and/or leading community events)
9	Ohio Certified Volunteer Naturalists (OCVN) long term Increases in ecosystem quality (as measured with test-kit and monitoring protocols) Increases in environmental services (e.g., acres of green space and/or protected areas, number of easements)

Outcome #1

1. Outcome Measures

Ohio Watershed Academy Short Term Percentage of participant incremental increase in self reported knowledge assessment scores (offered pre and post Academy training) Percentage of participants expanding knowledge and skills in watershed planning and professional networks (self reported)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	90

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The purpose of the Ohio Watershed Academy is to build the capacity of participants to lead watershed planning and protection efforts

What has been done

One Ohio Watershed Academy course completed with 28 students completing course

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #2

1. Outcome Measures

Ohio Watershed Academy Medium Term Percentage of participants implementing specific skills (e.g., stakeholder involvement, evaluation and/or outreach strategies) Percentage of participants taking on new leadership roles in watershed management

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Data to measure medium-term outcomes has not been collected

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #3

1. Outcome Measures

Ohio Watershed Academy Long term Improved watershed health (e.g., changes in water and habitat quality) Improved community and capacity for watershed protection in participant groups or organizations (percentage funding increase, new protection policies) Improved group organizational capacity (e.g., number of members, strategic plans created)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

No long-term data have been collected. One year is not enough time to measure long-term impacts

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #4

1. Outcome Measures

Ohio Watershed Leaders (OWLs) short term Percentage of participants increasing professional networks Percentage of participants increasing knowledge and skills

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	90

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The purpose of the OWLs workshop is to build the capacity of watershed leaders in a variety of areas

What has been done

One workshop was conducted with 40 participants

Results

Evaluations indicated that participants increased knowledge and skills in a variety of areas related to watershed protection

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #5

1. Outcome Measures
Ohio Watershed Leaders (OWLs) Medium term Percentage of participants cooperating or collaborating as a result of participation at OWLs Number of new partnerships or collaborations Percentage of participants implementing a new idea or skill gained from OWLs

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

No medium term data have been collected

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #6

1. Outcome Measures

Ohio Watershed Leaders (OWLs) long term Dollars saved or generated as a result of new partnerships and/or collaborations

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

No long-term data have been collected. One year is not enough time to observe long-term impacts.

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #7

1. Outcome Measures

Ohio Certified Volunteer Naturalists (OCVN) Short term Percentage of participants gaining knowledge and skills in local ecology, ecological systems, data collection, conservation, and interpretation Incremental increase in organizational capacity due to OCVN contributions (e.g., number of hours of interpretation offered, number of visitors reached)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

OCVN participants have a basic knowledge in nature study and specialized skills for volunteering in parks

What has been done

7 programs were conducted around the state

Results

All participants who completed the state certification exam passed the exam.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #8

1. Outcome Measures

Ohio Certified Volunteer Naturalists (OCVN) medium Percentage of participants applying conservation practices Percentage of participants involved in long-term monitoring and/or educational programs Percentage of OCVN volunteers participating in community service efforts beyond required service Percentage of OCVN who take on leadership roles (e.g., serve on the boards of directors of organizations serving the community and/or leading community events)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

No data have been gathered on medium-term impacts

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #9

1. Outcome Measures

Ohio Certified Volunteer Naturalists (OCVN) long term Increases in ecosystem quality (as measured with test-kit and monitoring protocols) Increases in environmental services (e.g., acres of green space and/or protected areas, number of easements)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

no long-term data have been collected. One year is not enough time to observe long-term impacts.

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Other (Evaluation Plan still being implemented)

Brief Explanation

Ohio Watershed Academy

Medium-term and Long-term Evaluation: Medium term evaluations have not been conducted for the 2007 class of the Ohio Watershed Academy. We do not currently have plans to conduct a medium term evaluation of Ohio Watershed Academy students from the 2007 class. However, we do plan on conducting a long-term evaluation of impacts of the Ohio Watershed Academy course within the next two years and it is likely that some participants in the 2007 class will be included in that survey. The long-term survey will include questions about impacts of participation on participants' skills, knowledge, and attitudes related to developing and implementing a watershed action plan. We will use some combination of mailed surveys, on-line surveys, and phone interviews. Our target would be 80% respondents indicating long-term impacts on their knowledge, skills, and attitudes toward collaborative and community-based watershed protection.

Ohio Certified Volunteer Naturalist

Medium- and Long-term Evaluation: We are in the process of conducting a short-term evaluation of OCVN participants. Many of the first-year participants have only recently completed the classroom hours. Medium-term evaluations will be conducted in 2009 at the 2nd annual OCVN conference. Mid-term measures will include gain in knowledge, skills, number of volunteers completing volunteer hour requirements, and total number of volunteer hours completed by program participants. Planning has not yet begun for long-term program evaluation, but it is likely that long-term impacts will be measured in 2-3 years.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Case Study
- Other (water quality & habitat monitori)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #26

V(A). Planned Program (Summary)

1. Name of the Planned Program

Youth Food Producing Animal Quality Assurance (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
306	Environmental Stress in Animals	10%		10%	
307	Animal Management Systems	5%		5%	
308	Improved Animal Products (Before Harvest)	5%		5%	
315	Animal Welfare/Well-Being and Protection	10%		10%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc	10%		10%	
723	Hazards to Human Health and Safety	10%		10%	
806	Youth Development	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	25.0	0.0	0.0	0.0
Actual	15.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
458549	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
762029	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
17654	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1. Extension Education: Development of Ohio's "Youth Food Animal Quality Assurance Curriculum Guide" (YFAQACG) including 12 chapters (Animal Welfare and Ethics, Food Safety, and the 10 Good Production Practices recognized by the Animal Industry), power-point presentation style notes and 22 hands-on experiential learning activities complimenting the important information that youth need to learn about animal production and food safety.

2. Volunteer Training: Yearly Quality Assurance (QA) in-service for 4-H extension educators and volunteers who will be instrumental in delivering quality assurance programming in Ohio at the county, club and species clinic level. This will serve to train the educator for QA programming state wide making each individual county, club or species clinic training session consistent from program to program.

3. Youth Training: County, club and species clinics will be used to educate youth exhibitors reaching 56,500 youth and their parents involved in youth food producing animal projects in Ohio.

4. Youth Evaluation: In 2007 a test out option was introduced into the Ohio State QA program. This option allows students which truly comprehend the information they have been taught to test out for up to a three year period at the county level.

5. All can use as reference: Further information will be posted in electronic form on the 4-H animal sciences website and will include updates to the YFAQACG.

2. Brief description of the target audience

Activity 1 and 5: "Educating the Educator" training portion of QA programming will be directed toward Extension Educators (n=100) that will be in a leadership role for the purpose of delivering QA sessions at the County, Club and Species Clinic Level. This will be a face to face training and Extension Educators will be able to interact with authors of the curriculum piece (YFAQACG).

Activity 2 and 5: Extension Educators will serve in the capacity of training volunteers (n=1500) that will deliver QA material to Youth at the county, club and species clinic level. These too will be face to face sessions that will allow for interaction with those teaching QA to Youth.

Activity 3 and 5: Volunteers at the county, club and species clinic level will deliver QA material to Youth (n=56,500) and any attending parents in Ohio

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	1600	25000	56500	56500
2007	1000	25000	56500	56500

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Communicate with Extension Educators yearly during the in-service/updates to determine if we are meeting their need for curriculum and use of the curriculum through year training. (track # of participants and # of sessions and topics discussed)

Year	Target	Actual
2007	0	96

Output #2

Output Measure

- Survey volunteers through extension educators to determine if YFAQACG is an effective tool in conducting QA programming at county, club and species clinic level

Year	Target	Actual
2007	0	120

Output #3

Output Measure

- Survey youth (n=56,500) participating in QA programming to determine if the program is meeting the needs of youth exhibitors maintaining the content standards that we have set for the curriculum and increasing the hands-on experiential activities as mode of delivery to youth.

Year	Target	Actual
2007	0	850

Output #4

Output Measure

- All can use as reference: Further information will be posted in electronic form on the 4-H animal sciences website and will include updates to the YFAQACG (track visits to website)

Year	Target	Actual
2007	0	3800

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	(Activity 3) To determine the effectiveness of QA programming, there will be a Pre- and post-test set administered for determining the comprehension of youth in QA principles. This will determine the effectiveness of the information listed in the YFAQACG and the implementation of the minimum standards delivered to 56,500 yearly in Ohio.
2	(Activity 3) To determine the effectiveness of QA programming, there will be a Pre- and post-test administered to the parents of youth exhibitors who attend QA sessions for determining comprehension of QA principles being taught using the YFAQACG and the minimum standards.
3	(Activity 1 and 2) Yearly QA in-service evaluations will be administered to extension professionals and volunteers that will be teaching QA to determine the efficiency of educational materials offered to teach youth in QA.
4	(Activity 1, 2, and 3) Tracking the incidence of drug residues in fair animals intended for food - Comprehension of QA principles will lead to a better understanding and a subsequent reduction in the amount type and degree of drug residue detected and subsequent retained and then condemned from human consumption.
5	(Activity 1, 2, and 3) Administer packer surveys to determine if an improvement in product quality post-QA education has been noticed by the commercial packing industry.
6	(Activity 1 and 2) Determining areas of violation will continue to help us emphasize key areas that youth need to comprehend and understand.
7	(Activity 1, 2, and 3) Survey producers that began their education in QA programming as a youth exhibitor and determine the impact that has had on there production practice today. Further compare and contrast their efforts with those producers who did not learn about QA from a youth based extension program.
8	(Activity 1, 2, and 3) Assuring that youth comprehend QA principles will increase the number of Livestock producers in the future that will be assuring consumers that they are receiving a safe wholesome product from the food producing animal industry.

Outcome #1

1. Outcome Measures

(Activity 3) To determine the effectiveness of QA programming, there will be a Pre- and post-test set administered for determining the comprehension of youth in QA principles. This will determine the effectiveness of the information listed in the YFAQACG and the implementation of the minimum standards delivered to 56,500 yearly in Ohio.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc
308	Improved Animal Products (Before Harvest)
723	Hazards to Human Health and Safety
806	Youth Development
315	Animal Welfare/Well-Being and Protection
307	Animal Management Systems
306	Environmental Stress in Animals

Outcome #2

1. Outcome Measures

(Activity 3) To determine the effectiveness of QA programming, there will be a Pre- and post-test administered to the parents of youth exhibitors who attend QA sessions for determining comprehension of QA principles being taught using the YFAQACG and the minimum standards.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The intent of this pre- and post-test application was to determine if the programming that is being conducted is having an impact on the information that youth are being taught.

What has been done

See External Factors Section

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

(Activity 1 and 2) Yearly QA in-service evaluations will be administered to extension professionals and volunteers that will be teaching QA to determine the efficiency of educational materials offered to teach youth in QA.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	86

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This will help determine whether the materials in printed form and supporting materials that are offered on the web are meeting the needs of our consumers

What has been done

During the 2007 Animal Science In-Service evaluation forms were handed out with the registration materials. This evaluation not only asked questions about the in-service program, but also asked questions about the QA curriculum and the types of new information as well as support materials that are needed, giving educators an opportunity to share their thoughts as we continue to develop the program and the materials that will support Youth Food Animal Quality Assurance.

Results

As a result of this method of evaluation we have continued to develop a well rounded program, supplied educators with more tools to execute their job, and to develop future in-service programs that will help in supporting the efforts of the educators.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development
315	Animal Welfare/Well-Being and Protection

Outcome #4

1. Outcome Measures

(Activity 1, 2, and 3) Tracking the incidence of drug residues in fair animals intended for food - Comprehension of QA principles will lead to a better understanding and a subsequent reduction in the amount type and degree of drug residue detected and subsequent retained and then condemned from human consumption.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Violations to the Livestock Show Reform Law 901-19 are recorded yearly. Some of these violations are from illegal use of medications to enhance the appearance of an animal, and others are from using either uninformed and/or poor management techniques.. The result could be violative levels of drug residues as well as the use of un approved substance for animal production.

What has been done

ODA determines from tissue samples of each of the champion animals whether residues are present and if the food product produced from the animal is safe for consumption. Each year a report is given which indicates what the present investigations are and what the expected out come will be.

Results

During the 2007 fair season the result was a higher number of violations, yet of that number there were less total violations that were due to illegal or off label drug use. There was an increase in poor management techniques resulting in lambs that did not meet the criteria listed in the general rules of fair codes for the state of Ohio (ex: testicular tissue that was present as a result of sloppy castration techniques. Although these animals were found to be in violation they would not have made a consumer sick. This is an improvement over previous years.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc
308	Improved Animal Products (Before Harvest)

Outcome #5

1. Outcome Measures

(Activity 1, 2, and 3) Administer packer surveys to determine if an improvement in product quality post-QA education has been noticed by the commercial packing industry.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Fairs are having a harder time in sequestering packer support in purchasing animals that are tagged for resale after the show is over. Identifying areas that can be improved upon from a product quality stand point will result in packers that are more apt to owkr with counties in buying livestock originating from a livestock exhibition.

What has been done

See External Factors Section

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
806	Youth Development
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc

Outcome #6

1. Outcome Measures
(Activity 1 and 2) Determining areas of violation will continue to help us emphasize key areas that youth need to comprehend and understand.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #7

1. Outcome Measures

(Activity 1, 2, and 3) Survey producers that began their education in QA programming as a youth exhibitor and determine the impact that has had on there production practice today. Further compare and contrast their efforts with those producers who did not learn about QA from a youth based extension program.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

It is our hope that the impact of QA training is long term and will impact production practices of future producers.

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
306	Environmental Stress in Animals
307	Animal Management Systems
806	Youth Development

Outcome #8

1. Outcome Measures

(Activity 1, 2, and 3) Assuring that youth comprehend QA principles will increase the number of Livestock producers in the future that will be assuring consumers that they are receiving a safe wholesome product from the food producing animal industry.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	1000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Aside from organized QA sessions the youth in the state of Ohio that come to the state fair are challenged in the area of QA through activities that are presented to them during the State Skillathon Competitions during the Ohio State Fair. Youth that truly comprehend this information excel in this are of the Ohio State Fair confirming that the Ohio QA program is impacting the way that youth think about responsible livestock production. .

What has been done

Youth are challenged through Skillathons as to there comprehension of the subject matter.

Results

The Skillathon QA stations across all food producing species have resulted in the highest scores when compared to other production based stations that are in each of these skillathons.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development
307	Animal Management Systems
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc
723	Hazards to Human Health and Safety
306	Environmental Stress in Animals
308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Public Policy changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

The Quality Assurance program in the state of Ohio has had a significant impact on the education of youth exhibiting livestock. More than half of the projected program was completed. As a result of State Government changes in law the pre- and post-tests for the exhibitors and parents, as well as the surveys with producers and packers were not complete. There are a number of contributing factors that were involved in this lack of completion. The first and foremost was the change in the state law which approved a change in the QA testing option to a 3 year test out for youth. The new law reads " a student may test out of QA within their specific age category for up to a 3 year period". Students were offered the option in a number of counties (15) to take the exam in lieu of attending a QA program. If they passed the exam the result was that they will not have to attend QA for up to a 3 year period. The exams were offered in a small (poultry combined with rabbit) and large (beef and dairy cattle, sheep, swine, goat, etc.) animal version and for two age categories (Intermediate 12-14 and Senior 15-18). Counties have a choice to offer the exams, so it was not offered in all 88 Ohio counties. However, in preparation of the testing a significant portion of time was put into developing and reviewing the questions. Additionally the counties that offered the exam sent the administered exams back to the OSU Animal Science Department and the exams were reviewed for content and for successful responses. Across both large and small animal versions there was a 70 percent pass rate for Senior students (15-18) and 62% for intermediate students (12-14) on the exams that were offered in 2007. Exams were evaluated and some questions were re-worked and other replaced with a series of new questions. Youth were asked to comment on the exam at the end and most felt that the questions were challenging but fair. The should no the information that they are being tested on and as result the high percentage pass rate. Educators felt that the exams were a step in the right direction. We will collect the exams in 2008 as well and evaluate the quality and accuracy of the exam questions.

Another area that affected completing the programs listed included limited personnel to help with completing the POW. January 1st of 2007 our department support staff position was vacated for t youth livestock programs and it was not until June 15th that a new person filled that position. The summer months are the middle of the fair season and so QA is not offered and program evaluation cannot be done during that time. In determining priorities for the 2007 year, the exams for the test out option took precedence.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants

Evaluation Results

Evaluation for the 2007 year included an evaluation of the test out option and its ability to challenge youth in a constructive format. The test was a new addition as a result of a change in the Ohio State Law mandating annual attendance to quality assurance. This took precedence as mentioned earlier in this report. This along with the evaluations that were offered to educators and volunteers during the Animal Science in-service were the primary components of evaluation that were offered to the QA programming efforts in Ohio in 2007. There are plans now that the test out option is offered and in place to execute the other modes of evaluation starting the 2008 year.

Key Items of Evaluation

The key components to this evaluation will be to take a diverse cross section of those that are affected by QA in Ohio at the youth level. Educators (both 4-H and Ag Ed), Volunteers, Faculty, Parents and Youth should all be surveyed to evaluate the curriculum and materials offered to teach from as well as what is the impact and effectiveness of this training. Further we will be sure to include the consumer of these animal products to assure that we are meeting the needs of the packing industry.

Program #27

V(A). Planned Program (Summary)

1. Name of the Planned Program

Pesticide Education Program (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
133	Pollution Prevention and Mitigation	10%		10%	
211	Insects, Mites, and Other Arthropods Affecting Plants	10%		10%	
212	Pathogens and Nematodes Affecting Plants	10%		10%	
213	Weeds Affecting Plants	10%		10%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	10%		10%	
312	External Parasites and Pests of Animals	10%		10%	
402	Engineering Systems and Equipment	10%		10%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc	10%		10%	
721	Insects and Other Pests Affecting Humans	10%		10%	
723	Hazards to Human Health and Safety	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	0.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

Face to face workshops, training and field days.

Develop powerpoints, DVD's, manuals and other resources

Assist in developing exams

Develop curricula for training new applicators

Partner with other state agencies such as ODA, ODH and ODOT.

Partner with other state programs and offer training to surrounding state's applicators

Provide pesticide information through websites, electronic newsletters and other technology as appropriate

2. Brief description of the target audience

Farmers/growers who use restricted and general use pesticides. Commercial applicators who apply pesticides as part of their job for private businesses or governmental agencies.

School personnel and others who apply pesticides where children and other sensitive populations may be exposed.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	7500	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	{No Data Entered}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	{No Data Entered}	{No Data Entered}	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of private applicators attending a certification program

Year	Target	Actual
2007	0	0

Output #2

Output Measure

- Number of commercial applicators attending a certification program

Year	Target	Actual
2007	0	0

Output #3

Output Measure

- Number of private applicators attending a recertification program

Year	Target	Actual
2007	0	0

Output #4

Output Measure

- Number of commercial applicators attending a recertification program

Year	Target	Actual
2007	7500	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number of participants who increased their knowledge
2	Number of participants who have adopted or plan to adopt a practice to protect human health or the environment

Outcome #1

1. Outcome Measures

Number of participants who increased their knowledge

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans

Outcome #2

1. Outcome Measures

Number of participants who have adopted or plan to adopt a practice to protect human health or the environment

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Other (Outcomes/Impacts reported on another website)

Brief Explanation

2007 Outcomes and Impact data for Pesticide Education Program are reported on another website.We would like to remove this program from our planned program list to eliminate double reporting of outcomes.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #28

V(A). Planned Program (Summary)

1. Name of the Planned Program

Greenhouse and Floriculture Systems and Marketing (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	15%		15%	
201	Plant Genome, Genetics, and Genetic Mechanisms	10%		10%	
202	Plant Genetic Resources	5%		5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	5%		5%	
204	Plant Product Quality and Utility (Preharvest)	10%		10%	
211	Insects, Mites, and Other Arthropods Affecting Plants	10%		10%	
212	Pathogens and Nematodes Affecting Plants	15%		15%	
215	Biological Control of Pests Affecting Plants	10%		10%	
216	Integrated Pest Management Systems	15%		15%	
403	Waste Disposal, Recycling, and Reuse	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	2.2	0.0
Actual	6.6	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
219633	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
377340	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
17096	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The floriculture team will conduct workshops, regional and state-wide seminars and presentations, greenhouse extension tours; develop fact sheets, web based educational materials, curriculum and other educational tools; partner within and outside OSU. Continue partnership with the Ohio greenhouse industry through OFA, An Association of Floriculture Professionals, and Extension personnel from other states such as Michigan and Illinois.

The team will also engage in interdisciplinary research projects that would develop new ideas using funds from local, regional and national agencies. These research projects will produce some of the information we will make available for our stakeholders.

2. Brief description of the target audience

Our target audience is comprised of greenhouse and garden center owners, managers, growers, pesticide applicators, industry representatives, and product manufacturers, consumers, and students.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	430	160000	100	0
2007	1500	200000	110	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	4	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Visit at least 125 growers each year across the State

Year	Target	Actual
2007	0	202

Output #2

Output Measure

- Reach up to 400 growers through talks and workshops

Year	Target	Actual
2007	0	1000

Output #3

Output Measure

- Reach at least 500 growers through Annuals and Mixed Container Trials tours and visits

Year	Target	Actual
2007	0	800

Output #4

Output Measure

- Reach at least 160,000 visitors through the internet and web-based training

Year	Target	Actual
2007	0	200000

Output #5

Output Measure

- Develop 5 to 6 new greenhouse related fact sheets per year. The team will also revise existing disease and insect ornamental fact sheets. Topics for new facts sheets include ethylene in greenhouses, organic greenhouse production, building a hobby greenhouse, etc.

Year	Target	Actual
2007	0	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Increase knowledge, skills and aspirations of greenhouse producers in Ohio. These goals will be evaluated by making personal interviews with growers, focus groups, and observations of Extension personnel on grower's production practices.
2	Change the way greenhouse businesses currently operate to adopt research-based information to improve efficiency of production, increase worker safety, decrease environmental pollution. Evaluation will be done as described for short-term outcomes plus statistics at the State and Federal levels.
3	Increase Ohio's market share of nationwide floriculture production sales and growers profitability. Evaluation will be done using statistics by USDA-NASS.
4	Increases in gross income keep pace with inflation. USDA statistics on floriculture sales and rankings.

Outcome #1

1. Outcome Measures

Increase knowledge, skills and aspirations of greenhouse producers in Ohio. These goals will be evaluated by making personal interviews with growers, focus groups, and observations of Extension personnel on grower's production practices.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Industry survival depends on how efficient and cost effective crops are produced and sold.

What has been done

Group educational programs, individual visits, workshops, e-mail publications

Results

Growers have learned how to be more efficient and increased IPM practices. We have learned this by informally talking with the growers during our visits, phone calls and e-mail communications. We did not have a quantitative target for 2007

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)

Outcome #2

1. Outcome Measures

Change the way greenhouse businesses currently operate to adopt research-based information to improve efficiency of production, increase worker safety, decrease environmental pollution. Evaluation will be done as described for short-term outcomes plus statistics at the State and Federal levels.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Industry is feeling pressure to be sustainable and environment friendly.

What has been done

Group educational programs, individual visits, workshops, e-mail publications

Results

Growers' interest on the issue is on the raise based on number of questions received by the professionals and educators in our team. We did not have a quantitative target for 2007

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
215	Biological Control of Pests Affecting Plants
212	Pathogens and Nematodes Affecting Plants
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants
403	Waste Disposal, Recycling, and Reuse
102	Soil, Plant, Water, Nutrient Relationships
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

Increase Ohio's market share of nationwide floriculture production sales and growers profitability. Evaluation will be done using statistics by USDA-NASS.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

It is important to have prove the importance and size of the State industry for research funding allocations

What has been done

During presentations and visits, growers have been asked to fill NASS survey each year

Results

NASS 2007 data will be available in June or July of 2008

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)

Outcome #4

1. Outcome Measures

Increases in gross income keep pace with inflation. USDA statistics on floriculture sales and rankings.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Production costs are skyrocketing while prices stay almost constant. Efficiency is crucial.

What has been done

All educational programs have been developed with economics in mind. We have been stressing cultural practices that reduce costs of production.

Results

No data were collected

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy

Brief Explanation

Profitability of the floriculture greenhouse industry is a key issue.Costs are increasing while prices of floriculture products remains stagnant.The economy also affects Extension professionals: we all have to do the same with fewer resources.There is more pressure to increase funding through "cost recovery".

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals,group,organizations) and non-participants

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #29

V(A). Planned Program (Summary)

1. Name of the Planned Program

Agronomic Crop Management and Certified Crop Advisor (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
133	Pollution Prevention and Mitigation	5%		5%	
204	Plant Product Quality and Utility (Preharvest)	5%		5%	
205	Plant Management Systems	20%		20%	
211	Insects, Mites, and Other Arthropods Affecting Plants	15%		15%	
212	Pathogens and Nematodes Affecting Plants	13%		13%	
213	Weeds Affecting Plants	20%		20%	
402	Engineering Systems and Equipment	7%		7%	
601	Economics of Agricultural Production and Farm Management	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	17.0	0.0	0.0	0.0
Actual	17.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
582359	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1000522	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
45329	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Crop Observation and Recommendation Network Newsletter

Crop Production Conference

Certified Crop Advisor College

FSR Certified Crop Advisor

Conservation Tillage Conference

Crop Profit

Multiple Regional/Local Agronomy Meeting/Workshops

Website

Local/On-Farm Research

Field Days

Bulletins/Fact Sheets/Publications

Work with Media and OSU Communications Technology

Building relationships with commodity organizations and agencies

Build relationships across other teams in OSU Extension.

Computer training on technologies for agronomic applications

Precision ag data management analysis and decision workshops

Develop educational programs and tools to improve the efficiency of nitrogen utilization to improve farm economics and reduce environmental impact.

Develop a user friendly manure nutrient credit spreadsheet for livestock and crop producers

2. Brief description of the target audience
Grain Producers and cash forages of both commercial size and part-time

Agriculture Industry- Fertilizer chemical retailers, Input company representatives, crop advisors

Certified Crop Advisors

Non-agronomic specialized educators

Agency Soil and Water Conservation Districts, Natural Resources Conservation Service, Ohio Department of Agriculture and Environmental Protection Agency

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	5000	40000	0	1000
2007	5000	60000	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Crop Observation and Recommendation Network Newsletter to be published 40 times per year, and to be distributed to 5,000 farmers and professionals.

Year	Target	Actual
2007	0	6200

Output #2

Output Measure

- One Crop Production Conference which provides updated training for ag industry and CCA reaching 200.

Year	Target	Actual
2007	0	172

Output #3

Output Measure

- One Certified Crop Advisor (CCA) College which provides updated training for ag industry and CCA reaching 140.

Year	Target	Actual
2007	0	151

Output #4

Output Measure

- One Farm Science Review (FSR) Certified Crop Advisor which provides updated training for ag industry and CCA reaching 80

Year	Target	Actual
2007	0	41

Output #5

Output Measure

- One FSR Conservation Tillage Conference which provides updated training for ag industry and CCA reaching 600.

Year	Target	Actual
2007	0	670

Output #6

Output Measure

- One Crop Profit Broadcast which provides updated training for farmers, ag industry and CCA reaching 500.

Year	Target	Actual
2007	0	0

Output #7

Output Measure

- Multiple Regional/Local Agronomy Meeting totaling 40 which reaches 2500 people with agronomic information.

Year	Target	Actual
2007	0	3120

Output #8

Output Measure

- Production and Issues Workshops totaling 15 reaching 600 people

Year	Target	Actual
2007	0	180

Output #9

Output Measure

- Website which reaches an estimated 60,000 hits per year

Year	Target	Actual
2007	0	2223655

Output #10

Output Measure

- Local/On-Farm Research projects totaling 35 sites.

Year	Target	Actual
2007	0	65

Output #11

Output Measure

- Field Days totaling 5 location and reaching 500 people

Year	Target	Actual
2007	0	410

Output #12

Output Measure

- Weed Control Guide for Ohio and Indiana 4000 distributed annually

Year	Target	Actual
2007	0	4120

Output #13

Output Measure

- Tri-State Fertilizer Recommendations for Corn, Soybean, Wheat and Alfalfa 1000 distributed annually.

Year	Target	Actual
2007	0	480

Output #14

Output Measure

- Field Crop Insects of Ohio 800 distributed annually

Year	Target	Actual
2007	0	180

Output #15

Output Measure

- Corn, Soybean, Wheat and Alfalfa Field Guide 1000 distributed annually

Year	Target	Actual
2007	0	600

Output #16

Output Measure

- Corn Disease Management in Ohio 500 distributed annually

Year	Target	Actual
2007	0	280

Output #17

Output Measure

- Profitable Soybean Disease Management in Ohio 500 distributed annually

Year	Target	Actual
2007	0	280

Output #18

Output Measure

- Wheat Disease Management in Ohio 250 distributed annually

Year	Target	Actual
2007	0	120

Output #19

Output Measure

- Seed Treatment for Ohio Agronomic Crops 150 distributed annually

Year	Target	Actual
2007	0	35

Output #20

Output Measure

- Ohio Agronomy Guide 700 distributed annually

Year	Target	Actual
2007	0	600

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Those who participate in technology workshops will improve efficiency of field activities by $15 per acre.
2	25% of meeting participants will indicate they will implement new management practices based on information received at the meetings.
3	25% of Ohio's Corn acres will implement a nitrogen efficiency model for their farm.
4	25% of crop production acres will implement weed resistance management strategies.
5	Utilization of appropriate IPM practices for disease and insect will occur on 15% of Ohio crop acres.

Outcome #1

1. Outcome Measures

Those who participate in technology workshops will improve efficiency of field activities by $15 per acre.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	37500000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Precision agriculture can speed planting and harvest - the timing of both h¡ve great impact on yield.

What has been done

One multi-day precision agriculture event was held. Sessions were included with the Conservation Tillage Conference.

Results

Growers and consultants covering 2,500,000 acres were trained in technology related to precision agriculture.

4. Associated Knowledge Areas

KA Code	Knowledge Area
213	Weeds Affecting Plants
102	Soil, Plant, Water, Nutrient Relationships
601	Economics of Agricultural Production and Farm Management
212	Pathogens and Nematodes Affecting Plants
402	Engineering Systems and Equipment
205	Plant Management Systems
133	Pollution Prevention and Mitigation
204	Plant Product Quality and Utility (Preharvest)
211	Insects, Mites, and Other Arthropods Affecting Plants

Outcome #2

1. Outcome Measures

25% of meeting participants will indicate they will implement new management practices based on information received at the meetings.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #3

1. Outcome Measures

25% of Ohio's Corn acres will implement a nitrogen efficiency model for their farm.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Due to price increases and management education, growers understood reduced need for nitrogen for corn.

What has been done

Newsletters, educational meetings, Conservation Tillage Conference, one-on-one sessions held with growers and consultants.

Results

Surveys at meetings indicated 65% of growers would implement a nitrogen managment plan to reduce N by 33 pounds.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
601	Economics of Agricultural Production and Farm Management
133	Pollution Prevention and Mitigation
402	Engineering Systems and Equipment
211	Insects, Mites, and Other Arthropods Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants

Outcome #4

1. Outcome Measures

25% of crop production acres will implement weed resistance management strategies.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Awareness of weed resistance increased in Ohio. Fall weed surveys indicate increasing acres with problem weeds.

What has been done

Weed surveys were conducted in fall 2006 and 2007 by Extension Agents in western Ohio.

Results

During winter recertification programs, it was noted that many growers are taking notes during resistance discussions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
601	Economics of Agricultural Production and Farm Management
211	Insects, Mites, and Other Arthropods Affecting Plants
213	Weeds Affecting Plants
402	Engineering Systems and Equipment
212	Pathogens and Nematodes Affecting Plants
102	Soil, Plant, Water, Nutrient Relationships
133	Pollution Prevention and Mitigation
205	Plant Management Systems

Outcome #5

1. Outcome Measures

Utilization of appropriate IPM practices for disease and insect will occur on 15% of Ohio crop acres.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There is an increase in acres infested with the variant Western corn rootworm.

What has been done

Educational sessions were conducted at winter meetings to increase scouting activities, implement needed controls.

Results

Growers ask questions, follow suggestions on when to control, limited scouting by grower however.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
133	Pollution Prevention and Mitigation
205	Plant Management Systems
102	Soil, Plant, Water, Nutrient Relationships
601	Economics of Agricultural Production and Farm Management
212	Pathogens and Nematodes Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
213	Weeds Affecting Plants
402	Engineering Systems and Equipment

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Case Study

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #30

V(A). Planned Program (Summary)

1. Name of the Planned Program

Managed Forage and Grazing (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
205	Plant Management Systems	50%		50%	
307	Animal Management Systems	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	1.0	0.0
Actual	5.5	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
183027	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
314450	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
14246	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Curriculum will be developed and delivered to teach and facilitate adoption of the principles of management intensive grazing. A variety of learning activities will be used to deliver this curriculum, including intensive workshops with outdoor hands-on activities, major conferences, research and demonstrations, development of individualized grazing plans, newsletters, articles in popular press, web-based educational resources, and TV and media programs.

2. Brief description of the target audience

Forage and livestock producers of Ohio; Extension Educators and Natural Resource Conservation Service grassland specialists; technical service advisors and providers

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	1200	100000	45	1000
2007	2500	663000	78	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	6	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Intensive workshops and educational presentations: Single and multiple session workshops will be delivered to teach concepts and practices on forage production, pasture management, and forages for horses. Approximately 6 to 8 workshops will be held each year in different locations throughout Ohio. These workshops often include hands-on learning activities. These workshops will be managed by the Integrated Forage Management Team of OSU Extension.

Year	Target	Actual
2007	0	12

Output #2

Output Measure

- Research and demonstrations: Applied research and demonstrations on forage and grazing lands management will be conducted each year. These include annual and multi-year evaluations of forage varieties for productivity and persistence in Ohio. Results and research summaries will be disseminated through the Ohio Forage Network website and through media outlets. In addition, a funded research project will be conducted in SE Ohio aimed at increasing farm profitability and productivity of grazing beef and dairy farms while maintaining minimum environmental impacts. Over the next five years we will develop new grazing management tools that will be validated on six monitor farms.

Year	Target	Actual
2007	0	8

Output #3

Output Measure

- Development of individualized grazing plans: Plans will be developed for approximately 30 producers annually, which will include paddock layout and design, water system development plans, seasonal forage inventory and feed budgeting management plans. This activity will be managed by the Integrated Forage Management Team of OSU Extension.

Year	Target	Actual
2007	0	32

Output #4

Output Measure

- Newsletter: These will be the primary methods used for written communication to out clientele concerning management of forages and grazing lands. We will produce a quarterly electronic and hardcopy newsletter that will also be posted on the web. While extension fact sheets are produced, they are no longer the primary method of delivering information. This activity will be managed by the Co-chairs the Integrated Forage Management Team of OSU Extension.

Year	Target	Actual
2007	0	4

Output #5

Output Measure

- Articles in popular press: Educational articles will be produced for biweekly column in Farm & Dairy magazine (All About Grazing) and approximately six articles in Ohio's Country Journal on an annual basis. In addition, results from the Ohio Forage Performance Trials will be published annually in Ohio's Country Journal. This activity will be managed by the Integrated Forage Management Team of OSU Extension.

Year	Target	Actual
2007	0	21

Output #6

Output Measure

- Web-based educational resources: The Integrated Forage Management Team of OSU Extension will manage, maintain, and publish new information on the Ohio Forage Network (http://forages.osu.edu). Resources available through this website include contact information for forage specialists, fact sheets and bulletins, research summaries, and software products. The quarterly newsletter produced by the team will be posted on this website.

Year	Target	Actual
2007	0	4

Output #7

Output Measure

- TV and media programs: Approximately 2 TV programs and 6 to 10 radio programs will be produced on an annual basis on topics related to forage and grazing lands management.. This activity will be managed by members of the Integrated Forage Management Team of OSU Extension.

Year	Target	Actual
2007	0	12

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Managed grazing plans will be developed for 10,000 acres annually and improved grazing management will be adopted on 6,000 acres annually.
2	More Ohio forage-based farms will become economically and environmentally sustainable.

Outcome #1

1. Outcome Measures

Managed grazing plans will be developed for 10,000 acres annually and improved grazing management will be adopted on 6,000 acres annually.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	30

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{ Forage-livestock production systems make a significant contribution to agricultural output in Ohio. There is a need for educational programs and materials to assist clientele in developing forage production and utilization systems that are profitable, environmentally sound, and socially acceptable.

What has been done

{ Twenty-four extension publications were authored or co-authored including bulletins, popular press and newsletter articles, and proceedings articles for extension clientele, and technical information was provided for 11 articles written by mass media reporters. 20,300 copies of informational bulletins were distributed.

Results

Ohio has increased the number of managed and planned grazing acres, protecting water quality, improving production. Development of the beginning grazing school curriculum is in the final review stages and will be introduced spring of 2008 at a Train the Trainer session. Since November, 2007, 5 different Forage Team members have posted information to the blog. In the Pasture Measurement Project one of the volunteers was quoted in a publication that their participation was one of the best things they have done. Over 460 producers attended educational programs offered. After one presentation over 60% indicated that they would make changes to their grazing management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
205	Plant Management Systems

Outcome #2

1. Outcome Measures

More Ohio forage-based farms will become economically and environmentally sustainable.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{ To increase participants knowledge about forages and grazing in order to increase net profits, improve environmental quality and quality of life for farm families.

What has been done

The Ohio forage team developed educational materials to be utilized in teaching, 9 schools were conducted.

Results

Tens of thousands of acres have adopted managed grazing. List practices to be implemented as a result of what you have learned in cow calf school:

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
205	Plant Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Retrospective (post program)
- During (during program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #31

V(A). Planned Program (Summary)

1. Name of the Planned Program

Conservation Tillage (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	35%		35%	
104	Protect Soil from Harmful Effects of Natural Elements	10%		10%	
111	Conservation and Efficient Use of Water	5%		5%	
112	Watershed Protection and Management	5%		5%	
132	Weather and Climate	5%		5%	
205	Plant Management Systems	15%		15%	
216	Integrated Pest Management Systems	10%		10%	
405	Drainage and Irrigation Systems and Facilities	5%		5%	
601	Economics of Agricultural Production and Farm Management	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	2.3	0.0	0.0	0.0
Actual	2.4	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
79866	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
137214	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
6217	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conservation Tillage Conference each February

No-till Field Days each summer

No-till Council program each December

Farm Science Review demonstrations and programs each September

Develop educational materials (fact sheets, powerpoints) for use by educators

Ohio No-till News page in Ohio's Country Journal, 8 issues per year

Information also presented on farm radio networks (ABN, BARN) and on web sites.

2. Brief description of the target audience

Farmers, primarily those growing corn, soybeans and wheat, plus large livestock operations with manure management problems

Public agency personnel (primarily Extension; NRCS; SWCD)

Crop consultants

Ag industry (suppliers of machinery, fertilizer, chemicals)

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	2000	50000	200	8000
2007	1500	50000	200	5000

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	1	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- At the Conservation Tillage Conference, we know how many crop consultants attend and which sessions they participate in. Based on evaluations submitted, we also have a good estimate on the number of farmers attending, the total acres, and the economic value per acre these farmers place on the conference.

Year	Target	Actual
2007	0	129000000

Output #2

Output Measure

- No-till field days and the Ohio No-till conference also offer credits for crop consultants, and evaluation surveys provide estimates of economic value to consultants and farmers.

Year	Target	Actual
2007	0	105

Output #3

Output Measure

- Ohio No-Till News page appears in Ohio's Country Journal, about 8 issues per year. The circulation of the journal is 20,000 and growing.

Year	Target	Actual
2007	0	20000

Output #4

Output Measure

- The value of the web sites (ctc.osu.edu and fabe.osu.edu/notill) can be roughly estimated by the number of page views.

Year	Target	Actual
2007	0	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	All participants gain knowledge of conservation tillage topics, including no-till corn, precision agriculture, controlled traffic, manure management for crops, water management, and cover crops.
2	Ten percent of participants not currently using conservation tillage for growing corn will at least try the practice. We will ask about tillage intentions on our evaluation form, and also ask about changes made the previous year as a result of attending a previous CTC or another one of our programs.
3	A measurable goal is that the acres of corn farmed no-till will increase 5% by 2011, as determined by a USDA survey. The most recent one in 2004 showed 23% of Ohio corn was no-tilled, so increasing to 28% is doable. Since 63% of soybeans are already no-tilled, virtually all of the increase would be in continuous no-till.

Outcome #1

1. Outcome Measures

All participants gain knowledge of conservation tillage topics, including no-till corn, precision agriculture, controlled traffic, manure management for crops, water management, and cover crops.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	63

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Cover crops and manure management are two rising issues. Cover crops reduce erosion and sequester leftover nutrients, both important to environmentalists. Manure nutrients are more valuable because of the rising costs of chemical fertilizers and application on no-till ground potentially affects the quality of water, air and soil.

What has been done

Participants at CTC could attend 4 hours of education on Cover Crops and 3.5 hours on Manure Management. These topics were also presented at the August field day and December no-till conference.

Results

At CTC the sessions on cover crops and manure were among the highest rated for knowledge gained.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
132	Weather and Climate
405	Drainage and Irrigation Systems and Facilities
601	Economics of Agricultural Production and Farm Management
104	Protect Soil from Harmful Effects of Natural Elements
102	Soil, Plant, Water, Nutrient Relationships
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

Ten percent of participants not currently using conservation tillage for growing corn will at least try the practice. We will ask about tillage intentions on our evaluation form, and also ask about changes made the previous year as a result of attending a previous CTC or another one of our programs.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	37

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

No-till acres should increase for several economic and environmental benefits.

What has been done

Conservation tillage and no-till systems are emphasized on the three programs.

Results

Attendance at CTC, the field day, and No-Till Conf. has increased steadily. Knowledge gained about conservation tillage by CTC participants increased by 0.5 on a 5.0 scale. 37% no-till, 40% conservation tillage

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
405	Drainage and Irrigation Systems and Facilities
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management
104	Protect Soil from Harmful Effects of Natural Elements
216	Integrated Pest Management Systems
132	Weather and Climate

Outcome #3

1. Outcome Measures
A measurable goal is that the acres of corn farmed no-till will increase 5% by 2011, as determined by a USDA survey. The most recent one in 2004 showed 23% of Ohio corn was no-tilled, so increasing to 28% is doable. Since 63% of soybeans are already no-tilled, virtually all of the increase would be in continuous no-till.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The general public wants lower cost food produced without environmental degradation.

What has been done

Farmers adopting continuous no-till, rather than rotational tillage, see the greatest benefits.

Results

Production costs decrease, soil quality and environmental conditions improve.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
601	Economics of Agricultural Production and Farm Management
112	Watershed Protection and Management
132	Weather and Climate
405	Drainage and Irrigation Systems and Facilities
102	Soil, Plant, Water, Nutrient Relationships
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Public Policy changes
- Government Regulations

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- During (during program)

Evaluation Results

CTC evaluations submitted at the end of the conference show knowledge gained in all six major topic areas, averaging 0.63 on a 5.0 scale. Because so many crop consultants attend our programs, we impact over 10 million acres of cropland.

Key Items of Evaluation

Farmers are more precisely applying fertilizer, especially nitrogen, to reduce costs. Extrapolating evaluation results from CTC shows an expected savings of $15 million on nitrogen by reducing the rate by an average 5 #/Acre. Overall benefits from the educational content of CTC add up to $129 million on 9 million acres of crops.

Program #32

V(A). Planned Program (Summary)

1. Name of the Planned Program

Sustainable Agriculture (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
123	Management and Sustainability of Forest Resources	10%		10%	
131	Alternative Uses of Land	10%		10%	
136	Conservation of Biological Diversity	10%		10%	
205	Plant Management Systems	10%		10%	
216	Integrated Pest Management Systems	10%		10%	
307	Animal Management Systems	10%		10%	
601	Economics of Agricultural Production and Farm Management	10%		10%	
604	Marketing and Distribution Practices	20%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	0.0	0.0
Actual	1.5	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
49917	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
85759	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
3885	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Primary:

Plan and conduct Sustainable ag newsletter, workshops, field days, travel scholarships, teaching kit for new educators, farm tours

Other:

Provide leadership for sustainable agriculture professional development programs for Extension agents, NRCS staff, and other agriculture professionals in Ohio

Serve as a technical resource regarding various sustainable ag issues for Extension agents, NRCS staff and other ag professionals.

Serve as a liason to the North Central Region of SARE Program and promote SARE programs and resources among farmers, Extension agents, NRCS staff, and other ag professionals in Ohio.

Provide opportunities to network for sustainable ag non-profit organizations, ag agencies, and organizations as well as farmers to develop educational programs and resources for Ohio farm families and consumers.

2. Brief description of the target audience

Extension Educators, NRCS staff, agricultural professionals, farmers, consumers

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	1000	5000	0	0
2007	1200	5500	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	1	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of requests for resources and programs, participant roster, number of grants submitted, participant evaluation

Year	Target	Actual
2007	0	70

Output #2

Output Measure

- A quarterly newsletter is sent to over 100 Educators, ag agency personnel, and farmers.

Year	Target	Actual
2007	0	180

Output #3

Output Measure

- Workshops are held in various locations around Ohio and are scheduled 2-3 times each year. Topics of workshops include SARE grants, cover crops, organic grain production, and alternative enterprises.

Year	Target	Actual
2007	0	11

Output #4

Output Measure

- Field days and tours are held during summer months around Ohio at over 20 locations. Farm topics include grain, vegetable, and livestock sustainable practices.

Year	Target	Actual
2007	0	3

Output #5

Output Measure

- $500 scholarships are given up to 10 times per year for Educators to travel to attend sustainable functions.

Year	Target	Actual
2007	0	3

Output #6

Output Measure

- Over 50 requests for grants and resources are received each year.

Year	Target	Actual
2007	0	85

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Increase the sustainable agriculture knowledge and skills of Extension Agents, NRCS staff and other ag professionals in Ohio
2	Increase the use of the SARE program and resources among farmers, Extension agents, NRCS staff, and other ag professionals in Ohio
3	Improve the practices of the farmers of Ohio to include sustainable agriculture approaches}
4	More Educators will become knowledgeable about sustainable practices, such as cover crops, organic fruit & vegetable production, sustainable beef production, direct marketing.
5	More Extension educators will conduct a greater number of programs on sustainable ag topics
6	Ohio farms will become more economically, environmentally, and socially sustainable

Outcome #1

1. Outcome Measures

Increase the sustainable agriculture knowledge and skills of Extension Agents, NRCS staff and other ag professionals in Ohio

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	113

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
136	Conservation of Biological Diversity
601	Economics of Agricultural Production and Farm Management
205	Plant Management Systems
102	Soil, Plant, Water, Nutrient Relationships
307	Animal Management Systems
131	Alternative Uses of Land
123	Management and Sustainability of Forest Resources
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

Increase the use of the SARE program and resources among farmers, Extension agents, NRCS staff, and other ag professionals in Ohio

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	67

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
216	Integrated Pest Management Systems
604	Marketing and Distribution Practices
131	Alternative Uses of Land
205	Plant Management Systems
102	Soil, Plant, Water, Nutrient Relationships
136	Conservation of Biological Diversity
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Improve the practices of the farmers of Ohio to include sustainable agriculture approaches}

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
604	Marketing and Distribution Practices
216	Integrated Pest Management Systems
131	Alternative Uses of Land
601	Economics of Agricultural Production and Farm Management
102	Soil, Plant, Water, Nutrient Relationships
136	Conservation of Biological Diversity
307	Animal Management Systems
205	Plant Management Systems

Outcome #4

1. Outcome Measures

More Educators will become knowledgeable about sustainable practices, such as cover crops, organic fruit & vegetable production, sustainable beef production, direct marketing.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	113

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
136	Conservation of Biological Diversity
205	Plant Management Systems
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management
307	Animal Management Systems
102	Soil, Plant, Water, Nutrient Relationships
123	Management and Sustainability of Forest Resources
604	Marketing and Distribution Practices

Outcome #5

1. Outcome Measures

More Extension educators will conduct a greater number of programs on sustainable ag topics

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	246

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity
216	Integrated Pest Management Systems
102	Soil, Plant, Water, Nutrient Relationships
307	Animal Management Systems
123	Management and Sustainability of Forest Resources
205	Plant Management Systems
604	Marketing and Distribution Practices
131	Alternative Uses of Land
601	Economics of Agricultural Production and Farm Management

Outcome #6

1. Outcome Measures

Ohio farms will become more economically, environmentally, and socially sustainable

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	200	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices
307	Animal Management Systems
131	Alternative Uses of Land
123	Management and Sustainability of Forest Resources
205	Plant Management Systems
136	Conservation of Biological Diversity

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Public Policy changes

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #33

V(A). Planned Program (Summary)

1. Name of the Planned Program

Ohio Dairy Health Management Certificate Program (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	15%		15%	
311	Animal Diseases	20%		20%	
312	External Parasites and Pests of Animals	5%		5%	
313	Internal Parasites in Animals	5%		5%	
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	5%		5%	
315	Animal Welfare/Well-Being and Protection	15%		15%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc	15%		15%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	15%		15%	
722	Zoonotic Diseases and Parasites Affecting Humans	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	10.0	0.0	0.0	0.0
Actual	17.5	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
582359	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1000522	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
45329	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Twelve 2-day modules are held that bring participants together. Farm visits will allow participants to work together on real world problems. Expert speakers are brought in to talk with the group. An e-mail listserv is used to allow participants to communicate with each other at any time over the three-year period.

Structured, step-wise, comprehensive program focused on dairy production medicine.

2. Brief description of the target audience

Veterinary practitioners whose practice has a large percentage of dairy clients; Practitioners who have been out of school and in practice for at least a few years

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	23	0	0	0
2007	23	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of participants at each session

Year	Target	Actual
2007	0	15

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Better understanding of dairy records
2	Better understanding of economics, nutrition, milk quality, cow comfort, and facilities; Interpersonal & Leadership skills; and Business & economic skills
3	A thorough understanding of all aspects in a modern dairy operation
4	Participants recognize OSU as leader in area
5	A change in behavior of the participants such that they have better interpersonal and consulting skills for Dairy Herd Health Management by increasing the number of veterinary services available, increasing the number of milk quality services, and increasing in consulting visits by veterinarians who were program participants
6	Improved economic viability for dairy veterinary practitioners and their dairy clients
7	Improved milk quality on client farms

Outcome #1

1. Outcome Measures

Better understanding of dairy records

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Without actual data, it is extremely difficult to manage dairy herds, or identify problems, develop solutions, set goals, monitor progress, and evaluate success of changes within a dairy herd. Several dairy record systems are available to provide these services. Understanding a dairy record system's strengths and limitations are critical to providing effective dairy consulting services.

What has been done

One of the first modules focused on dairy record systems, their use in dairy herd management, benchmarking client herds, and using these systems to identify opportunities for client farms.

Results

Throughout the certificate program, use of records in the areas of quality milk production, reproduction and herd health has been incorporated into teaching and discussions emphasizing on-farm application. Participants recognize the importance of using these tools and teaching their clients to use these tools in herd management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
301	Reproductive Performance of Animals
312	External Parasites and Pests of Animals
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals
315	Animal Welfare/Well-Being and Protection
722	Zoonotic Diseases and Parasites Affecting Humans
313	Internal Parasites in Animals
311	Animal Diseases

Outcome #2

1. Outcome Measures

Better understanding of economics, nutrition, milk quality, cow comfort, and facilities; Interpersonal & Leadership skills; and Business & economic skills

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Sustainable, profitable dairy farm businesses require a fine balance of production and business practices, as well as the ability to work with management teams, consultants and employees. During their training, veterinary practitioners spend the majority of their time learning about animal systems, health, prevention and treatment. Rarely is there much time to learn about other factors in any depth and study the integrated system. To effectively expand their practices into value-added consulting, practitioners need to expand their knowledge of these other areas and understand the relationships between them.

What has been done

The 3-year curriculum was designed to spend time studying these areas in-depth with homework activities, in-class discussion and individual interactions both exploring and reinforcing the relationships between these production-based areas and overall dairy farm business management and profitability.

Results

Participants are looking at both their client dairy farms and their own dairy practitioner businesses more holistically. Through discussions both in the classroom and individually, they exhibit awareness of and importance of applying business principles both to their client businesses and their practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
313	Internal Parasites in Animals
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals
312	External Parasites and Pests of Animals
311	Animal Diseases
301	Reproductive Performance of Animals
315	Animal Welfare/Well-Being and Protection
722	Zoonotic Diseases and Parasites Affecting Humans
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc

Outcome #3

1. Outcome Measures

A thorough understanding of all aspects in a modern dairy operation

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The dairy industry has changed significantly in the past 15 years, since many of the participants began practicing. Understanding the factors that have caused the shift from smaller to larger farms and the implications for all phases of animal and business management are critical for a practitioner to act effectively as a consultant.

What has been done

Workshops were designed to update practitioners on critical dairy production issues such as reproduction and health issues. These were balanced by business modules that also considered industry factors impacting the dairy business.

Results

Participants are more aware of and comfortable with the whole dairy farm management picture. A closing discussion during the final workshop indicated a desire to visit and study a wide variety of successful dairy operations that can serve as models for some of their clientele.

4. Associated Knowledge Areas

KA Code	Knowledge Area
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc
311	Animal Diseases
722	Zoonotic Diseases and Parasites Affecting Humans
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
301	Reproductive Performance of Animals
315	Animal Welfare/Well-Being and Protection

Outcome #4

1. Outcome Measures

Participants recognize OSU as leader in area

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

OSU's Department of Extension Veterinary Preventive Medicine and OSU Extension have extensive resources and expertise available to help both the dairy practitioner and their dairy clients. Not all practitioners or their clients are aware of this expertise and how it can benefit their practices/dairy farm businesses.

What has been done

The Ohio Dairy Health Management Certificate Program has exposed participating dairy practitioners to specialists from the College of Veterinary Medicine, and from the Departments of Extension, Animal Science and Food, Agricultural and Biological Engineering as teachers for the workshop. Other workshop speakers were brought in from other universities across the country.

Results

As a result of their participation and relationships built during the workshop, practitioners have increased contacts with OSU specialists for assistance with both their clients and their practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
313	Internal Parasites in Animals

311	Animal Diseases
301	Reproductive Performance of Animals
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
312	External Parasites and Pests of Animals
315	Animal Welfare/Well-Being and Protection
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc
722	Zoonotic Diseases and Parasites Affecting Humans
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals

Outcome #5

1. Outcome Measures

A change in behavior of the participants such that they have better interpersonal and consulting skills for Dairy Herd Health Management by increasing the number of veterinary services available, increasing the number of milk quality services, and increasing in consulting visits by veterinarians who were program participants

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
315	Animal Welfare/Well-Being and Protection

Outcome #6

1. Outcome Measures

Improved economic viability for dairy veterinary practitioners and their dairy clients

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Long-term viability of both the dairy practitioner and their dairy producer clients is dependant on sound production and business practices. Practitioners are in a unique position to observe both health and management needs as they are on client farms regularly. They also have the opportunity to offer input to dairy owners as respected members of the management team.

What has been done

Participants are referring clients to OSU Extension specialists to help answer financial and benchmarking questions.

Results

Participants are more aware of and seeking answers to their own practice's profitability and efficiency issues. They are considering how they need to change to meet new demands and take advantage of new opportunities. Also, how they should value their business as they consider ways to fairly and successfully pass the business to the next generation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
722	Zoonotic Diseases and Parasites Affecting Humans
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals
301	Reproductive Performance of Animals
315	Animal Welfare/Well-Being and Protection
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
313	Internal Parasites in Animals
311	Animal Diseases
312	External Parasites and Pests of Animals

Outcome #7

1. Outcome Measures
Improved milk quality on client farms

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Other (Outcome topics addressed over the course of this 3-year program.)

Brief Explanation

The Ohio Dairy Health Management Certificate Program is a 3-year professional development program. This final year's modules specifically addressed health and disease issues, necropsy and pathology, and calf and heifer management. While some impacts were already formally reported in previous years' reports, topics addressed throughout the program were frequently touched on in class discussions of current issues and problems.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- During (during program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #34

V(A). Planned Program (Summary)

1. Name of the Planned Program

Livestock Environmental Assurance and Mortality Management (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	5%		5%	
112	Watershed Protection and Management	10%		10%	
133	Pollution Prevention and Mitigation	20%		20%	
141	Air Resource Protection and Management	15%		15%	
302	Nutrient Utilization in Animals	5%		5%	
307	Animal Management Systems	25%		25%	
401	Structures, Facilities, and General Purpose Farm Supplies	5%		5%	
404	Instrumentation and Control Systems	5%		5%	
405	Drainage and Irrigation Systems and Facilities	5%		5%	
601	Economics of Agricultural Production and Farm Management	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	2.0	0.0
Actual	3.5	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
116472	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
200104	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
9066	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Communication and information exchange with key food-animal production entities for the purpose of refinement of educational programming and targeted programs

- Development of production site planning information to avoid or minimize future conflict.

- Provide on-farm environmental assessment for the purpose of review of the production site, facilities within the site, and general extraneous conditions that influence environmental and neighbor/community relations

- Expand and refine Mortality Composting Materials to address identified needs and challenges observed through current monitoring processes.

- Enhance web-based program delivery to improve access to stakeholders and improve efficiency of staff time and effort while improving materials offered.

- Where applicable, develop species specific Standard Operating Procedures, manuals, materials, and training.

- Develop courses/workshops that have direct application and on-site training capabilities to enhance environmental compliance.

- Develop courses offerings for professional on-site environmental managers, conservation planners and Technical Service Providers.

2. Brief description of the target audience

Livestock production entities regardless of size, scope or species; Local citizens as they request information and education relevant to livestock production and the environment; Lending institutions, equipment suppliers, builders, academia, and other parties involved in the business of livestock production.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	200	0	0	0
2007	550	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	3	0	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Standard evaluation of materials and workshops

Year	Target	Actual
2007	0	5

Output #2

Output Measure

- Database of individuals contacted with appropriate demographics

Year	Target	Actual
2007	0	800

Output #3

Output Measure

- Materials that enhance the ability to improve environmental compliance including factsheet-type, multi-media type, manuals, and or books that allow the learner to access information in the most appropriate methods and turn the knowledge they gain into application within the enterprise in an effort to enhance environmental compliance.

Year	Target	Actual
2007	0	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Determine detection, monitoring, and sampling systems that reliably indicate the impact and value of livestock enterprises in concert with the environment. Once the system(s) are identified to assess impact, programs and education materials targeted toward the key areas of focus will be developed, distributed, and training programs conducted.
2	Implementation and increased use of developed, science-based systems models and technology.
3	Protect the environment from degradation due to livestock production.

Outcome #1

1. Outcome Measures

Determine detection, monitoring, and sampling systems that reliably indicate the impact and value of livestock enterprises in concert with the environment. Once the system(s) are identified to assess impact, programs and education materials targeted toward the key areas of focus will be developed, distributed, and training programs conducted.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	1180

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{ Recycling animal manure nutrients in an economic, environmental and social manner is a concern for food animal production facilities and neighbors within proximity and associated communities.

What has been done

. Four educational programs have been identified, developed and implemented to address many of the concerns associated with animal manure nutrient recycling.

Results

More than 1180 individuals participate in educational programs targeting manure nutrient management, soil and manure testing, Best Management Practices for manure nutrient application and recycling as well as equipment maintenance and calibration.

4. Associated Knowledge Areas

KA Code	Knowledge Area
401	Structures, Facilities, and General Purpose Farm Supplies
307	Animal Management Systems
133	Pollution Prevention and Mitigation
112	Watershed Protection and Management
141	Air Resource Protection and Management
601	Economics of Agricultural Production and Farm Management
102	Soil, Plant, Water, Nutrient Relationships
302	Nutrient Utilization in Animals
405	Drainage and Irrigation Systems and Facilities
404	Instrumentation and Control Systems

Outcome #2

1. Outcome Measures

Implementation and increased use of developed, science-based systems models and technology.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	490

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{ Manure nutrient recycling practices are scrutinized more closely by various individuals in proximity of food production facilities.

What has been done

Educational and certification program were developed to address manure nutrient recycling application and management.

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
307	Animal Management Systems
405	Drainage and Irrigation Systems and Facilities
401	Structures, Facilities, and General Purpose Farm Supplies
601	Economics of Agricultural Production and Farm Management
302	Nutrient Utilization in Animals
133	Pollution Prevention and Mitigation
141	Air Resource Protection and Management
404	Instrumentation and Control Systems
102	Soil, Plant, Water, Nutrient Relationships

Outcome #3

1. Outcome Measures
Protect the environment from degradation due to livestock production.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	825

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{ Recycling animal manure nutrients in an economic, environmental and social manner to protect water quality is a concern for food animal production facilities and neighbors within proximity and associated communities.

What has been done

{ Educational and certification program were developed to address the value of manure nutrients, appropriate recycling and application practices and how best to manage this nutrient resource to protect water quality.

Results

More than 800 individuals participate in state-wide educational programs promoting the economic value of manure nutrients, how to best utilize this resource through soil and manure testing, and Best Management Practices to protect water quality and maintain environmental, economic and social viability.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
133	Pollution Prevention and Mitigation
601	Economics of Agricultural Production and Farm Management
405	Drainage and Irrigation Systems and Facilities
102	Soil, Plant, Water, Nutrient Relationships
404	Instrumentation and Control Systems
112	Watershed Protection and Management
401	Structures, Facilities, and General Purpose Farm Supplies
141	Air Resource Protection and Management
307	Animal Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Public Policy changes
- Government Regulations
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #35

V(A). Planned Program (Summary)

1. Name of the Planned Program

Management & Sustainability of Forest Resources (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources	30%		30%	
124	Urban Forestry	10%		10%	
125	Agroforestry	20%		20%	
133	Pollution Prevention and Mitigation	10%		10%	
135	Aquatic and Terrestrial Wildlife	10%		10%	
136	Conservation of Biological Diversity	5%		5%	
605	Natural Resource and Environmental Economics	15%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	4.3	0.0	1.2	0.0
Actual	4.3	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		**Research**	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
143094	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
245843	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
11138	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Develop curriculum
- Conduct workshops
- Develop fact sheets and bulletins
- Produce newsletters
- Provide web site for information and workshop registration
- Conduct research in support of programming efforts
- Partnering with other natural resource agencies and organizations to extend our impact
- Conduct in-service workshops for professionals

2. Brief description of the target audience

Woodland owners/landowners – those individuals who own forest land or other natural areas and are interested in learning more about it and how to manage the resource to best meet their needs

Natural resource professionals – foresters from state agencies and private industry, wildlife managers from state agencies, soil and water conservation district employees, any other group that works in the natural resource field

Forest industry – those individuals working in the forest products side of forestry, including paper mills, saw mills, loggers, timber buyers, consulting foresters, etc.

Homeowners – those homeowners interested in their tree resource around the home.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	5400	28000	0	0
2007	5680	18600	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	1	0	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Develop curriculum – We plan to continually update and update the curriculum of the Ohio Woodland Stewards program to meet the changing needs of our clientele. An example of curriculum development will be for those trying to find ways to best utilize ash trees as they continue to die from Emerald Ash Borer. This curriculum could be used by homeowners and forester alike. Another example is the development of a program to meet the future continuing education requirements for those enrolled in the forestry tax programs in Ohio.

Year	Target	Actual
2007	0	0

Output #2

Output Measure

- Conduct workshops – Workshops will be developed and offered on an as needed basis to meet either professional educational needs or woodland owner needs. Typically we try to offer a wide variety, both in content and location around the state.

Year	Target	Actual
2007	0	12

Output #3

Output Measure

- Develop fact sheets and bulletins – Each year we work through a list of what needs to be done. Emerald Ash Borer has forced some items onto the back burner and we will have to see about getting some of those items back on track.

Year	Target	Actual
2007	0	1

Output #4

Output Measure

- Produce newsletters – The Ohio Woodland Stewards program produces the Ohio Woodland, Watersheds and Wildlife newsletter which is offered in a high quality paper and electronic format, 3 times annually.

Year	Target	Actual
2007	0	3

Output #5

Output Measure

- Provide web site for information and workshop registration – The Ohio Woodland Stewards website has fact sheet and bulletin informational links along with electronic versions of the newsletter. There is online class registration available for both the OWS programs and whenever we hold workshops, the website it also used for registration (woodlandstewards.osu.edu). Track the number of visitors to the site as according to the web site server log

Year	Target	Actual
2007	0	68713

Output #6

Output Measure

- Conduct research in support of programming efforts – The current need for research is in the area of what will happen to our woodlands as the main front of emerald ash borer progresses through Ohio. What is left behind? How will the woodland respond? How can woodland owners be proactive instead of reactive? Will there be any ash left to work with?

Year	Target	Actual
2007	0	0

Output #7

Output Measure

- Partnering with other natural resource agencies and organizations to extend our impact – Working closely with Ohio Department of Natural Resources, Division of Forestry, Wildlife and Soil and Water Conservation to get forestry related topics out to the partners employees and then on to the public.

Year	Target	Actual
2007	0	0

Output #8

Output Measure

- Conduct in-service workshops for professionals – These workshop topics are generated year to year at the request of several committees and organizations (forestry committee of the Ohio Federation of Soil & Water Conservation Districts etc.) The number will vary from year to year but typically there is at least one or two.

Year	Target	Actual
2007	0	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Our major goal is for our client base to make informed decisions about the management of their natural resources. One way that we accomplish this is to help to connect them to the resource people who can help them to develop management plans which help them to set and accomplish goals.
2	One of the things that we would like to see is an increase in the number of folks who have and implement woodland management plans. Currently only about 3% of Ohio woodland owners have management plans.
3	Also, timber harvesting has a lasting impact on the forest resources. This impact can be positive or negative, and currently only about 17% of woodland owners seek professional assistance.
4	We would like to see an increase in the percentage of folks who have management plans and utilize professional assistance.

Outcome #1

1. Outcome Measures

Our major goal is for our client base to make informed decisions about the management of their natural resources. One way that we accomplish this is to help to connect them to the resource people who can help them to develop management plans which help them to set and accomplish goals.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources

Outcome #2

1. Outcome Measures

One of the things that we would like to see is an increase in the number of folks who have and implement woodland management plans. Currently only about 3% of Ohio woodland owners have management plans.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources

Outcome #3

1. Outcome Measures

Also, timber harvesting has a lasting impact on the forest resources. This impact can be positive or negative, and currently only about 17% of woodland owners seek professional assistance.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity
124	Urban Forestry
605	Natural Resource and Environmental Economics
123	Management and Sustainability of Forest Resources

Outcome #4

1. Outcome Measures

We would like to see an increase in the percentage of folks who have management plans and utilize professional assistance.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity
124	Urban Forestry
605	Natural Resource and Environmental Economics
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
123	Management and Sustainability of Forest Resources
125	Agroforestry

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Competing Programmatic Challenges

Brief Explanation

2007 was a planning year so some outcomes were not tracked/reported for this year.Evaluation plans are in place to track future outcome efforts.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)

Evaluation Results
{No Data Entered}

Key Items of Evaluation
{No Data Entered}

Program #36

V(A). Planned Program (Summary)

1. Name of the Planned Program

Food Safety Education Program for Consumers (Extension)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
607	Consumer Economics	10%		0%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.	30%		0%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	50%		0%	
722	Zoonotic Diseases and Parasites Affecting Humans	10%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan				
Actual	8.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
256615	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
346647	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
116448	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1) Conduct food safety education classes with participants in the FNP and EFNEP program
2) Conduct ServSafe classes with food establishment managers and employees
3) Conduct Safe Food Handling for Occasional Quantity Cooks classes with volunteer food preparers
4) Conduct general food safety classes with youth
5) Provide research based information to consumers through various forms of media, phone calls, fact sheets and web pages

2. Brief description of the target audience

1) Food stamp or food stamp eligible families (FNP)2) Low income families with young children (EFNEP)3) Food establishment managers (ServSafe manager training)4) Food service employees (ServSafe employee training)5) Volunteer food preparers (general population) (OQC)6) Youth (4H)7) General consumers (other formal or informal education)

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
2007	46000	80000	3749	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	1	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of single contact programs offered

Year	Target	Actual
2007	{No Data Entered}	44

Output #2

Output Measure

- Number of multiple contact programs offered

Year	Target	Actual
2007	{No Data Entered}	215

Output #3

Output Measure

- Number of participants completing evaluation forms

Year	Target	Actual
2007	{No Data Entered}	3428

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Percentage of adults and youth that demonstrate ability to practice personal hygiene, practice kitchen cleanliness, cook foods adequately, avoid cross contamination, or keep foods at safe temperatures
2	Adults and youth who indicate intent to adopt one or more safe food handling practices
3	Adults and youth will show a decrease in the number of illnesses caused by biological contamination of food (such as bacterial, viruses, parasites)
4	Percentage of adults and youth that demonstrate adoption of practice by handling behaviors associated with practicing personal hygiene, cooking foods adequately, avoiding cross contamination, or keeping foods at safe temperatures.

Outcome #1

1. Outcome Measures

Percentage of adults and youth that demonstrate ability to practice personal hygiene, practice kitchen cleanliness, cook foods adequately, avoid cross contamination, or keep foods at safe temperatures

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	3173

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Consumers benefit from practicing safe food handling because foodborne illness is prevented

What has been done

Numerous multi-contact and single-contact programs for adult and youth consumers

Results

85% of program participants report improved knowledge in safe food handling

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
722	Zoonotic Diseases and Parasites Affecting Humans
607	Consumer Economics

Outcome #2

1. Outcome Measures

Adults and youth who indicate intent to adopt one or more safe food handling practices

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	2152

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Consumers benefit from practicing safe food handling because foodborne illness is prevented

What has been done

Numerous multi-contact and single-contact programs for adult and youth consumers

Results

57% of participants report intent to implement new knowledge of safe food handling

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
607	Consumer Economics
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #3

1. Outcome Measures

Adults and youth will show a decrease in the number of illnesses caused by biological contamination of food (such as bacterial, viruses, parasites)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	115

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Health professionals, economic stakeholders and consumers aspire for for fewer foodborne illness outbreaks each year compared to the previous year

What has been done

Extension food safety programs (ServSafe, Occasional Quantity Cooks, EFNEP, Family Nutrition Program, Vegetable Safety, GAPs Training, Quality Assurance Programs, etc) aime to teach adulty and youth principles of food safety

Results

Foodborne illness outbreaks increased in 2006 (last available data). Outcomes should reflect multiple years of reporting to determine progress. One year is insufficient to monitor outcomes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
607	Consumer Economics
722	Zoonotic Diseases and Parasites Affecting Humans
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #4

1. Outcome Measures

Percentage of adults and youth that demonstrate adoption of practice by handling behaviors associated with practicing personal hygiene, cooking foods adequately, avoiding cross contamination, or keeping foods at safe temperatures.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	115

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Health professionals, economic stakeholders and consumers aspire for for fewer foodborne illness outbreaks each year compared to the previous year

What has been done

Extension food safety programs (ServSafe, Occasional Quantity Cooks, EFNEP, Family Nutrition Program, Vegetable Safety, GAPs Training, Quality Assurance Programs, etc) aime to teach adulty and youth principles of food safety

Results

Foodborne illness outbreaks increased in 2006 (last available data). Outcomes should reflect multiple years of reporting to determine progress. One year is insufficient to monitor outcomes. 115 outbreaks reported.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
722	Zoonotic Diseases and Parasites Affecting Humans
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
607	Consumer Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

-

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

-

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}