

2008 Ohio State University Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

Ohio, like other states and the nation as a whole, is facing severe economic downturns, pressures to become more energy independent, live more sustainably, and lessen impact on the environment. To do this requires new approaches, approaches in which the land grant programs can play a major role. By focusing on areas of research, development, and extension excellence that are of strategic importance to the state of Ohio and the nation, the Ohio Agricultural Research and Development Center (OARDC) and Ohio State University (OSU) Extension have directed resources in new and innovative ways to generate technology-based economic development, supported by new social and other human capital programs for Ohio, and for the nation. Today, OSU Extension and OARDC are focusing on three signature areas in agricultural biosciences and biotechnologies, hereafter referred to as agbioscience, as defined in the College of Food, Agricultural and Environmental Sciences (CFAES) Strategic Plan (2008). These are (1) Food Security, Production and Human Health; (2) Advanced Bioenergy and Biobased Products; and (3) Environmental Quality and Sustainability. Within these focal areas, multiple centers and collaborative programs have been established working to advance research from discovery to application and commercialization, truly operationalizing the concepts of GATE TO PLATE and CELL TO SELL. At the same time this institution has continued to serve traditional needs and stakeholders. According to the Battelle Technology Partnership Practice assessment team (2008) the foremost in-state driver of agbioscience research and development is OARDC with OSU Extension leading in the state in extension education and human capital development. Their assessment found OARDC to be a substantial economic engine for the State of Ohio. Battelle calculates that OARDC's spending impacts in FY2008 generated 1,609 jobs; \$156.3 million in economic output; \$59.2 million in personal income for Ohio residents, and \$5.5 million in state and local taxes. According to the Battelle study, OARDC scientific research, innovation and technology development is providing large-scale and widespread functional economic impacts across Ohio, both in terms of the generation of positive impacts (through the development, for example, of high-value crops, bio-based materials and technologies) and significantly reducing negative impacts (such as crop losses or disease impacts). The study points out that OARDC is a generator of significant economic impacts for the state in the form of: technology commercialization; new and improved crops, breeds, and products for Ohio producers; new and improved technologies for Ohio industry; and an enhanced and protected environment and quality of life for Ohioans. Each of these areas is supported by OSU Extension that further grows these numbers and impacts with an equally robust program.

For 2008, OARDC has reported an array of impacts across all Planned Programs. The programs have moved beyond creating food to creating energy and manufacturing materials such as domestic, non-food sources of natural rubber and ethanol. Plant and animal genetics research, in combination food technologies, engineering, and plant and animal health research are supporting a safer, healthier food supply that is more sustainable and with less environmental impact. Reported research into soil, air, water, and natural resources are insuring that natural resources for future generations will not be further impacted by our industry. From internationally recognized research such as the discovery of the gene that controls tomato shape and other fruit shapes to a community based watershed phosphorus trading program that is improving watershed aquatic health while growing an industry that was once seen as a major environmental management problem. OARDC supports research across five OSU colleges, entering into multi and interdisciplinary partnerships to address complex problems and issues that require broad thinking. Health and wellness, energy and environment, sustainable societies, and biobased advanced materials are among the problems being addressed in collaboration with both internal and external partners. These collaborative research ventures are providing leadership and research that is relevant to multiple sectors of our society and contributes to food, economic, environmental, and national security. All OARDC research findings are conveyed to stakeholders via strong outreach, engagement, and extension programs.

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.

OSU Extension and OARDC manage numerous independent and joint projects and programs. The Ohio Agricultural Research and Development Center and Ohio State University Extension have worked throughout 2008 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 (valued by OSU Extension to be over \$60 million for 2008) 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. To that end we are dedicated to maintaining our land grant mission and vision.

Total Actual Amount of professional FTEs/SYs for this State

Year:2008	Extension		Research	
	1862	1890	1862	1890
Plan	243.0	0.0	72.0	0.0
Actual	239.0	0.0	95.1	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 2008, OARDC and OSU Extension, and the College were engaged in two strategic planning exercises. Both utilized their advisory committees and multiple internal and external stakeholder groups to provide input on matters as specific as planning the 2008 annual reports to the difficult task of identifying the three common signature programs across research, extension, and resident instruction programs within the College of Food, Agricultural, and Environmental Sciences Strategic Plan that was required by the university. Each of the OSU Extension program areas conducts long range strategic planning annually to prioritize programming. All of these programs and OSU Extension stakeholders participated in and brought to closure the 2007-2008 OSU Extension strategic planning exercise as well as participated in the college-wide strategic planning effort. 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. OARDC centers and programs and their stakeholders participated in multiple sessions ranging from planning and setting research agendas, to formative and summative evaluation of research projects. OARDC internal competitive grants program (SEEDS) 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. Occasionally, faculty from outside the College were used as 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 are distributed via electronic media. Peer review, both formal and informal, and assessments from needs to formative to summative have long been part of the business culture of OSU Extension and OARDC.

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

Throughout 2008 OARDC and OSU Extension, as well as our college as a whole, have continued to have wide support and active participation from among our stakeholders. New stakeholders and partners are constantly being sought out and are seeking us out, especially as we enter new areas such as biobased product research and renewable energy from waste streams and other sustainable biomass sources. Now using electronic messaging and blogging, as well as interactive group messaging systems, OARDC, OSU Extension, and most academic departments/schools within the College of Food, Agricultural and Environmental Sciences more effectively use their external advisory committees and stakeholder groups as a forum to discuss current programs and gather their input for future direction, e.g. the 2008 Strategic Plan. More people can participate at lower time and travel costs using electronic messaging. 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. Stakeholders report that they appreciate this opportunity to make input. In addition to the series of OARDC Battelle studies in 2007 and 2008 that drew extensively on stakeholders, each program area within OSU Extension conducted stakeholder based 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. County Extension Advisory Committees as well as the State Extension Advisory Committee have been engaged in reviewing and prioritizing new multi and interdisciplinary programs as they relate to local communities. 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, i.e. identifying needs, 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 approach that is most effective 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 events 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. 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 onsite 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 worked with her graduate assistant to conduct 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, for example, from the Crop Observation Reporting Network (CORN) annually results in a savings ranging from \$8 -12 million in pesticide use.

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

The afore-referenced techniques are utilized at various levels of the organization to gather data from stakeholders. OSU Extension and OARDC, per se, as well as many faculty and staff members, departments and schools, 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.

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

The institution advances both basic and applied research and builds and tests advance models for extension programming that meets client needs. To accomplish this requires close client/stakeholder/customer interaction. Throughout 2008, both OARDC and OSU Extension have continued stakeholder activities that reinforces that our organizational culture is customer centered, customer focused. 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 wellbeing. 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 2008: Budget request to the state; relations with elected officials; personnel hires made; Ohio Third Frontier funding; new facilities planned and retrofitting of existing facilities; University mandated strategic planning at the college level; input into the OSU Extension Strategic Plan; organizational changes; program expansion and program reduction including development of new centers and closing of some facilities; content and format of publications; research grants and awards; program content and delivery strategies within OSU Extension, and membership, structure, and role of advisory committees. The primary information learned in each of these interactions is that the stakeholder perspective is not always as we might assume and there is wide variation on our input - output - impact models.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
9718159	0	6135548	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	9903750	0	10475041	0
Actual Matching	9903750	0	9384689	0
Actual All Other	0	0	0	0
Total Actual Expended	19807500	0	19859730	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous years				
Carryover	1441408	0	4339493	0

V. Planned Program Table of Content

S. NO.	PROGRAM NAME
1	Soil, Water and Air Systems-OARDC Led
2	Natural Resources and Environmental Systems-OARDC Led
3	Plant Systems-OARDC Led
4	Animal Systems-OARDC Led
5	Food, Agricultural, and Biological Engineering Systems-OARDC Led
6	Food Systems-OARDC Led
7	Bio-based Non-Food Value Chains-OARDC Led
8	Human Health and Safety-OARDC Led
9	Agricultural, Environmental, and Development Economics-OARDC Led
10	Human and Community Resource Development-OARDC Led
11	Building Human Capital (Extension)
12	Nutrition Education and Behavior (Extension)
13	Financial Security (Extension)
14	Financial Stability (Extension)
15	Food Safety Education Program for Consumers (Extension)
16	Ohio 4-H Teen Leadership (Extension)
17	Volunteer Education & Training (Extension)
18	Youth Food Producing Animal Quality Assurance (Extension)
19	Community Leadership Development (Extension)
20	Downtown Revitalization (Extension)
21	Business & Economic Development (Extension)
22	Building Sustainable Communities (Extension)
23	Advancing Community Tourism (Extension)
24	Direct Marketing Program (Extension)
25	Land Use (Extension)
26	Preparing Communities for the Knowledge Economy (Extension)
27	Community Based Watershed Program (Extension)
28	Pesticide Education Program (Extension)
29	Greenhouse and Floriculture Systems and Marketing (Extension)
30	Agronomic Crop Management and Certified Crop Advisor (Extension)
31	Managed Forage and Grazing (Extension)
32	Conservation Tillage (Extension)
33	Sustainable Agriculture (Extension)
34	Ohio Dairy Health Management Certificate Program (Extension)
35	Livestock Environmental Assurance and Mortality Management (Extension)
36	Management & Sustainability of Forest Resources (Extension)

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%		40%	
111	Conservation and Efficient Use of Water	20%		20%	
112	Watershed Protection and Management	20%		20%	
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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	6.6	0.0
Actual	0.0	0.0	6.9	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	1007155	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	634939	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 in 2008 include, but are not limited to: 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-commercialized 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. Specifics, as well as impacts, are reported in Outcome Measures.

2. Brief description of the target audience

Targeted audiences include , but are 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 Ohio Dept of Natural Resources 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
2008	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	12	
2008	0	54	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
2008	12	54

Output #2**Output Measure**

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

Year	Target	Actual
2008	0	0

Output #3**Output Measure**

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

Year	Target	Actual
2008	2	1

Output #4**Output Measure**

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

Year	Target	Actual
2008	0	0

Output #5**Output Measure**

- Consultations by recipients and in what areas;

Year	Target	Actual
2008	25	34

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
2008	120	255

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
2008	3	6

Output #8**Output Measure**

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

Not reporting on this Output for this Annual Report

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 "A" 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.

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
2008	2	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

1. The productive agricultural land in the Midwestern United States is heavily dependent on the use of fertilizers and drainage, especially for crops such as corn and soybean. Drainage has modified the natural hydrology of streams, increasing peak discharges and decreasing the time necessary to peak. Nitrogen, and particularly nitrate (NO₃-), is flushed with the water and often has little chance to be removed by ecosystems such as riparian systems and wetlands. As a result, intensive agriculture in the Midwest is in part responsible for eutrophication of surface waters, loss of biodiversity, and even human health issues. Sound data and models are needed to aid in mitigation.

2. The utilization of nitrogen is central to the Midwest's corn production program but economic costs and environmental impacts must be minimized.

What has been done

1. OARDC scientists indicate that total carbon, organic matter, nitrate concentrations, denitrification rates, and discharge are not significantly different between non-forested and forested research plots. However, the forested sites have a greater residence time. Loss rates of nitrate are not different between reach types. On the other hand, there are differences in nitrate loss rates between seasons. This finding was expected as temperatures, rain events, and in-stream nitrate concentrations do vary seasonally. Residence time has little ability to explain nitrate removal in these systems. Nitrate concentration in the water column does explain a majority of the variation in the nitrogen removal data. These data suggest that the sites are saturated with nitrate, limiting their capability to process this nutrient.

2. OARDC scientists, working with other Midwest counterparts, continue to improve their new economic-based nitrogen recommendations - formula based on new data as means of reducing recommended nitrogen inputs saving both money and lessening the potential environmental impacts.

Results

1. These results re-enforced the concept that control for nitrate should occur on farm, before the molecules have a chance to reach aquatic ecosystems. The adoption of on-farm Best Management Practices will contribute to slowing down the movement of nitrate and provide potential on-farm hotspots for denitrification.

2. Stakeholder provided data over a three year period collected by research and extension scientists found that in 2006, when these new recommendations were made, 65% of those responding to the new guidelines reported that they planned to decrease nitrogen application rates by an average of 24 pounds per acre. In 2007, 29% responded that they planned to decrease nitrogen application rates by an average of 19 pounds per acre. In 2008, 41% responded that they planned to reduce nitrogen application rates by an average of 22 pounds. The cumulative effect over the three years holds promise for dramatically reducing the excessive application of nitrogen, saving both money and the environment.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

102	Soil, Plant, Water, Nutrient Relationships
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.

Not reporting on this Outcome for this Annual Report

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Wetlands, both natural and created, are important in mitigating natural and human infused pollutants into rivers, waterbodies, and aquifers. Created wetlands are often built to mitigate for loss of natural wetlands. A goal of no-net-loss of wetlands is an ideal that is set forth by many organizations and groups.

What has been done

OARDC scientists have been conducting studies to compare the concept of net loss in quantity of acreage of wetlands to the concept of functionality of wetlands, a measure beyond just acreage per se. Wetlands of all different ages were compared. This research demonstrates that the Ohio landscape is experiencing a shift in wetland structural and functional characteristics as a result of mitigation efforts. Some ecological functions develop fairly quickly (< 5 years) in created wetlands while other key functions still do not reach the rate observed in natural wetland after 30-40 years of creation.

Results

OARDC research indicates that wetlands policy should shift from a no-net-loss of wetland area to a no-net-functional-loss of wetland area. Measuring wetlands without taking into account the functionality provides for an incomplete assessment and does not fully inform decision makers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
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
2008	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In watershed management, it is critical to identify sources and types of contaminations in order for community based stakeholders to be able to take personal ownership for their impacts and mitigate accordingly. Such is the case in one of OARDC's community based watershed study areas, Sugar Creek in NE Ohio. OARDC scientists seek to provide the best data and methodologies to inform decision making. Likewise they are working with the community and a national cheese company to manage phosphate loading with the steams in the watershed.

What has been done

In the Study of Pathogen Origin, Fate and Transporting using real-time quantitative PCR (qPCR), OARDC scientists have determined the magnitude of microbial contamination using Bacteroidales as an indicator bacteria. In addition, PCR analysis of these water samples with host specific Bacteroidales are being tested as a primary tool to identifying sources of contamination. Bacteroidales primers (human and bovine) suggest frequent human-specific sources of fecal contamination of water bodies in the residential areas and bovine specific sources of fecal contamination of water bodies in the livestock dense areas. Also, OARDC scientists have provided the data and model necessary for setting up a program where a cheese processor pays farmers to adopt conservation practices to reduce the phosphorus that would otherwise pollute the watershed. In exchange, the company receives phosphorus credits to use to keep its phosphorus levels within environmental standards.

Results

This OARDC study affirms the usefulness of Bacteroidales for source tracking of pathogens load in aquatic systems and should facilitate development of improved management practices to limit microbial/pathogen contamination. At the same time the phosphorus trading program ensured that the cheese processing company can continue to operate. In addition up to six times more phosphorus is being reduced than if the company had met Ohio Environmental Protection Agency standards by itself without farmer cooperation. The cheese processor was able to add 12 new jobs processing 250,000 pounds more milk per day with a four million pound increase in cheese production projected by 2010. The processor is the only U.S. manufacturer of Jarlsberg, a popular Norwegian Swiss.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
111	Conservation and Efficient Use of Water

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
2008	3	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Soil amendments from compost or byproducts often contain some level of heavy metals and other potential contaminants. Because of human health and environmental concerns, the bioavailability of these heavy metals must be clearly delineated. Accurate environmental assessment of contaminants in soils is critical to evaluate whether expensive remediation of contaminated soil is necessary. Soil properties can mitigate hazardous effects of contaminants through soil chemical sequestration and should be considered when evaluating ecological risk from terrestrial contamination.

What has been done

OARDC scientists studied the effect of soil chemical properties on chemical speciation and heavy metal bioavailability in contaminated soil and the ability of soil chemical properties to define ecotoxicity categories in development of Ecological Soil Screening Levels. Specifically, the scientists conducted and analyzed experiments focused on application of statistical methods to determine which soil properties control metal bioavailability to plant ecological receptors.

Results

The novel use of ridge regression to quantify the ability of soil to sequester contaminants and reduce phytotoxicity has been employed. Measurement of key soil properties followed by ridge regression can be used to determine whether site soil remediation is necessary. The research results show use of ridge regression provides a measure of the relative contribution of each soil property in modifying toxic metal (lead, cadmium, arsenic, and zinc) bioavailability and toxicity. The results from this project provide risk assessors with tools to make better initial estimates of contaminated soil risk and determine whether any further assessment is warranted. Remediation costs associated with excavation and replacement of contaminated soil exceeding \$10,000,000 per site are not uncommon. Use of soil properties to adjust risk may eliminate unnecessary soil remediation action and result in large remedial cost savings.

A parallel research project is resulting in a high impact document 'Risk Characterization of Spent Foundry Sands in Soil-Related Applications' that will serve as the basis for national guidelines for beneficial use of foundry sand. This study provides science based guidelines that will allow beneficial reuse of potentially up to 10 million tons of foundry sand in the US and save our manufacturing industry millions of dollars, thereby increasing their competitiveness, while benefiting the public.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
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.

Not reporting on this Outcome for this Annual Report

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 "A" commercial early adoption by one or more stakeholders/groups.

Not reporting on this Outcome for this Annual Report

Outcome #8

1. Outcome Measures

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

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As demand increases for for corn stover for ethanol production and other green energy/byproducts, a threat exists that too much stover can be removed resulting in a soil carbon depletion.

What has been done

OARDC scientists have been studying the impact of removing corn stover on soil carbon levels.

Results

OARDC scientists found that removal rates and impact of soil carbon were dependent on soil type and terrain characteristics such as clay content, drainage, and slope gradient. There is no one uniform reduction model. For example removal rates of more than 25% of corn stover on sloping soils significantly reduces soil carbon.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources

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

To a greater or lesser extent all factors noted above effect impacts. Perhaps the most influential factor effecting achievement of impacts is monetary. As state and federal base funding have not kept pace with inflation, researchers have sought to continue to grow extramural funding. Research faculty size is decreasing as the result of less federal and state support meaning fewer scientists to compete for funding. While researchers have been relatively successful in bridging part of the dollar gap (loss), that funding is limited to grant and contract scopes of work. This has two effects. One, these extramural funds can not be used to hire core faculty so the faculty can not regrow, often meaning that faculties operate with less than a critical mass. Second, fewer faculty members working more extensively on external grants means that some of the mission oriented research services, especially those provided to stakeholders without costs, can no longer be provided. Both place the faculty member and the institution at a disadvantage in terms of scholarship, stakeholder relations, and service.

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**Key Items of Evaluation**

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
123	Management and Sustainability of Forest Resources	25%		25%	
135	Aquatic and Terrestrial Wildlife	60%		60%	
136	Conservation of Biological Diversity	15%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	3.8	0.0
Actual	0.0	0.0	3.3	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	1306148	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	386028	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

For 2008, outputs within this planned research program are manifested in 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. Impacts are reported in Outcome Measures.

2. Brief description of the target audience

Targeted audiences include, 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
2008	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	25	
2008	0	50	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
2008	25	50

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
2008	25	25

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;

Not reporting on this Output for this Annual Report

Output #4**Output Measure**

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

Year	Target	Actual
2008	1	0

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
2008	10	23

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
2008	4	4

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
2008	3	6

Output #8**Output Measure**

- number of graduate students graduated and professional positions they hold

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> (b) improve the flow of forest raw materials to the extent it meets the needs of Ohio industries within ten years
3	<ul style="list-style-type: none"> (c) increase the production of oak and reduce maple to eventually achieve a balance equivalent to forest with natural fire regimes
4	<ul style="list-style-type: none"> (d) meet federal and state needs for research data related to Ohio forest systems as the demand arises
5	<ul style="list-style-type: none"> (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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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

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

Not reporting on this Outcome for this Annual Report

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

Not reporting on this Outcome for this Annual Report

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

Not reporting on this Outcome for this Annual Report

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Because both financial and human resources are often limited in natural resource management, understanding how the composition and structure of riparian forests have changed over time is difficult to determine. These data thought are invaluable to resource managers as they look to design riparian restoration plans to maximize environmental benefits.

What has been done

An easy to use OARDC developed computer-based functional delineation tool for integrated riparian restoration prioritization for assessment of ecosystem function was developed.

Results

The OARDC developed computer-based functional delineation tool suggests that over half of the total Cuyahoga Valley National Park (CVNP) in Ohio area is riparian, a fact that will likely result in a significant change in how resource managers and administrators manage the national park resources and interact with neighboring communities. Additionally, the integrated riparian restoration prioritization tool is also helping park resource managers prioritize their riparian restoration efforts, and providing a foundation that will help catalyze efforts to improve riparian function across the lower Cuyahoga River (Ohio) watershed.

4. Associated Knowledge Areas

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

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

Not reporting on this Outcome for this Annual Report

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

Not reporting on this Outcome for this Annual Report

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The removal of forest products, namely timber, can have an impact, positive or negative, on bird species. In order to make informed choices, forest managers need models that predict change as the result of timber harvest. For Ohio, oak timber management impacts on avian ecology is of primary concern.

What has been done

In the OARDC avian response to forest management for oak regeneration research project ornithologists evaluated the short-term response of avian communities to oak regeneration methods by comparing density and reproductive success of forest songbirds, including Cerulean Warbler, in unharvested forest stands and those managed for oak regeneration (shelterwood harvest). Field teams compared avian community composition (i.e., species richness, species composition, relative abundance/density of species) in forest stands treated with shelterwood harvests to unharvested sites, identified habitat characteristics associated with presence of sensitive species, and monitoring nesting success of canopy-nesting birds.

Results

OARDC ornithologists are providing science-based management recommendations on the size, shape, and spatial distribution of timber harvests that will promote the continued viability of early-successional and mature-forest bird communities. In particular the scientists have shown that (1) successional bird communities may be sensitive to patch and landscape attributes related to the size and distribution of early-successional habitats and (2) mature-forest bird communities heavily use successional habitats during the post-breeding and post-fledging periods. This research shows that use of shrubby areas by juvenile mature-forest birds (e.g., ovenbird and worm-eating warbler) increases survival rates.

4. Associated Knowledge Areas

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

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

Not reporting on this Outcome for this Annual Report

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 fundin)

Brief Explanation

To a greater or lesser extent all factors noted above effect impacts. Perhaps the most influential factor effecting achievement of impacts is monetary. As state and federal base funding have not kept pace with inflation, researchers have sought to continue to grow extramural funding. Research faculty size is decreasing as the result of less federal and state support meaning fewer scientists to compete for funding. While researchers have been relatively successful in bridging part of the dollar gap (loss), that funding is limited to grant and contract scopes of work. This has two effects. One, these extramural funds can not be used to hire core faculty so the faculty can not regrow, often meaning that faculties operate with less than a critical mass. Second, fewer faculty members working more extensively on external grants means that some of the mission oriented research services, especially those provided to stakeholders without costs, can no longer be provided. Both place the faculty member and the institution at a disadvantage in terms of scholarship, stakeholder relations, and service.

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%		30%	
205	Plant Management Systems	10%		10%	
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%	
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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	22.2	0.0
Actual	0.0	0.0	30.5	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	2518308	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	2645123	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 for 2008 include, but are not limited to: 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-commercialized 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. Specifics, as well as impacts, are found in Outcome Measures.

2. Brief description of the target audience

Targeted audiences include, 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 ongoing 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
2008	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	3

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	24	
2008	0	141	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;

Not reporting on this Output for this Annual Report

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
2008	24	141

Output #3**Output Measure**

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

Not reporting on this Output for this Annual Report

Output #4**Output Measure**

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

Year	Target	Actual
2008	0	3

Output #5**Output Measure**

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

Year	Target	Actual
2008	1	1

Output #6**Output Measure**

- consultations with recipients and in what areas;

Not reporting on this Output for this Annual Report

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;

Not reporting on this Output for this Annual Report

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.

Not reporting on this Output for this Annual Report

Output #9**Output Measure**

- number of graduate students graduated and professional positions they hold

Not reporting on this Output for this Annual Report

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	Instrumentation is critical to advancing knowledge and providing the industry with tools to increase effectiveness, efficiency, value added and/or environmental acceptability of their products.
18	Understanding of niche markets are important as the grow in size, scope, public demand, and economic viability.
19	Continued advances in green industry research is necessary to sustain the industry.
20	Biological controls for insects and pathogens are needed to mitigate health and environmental impacts resulting from the use of chemical agents.

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 Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Scientists, producers, processors, and consumers are interested in fruit shapes. 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, e.g. the tomato industry alone is worth more than \$100 million a year in Ohio. Combine this with new lines of pathogen resistant tomatoes and their genetic makers for economic stimulus.

What has been done

OARDC scientists have cloned a gene, named SUN, which plays a significant role in the elongated shape of different tomato varieties. In addition to explaining how tomatoes evolved from a round, berry-sized fruit into the wide array of shapes and sizes known today, SUN has potential help explain the morphological differences among edible fruits and vegetables such as peppers and members of the cucumber and squash family. This research is supported by the OARDC-developed Tomato Analyzer software, which can measure shape and color variations in vegetables; it assists researchers in conducting genomic studies of fruit development and study color disorders that seriously affect the tomato processing industry. OARDC scientists have also discovered a new gene for resistance to tomato bacterial spot.

Results

This SUN gene discovery, published in SCIENCE (March 14, 2008), can influence the process of fruit formation and facilitate the development of specifically shaped fruit. The design or control of fruit shape is most useful when introducing new varieties. Depending on the goal of the breeding project, the creation of niche markets may require an unusual shape of the product to meet consumer demands. The ability of tomato processors to plan for tomatoes of uniform shape can greatly improve processing, adding more efficiency and competitiveness to the industry. SUN findings combined with OARDC's identification a new gene from PI 128216 that confers resistance to tomato bacterial spot, and access to new tomato lines and genetic markers, provide substantial research and development support for the industry.

4. Associated Knowledge Areas

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

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

Not reporting on this Outcome for this Annual Report

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

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Corn and soybean seedling blight (Pythium) is the cause of significant stand reduction in Ohio. Where reduction levels are high, replanting of fields are required at a significant expense to growers.

What has been done

The most common Pythium management approach is fungicide seed treatments. Corn and soybean are produced on nine to ten million acres in Ohio, across 11 different soil types. Much of this soil is poorly drained and that exacerbates the growth of the mold. To target specific treatment regimes, DNA extractions or sample pretreatments are required for targeting the specific mold isolates, but these are require a substantial investment of time and money. A more efficient approach was needed.

Results

In order to target specific treatments, OARDC scientists used a polymerase chain reaction (PCR), a process of rapidly making copies of DNA from the 11 different soil typed growing regions, in combination with a Direct Colony approach. The DC -PCR approach combines the DNA isolation step with the PCR step to assess Pythium isolates. This is the first step in more rapidly targeting effective management strategies for Pythium to Ohio's wide array of soil-typed regions and the corn hybrids/soybean cultivars we grow.

4. Associated Knowledge Areas

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

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

Not reporting on this Outcome for this Annual Report

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Corn is a major food and fiber crop worldwide and is central Ohio agriculture. Gray leaf spot and northern leaf blight, fungi that are distributed widely across corn growing regions of the world, have been spreading in Ohio cornfields. Disease resistant germ plasm is needed to help ensure against crop losses; the traditional pesticide line of defense is expensive and often detrimental to the environment.

What has been done

OARDC scientists and colleagues worked to combine improved disease resistance and nutritional characteristics into corn germ plasm from the US and Africa. Corn Belt germ plasm was crossed with South African resistant germ plasm and then crossed with elite germ plasm from CIMMYT.

Results

The OARDC corn researchers found among six genes that gave resistance to gray leaf spot and northern leaf blight, plus resistance against maize streak that is endemic to Africa, four of the genes could be transferred to a breeding population. The top 10% of the most resistant lines, as identified by molecular markers, were stacked into smaller sub-populations so they could be more easily used as breeders. These top performers were selected for crossing with Quality Maize protein breeding lines, a highly enriched grain. Out of these discoveries will come new lines that are more resistant to the targeted pathogens, less expensive to grow, and that are more environmentally friendly.

4. Associated Knowledge Areas

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

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 inhibit diseases and how bacteria perturb the immune system

Not reporting on this Outcome for this Annual Report

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

Not reporting on this Outcome for this Annual Report

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
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The soybean aphid, first discovered in Ohio in 2001, is a sapsucker whose voracious appetite can greatly damage untreated soybean fields. It also has been known to transmit a host of viruses, including soybean mosaic virus, soybean dwarf virus, and alfalfa mosaic virus not only in soybean but also in a number of vegetable crops.

What has been done

OARDC scientists transferred the soybean aphid resistant gene, known as Rag1, from a resistant plant developed at the University of Illinois, to an Ohio cultivar and found that the hybrid was susceptible to soybean aphid, when it was expected to show resistance. The soybean aphid biotype in Ohio is different than the one in Illinois and this biotype can overcome resistance to the Rag1 gene.

Results

A soybean plant introduction (PI) has been found to show resistance to soybean aphid in Ohio, paving the way to control the insect through new resistant cultivars. The soybean PI, labeled PI 243540, contains a single dominant gene that allows the plant to resist soybean aphid feeding and aphid colonization.

4. Associated Knowledge Areas

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

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 Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Field trial data are highly sought after output of AG Experiment Stations and associated extension programs.

What has been done

In Ohio one hundred sixty two soybean varieties were evaluated for yield, relative maturity, disease resistance (Phytophthora, Sclerotinia), plant height and lodging, seed size, oil and protein content at six locations throughout Ohio. Sixty two soft red winter wheat varieties were evaluated for yield, test wt., seed size, lodging, plant height, heading date, and level of powdery mildew infection, and flour yield and softness. Additionally 241 corn varieties representing 35 commercial brands were evaluated in three regions of Ohio.

Results

The results of the 2008 Ohio Soybean Performance Trials indicate the good and poor qualities of the 185 varieties evaluated. These data assisted producers in selecting more productive varieties for their fields resulting in an estimated yield increase of 15 kg/ha over 1.25 million hectares worth \$15,600,000. The data also allow a producer to select the most appropriate varieties to meet the quality requirements for specific Identity Preserved Markets. These data assisted producers in selecting more productive wheat varieties for their fields resulting in an estimated yield increase of 10 kg/ha over 0.4 million hectares worth \$2,500,000.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
204	Plant Product Quality and Utility (Preharvest)

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 Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Resilience and continued adoption of previously released soybean cultivars in subsequent years, and the release of new varieties, are marks of a program geared to meet stakeholder needs.

What has been done

OARDC has a long history of releasing new, profitable soybean varieties.

Results

On an annual basis soybeans produced through OARDC discoveries continue to generate an estimated \$191 million in Ohio economic output, create \$67 million in income for Ohioans, and support 4,030 jobs. Each variety has been developed for its special traits. For example, the OHS 201 Wyandot line is optimized for food applications such as tofu, while HC01-289 Prohio combines high yield with very high protein content. The new OARDC Dennison soybean variety is expected to replace Kottman which was planted on an estimated 30,000 acres of Ohio cropland. The yield advantage of Dennison over Kottman in tests has been 6.1 bushels per acre; with soybean selling between \$7 and \$11 per bushel during 2008, this equates to an additional \$1.3 to \$2.0 million in revenue for Ohio farmers. Including indirect impacts, the total output benefits to the Ohio economy would be between \$3.4 and \$5.3 million. An estimated \$1.2 to \$1.9 million would be generated in personal income for Ohioans through this impact.

4. Associated Knowledge Areas

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

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
Not reporting on this Outcome for this Annual Report

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
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Raspberries are prone to fruit rot after picking, more so than in many other fruits, making the the post -harvest loss expensive.

What has been done

OARDC scientists, working with the industry, studied timing of application for fungicides in combination with cold storage of harvested fruits. Multiple fungicides application regimes were studied with emphasis on additional fungicide application after blooming but prior to harvest.

Results

Results indicate that preharvest (post-bloom) fungicide sprays are beneficial for control of post harvest Botrytis fruit rot, especially when coupled with cold-temperature storage. The results of this study will allow Ohio Raspberry producers to use preharvest applications of fungicides to hold raspberry fruits in cold storage for a longer period of time. Fruit quality will be greatly improved due to reduced fruit rot in storage and growers will be able to market fruit over a longer period of time. These results should aid in improving the quality of raspberry fruit in Ohio and increasing profits for raspberry producers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
216	Integrated Pest Management Systems
212	Pathogens and Nematodes Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants
205	Plant Management Systems

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
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Purple deadnettle is an obligate winter annual weed of the U.S. Corn Belt and an alternate host of soybean cyst nematode (SCN). SCN has a major negative impact on the return on investment for soybean producers. Sustainable and economic viable methods of control of deadnettle are a stated need among stakeholders.

What has been done

Field experiments were conducted using microplots to determine (1) the effect of purple deadnettle planting date, (2) the effect of purple deadnettle removal time, and 3) the effect of Italian ryegrass, a non-host winter cover crop, on SCN egg population density in continuous no-tillage soybean. A population change factor (PCF) to assess treatment effects on SCN population densities was calculated.

Results

Specifically, field and greenhouse experiments provided evidence that completion of the soybean cyst nematode (SCN) life cycle on purple deadnettle was prevented if the weed was removed before the accumulation of 380 soil degree days within the 5 to 30 C range. Results from the removal study also suggested that completion of the first SCN generation on purple deadnettle in the fall was the primary factor causing increases in egg population density. Lastly, results from the cover crop experiment indicated that a winter cover crop of Italian ryegrass was just as effective as a rotational summer corn crop in reducing SCN egg population density (ca. 50%). This information thus provides crop producers with a low-cost, sustainable management tool by which to reduce SCN populations.

Results of the cover crop experiment showed that a fall-seeded cover crop of Italian ryegrass reduced population densities of purple deadnettle and SCN eggs an average of 43 and 50%, respectively, between fall and the subsequent spring.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
205	Plant Management Systems
212	Pathogens and Nematodes 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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1. A wide array of insect are notorious as pests in a wide range of agricultural crops throughout the world. Ohio is no exception. Many of these share the ability to overwinter in a state of arrested development (diapause). This adaptation enables insects such as moths to successfully invade and inhabit diverse geographic areas and is indeed a key to their survival.

2. Multiple lines of defense exists against insects and pathogens. Some are expensive, some have unacceptable environmental impact, some cannot be used because that are not organic friendly, etc. OARDC scientists are searching for methods that compliment or replace products or techniques that are not acceptable lines of defense for one reason or another.

What has been done

1. OARDC entomologists are using state-of-the-art genomics techniques to understand how insects survive freezing so they can develop new pest control methods that are harmless to the environment. Researchers have found 11 previously undiscovered genes that help certain insects survive cold winter months by turning on a heat shock protein.

2. OARDC scientists investigated laboratory and commercial methods of making aqueous extracts from vermicomposts, the need for aeration, including methods of application and effects. These scientists investigated the effects of the vermicompost extracts on the germination, growth, flowering, and yields of strawberries, petunias, peppers, tomatoes, and cucumbers. Also studied were the effects of soil and foliar treatments on a range of plant diseases including Pythium, Rhizoctonia, Phytophthora, Verticillium wilt, powdery mildew, bacterial wilt, and early blight. The effects of the vermicompost extracts were also tested against the plant parasitic nematode Meloidogyne on several vegetable crops as well as on a range of arthropod pests including aphids, mealy bugs, red spider mites, tomato moths and cucumber beetles.

Results

1. OARDC scientists have focused on the production of one protein in particular, Hsp70, that enables insects such as gypsy moths and European corn borers to overwinter, resulting in millions of dollars of damage. When the insects were in their winter arrested stage (diapause), the Hsp70 protein was active. When gene producing the protein was knocked out, the insects died in response to freezing. The OARDC scientists have discovered a hormone they call the diapause hormone that can readily break this diapause offering potential for population manipulation. Based on understanding these survival genes and the related hormones, scientists can now develop technologies to better control pest populations.

2. All of the diseases and pest tested were suppressed significantly by the vermicompost aqueous extracts. In particular these findings are most important for organic farmers who need non-chemical methods of suppressing plant pathogens and diseases, plant parasitic nematodes, and arthropod pests. The ease of application of vermicompost extracts makes them particularly attractive to organic farmers. Likewise the cost factor and environmental impact may make the product attractive to all agricultural sectors as well.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
216	Integrated Pest Management Systems
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
202	Plant Genetic Resources
212	Pathogens and Nematodes Affecting Plants
205	Plant Management Systems
201	Plant Genome, Genetics, and Genetic Mechanisms

Outcome #17

1. Outcome Measures

Instrumentation is critical to advancing knowledge and providing the industry with tools to increase effectiveness, efficiency, value added and/or environmental acceptability of their products.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The tomato industry in Ohio is valued at \$100 million, and like all crops, is subject to multiple parameters for judging quality and product specifications for processing and marketing. Color in tomatoes and other vegetables is one of the parameters.

What has been done

OARDC scientists developed a new tool called Color Test (CT) and integrated it into OARDC's Tomato Analyzer (TA) software application resulting in TACT. Color Test permits accurate quantification of color and color uniformity, and allows scanning devices to be calibrated using color standards. To test the accuracy and precision of TACT, the scientists measured internal fruit color. They estimated genotypic variances associated with color parameters and demonstrated that the proportion of total phenotypic variance attributed to genotype for color and color uniformity measured with TACT was significantly higher than estimates obtained from using a colorimeter. Genotypic variance nearly doubled for all color and color uniformity traits when collecting data with TACT.

Results

The TACT software facilitates the rapid and quantitative collection of data relative to tomato quality, and demonstrated the utility of this software to tomato breeding populations. This digital phenotyping technique can also be applied to the characterization of color in other fruit and vegetable crops. The new Tomato Analyzer Color Test has excellent potential to foster major improvements in the industry.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
204	Plant Product Quality and Utility (Preharvest)

Outcome #18

1. Outcome Measures

Understanding of niche markets are important as the grow in size, scope, public demand, and economic viability.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Niche markets are becoming more important and in high demand.

What has been done

OARDC researchers are working with farmers, processors, and marketers to develop niche markets for local, Ohio-grown food.

Results

OARDC and OSU Extension scientists have provided the data and support for the development of the following niche markets: a grass-fed beef project that also embraces French meat-cutting techniques and offers customers leaner meat; \$11 million Ohio Signature Beef and Ohio Heritage Beef, which links small farmers with meat processors; freshwater shrimp production with the numbers of farms growing from two to 25 farms in seven years; the \$70 million wine industry with wineries increasing from 37 to 80 in 10 years; and polyculture modules for intensive fruit and vegetable plantings and high tunnels that allow farmers to grow produce 11 months of the year; and the development of high-quality spelt and hard winter wheat for use in artisan breads.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #19**1. Outcome Measures**

Continued advances in green industry research is necessary to sustain the industry.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Loss of potted plants in the green industry can be as high as 75%. Such loss level is not economically sustainable.

What has been done

OARDC has had ongoing research over the years to address the loss of potted nursery plants. Disease resistant composting technologies have been advanced to reduce the loss. New lines of biocontrols are now being researched for the green industry.

Results

Prior to the release of the OARDC disease resistant compost technology, up to 75% of potted plants could be lost to disease in production. Today, OARDC generated advanced potting mix technology has reduced these losses to the 10-15% range. The large advance in nursery productivity from advanced potting mixes has resulted in nursery production moving into a whole new scale of operations and profitability in Ohio. The advances made to date in OARDC developed biocontrol technologies, versus the traditional application of chemical fungicide, are alone estimated to provide a potential cost savings to the Ohio nursery industry of almost \$22 million annually.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants

Outcome #20**1. Outcome Measures**

Biological controls for insects and pathogens are needed to mitigate health and environmental impacts resulting from the use of chemical agents.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

An alternative for insects and pathogens control is needed given health and environmental impacts resulting from the use of chemical control agents. Two OARDC projects address this issue.

What has been done

1. White grubs are one of the most serious and damaging insect pests invading turf grass. The grubs feed on lawn grass roots, causing a characteristic browning of the grass. Traditional approaches to white grub control have focused on the application of aggressive chemical insecticides (such as diazinon, imidacloprid, trichlorfon, bendiocarb and halofenozide) but there are increasing human health and environmental health problems being identified and associated with the widespread application of these chemical agents. OARDC researchers are playing a leading role in finding alternative solutions for turf grass insect control using biological controls.

2. In the nursery industry, the traditional application of chemical fungicide, for example, costs between \$4-\$7 to treat each cubic yard of potting mix and the treatment has to be repeated four times per year. OARDC scientists are working to produce a biological control alternative.

Results

1. OARDC scientists have identified a new strain of nematode with highly positive insect control traits. The OARDC strain of nematode is more virulent and effective against a range of white grub species and also has better storage stability than all other products on the market. The OARDC research team produced a complete package for licensing to commercial partners for production and distribution. The nematode has now been found to be effective in the control of the grape root borer, an insect pest affecting Ohio grape production. In addition to avoiding the introduction of potentially toxic chemicals into the environment, nematode-based biocontrol agents have the advantage of inherent reproduction. The nematode feeds on bacterium within insect hosts and then reproduces, providing carry over control effects thereby requiring less frequent application than competing chemical products. Nematodes are also a smart system rather than a passive control system, in that the nematodes actively seek insect hosts in the soil, traveling directly to their targets.

2. A new biocontrol inoculant technology produced at OARDC only needs to be applied once per year, at a total cost of \$6 per cubic yard. A typical average wholesale price for potting mix and custom blended growing media being circa \$30 per cubic yard with 1.37 million cubic yards of mix consumed. If it costs an average of \$5.50 per cubic yard to treat with chemical fungicide and four applications are required per year this equates to \$30.1 million in chemical fungicide application costs. If OARDC developed biocontrol technology is used instead, at a one time per year application cost of \$6 per cubic yard, the cost would be just \$8.2 million, providing a potential cost savings to the Ohio nursery industry of almost \$22 million.

4. Associated Knowledge Areas

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

To a greater or lesser extent all factors noted above effect impacts. Perhaps the most influential factor effecting achievement of impacts is monetary. As state and federal base funding have not kept pace with inflation, researchers have sought to continue to grow extramural funding. Research faculty size is decreasing as the result of less federal and state support meaning fewer scientists to compete for funding. While researchers have been relatively successful in bridging part of the dollar gap (loss), that funding is limited to grant and contract scopes of work. This has two effects. One, these extramural funds can not be used to hire core faculty so the faculty can not regrow, often meaning that faculties operate with less than a critical mass. Second, fewer faculty members working more extensively on external grants means that some of the mission oriented research services(those provided to stakeholders without costs) can no longer be provided. Both place the faculty member and the institution at a disadvantage in terms of scholarship, stakeholder relations, and service.

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	12.8	0.0
Actual	0.0	0.0	23.8	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	1602409	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	2743643	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**

In the 2008 reporting year, outputs within this planned programs include, but are not limited to: 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-commercialized 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. Specifics, as well as impacts, are found in Outcome Measures.

2. Brief description of the target audience

Targeted audiences include, 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
2008	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	18	
2008	0	90	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
2008	10	20

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
2008	18	90

Output #3**Output Measure**

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

Year	Target	Actual
2008	0	0

Output #4**Output Measure**

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

Year	Target	Actual
2008	1	1

Output #5**Output Measure**

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

Year	Target	Actual
2008	0	0

Output #6**Output Measure**

- consultations with recipients and in what areas;

Year	Target	Actual
2008	5	8

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;

Not reporting on this Output for this Annual Report

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.

Not reporting on this Output for this Annual Report

Output #9**Output Measure**

- Number of graduate students graduated and professional positions held

Not reporting on this Output for this Annual Report

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

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
2008	1	1

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Improved reproduction efficiency is central to a sustainable beef and dairy animal industry in Ohio.

What has been done

OARDC scientists conducted experiments to determine the mechanisms which control development of the hypothalamus, pituitary, and ovaries during the early maturation period (birth to 6 months of age) in heifers. A model which involved early weaning and feeding a high concentrate diet, which has been demonstrated to induce precocious puberty, was used to determine the interactions of nutritional status and sexual maturation during this period.

Results

The results of these experiments have led to development of a more effective estrous synchronization program that is being adopted in the cattle industry. This program will be listed in the approved list published each year by the AI industry. Recent research has increased the convenience of this technology for use by producers. The new technology developed for reproductive cycle control resulted in an approximately 12.5% increase in fertility in postpartum beef cows and heifers. For cows in which this technology is used, 12.5% of cows would become pregnant 21 days earlier than with the traditional approach. If this approach was implemented throughout Ohio for the 500,000 beef and dairy cows in Ohio on an annual basis, the reduction in days open would be 1,312,500 days. Each day that a beef or dairy cow remains non-pregnant incurs a loss of greater than \$3/cow or approximately a \$4 million dollar savings annually. A second impact of adoption of this technology would be the reduction in replacement costs. Although the magnitude of this effect is difficult to predict, increased fertility unquestionably would reduce culling of cows for reproductive problems. An annual reduction in replacement rate of 1% for 500,000 cows would require 5000 fewer replacements in Ohio at a conservative replacement cost of \$1000 per replacement or a \$5 million savings annually.

This approach is being adopted and used by innovative producers in Ohio and other parts of the US who wish to maximize pregnancy rates. It is anticipated that the economic benefits of this approach will continue to increase its rate of adoption.

4. Associated Knowledge Areas

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

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

Not reporting on this Outcome for this Annual Report

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 Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ohio has a \$3.3 billion poultry industry. A key question the industry has posed and a long term line of research at OARDC relates to how muscle growth is regulated at the genetic level. Ultimately this knowledge leads to the breeding of birds that grow faster and exhibit commercially desirable meat characteristics.

What has been done

An OARDC line of poultry research addresses extracellular matrix and the satellite cells that lie just outside the muscle fiber. These studies have helped to explain on how these cells help regulate muscle growth. OARDC researchers continue to analyze and sequence genes known to be involved in muscle development, looking for molecules that have a role in different growth factors.

Results

As a result of OARDC scientist' ongoing work in genetic selection, broilers now are ready for harvest 38 to 40 days after hatching, compared to 60 to 70 days 40 years ago. Turkeys are now ready for harvest in 14 weeks, two weeks less than in the 1960s and 1970s. Additionally these bird are bigger and have improved meat quality. This provides for a more bountiful supply of the desired product along with economic advantages.

This line of research has now released eight turkey gene sequences published in the National Institutes of Health's (NIH) GenBank. Such improved breeding strategies have major economic impact. A one-percent increase in breast meat yield, for example, is worth \$75 million to the U.S. poultry industry. Likewise the quality and quantity of poultry available to consumers improves the nation's overall food system.

4. Associated Knowledge Areas

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

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 Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1. Phosphorus is a required nutrient for beef. Phosphorus is typically a relatively expensive mineral to supplement (July 2008, Dicalcium Phosphate-1000 dollars per ton), meaning that every 1% phosphorus in a mineral mix equates to approximately \$25. Likewise excreted phosphorus has detrimental effects on the environment. Models used in the Ohio beef industry lack the precision necessary to optimize phosphorus intake and minimize excreted phosphorus. The industry has a stated desire to reduce both the economic and environmental costs of phosphorus as a feed supplement.

2. Ohio has an abundant supply of dried distillers grain in need of utilization.

What has been done

1. OARDC scientists found during the extended grazing work that the Ohio forage resources do meet or sometimes exceed the nutritional needs of the modern beef cow. In a 2-year project, it was determined that some of Ohio's forage resource was higher in phosphorus content than originally assumed. Where supplemental feeding is required, OARDC scientists have developed a model to assist with phosphorus supplements.

2. OARDC scientists found that as more corn gluten feed and distillers grain are used in the beef industry, both high in phosphorus content, it has been possible to eliminate phosphorus supplementation in many beef cow herds. Distillers grain in particular has been shown in OARDC studies to be an excellent beef cattle feed.

Results

1. OARDC scientists found that using more accurate forage phosphorus concentrations, and reducing the phosphorus concentration in mineral mixes from 6 - 8% to 2 - 4%, based on the time of year and forage being fed, cattle producers can save approximately 100 dollars per ton of mineral, or five cents per pound of mineral. With 292,000 beef cows in Ohio, the annual savings exceeds \$1.3 million. Equally as important, phosphorus supplementation in excess of an animal's requirement leads to phosphorus being excreted into the environment, leading to water quality issues. Reducing the phosphorus content in mixes to the levels previously mentioned saves 80 pounds of phosphorus per ton of mineral. With 292,000 beef cows consuming 91.25 pounds of mineral per year, or 13,322.5 tons of mineral mix, this has the potential to save 1,065,800 pounds of phosphorus supplementation per year, reducing both the economic and environmental costs. The Ohio Carroll County Cattlemen's Association reported they are saving \$17K annually in mineral costs based on this research.

2. With the production of distillers grains as a byproduct of the growing ethanol industry, OARDC scientists have now shown this source of nutrition has excellent efficacy for pregnant beef cows. These alternatives result in a 50 percent reduction in feed cost, a 50 percent reduction in manure output and a 20 percent reduction in manure nitrogen. Additionally this research has shown that extended grazing of pasture regrowth, winter grazing of corn, and utilization of grain processing byproducts also can reduce feed costs substantially without any loss in production.

4. Associated Knowledge Areas

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

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Improved energetic efficiency within Ohio dairy industry is a joint goal of the industry and dairy scientists at OARDC.

What has been done

OARDC scientists conducted research to determine whether a probiotic (predominantly propionibacteria) improved energetic efficiency of dairy cows. Cows were fed a control diet or the same diet supplemented with live propionibacteria each day for the first 120 days of lactation. Production, feed intake, and efficiency were measured.

Results

Results from the experiment evaluating propionibacteria found that cows fed the probiotic were about 5 percent more efficient than cows not fed the supplement. The primary mode of action was probably via altered rumen fermentation (more propionic acid) which resulted in more efficient production of ATP. If results of this experiment are adopted by the industry and this product is used, it will reduce the cost of producing milk (lower feed cost per unit of milk produced) and will reduce manure output per unit of milk produced.

4. Associated Knowledge Areas

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

Not reporting on this Outcome for this Annual Report

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

Not reporting on this Outcome for this Annual Report

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Ohio baitfish sales are an integral part of the Ohio aquaculture industry, which has nearly doubled from \$1.8 million in 1997 to \$3.3 million in 2006, according to the USDA. Ohio also ranks fifth nationally in the number of baitfish farms, behind Arkansas, Minnesota, New York and Wisconsin. Ohio imports most of its baitfish from those states. Ohio baitfish industry has a goal of reducing some of the dependence on imported baitfish from other states, especially given that Ohio occasionally faces supply shortages, regulatory problems regarding shipping, and desire to reduce interstate transportation cost and the associated carbon footprint.

What has been done

OARDC scientists have successfully induced the first known indoor spawning of the spotfin shiner and produced juvenile spotfins for the market. The spotfin shiner looks similar to the emerald shiner, a widely used Ohio wild caught baitfish. Researchers have successfully spawned the spotfin shiner beyond its normal summer spawning season, using thermal and light cycles to mimic spawning conditions. By inducing spawning conditions multiple times indoors, researchers have been able to build a robust broodstock.

Results

Researchers have disseminated the spawning and development techniques to Ohio fish farmers to help grow the industry and to help meet demand for shiners in Ohio in 2009 .

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
301	Reproductive Performance 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
Not reporting on this Outcome for this Annual Report

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.
Not reporting on this Outcome for this Annual Report

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
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Application of research in timely manner is critical to being part of the frontline first responders. OARDC's research partners and stakeholders expect full participation.

Providing reagents to facilitate testing is one way the program can contribute to being on the frontline.

What has been done

OARDC's Food Animal and Health Research Program prepared large pools of coronaviruses/infectious bronchitis virus (IBV) and turkey coronavirus (TCV) in egg embryos; antisera were prepared against these viruses in chickens, turkeys, and guinea pigs. This work was done under a contract with the National Institutes of Health and the reagents were deposited with the American Type Culture collection for national and international distribution.

Results

The OARDC reagents produced are the universal standards that will facilitate diagnosis and studies on coronaviruses/infectious bronchitis virus (IBV) and turkey coronavirus (TCV) .

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

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

Not reporting on this Outcome for this Annual Report

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The development of a Real-Time PCR Assay for Rapid Detection of Very Virulent Infectious Bursal Disease Virus (vvIBDV) is critical to sustaining the poultry industry. The poultry and egg production industries have a total economic impact on Ohio of over \$861 million annually and generate almost 8,700 jobs in the state. Poultry is a \$20 billion industry in the US.

What has been done

Very Virulent IBDV is a disease that has significant negative economic impact for the global poultry industry. OARDC has developed, through its Center for Diagnostic Assays (CDA), the only validated tool for detection of vvIBDV. The development of the vvIBDV real-time assay is providing a front-line tool for monitoring and controlling the spread of this highly destructive immunosuppressive poultry disease. This is one more in a long line of scientific contributions in this area where OARDC research has resulted in the development of molecular-based diagnostic for multiple infectious agents including Mycobacterium, prion proteins, E. coli 0157, Bovine torovirus (BToV), infectious bursal disease virus (IBDV) (Patent #6,114,112) as well as biological control agents Trichoderma hamatum 382, and DAPG producing Pseudomonas fluorescens.

The assay is patent pending and builds upon OARDC's existing strengths and technologies in the field of food animal diseases and diagnostics.

Results

The development of a first of its kind validated Real-Time PCR Assay for Rapid Detection of Very Virulent Infectious Bursal Disease Virus (vvIBDV) is most important because IBDV is able to rapidly produce mutated viruses that are resistant to vaccines. The vvIBDV strain causes unusually high morbidity and mortality. Early diagnosis is central to protecting this industry from one of its most economically damaging diseases.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
307	Animal Management Systems

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

To a greater or lesser extent all factors noted above effect impacts. Perhaps the most influential factor effecting achievement of impacts is monetary. As state and federal base funding have not kept pace with inflation, researchers have sought to continue to grow extramural funding. Research faculty size is decreasing as the result of less federal and state support meaning fewer scientists to compete for funding. While researchers have been relatively successful in bridging part of the dollar gap (loss), that funding is limited to grant and contract scopes of work. This has two effects. One, these extramural funds can not be used to hire core faculty so the faculty can not regrow, often meaning that faculties operate with less than a critical mass. Second, fewer faculty members working more extensively on external grants means that some of the mission oriented research services, especially those provided to stakeholders without costs, can no longer be provided. Both place the faculty member and the institution at a disadvantage in terms of scholarship, stakeholder relations, and service.

V(l). 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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	3.8	0.0
Actual	0.0	0.0	5.2	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	818513	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	328766	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 for 2008 include but are not limited to: 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-commercialized 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. Specifics, as well as impacts, are found in Outcome Measures.

2. Brief description of the target audience

Targeted audiences include, 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
2008	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	2

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	7	
2008	0	18	0

V(F). State Defined Outputs

Output Target

Output #1**Output Measure**

- number of graduate students graduated and professional positions held
Not reporting on this Output for this Annual Report

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
2008	3	5

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
2008	7	18

Output #4**Output Measure**

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

Year	Target	Actual
2008	0	0

Output #5**Output Measure**

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

Year	Target	Actual
2008	1	1

Output #6**Output Measure**

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

Year	Target	Actual
2008	0	2

Output #7**Output Measure**

- consultations with recipients and in what areas;

Year	Target	Actual
2008	5	12

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;

Not reporting on this Output for this Annual Report

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.

Not reporting on this Output for this Annual Report

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 Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	1

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Wastewater treatment for both municipal sanitary sewers and treatment of various industrial waste are critical to economic, environmental, and personal health. Given Ohio's high water table and extensive number of lake and streams, negative impacts from wastewater can spread rapidly and must be mitigated.

What has been done

OARDC scientists conducted bench scale studies on treatment of turkey processing wastewater that resulted in a pilot-plant being constructed onsite to investigate the efficiency in removing organic and inorganic pollutants. Results indicate that a layered sand bioreactor can effectively remove readily biodegradable organic carbon fraction. An additional textile bioreactor was used to investigate the removal of nitrogen. This research was then expanded to the application of fixed media bioreactors to the treatment of sanitary sewer overflows (SSO) at high hydraulic loading of 0.2 m/h. Sand, peat, and textile (felt) were used as media to treat simulated 6-h peak flows for a 25-year SSO event in the city of Columbus, Ohio.

Results

The first enhanced layered sand bioreactor pilot treatment plant in Ohio was constructed and placed into operation at a turkey processing plant in Harrison, Ohio. The OARDC 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.

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 #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

Not reporting on this Outcome for this Annual Report

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
2008	1	1

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Soybean yield loss due to Asian Soybean Rust can be range from negligible to complete loss of the crop depending on conditions. Economic impacts vary in magnitude. If rust causes a modest 20% loss of the soybean crop in Ohio, the loss to growers alone is \$270 million annually. Chemical control is required.

What has been done

OARDC have long been involved in researching effective and efficient application of chemicals and biocontrol agents to reduce impacts from pathogens such as the Asian Soybean Rust. Spraying recommendations from chemical suppliers have proven inadequate for addressing the problem in an effective and efficient manner. OARDC scientists have completed a series of studies that address the primary mechanical and application related variables associated with chemical delivery systems.

Results

The studies have resulted in a mechanical application model for the effective and efficient delivery of chemicals necessary to treat for the Asian Soybean Rust. With adoption of the guidelines, Ohio soybean growers can dramatically reduce crop loss potentially saving hundreds of millions of dollars.

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment

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

Not reporting on this Outcome for this Annual Report

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

Not reporting on this Outcome for this Annual Report

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Effective energy inputs into livestock production will determine the success of this industry in continuing to provide affordable meat products for human consumption and in reducing the carbon footprint. Recycling within food animal industry holds promise for reducing the carbon footprint.

What has been done

OARDC scientists have developed a system equations for evaluating fossil energy used during the production of food energy and protein by intensive livestock enterprises. Analysis included fossil energy in feed and conversion efficiency of animals, the fossil energy of housing, equipment, labor, supplies, electrical and liquid fuel inputs, resource recovery (manure management and energy production) and reproductive efficiency of breeding stock. Five U.S. Midwest livestock systems, Beef I, Beef II (grazing), Pork I (farrow to finish), Pork II (I + manure recycling) and Chicken I (broiler) were analyzed.

Results

Results indicated 54-59% of fossil energy input is associated with feeding program when manure not recycled. Recycling manure to crops lowered fossil energy input for swine by 40%. Order of fossil energy efficiency without recycling manure of species was poultry, swine, beef II (grazing) and beef I. Edible meat per fossil energy input was highest for swine production. Overall, the generalized equations for predicting fossil energy use in livestock enterprises are applicable to livestock production concepts to predict expected outcomes as management strategies change. Equations serve as a tool to minimize livestock's carbon footprint.

4. Associated Knowledge Areas

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

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 Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Given the array of biomass available in Ohio for heating greenhouses and other structures, technologies are needed that can take advantage of the various heat sources.

What has been done

OARDC scientists are focusing on the development of biomass combustion systems, particularly those using crop and crop residue as the primary fuel. A key goal of the OARDC work is the development of high-efficiency and automated combustion systems. A particular emphasis is being placed on fluidized bed combustion processes.

Results

OARDC research has resulted in development and commercialization of an 8 million BTU/hr. flex-fuel combustion system, using the fluidized bed technology, which was installed at an Ohio greenhouse. Greenhouse operators found the system to be effective and cost-efficient, reducing overall energy expenditures by a substantial \$200,000 annually. Currently the team has developed a fluidized bed combustion unit using shelled corn as fuel with a 65% combustion efficiency. The OARDC scientists are working on refining the system with a more advanced third generation model with goals of reaching 85-90% combustion efficiency.

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

Not reporting on this Outcome for this Annual Report

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 -

Not reporting on this Outcome for this Annual Report

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

To a greater or lesser extent all factors noted above effect impacts. Perhaps the most influential factor effecting achievement of impacts is monetary. As state and federal base funding have not kept pace with inflation, researchers have sought to continue to grow extramural funding. Research faculty size is decreasing as the result of less federal and state support meaning fewer scientists to compete for funding. While researchers have been relatively successful in bridging part of the dollar gap (loss), that funding is limited to grant and contract scopes of work. This has two effects. One, these extramural funds can not be used to hire core faculty so the faculty can not regrow, often meaning that faculties operate with less than a critical mass. Second, fewer faculty members working more extensively on external grants means that some of the mission oriented research services, especially those provided to stakeholders without costs, can no longer be provided. Both place the faculty member and the institution at a disadvantage in terms of scholarship, stakeholder relations, and service.

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

Stakeholders and partners have been a key part of each defined outcome reported within this planned program.

Key Items of Evaluation

Those stakeholders and partners asking for and participating in this planned program research, as well as many others, will see positive economic, environmental, and personal health impacts from the outcomes reported in this planned program.

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	45%		45%	
502	New and Improved Food Products	20%		20%	
702	Requirements and Function of Nutrients and Other Food Components	15%		15%	
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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	8.7	0.0
Actual	0.0	0.0	10.1	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	1493865	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	1411374	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

For 2008, outputs within the Food Systems planned program include, but are not limited to: 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. Specifics, as well as impacts, are found in Outcome Measures.

2. Brief description of the target audience

Targeted audiences include, 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
2008	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	1

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	16	
2008	0	36	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
2008	16	36

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
2008	20	30

Output #3**Output Measure**

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

Year	Target	Actual
2008	1	0

Output #4**Output Measure**

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

Year	Target	Actual
2008	1	1

Output #5**Output Measure**

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

Year	Target	Actual
2008	0	1

Output #6**Output Measure**

- consultations with recipients and in what areas;

Not reporting on this Output for this Annual Report

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
2008	2	4

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.

Not reporting on this Output for this Annual Report

Output #9**Output Measure**

- Number of graduate students completing degree

Not reporting on this Output for this Annual Report

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 least one major study each five years demonstrating negative nutritional side effects, fatty acids and obesity or obesity-related hepatic steatosis 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.

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

Not reporting on this Outcome for this Annual Report

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
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Producing 7.5 billion eggs per year, Ohio ranks second in the nation in egg production. Production was valued at \$279 million in 2006, with a total impact on the Ohio economy of \$527 million, and supported over 5,300 jobs in the state. Industry efforts to reduce Salmonella in eggs have already resulted in a halving of cases in Ohio since 1997. Now the The U.S. Egg Safety Action Plan calls for complete eradication of Salmonella from market shell eggs by 2010.

What has been done

OARDC scientists are targeting a further significant reduction by optimizing an ozone processing technology for eradication of Salmonella in fresh eggs and are now exploring the market potential of the process.

Results

The OARDC scientists and their industry partners have developed and patented a new method of eliminating Salmonella using a combination of ozone, carbon dioxide, mild heat, and alternating vacuum and pressure. The potential economic benefits from Salmonella elimination technologies in eggs would be highly significant. The USDA estimates place the average cost of a Salmonellosis case at between \$331 and \$1,664. On this basis, the estimated annual cost savings in Ohio alone would equal between \$9.3 million and \$46.6 million.

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 #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

Not reporting on this Outcome for this Annual Report

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
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

OARDC and other researchers have identified tomatoes as the primary food source for lycopene. Lycopene belongs to a family of antioxidants called carotenoids, which give certain fruits and vegetables their distinctive colors. Additionally these studies have identified carotenoids' antioxidant properties as being associated with protecting cells and regulating cell growth and death, all of which play a protective role against multiple disease processes, and in particular, are linked to the prevention of cancer and other chronic diseases. Improving the human body utilization of lycopene has major health benefits.

What has been done

OARDC scientists are studying lycopene for health benefits. In its standard structure in the average red tomato, the lycopene molecule is laid out in a linear configuration. That structure appears to hinder the molecule's absorption through intestinal walls and into the blood. Most of the lycopene that is found circulating in human blood is configured in a bent molecular form. This means that either the human body somehow transforms lycopene molecules through reactions that have yet to be identified, or that the bent molecular structures of lycopene are much more likely to be absorbed into the blood and transported to tissue -- a necessary step in preventing disease. The researches devised a way to process red tomatoes into a sauce that contains the bent molecular forms of lycopene.

Results

OARDC scientists have found that lycopene molecules in tomatoes that are combined with fat and subjected to intense heat during processing are restructured in a way that appears to ease their transport into the bloodstream and tissue, thus increasing the availability of this most important carotenoid. These finding further informs early OARDC research that has shown cardiovascular benefits through soy enhanced tomato juice in terms of oxidative resistance to LDL and VLDL cholesterol, and for improving the positive ratio between total cholesterol and HDL cholesterol.

4. Associated Knowledge Areas

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

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 Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

(1) Functional foods, foods having human health values beyond traditional nutrition, have a global market estimated to reach \$90.5 billion by 2013. There is potential for significant functional foods based economic development to occur in Ohio. Ohio already has a food processing sector accounting for \$11.1 billion in gross state product. To grow this industry in Ohio, a strong research and development program needs to be maintained.

(2) Tomatoes are the second most produced and consumed vegetable in the US, providing a rich source of dietary carotenoids such as lycopene and carotene. Human epidemiological and clinical studies have suggested health benefits associated with the consumption of tomatoes and processed tomato products.

What has been done

(1) The OARDC Center for Advanced Functional Food Research and Entrepreneurship (CAFFRE) seeks to discover and develop high-value functional foods with special application to the treatment or prevention of major chronic diseases (such as obesity, diabetes, vascular diseases, arthritic and autoimmune conditions, and neurodegenerative diseases). Progress at the center has been significant generating new products. Rather than trying to introduce a new sector for the state, functional foods represent enhanced product opportunities for an existing sector, thereby leveraging existing channels in the state. To this end CAFFRE has established an aggressive agenda for researching the potential of numerous foods.

(2)OARDC scientists evaluated a rapid and high-throughput infrared spectroscopic approach for determining the impact of processing technologies and variety choice on carotenoid content, chemical transformations and stability of carotenoids pigments. The focus was on exploring the structural and chemical transformations of biologically-active compounds during processing in order to produce foods with optimal levels of health components.

Results

(1) CAFFRE has accelerated several functional food technologies along the pathway to market including :(A) Advancements have been made with soy enhanced bread. The bread, -Healthyheart - has moved from lab, to prototype and into limited retailing. (B) Soy-enhanced Tomato Juice has shown cardiovascular benefits through soy enhancement in terms of oxidative resistance to LDL and VLDL cholesterol, and for improving the positive ratio between total cholesterol and HDL cholesterol. (C) For Oral Cancer Prevention via Black Raspberries, CAFFRE researchers have shown both in vitro and in vivo cancer prevention benefits from the consumption of black raspberries. This has resulted in the development and testing of two products, a black raspberry lozenge and an oral gel containing freeze dried blackberries; both are designed for topical application against oral cancers. CAFFRE patent pending technologies include:(a) Methods for enhancing soy-containing foods and (b) Formula and process for making soy-based bakery products.

(2)The OARDC developed technique for identification and quantification of carotenoids in food matrices allowing for accurate quantification of lycopene and carotene for various tomato products. Also, a technique that improves the process of screening for carotenoid rich products was developed. These techniques are being applied to evaluate the chemical transformations that biologically active compounds undergo during processing, using both conventional thermal and emerging non-thermal technologies. Additionally, in maize research, OARDC breeders are accelerating development of lines high in carotenoid pigments and anthocyanin content, a valuable functional food traits. Such research will help processors to develop functional foods that will yield added value for growers, processors, and consumers.

4. Associated Knowledge Areas

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

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

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

1. With the global market for functional foods estimated to reach \$90.5 billion by 2013, there is potential for significant functional foods based economic development to occur in Ohio. Three research issues have been addressed in part by OARDC in 2008. Certain food ingredients can play a major role in cancer prevention. Some food ingredients with cancer lowering potential are not strictly required by the body, but can produce health benefits. While this baseline knowledge is most important, the types of foods and their impacts need to be expanded. In particular, given green teas popularity, ease of access as near ready food, and its purported medical importance, identification of methodologies to study flavonoids in teas is important.

2. Carotenoids are a family fat soluble pigments such as beta-carotene and lycopene in plant foods. It is well established that increased consumption of carotenoid-rich fruits and vegetables reduces the risk of chronic diseases. The 2005 Dietary Guidelines encourage consumption of seven to nine servings of carotenoid rich fruits and vegetables per day, but average consumption of fruits and vegetables by adults in USA is only 4.4 serving daily and 42% of Americans eat less than 2 daily servings. Moreover, the absorption of carotenoids from foods is poor. The combination of insufficient consumption of fruits and vegetables and poor carotenoid absorption limits the potential impact that these compounds have on preventing disease. Thus, strategies to increase the absorption of ingested carotenoids are needed.

3. Likewise berries are showing a remarkable impact on reducing or eliminating cancer cells.

What has been done

1. OARDC scientists focused on the group of food ingredients is known as phytochemicals. Phytochemicals include green tea compounds that belong to a chemical class called flavonoids. In cultured cells and experimental animal studies, flavonoids have been shown actions that can work against cancer development. This project asks if green tea flavonoid intake can produce these same actions in humans. If the flavonoids do show these actions in people, then subsequent studies will see if giving green tea beverage or other food sources of flavonoids lowers cancer rates in high risk people. Also, since some of the flavonoid action could also affect other disease, such as cardiovascular disease, work can also be directed to these diseases.

2. Dietary fat enhances co-consumption of carotenoid-rich foods but there is a need to decrease fat and particularly saturated fat intake. OARDC scientists are seeking to understand how much fat and what type of dietary fat are optimal for carotenoid absorption in humans lacking in such. An in-depth understanding of the impact of dietary lipids on carotenoid absorption is needed for food manufacturers to develop strategies to maximize carotenoid absorption from commonly consumed foods in meals with reduced fat. This research uses a cost effective model system that simulates the digestion and absorption of carotenoids from foods to better define the effect of amount and types of dietary lipids.

3. OSU scientists have been advancing the knowledge of the role of black raspberries in cancer management.

Results

1. The results obtained thus far have not yet contributed to the overall of the value of the tea per se, but the OARDC scientists have determined the right conditions for certain methodologies to be implemented. Establishing appropriate scientific methodologies is an important outcome for both this study and to inform other scientists advancing this line of inquiry.

2. Study results suggests that a limited amount of fat, and especially oils such as olive, canola, and soybean oils rich in unsaturated fatty acids, promote the absorption of carotenoids. These results have established the necessary foundation for initiating a human study to directly determine the amount and types of dietary fat that optimize the absorption of health promoting carotenoids.

3. Findings from these studies suggest that a mixture of preventative agents, which berries provide, may more effectively prevent cancer than a single agent that targets only one or a few genes. Black raspberries have vitamins, minerals, phenols and phytosterols, many of which individually are known to prevent cancer in animals. Freeze drying the berries concentrates these elements about ten times, giving a power pack of chemoprevention agents that can influence the different signaling pathways that are deregulated in cancer.

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 least one major study each five years demonstrating negative nutritional side effects, fatty acids and obesity or obesity-related hepatic steatosis or prostate cancer.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

1. Weight gain, obesity, health and fitness, and diseases such as diabetes are major and highly related human conditions. Weight loss can be accompanied by various side effects. How to make informed decisions about how to lose weight without side effects is a societal need.

2. Prostate and bladder cancers are significant health problems in the US. 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

1. To help inform weight loss decisions, OARDC scientists have addressed if an oil made of natural fatty acids that is sometimes used as a weight-loss supplement may need to be paired with hormones or other substances to prevent health problems that can follow rapid weight loss. Conjugated linoleic acid (CLA), a compound naturally found in some meat and dairy products, can reduce body fat in some studies in humans. Synthetic forms of CLA are marketed as supplements that help reduce body fat. A series of studies using mice have generated some much needed information on mitigating side effects from CLA diet supplements.

2. OARDC researchers are working to identify new molecular targets needed to develop effective strategies to reduce the development and progression of both prostate and bladder cancers. The objectives of this project have been to examine if cyclooxygenase enzymes are signaling pathway and a valid target for the prevention and treatment of prostate and bladder cancers, and examine the molecular mechanisms involved in prostaglandin pathway and carcinogenesis in prostate and bladder cancers.

Results

1. An OARDC study in mice found that the hormone leptin adds an element of protection against side effects that can accompany fat loss with conjugated linoleic acid (CLA), a weight loss supplement. Fat loss is not dependent on leptin but without leptin, CLA could have some short-term effects on insulin resistance, i.e. the mice became insulin resistant. When mice are fed CLA and given leptin, the same fat loss occurs but insulin resistance does not develop.

2. OARDC researchers and colleagues have found that a gene product called cyclooxygenase enzymes may not play its long suspected role in the progression of prostate cancer, but does appear to have a pivotal role in bladder carcinogenesis by regulating the expression of specific patterns of genes. Dietary fatty acids play an important role in the modulation of the synthesis of a family of active lipid compounds referred to as prostaglandins. COX activity is the rate limiting step for the production of prostaglandins. Thus, dietary fatty acids may have an important role in determining the risk of bladder carcinogenesis. Additionally, OARDC scientists found that a family of compounds referred to as anthocyanins found in black raspberries inhibit the proliferation of bladder cancer cells in culture and that these compounds are absorbed by rats and are present in urine that 'bathes' the surface layer of cells lining the bladder. Black raspberries contain high levels of anthocyanins and are well liked by consumers, making them an ideal food for chemoprevention studies.

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.

Not reporting on this Outcome for this Annual Report

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Recent outbreaks of E. coli and Salmonella in fresh produce, coupled with heightened media coverage of such events, have thrust fruit and vegetable safety into the forefront of public attention. The outbreaks, or perceived outbreaks, can be costly. OARDC research estimates the economic cost of foodborne illness in Ohio between \$1 billion and \$7.2 billion annually. A widespread Salmonella outbreak in 2008 is estimated to have cost American tomato growers more than \$300 million, even though contamination was finally traced to Mexican-grown peppers with no direct link to tomatoes.

What has been done

OARDC scientists are studying the processes that impact growth and survival of E. coli O157 on the surface of vegetables, or even worse, inside the plant tissue, where it cannot be washed off or killed by disinfectants.

Results

In year one of the study, OARDC scientists found a distinct seasonality in the frequency that vegetables are contaminated with bacteria from the environment, occurring in the warmer months of the year, the same time when most outbreaks of disease associated with vegetables have occurred in the United States. Researchers have also found that plant diseases and other damage to living plants can contribute to increased E. coli proliferation. As pathogens come in contact with vegetables they break down tissue releasing sugars and other compounds that can be used by human pathogens as a food source. Human pathogens can also get into the tissue thanks to the injuries caused by plant pathogens, where they find a safe environment to survive. Training is underway among producers to apply these new findings as one step to reducing threats from E. coli O157.

4. Associated Knowledge Areas

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

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
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

OARDC scientists have previously discovered the real magnitude of antibiotic resistant bacteria in the food chain. The demand exists to continue investigating the microbial ecology associated with the food chain and to discover the importance of microbial progression to food safety and quality, as well as the contribution of commensal organisms to ecosystem development, disease progression, and resistance to antimicrobial agents. Such lines of research are required to maintain a safe and secure food supply.

What has been done

OARDC scientists found that a common probiotic strain supplement in all yogurt products contained a tetracycline resistance gene. The industry believed the resistance had been removed from the market. Additionally the prevalence of an antibiotic resistant bacteria in name-brand cheeses has reduced significantly.

Results

OARDC scientists, working with smaller cheese manufacturers, identified several critical control points in cheese fermentation for minimizing antibiotic resistant bacterial contamination. It is anticipated that the Dairy Management Inc will recommend the new processing control procedures to the dairy industry that have been generated by this research.

4. Associated Knowledge Areas

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

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

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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 Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

For over a half a century, OARDC scientists have worked to improve the ability of Swiss cheese manufacturers to produce a better tasting, better looking cheese for consumers, and have helped keep Ohio firmly at the top in U.S. Swiss cheese production, producing approximately 130 million pounds annually. Swiss cheese gets its characteristics from three types of bacterial starters. However, cheese manufacturers, who purchase these bacteria from starter-culture companies, do not always get what they expect given that different strains of the same bacteria can behave differently. The outcome can mean unwanted results in the final product and substantial losses.

What has been done

The OARDC team has developed a rapid system to analyze starter cultures, reducing the time needed from several days to 30 seconds. The technique, known as FTIR (fourier transform infrared) spectroscopy has replaced more expensive traditional methods involving cell morphology, biochemical tests and molecular typing. The research team has also developed a technique to use the technology to examine cheese protein and fatty acids during ripening.

Results

FTIR (fourier transform infrared) spectroscopy and the the technology to examine cheese protein and fatty acids during ripening have been developed and widely adopted generating both efficiency within the industry and positive economic return.

4. Associated Knowledge Areas

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

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

To a greater or lesser extent all factors noted above effect impacts. Perhaps the most influential factor effecting achievement of impacts is monetary. As state and federal base funding have not kept pace with inflation, researchers have sought to continue to grow extramural funding. Research faculty size is decreasing as the result of less federal and state support meaning fewer scientists to compete for funding. While researchers have been relatively successful in bridging part of the dollar gap (loss), that funding is limited to grant and contract scopes of work. This has two effects. One, these extramural funds can not be used to hire core faculty so the faculty can not regrow, often meaning that faculties operate with less than a critical mass. Second, fewer faculty members working more extensively on external grants means that some of the mission oriented research services, especially those provided to stakeholders without costs, can no longer be provided. Both place the faculty member and the institution at a disadvantage in terms of scholarship, stakeholder support, and service.

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.0	0.0
Actual	0.0	0.0	1.1	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	97145	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	48539	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 for this reporting year include, but are not limited to: 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. Specifics, as well as impacts, are found in Outcome Measures.

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
2008	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	2	
2008	0	5	0

V(F). State Defined Outputs

Output Target

Output #1**Output Measure**

- Commercialized products and processes (primary focus) to meet consumer needs and demands.

Not reporting on this Output for this Annual Report

Output #2**Output Measure**

- Increase the number of patents in five years.

Year	Target	Actual
2008	0	0

Output #3**Output Measure**

- Plan meeting with advisory groups to communicate findings and plan new research.

Year	Target	Actual
2008	5	20

Output #4**Output Measure**

- Monitor and report online and in print research $\tilde{\Delta}$ -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

Not reporting on this Output for this Annual Report

Output #5**Output Measure**

- Produce peer-reviewed journal articles;

Year	Target	Actual
2008	2	5

Output #6**Output Measure**

- Create non-commercialized techniques that are distributed to those in need.

Not reporting on this Output for this Annual Report

Output #7**Output Measure**

- Provide consultation services and meetings with stakeholders and supporters.

Not reporting on this Output for this Annual Report

Output #8**Output Measure**

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

Not reporting on this Output for this Annual Report

Output #9**Output Measure**

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

Not reporting on this Output for this Annual Report

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, through 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, through 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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

Outcome #6

1. Outcome Measures

Support, through 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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Distillers grain is a byproduct of ethanol production that has increased from one million tons produced in 1996 to over ten million tons annual production in 2008. It is much less expensive than traditional ruminant feeds. Utilizing distillers grains as a value added component in biomass conversion is desired for both economic purposes and to reduce the environmental wastestream from ethanol and other processors who generate distillers grains.

What has been done

Distillers grains have long been viewed as an acceptable supplement for ruminants, and as reported in previous years, OARDC researchers have demonstrated how to make the byproduct suitable for non ruminants. New research by OARDC scientists has now characterized the value to ruminants.

Results

Dried distillers grains are high in energy, unlike corn, and low in starch. OARDC scientists now calculate that up to 20 percent of a dairy cow diet can be made up of distillers grain without effecting production. If every dairy cow in Ohio were fed a ten percent diet of distillers grain, 270 million tons of the product per year would be used.

4. Associated Knowledge Areas

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

Outcome #7**1. Outcome Measures**

Support, through 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
2008	0	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

U.S. industries have long sought a domestic source for natural rubber for tires and non tire products such as conveyor belts, hoses, power transmission belts, hydraulics, air springs, and rubber tracks. Natural rubber is key to transportation, defense, and many other industries. The United States must import 100 percent of this resource from abroad at a costs of \$3.3 billion annually. Additionally, natural rubber inventories are becoming scarce and costs have increased almost seven-fold since 2002. Estimates indicate that demand will exceed supply in 2020 by approximately 15 percent.

What has been done

OARDC is working with other university and industry partners to domesticate and grow *Taraxacum kok-saghyz* (TKS), a type of dandelion native to the Republics of Kazakhstan and Uzbekistan that produces high-quality, abundant latex in its taproot.

Results

To date OARDC scientists have identified and isolated for seed production numerous individual plants that can produce 15 or more pounds of rubber from every 100 pounds of dry roots. Traditional breeding methods and new genetic techniques are leading to new breeding lines and varieties. Russian dandelion roots also contain high amounts of inulin. Forty-five percent or more of TKS dry matter is comprised of inulin, a naturally occurring carbohydrate that is increasingly being used as a food additive and can also be turned into ethanol similar to the way this biofuel is produced from corn. Thus, TKS can yield two highly strategic products from just one crop.

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

To a greater or lesser extent all factors noted above effect impacts. Perhaps the most influential factor effecting achievement of impacts is monetary. As state and federal base funding have not kept pace with inflation, researchers have sought to continue to grow extramural funding. Research faculty size is decreasing as the result of less federal and state support meaning fewer scientists to compete for funding. While researchers have been relatively successful in bridging part of the dollar gap (loss), that funding is limited to grant and contract scopes of work. This has two effects. One, these extramural funds can not be used to hire core faculty so the faculty can not regrow, often meaning that faculties operate with less than a critical mass. Second, fewer faculty members working more extensively on external grants means that some of the mission oriented research services, especially those provided to stakeholders without costs, can no longer be provided. Both place the faculty member and the institution at a disadvantage in terms of scholarship, stakeholder support, and service.

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.4	0.0
Actual	0.0	0.0	2.7	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	148787	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	197247	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 for 2008 include, but are not limited to: 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. Specifics, as well as impacts, are found in Outcome Measures.

2. Brief description of the target audience

Targeted audiences include, 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
2008	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	2	
2008	0	5	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;

Not reporting on this Output for this Annual Report

Output #2**Output Measure**

- Document consultations with recipients and in what areas;

Not reporting on this Output for this Annual Report

Output #3**Output Measure**

- Provide and document 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;

Not reporting on this Output for this Annual Report

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;

Not reporting on this Output for this Annual Report

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
2008	2	5

Output #6**Output Measure**

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

Not reporting on this Output for this Annual Report

Output #7**Output Measure**

- Patents by number and who partnered/purchased/commercialized will be documented.

Year	Target	Actual
2008	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.

Not reporting on this Output for this Annual Report

Output #9**Output Measure**

- The number of graduate students graduated and professional positions they hold will be tracked and reported.

Not reporting on this Output for this Annual Report

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 every three years.
7	Advanced studies in diagnostic assays in plant, animal, and human health result in a healthier, more productive society.

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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
2008	0	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Determining accurate estimates for the cost of foodborne illness in US is problematic. Accurate costs are needed to inform decision making. In the past, estimates of the cost of foodborne illness have been based on a method that focuses on a small subsample of pathogens, accounting for fewer than 4 million of the estimated 76 million cases of foodborne illness Americans experience each year. These estimates have not typically included important social costs such as the lost quality of life an afflicted individual experiences from pain and suffering.

What has been done

OARDC scientists have derived new, more accurate estimates for the cost of foodborne illness. To do so they developed a method for more comprehensively measuring the social cost of foodborne illness that could become the standard model used nationwide. Using the new model, the best estimate of the annual cost of foodborne illness in Ohio is approximately \$4.1 billion. This represents an annual cost of \$355 for each Ohio resident.

Results

The new OARDC model for more comprehensively measuring the social cost of foodborne includes all 26 distinct foodborne pathogens reported in by the Center for Disease Control and Prevention, as well as those caused by unknown agents. It estimates distinct costs for specific pathogens, with higher costs for serious foodborne illnesses such as listeria and botulism, and lower costs for milder diseases, caused by pathogens such as Campylobacter or Norwalk-like viruses. The model provides a template that can be used to estimate costs on a state-by-state basis. The template accounts for differences in consumption patterns, food safety practices, and climate, all of which affect the incidence of foodborne illness, as well as state-specific costs of medical care (including medication, doctor visits and hospitalization) and lost quality of life and productivity (including lost work days, pain and suffering, and deaths) associated with foodborne illness.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

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.

Not reporting on this Outcome for this Annual Report

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 every three years.

Not reporting on this Outcome for this Annual Report

Outcome #7

1. Outcome Measures

Advanced studies in diagnostic assays in plant, animal, and human health result in a healthier, more productive society.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Creating molecular based diagnostic assays for plant, animal, and human health infectious agents is necessary to insure a healthy, sustainable society.

What has been done

OARDC scientists maintain an ongoing long term research program of international reputation directed toward diagnostics of infectious agents.

Results

OARDC research, over the past decade, has resulted in the development of molecular-based diagnostic for multiple infectious agents including Mycobacterium, prion proteins, E. coli 0157, Bovine torovirus (BToV), infectious bursal disease virus (IBDV) (Patent #6,114,112) as well as biological control agents Trichoderma hamatum 382, and DAPG producing Pseudomonas fluorescens. Diagnostic assays in development include those for Mollicutes (phytoplasma species), soybean rust pathogen, soybean root pathogens, Bacillus subtilis strains with plant disease biocontrol activity, Enterobacter sakazakii which causes meningitis in humans, and monoclonal antibody based BToV and vvIBDV assays. Now the OARDC - Food Animal Health Research Program has become the first U.S. facility authorized to study vvIBDV, the very virulent bursal disease virus.

4. Associated Knowledge Areas

KA Code	Knowledge Area
722	Zoonotic Diseases and Parasites Affecting Humans
721	Insects and Other Pests Affecting Humans
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

To a greater or lesser extent all factors noted above effect impacts. Perhaps the most influential factor effecting achievement of impacts is monetary. As state and federal base funding have not kept pace with inflation, researchers have sought to continue to grow extramural funding. Research faculty size is decreasing as the result of less federal and state support meaning fewer scientists to compete for funding. While researchers have been relatively successful in bridging part of the dollar gap (loss), that funding is limited to grant and contract scopes of work. This has two effects. One, these extramural funds can not be used to hire core faculty so the faculty can not regrow, often meaning that faculties operate with less than a critical mass. Second, fewer faculty members working more extensively on external grants means that some of the mission oriented research services, especially those provided to stakeholders without costs, can no longer be provided. Both place the faculty member and the institution at a disadvantage in terms of scholarship, stakeholder support, and service.

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%		20%	
602	Business Management, Finance, and Taxation	20%		20%	
603	Market Economics	15%		15%	
605	Natural Resource and Environmental Economics	15%		15%	
606	International Trade and Development	15%		15%	
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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	7.5	0.0
Actual	0.0	0.0	8.0	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
0	0	1136275	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	658387	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

Food, Agricultural and Economics Development planned program outputs for this planning year include, but are not limited to: 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. Specifics, as well as impacts, are found in Outcome Measures.

2. Brief description of the target audience

Targeted audiences include, 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
2008	0	0	0	0

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

Patent Applications Submitted

Year Target

Plan: 0

2008 : 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	14	
2008	0	47	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
2008	20	57

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
2008	14	47

Output #3**Output Measure**

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

Not reporting on this Output for this Annual Report

Output #4**Output Measure**

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

Not reporting on this Output for this Annual Report

Output #5**Output Measure**

- Track 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;

Not reporting on this Output for this Annual Report

Output #6**Output Measure**

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

Not reporting on this Output for this Annual Report

Output #7**Output Measure**

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

Not reporting on this Output for this Annual Report

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 uncertainty.
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.

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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 uncertainty.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Society is faced with the probability of pathogen contamination in retail food packages each time they make a purchase and use the product. Reduction in this probability is an added expense for food processing. Understanding consumers Willing To Pay to reduce this probability is an important step in helping processors and those who manufacture packaging determine society's demand for reducing risk buy purchasing a safety enhanced product.

What has been done

OARDC economists estimated the consumer's choice between a safety enhanced and an existing product, the change in subjective probability of contracting foodborne illness associated with the enhanced product and the change in demand for the enhanced product. The estimated results are consistent with utility theory and comparable to market values for non-safety quality attributes and experimental values for safety enhancements.

Results

The Willing To Pay estimates range from \$250 million for a 5 percent reduction in the subjective probability of becoming ill from Listeria after eating hot dogs made at home where the reduction in probability occurs through the use of electronic beam technology to \$1,190 million for a 5 percent reduction in the subjective probability of becoming ill from E. coli after eating hamburgers made at home where the reduction in probability occurs through the use of electron beam technology. The results concerning consumer willingness to pay for reductions in the probability of foodborne illness will be used by policy makers and analysts at the U.S. Department of Agriculture and the U.S. Centers for Disease Control and Prevention for policy planning purposes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
610	Domestic Policy Analysis
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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.
Not reporting on this Outcome for this Annual Report

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.
Not reporting on this Outcome for this Annual Report

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.
Not reporting on this Outcome for this Annual Report

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.
Not reporting on this Outcome for this Annual Report

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
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Increasing agricultural productivity among among developing countries can aid in quality of life, national security, and improve the US trade with those counties.

What has been done

OARDC scientists and other U.S. researchers have found that in regions such as southern India and Bangladesh vegetable growing can increase net income by 29% over rice growing and use less pesticides. In Vietnam the earnings associated with this shift are 189% increase in net profits. Thus research and development programs, such as OARDC's international work in Integrated Pest Management, aid in such shifts being made.

Results

In addition to in county improvements, it is now estimated by the International Food Policy Research Institute that a one dollar increase in a developing country's farm output leads to 73 cents in new imports. OARDC Integrated Pest Management Program and International Plant Diagnostic Network are providing research methodologies and practice technologies that provide for this enhanced productivity and subsequent international trade.

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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

To a greater or lesser extent all factors noted above effect impacts. Perhaps the most influential factor effecting achievement of impacts is monetary. As state and federal base funding have not kept pace with inflation, researchers have sought to continue to grow extramural funding. Research faculty size is decreasing as the result of less federal and state support meaning fewer scientists to compete for funding. While researchers have been relatively successful in bridging part of the dollar gap (loss), that funding is limited to grant and contract scopes of work. This has two effects. One, these extramural funds can not be used to hire core faculty so the faculty can not regrow, often meaning that faculties operate with less than a critical mass. Second, fewer faculty members working more extensively on external grants means that some of the mission oriented research services, especially those provided to stakeholders without costs, can no longer be provided. Both place the faculty member and the institution at a disadvantage in terms of scholarship, stakeholder support, and service.

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	5.2	0.0
Actual	0.0	0.0	3.5	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	346436	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	330643	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**

For 2008 outputs within the Human and Community Resource Development planned program include, but are not limited to: 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. Specifics, as well as impacts, are found in Outcome Measures.

2. Brief description of the target audience

Targeted audiences include, 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
2008	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	12	
2008	0	21	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
2008	10	27

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
2008	12	21

Output #3**Output Measure**

- Tracking of non - commercialized techniques such as methods for documenting specific programs and who received those programs and what was the impact;

Not reporting on this Output for this Annual Report

Output #4**Output Measure**

- Documenting of consultations with recipients and in what areas;

Not reporting on this Output for this Annual Report

Output #5**Output Measure**

- Recording of 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

Not reporting on this Output for this Annual Report

Output #6**Output Measure**

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

Not reporting on this Output for this Annual Report

Output #7**Output Measure**

- Document number of graduate students graduated, their research area, and placement in the profession

Not reporting on this Output for this Annual Report

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.

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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 \hat{A} –learning leading to gain score increases within and a better-educated workforce.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

To be effective, project information that documents changes in county governments' economic growth and public service activities and the resulting effects on socioeconomic well-being are needed. Without long term data, effectiveness may be limited.

What has been done

Using social science theory on the cost/benefits of decentralized government, required data for policy purposes were gathered by OARDC scientists. Working with the National Association of Counties, the project compared current (2008) survey data with first-wave (2001) survey data, documenting changes in counties' economic growth and public service activities. Findings include: (1) Counties are increasing (not decreasing) their involvement in most economic development and public service activities from 2001-2008 (even in the face of a poorer national economy); (2) Rates of privatizing public services have decreased slightly; (3) Systematic urban-rural differences persist over time; and (4) Remote (nonmetro, nonadjacent) counties provide a more limited menu of public services and undertake fewer economic development activities. Additional trends were summarized to aid in decision making.

Results

OARDC scientists have constructed the nation's first generalizable panel database on counties' economic development and public service activities that specifically focuses on small, rural counties. This provides valuable benchmark data for county governments to compare their activities with regard to economic development and public services that can guide their future economic development and expansion of jobs across the nation, including Ohio. The National Association of Counties is releasing the results to counties across the nation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
902	Administration of Projects and Programs
901	Program and Project Design, and Statistics

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
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Understanding financial education is critical to advancing a society that is highly dependent on sound financial decision making. The research question is does financial education make a difference in participants decision processes.

What has been done

OARDC scientists conducted a series of studies over time to measure changes in financial knowledge and financial behavior resulting from financial education among high school and college age youth, women of all ages, and public fund treasurers.

Results

OARDC research confirms the finding that financial education is not an effective stand alone method for improving financial knowledge or behavior. In all evaluations moderating variables such as experience with finances, learning in other contexts (e.g. churches, schools, families), use of a workbook in independent study, use of a case study approach, and being relatively new to the process of managing one's finances influences the relationship between education and knowledge changes. Moreover, changes in financial knowledge were not found to be a critical mediator of financial behavior change (increased savings, lowered debt levels). A key finding is that financial education in high schools appears to be significantly less effective in changing knowledge and behavior when compared to parallel college education. The college setting appears to be more effective in transferring the core lessons of the financial planning process.

4. Associated Knowledge Areas

KA Code	Knowledge Area
901	Program and Project Design, and Statistics
903	Communication, Education, and Information Delivery

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

To a greater or lesser extent all factors noted above effect impacts. Perhaps the most influential factor effecting achievement of impacts is monetary. As state and federal base funding have not kept pace with inflation, researchers have sought to continue to grow extramural funding. Research faculty size is decreasing as the result of less federal and state support meaning fewer scientists to compete for funding. While researchers have been relatively successful in bridging part of the dollar gap (loss), that funding is limited to grant and contract scopes of work. This has two effects. One, these extramural funds can not be used to hire core faculty so the faculty can not regrow, often meaning that faculties operate with less than a critical mass. Second, fewer faculty members working more extensively on external grants means that some of the mission oriented research services, especially those provided to stakeholders without costs, can no longer be provided. Both place the faculty member and the institution at a disadvantage in terms of scholarship, stakeholder support, and service.

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: 2008	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
745889	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
745889	0	0	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

- 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
2008	14942	23941	10000	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1**Output Measure**

- Total number of participants in the program/project.

Year	Target	Actual
2008	45000	23941

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
2008	400	691

Output #3**Output Measure**

- Number of participants attending presentations and/or demonstrations.

Year	Target	Actual
2008	20000	14942

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
2008	22000	14550

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Improved knowledge is the first step in bringing about change.

What has been done

Relevant projects related to child development, child care, and parenting are designed and offered.

Results

Participants indicate they learned new information.

4. Associated Knowledge Areas

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

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
2008	11000	11977

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Planning to adopt practices is a key step in moving toward lasting change.

What has been done

Participants attend sessions and see a need for change.

Results

Participants indicate their intentions to change behaviors and adopt recommended practices.

4. Associated Knowledge Areas

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

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
2008	8000	5261

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Adopting new behaviors is the ultimate goal of extension programs.

What has been done

Participants internalized education outcomes.

Results

Participants adopt recommended practices and change behavior.

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**

- Economy
- Public Policy changes
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Several community level factors can occur that would impact program participation, including those listed above. We plan our program numbers despite declining economic circumstances.

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

Entered above

Key Items of Evaluation

Key items are output and outcome measures reported above

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	52.0	0.0	0.0	0.0
Actual	36.0	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 1491778	1890 Extension 0	Hatch 0	Evans-Allen 0
1862 Matching 1491778	1890 Matching 0	1862 Matching 0	1890 Matching 0
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Expanded Food and Nutrition Program (EFNEP)

- Series of Classes • Newsletter • Youth curriculum and day camps • Training provided for EFNEP staff by state personnel • Collaborations with agencies including Women Infants and Children, Local Health Departments, 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 classes offered in participating counties • Newsletter (four issues developed) • Training for program team provided by statewide Dining with Diabetes Team and invited speakers • Curriculum revision and development 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 • Directory services for individuals with diabetes developed. • Funding received for development of website and marketing materials.

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 • Youth Nutrition -- writing teams developed new project books, facilitated state fair nutrition judging. Wrote 13 fact sheets / curriculum.

2. Brief description of the target audience

The target audience varies by program;

Expanded Food and Nutrition Education and Family Nutrition Programs are targeted to reach low-income audience homemakers with children from birth to 18 years of age and specifically for the Family Nutrition Program 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. Youth nutrition programming is conducted through the 4-H program; at resident and day / camps and classrooms.

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	36000	5000	11000	0
2008	49200	78124	23586	350

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	10	0	10

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of participants

Year	Target	Actual
2008	1600	62389

Output #2

Output Measure

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

Year	Target	Actual
2008	16	16

Output #3

Output Measure

- Collaborations formed/maintained

Year	Target	Actual
2008	3	4

Output #4

Output Measure

- Curriculum revised/created for DWD and EFNEP

Year	Target	Actual
2008	1	2

Output #5

Output Measure

- Number of classes

Year	Target	Actual
2008	90	90

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

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
2008	50	90

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Those who understand the impacts and resulting costs to society that poverty and diet quality have upon the health and wellness of individuals and family members.

What has been done

EFNEP and FNP peer trained paraprofessionals teach low income individuals using messages about nutrition, food resource management, food safety, and physical activity to improve their health and wellbeing. Programs are usually in a group setting, at a location near the participant's home, offered free of charge, and experiential in nature. EFNEP graduates participants who attend 75% of the classes offered as a series. DINING WITH DIABETES CURRICULUM FOCUSES ON THE PLATE METHOD EACH SESSION

Results

Behavior Changes of EFNEP Graduates and Dining with Diabetes Participants: Nutrition practices: 80% of adult participants improved one or more nutrition practices (more often planned meals in advance, compared prices when shopping, used a list for grocery shopping or less often ran out of food before the end of the month and 26% of adult participants increased their physical activity.

Behavior changes of FNP participants: Ninety five percent (95) of participants in a single nutrition lesson reported learning new information and 90% reported planning to make one or more changes. Each of the indicators in the retrospective surveys of participants at the end of a series had a significant, positive mean change ($p < 0.000$) for each indicator for MyPyramid: Using the Nutrition Facts on labels, using MyPyramid to select a variety of foods; eating at least 2 cups of vegetables each day; eating at least 1.5 cups of fruit each day; and being physically active for at least 30 minutes most days.

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
2008	75	90

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

PORTION CONTROL MAY IMPROVE HEALTH STATUS IN INDIVIDUALS WITH DIABETES. Those who understand the impacts and resulting costs to society that poverty and diet quality have upon the health and wellness of individuals and family members and participants who want to improve individual and family health and wellness.

What has been done

PORTION SIZE IS AN INTEGRAL PART OF DWD CLASSES. EFNEP and FNP peer trained paraprofessionals teach low income individuals using messages about nutrition, food resource management, food safety, and physical activity to improve their health and wellbeing. Programs are usually in a group setting, at a location near the participant's home, offered free of charge, and experiential in nature. EFNEP graduates participants who attend 75% of the classes offered as a series.

Results

1245 Dining with Dabetes PARTICIPANTS INDICATED THAT THEY ARE EATING SMALLER PORTIONS. Ninety percent (90) of participants in a single nutrition lesson reported planning to make one or more changes. Indicators include Using the Nutrition Facts on labels, using MyPyramid to select a variety of foods; eating at least 2 cups of vegetables each day; eating at least 1.5 cups of fruit each day; and being physically active for at least 30 minutes most days.

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
2008	60	26

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Those who understand the negative impacts of obesity on the health and quality of life children and adults, those who understand the resulting costs to society, and participants who desire to improve individual and family health and wellness.

What has been done

EFNEP and FNP peer trained paraprofessionals teach low income individuals using messages about nutrition, food resource management, food safety, and physical activity to improve their health and wellbeing. Programs are usually in a group setting, at a location near the participant's home, offered free of charge, and experiential in nature. EFNEP graduates participants who attend 75% of the classes offered as a series.

Results

Physical activity is incorporated into nutrition programs. Behavior Changes of EFNEP Graduates: Nutrition practices: 80% of adult participants improved one or more nutrition practices (more often planned meals in advance, compared prices when shopping, used a list for grocery shopping or less often ran out of food before the end of the month and 26% of adult participants increased their physical activity.

Behavior changes of FNP participants: Ninety five percent (95) of participants in a single nutrition lesson reported learning new information and 90% reported planning to make one or more changes. Each of the indicators in the retrospective surveys of participants at the end of a series had a significant, positive mean change ($p < .000$) for each indicator for MyPyramid: Using the Nutrition Facts on labels, using MyPyramid to select a variety of foods; eating at least 2 cups of vegetables each day; eating at least 1.5 cups of fruit each day; and being physically active for at least 30 minutes most days.

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
2008	51	50

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Those who understand the impacts and resulting costs to society that poverty and diet quality have upon the health and wellness of individuals and family members and participants who want to improve individual and family health and wellness.

What has been done

EFNEP and FNP peer trained paraprofessionals teach low income individuals using messages about nutrition, food resource management, food safety, and physical activity to improve their health and wellbeing. Programs are usually in a group setting, at a location near the participant's home, offered free of charge, and experiential in nature. EFNEP graduates participants who attend 75% of the classes offered as a series.

Results

Behavior Changes of EFNEP Graduates: Nutrition practices: 80% of adult participants improved one or more nutrition practices (more often planned meals in advance, compared prices when shopping, used a list for grocery shopping or less often ran out of food before the end of the month and 26% of adult participants increased their physical activity.

Behavior changes of FNP participants: Ninety five percent (95) of participants in a single nutrition lesson reported learning new information and 90% reported planning to make one or more changes. Each of the indicators in the retrospective surveys of participants at the end of a series had a significant, positive mean change ($p < .000$) for each indicator for MyPyramid: Using the Nutrition Facts on labels, using MyPyramid to select a variety of foods; eating at least 2 cups of vegetables each day; eating at least 1.5 cups of fruit each day; and being physically active for at least 30 minutes most days.

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

Not reporting on this Outcome for this Annual Report

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

Key Items of Evaluation

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	38.0	0.0	5.0	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
414383	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
414383	0	0	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**

#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	3000	6000	0	0
2008	2947	2003	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	3	3	
2008	3	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # web page hits

Not reporting on this Output for this Annual Report

Output #2

Output Measure

- # classes conducted

Year	Target	Actual
2008	60	199

Output #3

Output Measure

- # fact sheets distributed

Year	Target	Actual
2008	1000	1100

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
2008	1400	2237

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Knowledge gain and planned behavior change are requisite steps in the direction of changed behavior and improved practices.

What has been done

Extension educators around the state offer financial security programming.

Results

Individuals and couples gained financial security knowledge.

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
2008	500	550

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Pre-retirees may not be preparing adequately to cover income and health care needs throughout their retirement years. Researchers have predicted that less than three-fifths of baby boomers are expected to have enough income to maintain their pre-retirement standard of living.

What has been done

Programs were offered to help individuals and couples plan for a future of economic well-being and enhanced quality of life, including financial security in retirement.

Results

Participants increased their financial literacy.

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
2008	150	169

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

To accumulate savings sufficient to cover retirement expenses, saving and contributing to retirement plans is necessary.

What has been done

Programs were offered to encourage retirement planning.

Results

Despite the economic downturn, individuals and couples initiated or increased retirement plan contributions.

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
2008	150	928

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Establishing investment goals helps promote commitment to accumulating savings to cover expenses.

What has been done

Programs were offered to encourage financial security through investments and investing.

Results

Individuals and couples made progress toward their goal of financial security in retirement as a result of participating in Extension programs.

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

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

Seventy percent of those who planned to adopt one or more recommended practices reported that they actually did so. Others established or revised investment goals, or began or increased participation in employer-provided retirement plans.

Key Items of Evaluation

Reported on above

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	38.0	0.0	5.0	0.0
Actual	10.5	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
435102	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
435102	0	0	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

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	3000	6000	0	0
2008	8431	17677	0	0

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

Year Target

Plan: 0

2008 : 0

Patents listed**3. Publications (Standard General Output Measure)****Number of Peer Reviewed Publications**

	Extension	Research	Total
Plan	3	2	
2008	1	0	1

V(F). State Defined Outputs**Output Target****Output #1****Output Measure**

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

Year	Target	Actual
2008	13000	8431

Output #2**Output Measure**

- Curriculum developed

Year	Target	Actual
2008	3	1

Output #3**Output Measure**

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

Year	Target	Actual
2008	40	38

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
2008	8500	6043

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Sound money management practices are required to meet everyday living expenses.

What has been done

Programs were offered to help families assess their financial circumstances, increase their financial management skills, and develop their decision-making abilities to improve both present and future economic well-being.

Results

Of the 72% who planned to adopt recommended practices, 36% actually did adopt one or more of them.

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
2008	2500	629

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Accumulated savings provide financial support should unexpected expenses occur or income suddenly drop.

What has been done

Programs and social marketing campaigns, such as AmericaSaves, were offered to increase awareness of and encourage savings.

Results

Savings were increased.

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
2008	1400	577

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Many Americans don't keep adequate or accurate financial records. Being organized is the first step in establishing a sound financial management plan.

What has been done

Financial management programs are offered that stress the importance of organizing records.

Results

Participants organized their financial records.

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
2008	850	443

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Occasional expenses occur with regularity, but are frequently not adequately anticipated, resulting in borrowing or increased credit card debt.

What has been done

'Don't let occasional expenses bust your budget' programming is offered.

Results

Individuals set aside money to cover their occasional expenses.

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

Not reporting on this Outcome for this Annual Report

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

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

1. Evaluation Studies Planned

- After Only (post program)

Evaluation Results

Many Ohioans made progress in their financial management skills and behavior as a result of participating in Extension programs: 72% planned to adopt recommended practices; of those, 36% actually did adopt one or more of them. Of those who planned to adjust their spending to their income, 68% actually did. Of participants who planned to start or increase saving toward a goal, 62% actually did save more.

Key Items of Evaluation

Reported on above

Program #15

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%		10%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.	30%		30%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	50%		50%	
722	Zoonotic Diseases and Parasites Affecting Humans	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	7.5	0.0	1.5	0.0
Actual	13.0	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
538698	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
538698	0	0	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

- 1) Conduct food safety education classes with participants in the FNP and EFNEP program
- 2) Conduct ServSafe classess 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	15000	75000	400	2000
2008	23869	7138	4551	1360

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	2	2	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1**Output Measure**

- Number of single-contact programs offered
Not reporting on this Output for this Annual Report

Output #2**Output Measure**

- Number of multiple-contact programs offered

Year	Target	Actual
2008	100	4926

Output #3**Output Measure**

- Number of direct-contact participants

Year	Target	Actual
2008	15400	28420

Output #4**Output Measure**

- Number of indirect-contact participants

Year	Target	Actual
2008	77000	8498

Output #5**Output Measure**

- Number of print materials distributed
Not reporting on this Output for this Annual Report

Output #6**Output Measure**

- Number of participants completing evaluation forms

Year	Target	Actual
2008	1540	9202

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	Percentage of adults and youth who indicate an intent to adopt one or more safe food handling practices
3	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.
4	Adults and youth will show a decrease in the number of illnesses caused by biological contamination of food (such as bacterial, viruses, parasites)

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
2008	10	46

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Adult and youth consumers in Ohio handle food that has the potential of making them ill. Foodborne illnesses cost taxpayers \$1-\$7.2 billion in health care, quality of life, and work productivity cost emphasizing the need for food safety education.

What has been done

Ohio State University Extension offers numerous food safety education opportunities, from quality assurance programs for 4H youth to certification courses in ServSafe and HACCP. Both the EFNEP and Family Nutrition Program teach 20% of their classes on food safety. Food handlers in 4H and other volunteer programs complete the Safe Food Handling for Occasional Quantity Cooks classes as part of their volunteer training.

Results

There were 28420 participants in all types of food education programs in 2008. Almost half (46.7%) reported on their evaluations that they had learn new information about one or more safe food handling skills or good agricultural practices that promote safe food.

4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics
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

Outcome #2**1. Outcome Measures**

Percentage of adults and youth who indicate an 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
2008	10	28

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Adult and youth consumers in Ohio handle food that has the potential of making them ill. Foodborne illnesses cost taxpayers \$1-\$7.2 billion in health care, quality of life, and work productivity cost emphasizing the need for food safety education.

What has been done

Ohio State University Extension offers numerous food safety education opportunities, from quality assurance programs for 4H youth to certification courses in ServSafe and HACCP. Both the EFNEP and Family Nutrition Program teach 20% of their classes on food safety. Food handlers in 4H and other volunteer programs complete the Safe Food Handling for Occasional Quantity Cooks classes as part of their volunteer training.

Results

There were 28420 participants in all types of food education programs in 2008. Over a quarter (28.8%) reported on their evaluations that they intended to adopt one or more safe food handling skills or good agricultural practices that promote safe food.

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 #3

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
2008	500	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Adult and youth consumers in Ohio handle food that has the potential of making them ill. Foodborne illnesses cost taxpayers \$1-\$7.2 billion in health care, quality of life, and work productivity cost emphasizing the need for food safety education.

What has been done

Ohio State University Extension offers numerous food safety education opportunities, from quality assurance programs for 4H youth to certification courses in ServSafe and HACCP. Both the EFNEP and Family Nutrition Program teach 20% of their classes on food safety. Food handlers in 4H and other volunteer programs complete the Safe Food Handling for Occasional Quantity Cooks classes as part of their volunteer training.

Results

There were 28420 participants in all types of food education programs in 2008. Actual behavior change was reported by 10.7% of the participants on their evaluations. Changes were reported for the adoption of one or more safe food handling skills or good agricultural practices that promote safe food.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
607	Consumer Economics
722	Zoonotic Diseases and Parasites Affecting Humans
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.

Outcome #4**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
2008	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Adult and youth consumers in Ohio handle food that has the potential of making them ill. Foodborne illnesses cost taxpayers \$1-\$7.2 billion in health care, quality of life, and work productivity cost emphasizing the need for food safety education.

What has been done

Ohio State University Extension offers numerous food safety education opportunities, from quality assurance programs for 4H youth to certification courses in ServSafe and HACCP. Both the EFNEP and Family Nutrition Program teach 20% of their classes on food safety. Food handlers in 4H and other volunteer programs complete the Safe Food Handling for Occasional Quantity Cooks classes as part of their volunteer training.

Results

Not measured

4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics
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

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

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

1. Evaluation Studies Planned

- Retrospective (post program)
- 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

Not measured

Key Items of Evaluation

Not measured

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	10.0	0.0	0.0	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
414383	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
414383	0	0	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

4 H Leadership Projects - 4 H projects are planned experiences in which youth develop knowledge, attitudes, skills, and aspirations related to a specific topic, and also develop leadership and citizenship life skills related to those topics. Information and research results were disseminated to youth through 211 Ohio 4 H projects in 2008. The 12 existing 4 H leadership projects were reviewed in 2008, five dated ones were dropped, a new 4-H CARTEENS project book was published, and plans were developed to publish three new 4-H leadership project books to replace the remaining six. | 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 were provided in most Ohio counties in 2008. | Junior/Teen Leadership Programs - Resources and education in County 4 H Junior/Teen Leadership programs enabled teens to develop advanced leadership among peer leaders | 4 H Camp Counselor Opportunities - Teens developed advanced leadership abilities by serving as 4 H camp counselors, student assistants and in similar roles. These teens received 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 gained real life leadership experience. Resources and workshops were provided in 2008 to strengthen teen board leadership opportunities. | 4 H Ambassadors & Spokesperson Opportunities - Ohio 4 H Ambassadors developed leadership by serving as 4 H youth spokespersons throughout the state. Also, county programs such as Awareness Teams, Public Relations Corps and other leadership opportunities were offered. | 4 H CARTEENS and other 4 H Leadership Emphasis Programs - Teens developed leadership through special emphasis 4 H leadership programs such as the 4 H CARTEENS program (in which teen leaders peer teach traffic safety and personal responsibility). Resources and workshops were provided. | 4 H Service Leadership - Ohio 4 H members developed leadership abilities by planning, conducting, and evaluating 4 H service learning programs and projects. Resources and education were provided. | 4 H Workforce Preparation - Integrated Extension and Research programming enabled 4 H teen participants (and stakeholders) to document high value workforce abilities gained. | State 4 H Leadership Camp - Leadership Camp was again the epitome of a successful "learn by doing" approach to leadership development. | Ohio 4 H Teen Conference - A strong leadership dimension was incorporated into the annual Ohio 4 H Teen Conference, which involved over 800 teens in 2008.

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

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	2500	5000	25000	50000
2008	2397	4795	33564	67128

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	1	0	1

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
2008	25000	33564

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
2008	12	12

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. (types of roles)
5	Better lives, businesses, and communities for all citizens. (types of roles)
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. (types of roles)

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
2008	250000	342657

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Youth leadership development is an essential component of preparing youth for adult success.

What has been done

Two hundred eleven (211) Ohio 4-H projects and numerous 4-H group leadership experiences involved more than 340,000 4-Hers.

Results

342,657 Ohio 4-H Members learned to effectively exercise leadership through 4-H projects and group leadership.

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
2008	20000	25848

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The development of leadership knowledge, attitudes, skills, and aspirations (KASA) is a key element of youth leadership development.

What has been done

Targeted 4-H teen leadership program learning experiences were offered to youth throughout Ohio.

Results

25,848 teens developed advanced level leadership knowledge, attitudes, skills and aspirations through Ohio 4-H.

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
2008	2000	171328

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The application of real life leadership is necessary for making a positive impact with others.

What has been done

Youth were provided opportunities to us real life leadership in their clubs, communities, country, and world.

Results

More than 170,000 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. (types of roles)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	12	12

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

4-H teens and young alumni must learn to effectively lead groups, programs and activities in various leadership roles.

What has been done

4-H teens were provided opportunities to provide leadership in various local, county, and state leadership roles.

Results

25,848 Ohio 4-H teens effectively lead groups, programs and activities in 12 Ohio 4-H leader roles.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #5

1. Outcome Measures

Better lives, businesses, and communities for all citizens. (types of roles)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	12	342657

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 programs and opportunities built around the goal of making the best better were offered to all Ohio 4-H youth.

Results

342,657 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. (types of roles)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	12	2269

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

2,269 older 4-Hers became more pro-active as leaders for the future through continued involvement in 4-H programs

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

County-based 4-H teen leadership programs were evaluated by local 4-H program professionals. In addition, evaluations of the 2008 State 4-H Leadership Camp and the 2008 Ohio 4-H CARTEENS In-Service Conference revealed the following:

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

Evaluation Results from the 2008 State 4-H Leadership Camp

To evaluate the degree to which the purposes and goals of the 2008 State 4-H Leadership Camp were met, participants are asked to complete written evaluation instruments at the conclusion of the program. Data were analyzed using the SPSS 15.0 for Windows statistical program. Independent Samples T-tests were performed and revealed few significant differences in results due to gender, 4-H projects completed, or leadership positions held. Therefore, the following evaluation results may be generalized to all 2008 4-H Leadership Camp participants.

1. State 4-H Leadership Camp was rated very highly overall, and all objectives were achieved.

2. (scale: 7=strongly agree/excellent to 1=strongly disagree/very poor):

2008 State 4-H Leadership Camp Objectives Evaluated(n=100) x SD Overall Evaluation of State 4-H Leadership Camp 5.9 1.0 As a result of participation in Leadership Camp, campers . . .

Learned important leadership skills and abilities needed for adult success 6.0 .81 Experienced real-life leadership experiences in leading groups and achieving goals, taking initiative, showing good character & developing leadership skills 6.2 .79 Achieved friendships they think will last a long time 6.1 1.1 Prepared for success in achieving personal dreams and ideals 6.1 .94

2. Camper qualitative evaluation comments about the 2008 Leadership Camp program, and their suggestions for 2009 reflected that campers were highly satisfied with their State 4-H Leadership Camp experiences.

Evaluation Results from the 2008 Ohio 4-H CARTEENS Conference

To evaluate the degree to which the purposes and goals of the 4-H CARTEENS Conference were met, participants are asked to complete a written evaluation instrument at the conclusion of the program. Data were analyzed using the SPSS 15.0 for Windows statistical program. Independent Samples T-tests and Anova analyses were performed and revealed few significant differences in results due to gender, role and number of years in working with the CARTEENS program, years of involvement in 4-H, or types of other leadership roles and service. Therefore, the evaluation results may be generalized to all 2008 CARTEENS In-Service Conference participants.

1. The statewide 4-H CARTEENS In-Service Conference was rated very highly, and the conference objectives were achieved (scale: 7=strongly agree/excellent to 1=strongly disagree/very poor):

MeanSDEvaluation Ratings of Achievement of CARTEENS Conference Objectives

As a result of participating in this conference . . . Partnerships between local 4-H CARTEENS, Highway Patrol, the Court, and other local partners will be improved (n=33) 6.2 0.9 Participants recieved new curriculum and resources to use in local 4-H CARTEENS programs (n=34) 6.3 1.0 Participants learned new ideals and methods that they will use to improve their 4-H CARTEENS programs (n=34) 6.4 0.9 Participants will do a better job in planning, conducting, evaluating and reporting their CARTEENS program accomplishments (n=34) 6.2 0.9

2. Respondents perceived that their abilities to plan, conduct, and evaluate local 4-H CARTEENS programs were significantly improved as a result of their conference participation.

Characteristic

Mean Pre-Conference

Mean Post-Conference Sig. a. ability to develop working relationship with program partners (n=34) 4.6 5.9 0.000 b. awareness / knowledge of available CARTEENS resources (n=34) 4.5 6.0 0.000 c. ability to use 4-H CARTEENS resources in local programs (n=33) 4.7 5.9 0.000 d. teaching skills and abilities used in CARTEENS (n=34) 5.0 5.9 0.000 e. skill in planning effective CARTEENS programs (n=31) 4.5 5.8 0.000 f. ability to work effectively with CARTEENS program participants (n=34) 5.0 6.0 0.000 g. ability to work effectively with CARTEENS program participants (n=34) 4.5 5.5 0.000 h. understanding of teen driving issues (n=34) 4.8 5.8 0.000 i. ability to use CARTEENS skill stations and other resources (n=33) 4.3 5.7 0.000 j. ability to conduct effective CARTEENS programs (n=33) 4.6 5.7 0.000 k. ability to evaluate CARTEENS program impacts (n=33) 4.2 5.6 0.000

3. Qualitative participant comments about the 2008 CARTEENS In-Service Conference, and their suggestions for future programs reflected that they were highly satisfied with the conference.

Key Items of Evaluation

- The degree to which the objectives of the CARTEENS and State 4-H Leadership Camp objectives were achieved

Program #17

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	25.0	0.0	0.0	0.0
Actual	27.0	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 1118834	1890 Extension 0	Hatch 0	Evans-Allen 0
1862 Matching 1118834	1890 Matching 0	1862 Matching 0	1890 Matching 0
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 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 (The event was cancelled due to a major winter storm that paralyzed Ohio).
- 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 (Due staffing changes, this output was not addressed.)
- 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	12000	0	200000
2008	8500	14000	60	20000

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	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
2008	1500	4000

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.

Not reporting on this Output for this Annual Report

Output #3**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
2008	15000	10000

Output #4**Output Measure**

- Develop three new web-based training and/or education modules focusing on youth development principles, youth/adult partnerships, and conflict management for volunteers and build library of resources that includes over 50 curriculum pieces for Educators to use when conducting required new volunteer orientation training/education programs for 1800 individuals yearly.

Not reporting on this Output for this Annual Report

Output #5**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
2008	500	400

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	75% 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	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.
3	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.
4	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**

75% 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
2008	7500	9000

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Parents of 4-H members want to know that their children are participating in a safe environment.

What has been done

New volunteers received training in safety expectations of OSUE programs as well as demonstrations of a positive experiential learning model.

Results

Extension professionals reported good experiences for 4H club members.

4. Associated Knowledge Areas

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

Outcome #2**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
2008	5000	3500

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Parents and stakeholders of OSUE 4H want the youth to have positive educational experiences during 4H membership.

What has been done

Incorporating the experiential learning model into 4H club programming has been taught to county volunteers.

Results

Feedback gathered from youth verifies their appreciation of learning in 4H, and prefer to the typical classroom format of public education.

4. Associated Knowledge Areas

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

Outcome #3**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
2008	5000	5000

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

For the 'Value Added' aspect of Extension programs, funders need to know that volunteers use skills gained in Extension outside Extension roles.

What has been done

At state and multi-state training, volunteers were asked to report use of new skills with other community organizations.

Results

Of those responding to a survey, 35% did report using skills learned in Extension with other youth and civic organizations.

4. Associated Knowledge Areas

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

Outcome #4**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
2008	5000	5000

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

4-H professionals and parents of 4-H members want the confidence that programs in the name of 4-H are positive and safe experiences for the youth.

What has been done

Emotional and physical safety are topics included in all new volunteer orientation and are included in lessons on 'Key Elements of Positive Youth Development.

Results

Participants in these lessons at county and regional trainings acknowledge greater awareness of Safety as component of 4H club delivery.

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**

- Economy
- Public Policy changes
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation**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

Studies verified that volunteers gained knowledge, increased awareness, and developed appropriate skills to use with youth.

Key Items of Evaluation

Knowledge pre & post training; levels of awareness of youth issues; plans to incorporate new skills within 4-H volunteer roles.

Program #18

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	25.0	0.0	0.0	0.0
Actual	35.0	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 1450340	1890 Extension 0	Hatch 0	Evans-Allen 0
1862 Matching 1450340	1890 Matching 0	1862 Matching 0	1890 Matching 0
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 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. 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 4: "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 4: 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 4: 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
2008	1578	25000	70000	70000

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	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
2008	80	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
2008	150	72

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
2008	2500	1800

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
2008	5000	4759

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
2008	5000	500

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The Ohio Department of Agriculture, Agricultural societies, Ag Education all care about the information that is being taught and the way that we teach it.

What has been done

Although we have not completed a pre-test we have conducted 3 years of voluntary testing within several counties since the inception of the Youth Food Animal Quality Assurance Curriculum Guide and Educational Program. Within this 3 year period students would have been exposed to the breadth of the Ohio QA information within the curriculum guide and with that in mind should have a clear understanding as to the information that they need to know. The exams have been offered at the 12-14 and 15-18 year age groups and have be delivered in 2 forms (Large and small animal).

Results

Over the 3 year period passing rate for the exams across both large and small as well as both age categories have increased over the 3 year (2006, 2008, 2009) period (51%, 64%, and 72%). There is a clear linear trend in the increase in knowledge that is gained. Further the assumption that knowledge is retained is also clear.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection
308	Improved Animal Products (Before Harvest)
306	Environmental Stress in Animals
806	Youth Development
723	Hazards to Human Health and Safety

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.

Not reporting on this Outcome for this Annual Report

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
2008	50	96

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
306	Environmental Stress in Animals
315	Animal Welfare/Well-Being and Protection
308	Improved Animal Products (Before Harvest)
307	Animal Management Systems
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
806	Youth Development
723	Hazards to Human Health and Safety

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.

Not reporting on this Outcome for this Annual Report

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.

Not reporting on this Outcome for this Annual Report

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
2008	100	108

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Being sure that youth understand the importance of drug residue violations.

What has been done

In two programs in 2008 the Ohio Junior fair Board Conference and The Ohio 4-H Teen Conference, sessions were offered that briefed youth on the violative residues that were found in Livestock sampled from junior fairs in 2007. These students represented the leaders of their local community organizations.

Results

Both Targeted tests (all Champions and Reserve animals) at the county fairs and state fairs as well as the random tests on other fair animals have resulted in, for the first time since the inception of this state mandated rule, '0' violations or residues. This will result in packer, retailer and consumer confidence that Food Animal Quality Assurance Education is impacting the way that we train the future of the livestock industry.

4. Associated Knowledge Areas

KA Code	Knowledge Area
315	Animal Welfare/Well-Being and Protection
723	Hazards to Human Health and Safety
308	Improved Animal Products (Before Harvest)
307	Animal Management Systems
806	Youth Development
306	Environmental Stress in Animals
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc

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.

Not reporting on this Outcome for this Annual Report

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
2008	200	1328

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 challenge 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
315	Animal Welfare/Well-Being and Protection
307	Animal Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Government Regulations

Brief Explanation

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 2008 year included an evaluation of the test out option and its ability to challenge youth in a constructive format over the 3 years that the test has been offered. This was also the first 3 years of the Youth Food Animal Quality Assurance Program Curriculum and over a 3 year period that way that it is designed youth will have been exposed to the information that is critically important for QA. 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 2008. There are plans now that the test out option is offered and in place and evaluated over the first 3 years since its inception, to execute the other modes of evaluation starting the 2009 year. With changes in the state Law in 2007 (end of) the requirements for the test out option took precedence in 2008. As well as changes in curriculum supplements to meet the National Pork Board Standards for PQA plus also need to be done early in 2008 so time was limited to complete the packer, parent and livestock producer surveys.

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 #19

V(A). Planned Program (Summary)

1. Name of the Planned Program

Community 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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	4.2	0.0	0.0	0.0
Actual	1.0	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
41438	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
41438	0	0	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

- 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

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	800	0	0	0
2008	1208	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of classes held and number of participants

Year	Target	Actual
2008	55	259

Output #2

Output Measure

- Partnerships with local organizations

Year	Target	Actual
2008	25	6

Output #3

Output Measure

- number of curriculum developed

Year	Target	Actual
2008	2	1

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	1% increase in regional cooperation by elected officials
7	5% increase in community vision building
8	1% increase in participation in Ohio Community Leadership Development Programs
9	5% decrease in Ohio ethics court cases
10	1% increase in citizen participation in local government
11	1% decrease in community conflict and the need for mediation
12	1% increase in citizen trust of local government
13	5% 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
2008	16	14

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The public wants elected officials to act ethically.

What has been done

Taught an ethics class to elected officials.

Results

To date 0% of the officials in the class has been charged with an ethics violation.

4. Associated Knowledge Areas

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

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
2008	560	1208

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Communities need volunteer leaders to get things done.

What has been done

Engage citizens in leadership development.

Results

80% of citizens have stepped forward to lead volunteers groups.

4. Associated Knowledge Areas

KA Code	Knowledge Area
---------	----------------

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
2008	125	112

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Groups expect their leaders to act in inclusive, courageous and decisive ways.

What has been done

Taught classes on inclusive, courageous and decisive leadership.

Results

We have better leaders.

4. Associated Knowledge Areas

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

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
2008	15	12

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The Ohio Ethics Commission.

What has been done

Taught leaders about the OEC.

Results

100% have been willing to call when they have a ethics question.

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services

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
2008	15	5

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Communities expected to be involved in the decision making process.

What has been done

Taught leaders how to run large community meetings.

Results

Five new large community meetings were held.

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services

Outcome #6**1. Outcome Measures**

1% 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
2008	15	16

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The tax payers.

What has been done

A mayors group has been formed in Northeast Ohio to promote cooperation.

Results

Cities, towns, townships, and counties are making joint purchases. This activity is saving tax dollars.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #7

1. Outcome Measures

5% 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
2008	50	207

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Citizens expect to have a community vision.

What has been done

Taught elected officials how to lead a community vision building process.

Results

Leaders are engaging citizens in developing community visions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #8

1. Outcome Measures

1% 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
2008	50	39

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Volunteer groups expect to have trained leaders.

What has been done

Supported Ohio Community Leadership programs.

Results

Enrollments went up.

4. Associated Knowledge Areas

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

Outcome #9

1. Outcome Measures

5% 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
2008	15	12

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The citizens of Ohio expect elected officials to act ethically.

What has been done

Taught a class in ethics.

Results

None of the students has been brought up on ethics charges.

4. Associated Knowledge Areas

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

Outcome #10

1. Outcome Measures

1% 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
2008	50	107

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Communities need citizens to participate in local government.

What has been done

Leadership classes have been taught.

Results

More citizens are becoming involved in local government.

4. Associated Knowledge Areas

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

Outcome #11**1. Outcome Measures**

1% 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
2008	55	43

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Community conflict slows down action that improve life in communities.

What has been done

Conflict resolution classes have been taught.

Results

There is less community conflict.

4. Associated Knowledge Areas

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

Outcome #12**1. Outcome Measures**

1% 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
2008	55	43

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Citizens need to trust local government.

What has been done

Leaders have been trained on creating accountability.

Results

Citizens trust leaders who implemented accountability measures.

4. Associated Knowledge Areas

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

Outcome #13**1. Outcome Measures**

5% 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
2008	560	1208

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Communities need people who will step forward and lead.

What has been done

Citizens have been engaged and coached on the importance of leading.

Results

More people are taking a lead on projects and in groups.

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.)

Brief Explanation

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

Observation has shown us that the citizens we work with, teach, and coach are more willing and able to lead in their communities and organizations.

Key Items of Evaluation

In the areas in which we worked in 2008 there have been no local officials who have been brought up on ethics charges. In the face of difficult economic times they have shown courage and decisiveness. They have engaged citizens in the decision making process. Citizens have stepped forward when necessary to lead.

Program #20

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	3.0	0.0
Actual	2.0	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
82877	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
82877	0	0	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

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	275	1375	0	0
2008	120	1200	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	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
2008	100	70

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
2008	250	200

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Downtowns need to develop cohesive and coordinated strategies for revitalization in an attempt to stimulate investment.

What has been done

Programs were presented on developing community downtown revitalization strategies in two cities in Ohio.

Results

Participants gained knowledge and strategies were developed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
602	Business Management, Finance, and Taxation
607	Consumer Economics
603	Market Economics

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
2008	50	50

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Downtown revitalization strategies need to be developed into a written plan so that they can be utilized over time as personnel changes.

What has been done

One written downtown revitalization strategy has been written.

Results

The written plan is being implemented.

4. Associated Knowledge Areas

KA Code	Knowledge Area
603	Market Economics
608	Community Resource Planning and Development

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
2008	100	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Plans need to be implemented so that economic growth can occur with a sense of direction.

What has been done

One plan has been implemented.

Results

Economic investment is occurring.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
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

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

Evaluations are not complete at this time

Key Items of Evaluation

Knowledge gained

Program #21**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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	8.0	0.0	0.0	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 290068	1890 Extension 0	Hatch 0	Evans-Allen 0
1862 Matching 290068	1890 Matching 0	1862 Matching 0	1890 Matching 0
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 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), Business owners and leaders, Entrepreneurs, 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
2008	2000	100000	200	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	1	0	
2008	0	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
2008	1023	1898

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 base
7	Develop economic clusters & improve regional economies
8	Provide direct technical assistance in areas of money, marketing, and management for entrepreneurs and small business owners.
9	Diversity retail economies and strengthen retail base by identifying sales leakages and surpluses.

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
2008	348	80

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Community will have successfully fostered entrepreneur based business

What has been done

Public officials and non-profit organizations will have an awareness and understanding of the components of an entrepreneurial friendly community. A series of capacity building workshops and follow-up meetings were held in both Carrollton and Gallipolis.

Results

16 community leaders learned about adding value to agricultural products at an agricultural economic development seminar.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #2**1. Outcome Measures**

Identify sales leakages & surpluses

Not reporting on this Outcome for this Annual Report

Outcome #3**1. Outcome Measures**

Determine economic development strategies

Not reporting on this Outcome for this Annual Report

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
2008	38	15

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Communities lack knowledge of how changes in a particular economic subsector impacts the larger economy. An improved understanding of this economic relationship enables community officials to target development in specific economic subsectors.

What has been done

Two economic impact reports were developed in cooperation with ODOD officials to help community volunteers and development officials have gained a better understanding of how changes in one economic subsector can impact the larger economy (Input/Output Analysis).

Results

As a result of engaging with ODOD officials in this applied research, a savings of more than \$60,000 was realized; and development officials gained information that will enable them to focus efforts on strengthening economic subsectors that circulate the greatest amount of dollars within the regional economy with hopes of improving economic conditions within the region.

4. Associated Knowledge Areas

KA Code	Knowledge Area
603	Market Economics

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
2008	145	1700

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Local communities lack an understanding of community issues related to economic development. Local officials lack knowledge of existing business needs and resulting expansion strategies.

What has been done

BR&E training has been conducted including on-site workshops, volunteer organizational efforts, BR&E hard copy and web-based materials, questionnaires, reports, presentations.

Results

In 2008, program participants estimated that approximately 100 local community officials have adopted one or more recommended practices for retaining jobs or expanding employment in their community as a result of participating in the BR&E program. Program participants have also indicated that the BR&E program has helped them and fellow local officials better do their jobs, helped them establish relationships with area employers that have enabled them to become more successful, and benefited from involving local community volunteers. The program has helped existing businesses in Van Wert retain 900 jobs and create 690 jobs since 2000.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #6

1. Outcome Measures

Diversify retail economies & strengthen retail base
Not reporting on this Outcome for this Annual Report

Outcome #7

1. Outcome Measures

Develop economic clusters & improve regional economies
Not reporting on this Outcome for this Annual Report

Outcome #8

1. Outcome Measures

Provide direct technical assistance in areas of money, marketing, and management for entrepreneurs and small business owners.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	145	557

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Small business owners and managers need to better understand money, marketing, and management in order to remain competitive.

What has been done

The center assisted 557 existing business owners and entrepreneurs looking to start a business. Topics ranged from business planning workshops, business taxes and labor law compliance to value added wood products and marketing.

Results

The center invested 4,055 hours to support business planning, marketing, and management practices of these entrepreneurs. Additionally, the center provided 30 training events for 515 attendees and a total of 2,317 hours. invested 4,055 hours to support business planning, marketing, and management practices of these entrepreneurs. Additionally, the center provided 30 training events for 515 attendees and a total of 2,317 hours. Topics ranged from business planning workshops, business taxes and labor law compliance to value added wood products and marketing.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
606	International Trade and Development

Outcome #9**1. Outcome Measures**

Diversify retail economies and strengthen retail base by identifying sales leakages and surpluses.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	48

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

To help local development officials make better informed decisions, retail market analysis seeks to identify market trends in local and regional retail sectors using detailed demographic and retail sales data on local communities. The goal of the program is to provide relevant information and analysis that can be used as input into economic development strategies for local communities. The final product is a retail market analysis report that contains an analysis of retail sales surplus and leakages across the local region for approximately 30 retail sectors and trends in population and economic attributes of the community.

What has been done

One retail market report was initiated for one Ohio community (Pickaway County) in 2008. Retail Market Analysis completed for Medina, Ohio.

Results

Local development officials and community volunteers increased knowledge of concepts of retail sales leakage and surplus. Local development officials became better informed enabling them to make decisions that consider effects of retail sales leakages and surpluses within their community. Anticipated medium to long term impact: Local retail conditions and overall retail makeup in study area communities improve.

4. Associated Knowledge Areas

KA Code	Knowledge Area
603	Market Economics

V(H). Planned Program (External Factors)**External factors which affected outcomes**

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

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

An estimated 100 local community volunteer hours were donated to BR&E programming efforts in 2008. Program partners estimate 140 jobs were created by existing businesses, and more than 300 were retained. The program has helped existing businesses in Van Wert retain 900 jobs and create 690 jobs since 2000.

Key Items of Evaluation

Volunteer hours contributed, jobs created and/or retained.

Program #22

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	10.0	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
62157	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
62157	0	0	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

- 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	400	1500	150	300
2008	400	2000	30	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	2	0	
2008	2	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Establishment of web site, number of hits
Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of persons engaged in regional sustainability workshops
Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number of regional workshops and meetings held
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of statewide conferences
Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Number of programs developed
Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Number of programs conducted; number of participants

Year	Target	Actual
2008	5	5

Output #7

Output Measure

- Number of curriculum modules created, and delivered

Year	Target	Actual
2008	3	1

Output #8

Output Measure

- Number of applied research studies conducted; number published

Year	Target	Actual
2008	1	1

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
2008	1000	800

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

By increasing the knowledge, communities will increase awareness of the triple bottom line of environment, social and economic well being of communities.

What has been done

Communities have been engaged in a Sustainable Community Development Participation Process.

Results

Plans are underway to implement changes.

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
2008	5	2

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

By increasing the awareness of OSU Extension as a source for sustainable development information communities throughout Ohio will implement change.

What has been done

Curriculum and program information has been made available to the public.

Results

Communities have contacted OSU Extension requesting programs and information.

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
2008	5	2

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

If communities take a sustainable approach to planning and development, results can occur long term.

What has been done

Several communities have adopted sustainable planning and development approaches.

Results

2 Long term, localized planning and development strategies are being implemented.

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
2008	1	1

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

By approaching development issues from a regional perspective community resources can be better utilized.

What has been done

Regional efforts are starting to be discussed.

Results

One regional sustainable development approach is being implemented.

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
2008	35	5

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

By utilizing web based information sustainable development issues can be addressed.

What has been done

Curriculum has been posted to the web.

Results

2 communities throughout Ohio are considering utilizing OSU Extension Programming for sustainable development approaches to to planning.

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
2008	10	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

If more local, regional and state entities adopt and implement sustainable development programs and policies, local economies will improve.

What has been done

One community in Ohio has adopted and is implementing a sustainable development program to address growth issues.

Results

Local economic indicators are showing growth.

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

Not reporting on this Outcome for this Annual Report

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

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 evaluations completed in 2008.

Key Items of Evaluation

Not available for 2008.

Program #23

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: 2008	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 269349	1890 Extension 0	Hatch 0	Evans-Allen 0
1862 Matching 269349	1890 Matching 0	1862 Matching 0	1890 Matching 0
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 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.
- Continue Info@coastalohio.com monthly e-newsletter to approximately 650 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, state, and national tourism organizations, e.g. OAC, Ohio Byways Alliance, National Scenic Byways Program, Great Lakes North America, Ohio Travel Association, Ohio Tourism Roundtable.
- 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.
- Link tourism suppliers to natural, cultural , culinary and historical attractions to enhance economic impact.
- Continue development of web site showcasing the intrinsic features of a region, as well as resource for stakeholders in creating the resource-based tourism product.
- Create new tourism products by linking existing and emerging sites featuring our intrinsic features into maps, brochures, itineraries, etc.
- Implement strategies from corridor management plans and community plans, as well as byway-wide marketing plans.
- By late-2008, update existing corridor management plans by soliciting additional stakeholder input on future directions.

2. Brief description of the target audience

Internal – Extension Educators and other Extension staff; other related teams and OSU people

External – 1. Persons involved with local and regional destination marketing organizations, tourism initiatives, and tourism-related businesses; 2. Farmers and farm organizations and landowners considering agri-tourism and other direct marketing opportunities; 3. Community leaders; and public and elected officials; 4. Regional and state economic development professionals interested in tourism as an economic development strategy; 5. Local, district and state resource managers of natural areas, state parks, historical sites, etc., including those affiliated directly with ODNR, Ohio Historical Society and related organizations; 6. Crafters, artisans, small business operators, gift and museum shop operators, and tourism-related entrepreneurs; 7. Persons affiliated with or contemplating developing new tourism experiences, events, or souvenir and gift products embracing the region's intrinsic qualities; 8. National Scenic Byway program, key; 9. Statewide tourism-related organizations and divisions, such as the Ohio Travel Association, Ohio Restaurant Association, Ohio Hotel and Lodging Association, Ohio Division of Travel and Tourism, 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	1700	450000	100	200
2008	1700	450000	100	200

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1**Output Measure**

- # of fact sheets developed

Year	Target	Actual
2008	4	4

Output #2**Output Measure**

- # invited presentations

Year	Target	Actual
2008	8	8

Output #3**Output Measure**

- # of times Tourism Teaching modules utilized, audience reached

Year	Target	Actual
2008	10	10

Output #4**Output Measure**

- # of attendees at Advancing Community Tourism Conferences

Not reporting on this Output for this Annual Report

Output #5**Output Measure**

- # Print and radio media spots/ articles

Year	Target	Actual
2008	8	8

Output #6**Output Measure**

- # of Tourism/Direct Marketing team members

Year	Target	Actual
2008	12	20

Output #7**Output Measure**

- # of members called upon as resource professionals

Year	Target	Actual
2008	5	5

Output #8**Output Measure**

- # dollars directly awarded for tourism projects

Year	Target	Actual
2008	45000	25000

Output #9**Output Measure**

- # Extension personnel involved in tourism projects/educational development

Not reporting on this Output for this Annual Report

Output #10**Output Measure**

- # contacts reached through regional e-newsletters distributed x # annual issues distributed

Not reporting on this Output for this Annual Report

Output #11**Output Measure**

- # new travel itineraries developed

Not reporting on this Output for this Annual Report

Output #12**Output Measure**

- # travel inquiries/web site visitors about Extension-led byway efforts

Year	Target	Actual
2008	450000	450000

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, direct support, use of Extension materials, direct contact with Extension professionals as resources
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, development of standardized measurement of impact, outreach to potential visitors, development of materials to be used by destination marketing organizations to promote the region. Measured by - direct and indirect visitor spending, jobs created, local and state tax revenue generated, payroll expenditures
4	Community and grassroots efforts to protect and conserve local and regional natural areas, historic sites, and cultural features are successful. Achieved through – Educational materials and workshops (grant-writing, importance of intrinsic features), cooperative groups (such as lighthouses, gardens, etc. with similar needs to consolidate purchasing and efforts), regional plans for enhancing the intrinsic features of communities, regular communications (thru newsletters, web site) to provide funding sources and preservation/conservation assistance. Measured by – number of support requests received by Extension Team members for funding efforts and/or preservation/conservation projects, acreage preserved, number of projects restored or under process, amount of grant funding/investment in historic preservation and natural areas conservation.
5	Residents and nonresidents view Extension-led byway regions as destinations. Achieved through – byway and wayfinding signage development and installation; design standards and distribution of regional byway signage logos; local, regional and national media stories placed; new products created to enhance the visitor experience. Measured by - Adoption of byway logos in local tourism promotional materials, observation, comments by local officials, number of requests for information, and/or surveys of byway visitors

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, direct support, use of Extension materials, direct contact with Extension professionals as resources

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	75	75

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

New technology offers opportunity to increase education access.

What has been done

The Tourism Team generated funds to develop a new web-based Ohio Tourism Toolbox.

Results

Resources were secured. Key stakeholders assisted in drafting a site that launches in 2009.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
605	Natural Resource and Environmental Economics
134	Outdoor Recreation

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
2008	20	20

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Community and regional tourism planning benefits tourists, entrepreneurs and the community.

What has been done

The team met with various local, regional, and state leaders.

Results

Communities and regions throughout the state demonstrated new approaches to tourism development.

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
607	Consumer Economics
604	Marketing and Distribution Practices
608	Community Resource Planning and Development

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, development of standardized measurement of impact, outreach to potential visitors, development of materials to be used by destination marketing organizations to promote the region. Measured by - direct and indirect visitor spending, jobs created, local and state tax revenue generated, payroll expenditures

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	1

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Ohio is rich in diversity with unique opportunities for tourism development.

What has been done

Regional and state resources were developed for the new Ohio Tourism Toolbox.

Results

The state's economic impact from tourism grew to \$38 billion.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
607	Consumer Economics
605	Natural Resource and Environmental Economics
604	Marketing and Distribution Practices

Outcome #4**1. Outcome Measures**

Community and grassroots efforts to protect and conserve local and regional natural areas, historic sites, and cultural features are successful. Achieved through – Educational materials and workshops (grant-writing, importance of intrinsic features), cooperative groups (such as lighthouses, gardens, etc. with similar needs to consolidate purchasing and efforts), regional plans for enhancing the intrinsic features of communities, regular communications (thru newsletters, web site) to provide funding sources and preservation/conservation assistance. Measured by – number of support requests received by Extension Team members for funding efforts and/or preservation/conservation projects, acreage preserved, number of projects restored or under process, amount of grant funding/investment in historic preservation and natural areas conservation.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	2	2

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Sustainable tourism efforts provide short and long-term benefits.

What has been done

Team specialists provided assistance for nature-based tourism and heritage/cultural tourism initiatives.

Results

Case studies developed in 2009.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
605	Natural Resource and Environmental Economics
134	Outdoor Recreation

Outcome #5**1. Outcome Measures**

Residents and nonresidents view Extension-led byway regions as destinations. Achieved through – byway and wayfinding signage development and installation; design standards and distribution of regional byway signage logos; local, regional and national media stories placed; new products created to enhance the visitor experience. Measured by - Adoption of byway logos in local tourism promotional materials, observation, comments by local officials, number of requests for information, and/or surveys of byway visitors

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	2	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Development of byway regions as destinations attracts residents and non-residents.

What has been done

Team specialists focused on by-way development.

Results

Case studies developed in 2009.

4. Associated Knowledge Areas

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics
604	Marketing and Distribution Practices
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.)
- Other (National Security Issues)

Brief Explanation

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

Survey conducted in 2009.

Key Items of Evaluation

Tourism Development.

Program #24**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: 2008	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
414383	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
414383	0	0	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**

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. We partner with the Ohio State University Extension Tourism Team to advance shared priorities.

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) facilitators, 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	600	1500	0	0
2008	600	1500	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	1	0	
2008	1	0	0

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
2008	3	3

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
2008	5	5

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Direct Marketing advances in Ohio through numerous stakeholder groups.

What has been done

The Team expanded to include new partners, such as the new Ohio Farmer's Managers' Network.

Results

The team, and collaborating partners generated more than \$200,000 to bring new programs to Ohio Direct Marketers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices

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
2008	100	100

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Operators of small farms represent 75 percent of Ohio farms.

What has been done

More than 100 people attended educational sessions delivered by the Direct Marketing Team.

Results

Survey conducted at end of 2008 - results reported in 2009.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
607	Consumer Economics
608	Community Resource Planning and Development

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
2008	100	300

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Improve the local and regional food system.

What has been done

The Ohio Direct Marketing Team brought MarketMaker to Ohio.

Results

More than 300 producers participated in Ohio Market Maker by registering their business. The website generated more than 500,000 hits.

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

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

Survey conducted at the end of 2008 – reported in 2009.

Key Items of Evaluation

Marketing practices, challenges, and opportunities.

Program #25

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	3.8	0.0	0.0	0.0
Actual	1.0	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
41438	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
41438	0	0	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

Major educational areas of the Land Use Team

Land Use Tools

Sustainable Development

AEPP Program

Estate Planning

Farm Land Preservation

-Workshops

-Team and committee meetings

-Develop planning documents

-Develop curriculum modules

-Develop Fact sheets on land use issues

-Develop 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

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
2008	185	31000	10000	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)**Number of Peer Reviewed Publications**

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs**Output Target****Output #1****Output Measure**

- # of participants at workshops

Year	Target	Actual
2008	150	185

Output #2**Output Measure**

- # of committee meetings

Year	Target	Actual
2008	20	36

Output #3**Output Measure**

- # of planning documents produced

Year	Target	Actual
2008	2	2

Output #4**Output Measure**

- # of curricula

Year	Target	Actual
2008	1	2

Output #5**Output Measure**

- # of fact sheets

Year	Target	Actual
2008	1	1

Output #6**Output Measure**

- # of hits on upgraded website

Not reporting on this Output for this Annual Report

Output #7**Output Measure**

- Partnerships maintained/developed with officials

Year	Target	Actual
2008	4	4

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
2008	500	185

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

By increasing the knowledge of Ohioans about land use issues, less land use conflicts will occur.

What has been done

Land Use education programs have been completed throughout Ohio.

Results

Four community land use plans, subdivision regulations or zoning resolutions have been developed or updated.

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
2008	4	4

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

By engaging in the development or update of a land use plan less development and land use conflict will occur.

What has been done

Land Use education programs have occurred throughout the state in various settings.

Results

Two communities, after utilizing OSU Extension Resources, have begun the process of updating land use plans.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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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
2008	2	2

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

If plans and policies are implemented by government officials less land use conflicts will occur.

What has been done

Communities have utilized OSU Extension Land Use Education Resources.

Results

At least four local governments across Ohio have implemented land use 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
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Security Issues; demographic cha)

Brief Explanation**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

Pre and Post Test

Key Items of Evaluation

Knowledge gained.

Program #26

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: 2008	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
248630	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
248630	0	0	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

Workshop held with Middle School teachers (3) and the Guidance Counselor and talking with them about the "Know how to Go" messages and how to relay them to students, especially outreach to bright middle schoolers from low income families. Youth Leadership students learned about sharing the KHTG messages with elementary students. Students to think about their own college going aspirations and talk to people about their college going experiences. 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:

- School officials
- Youth age 12-14

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	530	2450	50	250
2008	80	5	36	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1**Output Measure**

- Local elected and appointed officials

Not reporting on this Output for this Annual Report

Output #2**Output Measure**

- Business leaders

Not reporting on this Output for this Annual Report

Output #3**Output Measure**

- Economic development professionals

Year	Target	Actual
2008	30	1

Output #4**Output Measure**

- Community residents

Not reporting on this Output for this Annual Report

Output #5**Output Measure**

- School officials and parents of school age children

Year	Target	Actual
2008	0	12

Output #6**Output Measure**

- Support service providers (banks, advisors)

Year	Target	Actual
2008	50	3

Output #7**Output Measure**

- Youth aged 13 – 17

Year	Target	Actual
2008	50	36

Output #8**Output Measure**

- Lower skilled/traditional workforce

Not reporting on this Output for this Annual Report

Output #9**Output Measure**

- Potential and existing entrepreneurs

Year	Target	Actual
2008	30	5

Output #10**Output Measure**

- Unemployed/underemployed

Not reporting on this Output for this Annual Report

Output #11**Output Measure**

- number of communities reached

Not reporting on this Output for this Annual Report

Output #12**Output Measure**

- Number of schools reached

Year	Target	Actual
2008	{No Data Entered}	3

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
2008	120	80

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The more people who learn about the knowledge economy, the more people will recognize the importance of obtaining higher education.

What has been done

Workshops have occurred throughout Ohio.

Results

Knowledge has been gained.

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
2008	40	3

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

By establishing networks around the subject of the Knowledge Economy, knowledge gained will occur exponentially.

What has been done

Efforts to create networks has begun.

Results

3 networks have been established.

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

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

Pre- and post-testing

Key Items of Evaluation

Knowledge gained

Program #27

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	6.5	0.0	0.0	0.0
Actual	3.0	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
124315	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
124315	0	0	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

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	111	0	15	0
2008	179	300	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	1	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
2008	1	1

Output #2

Output Measure

- Ohio Watershed Leaders Number of workshops Number of materials distributed Number of workshop participants

Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Ohio Certified Volunteer Naturalists Number of trainings Number of agency partners collaborating Number of manuals distributed Number of certified and trained volunteers Number of chapters formed Number of volunteer service hours completed

Year	Target	Actual
2008	5	10

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
2008	80	75

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Watershed group leaders and participants are interested in acquiring new skills and knowledge to more effectively participate in watershed protection efforts.

What has been done

Ohio Watershed Academy course was conducted. 33 students started the course; 19 completed.

Results

Students indicated in the final evaluation that they increased their ability to lead and participate in collaborative watershed management.

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

Not reporting on this Outcome for this Annual Report

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
2008	20	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

Outcome #4**1. Outcome Measures**

Ohio Watershed Leaders (OWLs) short term Percentage of participants increasing professional networks Percentage of participants increasing knowledge and skills

Not reporting on this Outcome for this Annual Report

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

Not reporting on this Outcome for this Annual Report

Outcome #6**1. Outcome Measures**

Ohio Watershed Leaders (OWLs) long term Dollars saved or generated as a result of new partnerships and/or collaborations

Not reporting on this Outcome for this Annual Report

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
2008	80	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The Ohio Certified Volunteer Naturalist program is a volunteer educational program designed to meet the natural resource

What has been done

Ten local programs were hosted in 2008. 170 people completed the trainings. Watershed groups, local parks, nature center and other

Results

85% of respondents selected 'yes' when asked if they were able to apply knowledge gained from the program.

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
2008	80	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Many of Ohio's citizens wish to know more about their natural environment and wish to volunteer in local parks.

What has been done

10 OCVN programs were conducted around Ohio in 2008 with 179 participants.

Results

4200 service hours were completed in local parks and natural areas by OCVN volunteers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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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)

Not reporting on this Outcome for this Annual Report

V(H). Planned Program (External Factors)**External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Competing Public priorities
- Other (Land Use development)

Brief Explanation

The Ohio Watershed Leaders program was not conducted in 2008 due to two major national watershed related conferences occurring in Ohio in 2008 – "River Rally" and the USEPA "National Nonpoint Source Monitoring Workshop."

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

OCVN: 85% of participants agreed that they were able to apply knowledge gained from the program. OCVN participants contributed 4200 hours of service to local parks and recreational areas. Ohio Watershed Academy: Students found the Academy to be beneficial in terms of their watershed management responsibilities and their exposure to new ideas and potential colleagues. Before the course, 17% of students indicated their level of knowledge of watershed planning was "good"; after the course 67% indicated their level of knowledge of watershed planning was "good".

Key Items of Evaluation

Program #28

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: 2008	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
165753	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
165753	0	0	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

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
2008	9874	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1**Output Measure**

- Number of private applicators attending a certification program

Year	Target	Actual
2008	100	752

Output #2**Output Measure**

- Number of commercial applicators attending a certification program

Year	Target	Actual
2008	150	535

Output #3**Output Measure**

- Number of private applicators attending a recertification program

Year	Target	Actual
2008	5000	5000

Output #4**Output Measure**

- Number of commercial applicators attending a recertification program

Year	Target	Actual
2008	2000	3000

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
2008	500	1455

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Private industry and public applicators must stay current with environmental and safety practices and legal issues.

What has been done

Over 100 continuing education programs were provided across the state.

Results

Over 9,000 applicators were able to maintain certifications required for their jobs and farming operations.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
213	Weeds Affecting Plants
133	Pollution Prevention and Mitigation
721	Insects and Other Pests Affecting Humans
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
402	Engineering Systems and Equipment
723	Hazards to Human Health and Safety
312	External Parasites and Pests of Animals
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

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
2008	500	1455

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Industry, growers and public agencies use pesticides to protect human health and increase farm and industry productivity; however, they must also minimize the risks associated with pesticide use by adopting best management practices.

What has been done

Over 100 continuing Education programs were provided across the state.

Results

1455 respondents at commercial training programs indicated that they have adopted best management practices for pesticides as follows: use protective clothing 59-67%; use IPM practices 50-57%; read labels more 67-76%; keep accurate records 77%; and improved drift management 47 to 60%.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sourc
213	Weeds Affecting Plants
212	Pathogens and Nematodes Affecting Plants
721	Insects and Other Pests Affecting Humans
723	Hazards to Human Health and Safety
312	External Parasites and Pests of Animals
402	Engineering Systems and Equipment
133	Pollution Prevention and Mitigation
211	Insects, Mites, and Other Arthropods Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)

Evaluation Results

Commercial applicator data given under outcome results above.

Key Items of Evaluation

40% of industry respondents attended programs more frequently than required by law.

Program #29

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	2.2	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
165753	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
165753	0	0	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

The Ohio State University Extension floriculture team actively collaborates with producers, local, regional and state-wide industry organizations as well as extension personnel from neighboring states to conduct workshops, seminars, and extension tours as well as develop fact sheets, web-based educational materials, curriculum and other educational tools.

The team engages in interdisciplinary research and extension projects utilizing funds from local, regional and national organizations and agencies to develop research-based information and technologies that positively impact the greenhouse industry in Ohio and abroad. These efforts are the foundation of new resources made available to 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	450	165000	110	0
2008	6349	2067732	542	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	31	0	31

V(F). State Defined Outputs

Output Target

Output #1**Output Measure**

- Visit at least 125 growers each year across the State

Year	Target	Actual
2008	125	479

Output #2**Output Measure**

- Reach up to 400 growers through talks and workshops

Year	Target	Actual
2008	350	2916

Output #3**Output Measure**

- Reach at least 500 growers through Annuals and Mixed Container Trials tours and visits

Year	Target	Actual
2008	500	5000

Output #4**Output Measure**

- Reach at least 160,000 visitors through the internet and web-based training

Year	Target	Actual
2008	160000	184596

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
2008	4	2

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 and will be measured by the percent of total wholesale value of states surveyed.
4	Increases in gross income keep pace with inflation. USDA statistics on floriculture sales and rankings. Measured as the wholesale values of reported floriculture crops in millions of dollars.

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
2008	300	334

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Greenhouse producers and employees are in need of educational materials and programs that increase their awareness of greenhouse pests and lead to the implementation of research-based information and techniques that improve their pest management skills. As part of an effective integrated pest management (IPM) program, growers must be good stewards of available chemicals and properly rotate between similar active ingredients to ensure against selection for resistant pests.

What has been done

In cooperation with regional and state-wide industry associations, the greenhouse extension team personally visited over 334 greenhouse operations in Ohio and reached nearly 1500 individuals through workshops, tours and other programs specifically geared for producers. Educational programs and materials focused on how to properly rotate fungicides and insecticides.

Results

OSU colleagues directly reached at least 31% of reported greenhouse operations in Ohio to provide updated pest management information with approximately 60% of these implementing a recommended method of scouting or rotation program. Adoption of this information leads to timely and accurate insect and pest identification which reduces the use and cost of pesticide applications.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
102	Soil, Plant, Water, Nutrient Relationships
211	Insects, Mites, and Other Arthropods Affecting Plants
201	Plant Genome, Genetics, and Genetic Mechanisms
204	Plant Product Quality and Utility (Preharvest)
216	Integrated Pest Management Systems
403	Waste Disposal, Recycling, and Reuse
215	Biological Control of Pests Affecting Plants
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants

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
2008	150	220

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Greenhouse producers are limited in the availability of effective chemical control products for common pests of vegetable and ornamental crops. Additionally, the production of herbaceous plant material requires sound sanitation practices to minimize losses due to pathogens yet there is little published research that compares the efficacy of disinfectants against common greenhouse pathogens, thus making it difficult to make recommendations to growers.

What has been done

Two chemistries were identified as compounds with excellent efficacy against thrips, a difficult to control greenhouse insect. Thrips was added to the label of both compounds (chlorfenapyr and pyridalyl) and made available to US greenhouse producers. In addition, other compounds were recommended for control of whiteflies and mealybugs on greenhouse tomatoes and bedding plants, respectively.

Results

Through various presentations given at Extension meetings, grower visits and pesticide certification conferences, rotation recommendations were provided for management of these pests. Producers in Ohio and the US added these new materials to their pesticide rotations with excellent results (at least 60% of growers visited have started using these recommendations). This in turn reduced the possibility of thrips, whiteflies and citrus mealybug populations from becoming resistant to the most widely used compounds resulting in the protection of at least \$127 million in plant products in Ohio and \$1.8 billion in the US.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
204	Plant Product Quality and Utility (Preharvest)
216	Integrated Pest Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
102	Soil, Plant, Water, Nutrient Relationships
201	Plant Genome, Genetics, and Genetic Mechanisms
215	Biological Control of Pests Affecting Plants
212	Pathogens and Nematodes Affecting Plants
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants

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 and will be measured by the percent of total wholesale value of states surveyed.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	3	4

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

To maintain and increase Ohio's market share of floriculture production in the United States, Ohio producers must continually explore and expand new product offerings for consumers to drive wholesale and retail demand of floriculture products. New product development and evaluation is an important tool in this process.

What has been done

The greenhouse extension team partnered with more than 17 industry organizations and companies to trial and evaluate over 300 varieties of annuals at the Cincinnati Zoo and Botanical Garden and the Ohio State University Annuals and Mixed Container Trails in 2008. Industry partners, producers and consumers were invited and encouraged to tour and evaluate plants at both sites.

Results

Brochures on the trial results were given to approximately 4,000 individuals at the Cincinnati Flower Show by Master Gardeners and OSUE, Hamilton County personnel. Results from both trials are available on various websites, including the Cleveland Zoo and Botanical Garden, Cincinnati Flower Grower's Association, Ohionline, and Ohio Floriculture website. These efforts are expected to reflect positively on consumer interest and demand for floriculture crops in 2009.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
403	Waste Disposal, Recycling, and Reuse
216	Integrated Pest Management Systems
212	Pathogens and Nematodes Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
211	Insects, Mites, and Other Arthropods Affecting Plants

Outcome #4**1. Outcome Measures**

Increases in gross income keep pace with inflation. USDA statistics on floriculture sales and rankings. Measured as the wholesale values of reported floriculture crops in millions of dollars.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	172	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

To maintain a viable business, greenhouse producers must cover their fixed and variable costs of production. One measurement of the general health of the state's industry is to measure the wholesale value of products compensated for the annual rate of inflation over time.

What has been done

The greenhouse extension team has worked directly and indirectly with producers across the state to provide research-based recommendations to increase efficiencies of production, reduce costs, improve profits, identify marketing channels, add value to products and services and manage labor forces. This has been achieved through one-on-one site visits and consultations, newsletters, e-mail communications, workshops, tours and other extension programs.

Results

Ohio continues to be a leading state in floriculture production. According to the latest USDA-NASS statistics on Floriculture Crops for 2007, the number of producers reporting gross sales over \$10,000 declined 9% from 551 to 497, yet the estimated wholesale value for their products increased 3% from approximately \$195 to \$201 million. This increase outpaced an average inflation rate of 2.85% for 2007.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
216	Integrated Pest Management Systems
102	Soil, Plant, Water, Nutrient Relationships
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Government Regulations
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

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

Key Items of Evaluation

Program #30

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: 2008	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
704451	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
704451	0	0	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

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
2008	100280	217000	500	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	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
2008	40	4500

Output #2**Output Measure**

- One Crop Production Conference which provides updated training for ag industry and CCA reaching 200.

Year	Target	Actual
2008	200	197

Output #3**Output Measure**

- One Certified Crop Advisor (CCA) College which provides updated training for ag industry and CCA reaching 140.

Year	Target	Actual
2008	120	156

Output #4**Output Measure**

- One Farm Science Review (FSR) Certified Crop Advisor which provides updated training for ag industry and CCA reaching 35

Year	Target	Actual
2008	35	45

Output #5**Output Measure**

- One FSR Conservation Tillage Conference which provides updated training for ag industry and CCA reaching 600.

Year	Target	Actual
2008	600	670

Output #6**Output Measure**

- Multiple Regional/Local Agronomy Meeting totaling 40 which reaches 2500 people with agronomic information.

Year	Target	Actual
2008	2500	2650

Output #7**Output Measure**

- Production and Issues Workshops totaling 15 reaching 600 people

Year	Target	Actual
2008	30	85

Output #8**Output Measure**

- Website which reaches an estimated 60,000 hits per year

Year	Target	Actual
2008	60000	300000

Output #9**Output Measure**

- Local/On-Farm Research projects totaling 35 sites.

Year	Target	Actual
2008	20	31

Output #10**Output Measure**

- Field Days totaling 5 location and reaching 500 people

Year	Target	Actual
2008	100	745

Output #11**Output Measure**

- Weed Control Guide for Ohio and Indiana 4000 distributed annually

Year	Target	Actual
2008	4000	5000

Output #12**Output Measure**

- Tri-State Fertilizer Recommendations for Corn, Soybean, Wheat and Alfalfa 1000 distributed annually.

Year	Target	Actual
2008	1000	350

Output #13**Output Measure**

- Field Crop Insects of Ohio 800 distributed annually

Year	Target	Actual
2008	800	520

Output #14**Output Measure**

- Corn, Soybean, Wheat and Alfalfa Field Guide 1000 distributed annually

Year	Target	Actual
2008	1000	452

Output #15**Output Measure**

- Corn Disease Management in Ohio 500 distributed annually

Year	Target	Actual
2008	500	205

Output #16**Output Measure**

- Profitable Soybean Disease Management in Ohio 500 distributed annually

Year	Target	Actual
2008	500	380

Output #17**Output Measure**

- Wheat Disease Management in Ohio 250 distributed annually

Year	Target	Actual
2008	250	150

Output #18**Output Measure**

- Seed Treatment for Ohio Agronomic Crops 150 distributed annually

Year	Target	Actual
2008	150	105

Output #19**Output Measure**

- Ohio Agronomy Guide 700 distributed annually

Year	Target	Actual
2008	700	390

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
2008	15	10

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Technology workshops provide an opportunity for participants to have an in depth discussion of pest management and production practices.

What has been done

Two workshops on production issues and pest management were presented.

Results

45 participants participated in these workshops and reported they would use information presented to increase profitability on their acres managed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
213	Weeds Affecting Plants
212	Pathogens and Nematodes Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants
205	Plant Management Systems

Outcome #2**1. Outcome Measures**

25% of meeting participants will indicate they will implement new management practices based on information received at the meetings.

Not reporting on this Outcome for this Annual Report

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
2008	25	25

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Nitrogen Management has been a key issue in corn production since nitrogen prices have increased 400% over the past several years.

What has been done

OSU Extension has responded with nitrogen research and a new tool to better advise farmers on economically responsive nitrogen rates. Dr Robert Mullen has created a nitrogen recommendation and risk analysis spreadsheet which takes the price of corn and nitrogen in combination with an extensive database of nitrogen response plots, conducted on OARDC Agricultural Research Station and with on-farm cooperators, to provide a nitrogen rate with the best economic return.

Results

It is estimated that 50% of corn acres have reduced nitrogen use by 10 pounds per acres resulting in nitrogen savings of \$8.2 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
133	Pollution Prevention and Mitigation

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
2008	25	15

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Field research with herbicide-resistant weed populations provides strategies to remediate and slow the development of glyphosate resistance, and helps sustain profitable corn and soybean production on Ohio.

What has been done

The rapid adoption of crops resistant to glyphosate in the past decade led to the oversimplification of weed management programs in corn and soybeans, and reliance on glyphosate to the exclusion of other herbicides. Glyphosate-resistant horseweed became widespread across Ohio by 2003, and OSU weed scientists subsequently identified glyphosate-resistant populations of common ragweed and giant ragweed. Glyphosate resistance often occurs in combination with resistance to ALS-inhibiting herbicides, the other primary type of herbicide for control of these weeds in soybeans. Further spread of resistance threatened the economic viability of glyphosate-resistant crops, which now account for 70 and 90% of the corn and soybeans planted in Ohio, respectively.

Results

Adoption by growers of strategies and practices recommended by OSU weed scientists resulted in successful management of glyphosate-resistant weed populations. Our information also spurred many growers to adopt more diverse herbicide programs, which has prevented them from having substantial resistance problems and helped sustain the long-term viability of glyphosate-resistant cropping systems. Based on the conservative estimate that herbicide resistance causes growers to spend an additional \$10 to \$15 per acre, or lose a similar amount from lack of control, our recommendations have the potential to protect approximately \$40 to \$60 million in income for soybean growers, and a similar amount for corn growers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
213	Weeds Affecting Plants

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
2008	15	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Reducing pesticide use lowers environmental risk and increases profitability in the absence of pest.

What has been done

Soybean Rust monitoring through sentinel plots has been a statewide coordinated effort which feeds into a nationwide network monitoring the development potential of this disease with no known resistance in current commercial soybean varieties. The sentinel plot program effort has provided the field observation confirmation to understand the distribution potential of rust from overwinter sites in Florida to Ohio. Additionally the observation from this program have identified outbreaks of frogeye leaf spot in soybean varieties without resistance to this disease and for monitoring development of soybean aphid an important yield reducing insect.

Results

It is estimated that not spraying for soybean rust on 50% of Ohio's soybean acres results in a savings of \$11.25 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
213	Weeds Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

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

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

Key Items of Evaluation

Program #31

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	1.0	0.0
Actual	5.0	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
207191	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
207191	0	0	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

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
2008	5272	122000	350	1000

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	5	0	5

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
2008	6	89

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
2008	10	29

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
2008	30	1246

Output #4**Output Measure**

- Newsletter: These will be the primary methods used for written communication to our 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
2008	2	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
2008	20	26

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
2008	6	9

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
2008	10	16

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
2008	20	1638

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Ohio producers with grazing-based livestock operations are looking for ways to better manage their operations, with the ultimate goal of being more profitable while sustaining their natural resources.

What has been done

Extension meetings, intensive workshops with new curriculum, and pasture walks were conducted and extension publications and popular press and newsletter articles were written to teach producers how to manage their grazing operations in a profitable and environmentally sound manner.

Results

In 2008, individualized managed grazing plans were developed for 1246 farms covering 64,618 acres and improved grazing management plans were adopted and implemented on 1638 farms covering 79,693 acres.

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
2008	10	1638

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Ohio producers with grazing-based livestock operations are looking for ways to cut production costs, be more profitable and protect the natural resources on their farms for their children.

What has been done

Over \$7 million was spent by Ohio producers and the Natural Resources Conservation Service cost-sharing on improved grazing infrastructure improvements and conservation practices that will improve the sustainability of their grazing operations.

Results

Survey results document that over 80% of past participants in the Pasture for Profit workshops have used what they learned to improve their production systems, resulting in gains in the indicators of financial profitability. If all Ohio cattle producers were able to achieve what past participants of the program have accomplished, it would represent production cost savings of \$17 million to \$33 million in Ohio alone. Many of our graduates are also making progress in reducing the impact of their livestock on the environment. Twenty five percent indicated they now fence livestock out of streams, 47% have added water sources that reduce environmental deterioration, and 37% are controlling access to ponds.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
307	Animal 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**V(I). Planned Program (Evaluation Studies and Data Collection)****1. Evaluation Studies Planned**

- Retrospective (post program)
- During (during program)

Evaluation Results

During and retrospective surveys were conducted at two meetings and in personal one-on-one contact. Over 95% of the participants felt that information learned in the course will impact their bottom line. Producers saved nearly 50% on input costs by adopting nutrient management regimens recommended by this educator.

Key Items of Evaluation

Value of information received.

Cost savings once recommendations were implemented.

Program #32

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	2.4	0.0	0.0	0.0
Actual	2.5	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
103596	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
103596	0	0	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

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
2008	1700	50000	150	5000

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	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. Reported in millions of dollars.

Year	Target	Actual
2008	20	200

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. Reported in millions of dollars.

Year	Target	Actual
2008	2	2

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
2008	20000	22000

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
2008	1000	1200

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
2008	800	1150

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The general population wants cleaner water and maintenance of low cost food products.

What has been done

The Conservation Tillage programs emphasize the specific topics above.

Results

Farmers increased their knowledge of cover crops, compaction, precision agriculture and manure management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
104	Protect Soil from Harmful Effects of Natural Elements
601	Economics of Agricultural Production and Farm Management
102	Soil, Plant, Water, Nutrient Relationships

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
2008	10	10

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Increasing acres of continuous no-till will decrease costs for farmers and improve water quality for society.

What has been done

Attendees are adopting no-till at a rate about double the overall farm population.

Results

Attendees use no-till for about 40% of corn acres, compared to about 20% for state average.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
601	Economics of Agricultural Production and Farm Management
132	Weather and Climate
112	Watershed Protection and Management

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
2008	23	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Everyone benefits from continuous no-till because of improved water quality, soil quality and air quality.

What has been done

Attendees are increasing their no-till acres.

Results

No official data has been collected by USDA since 2004.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
112	Watershed Protection and Management
405	Drainage and Irrigation Systems and Facilities
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

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

1. Evaluation Studies Planned

- After Only (post program)
- During (during program)

Evaluation Results

For the CTC, 19% completed the evaluation.

Key Items of Evaluation

Respondents said the educational value was about \$15 per acre, or \$4 Million for farmers and \$250 Million for Consultants.

Program #33**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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	0.0	0.0
Actual	0.5	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
20719	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
20719	0	0	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**

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
2008	1200	5000	0	0

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

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	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
2008	150	150

Output #2**Output Measure**

- A quarterly newsletter is sent to over 100 Educators, ag agency personnel, and farmers.

Year	Target	Actual
2008	180	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
2008	4	5

Output #4**Output Measure**

- Field days and tours are held during summer months around Ohio at various locations. Farm topics include grain, vegetable, and livestock sustainable practices.

Year	Target	Actual
2008	5	5

Output #5**Output Measure**

- \$500 scholarships are given to Educators to travel to attend sustainable functions.

Year	Target	Actual
2008	8	8

Output #6**Output Measure**

- Over 50 requests for grants and resources are received each year.

Year	Target	Actual
2008	55	60

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 Educators, NRCS staff and other ag professionals in Ohio
2	Increase the use of the SARE program and resources among farmers, Extension Educators, 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 Educators, 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
2008	150	150

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Extension Educator, NRCS staff, ag professionals.

What has been done

Participants in workshops, field days, and conferences.

Results

Participation has increased knowledge.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
307	Animal Management Systems
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management
102	Soil, Plant, Water, Nutrient Relationships

Outcome #2**1. Outcome Measures**

Increase the use of the SARE program and resources among farmers, Extension Educators, 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
2008	175	180

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Extension Educators, NRCS staff, ag professionals.

What has been done

Offered reference materials, SARE bulletins, and web information.

Results

Increased knowledge of participants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
307	Animal Management Systems
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management
216	Integrated Pest Management Systems

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
2008	100	100

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Ohio farmers

What has been done

Offered examples of sustainable practices with demonstrations and field days

Results

Increase number of farmers practicing sustainable practices

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity
216	Integrated Pest Management Systems
307	Animal Management Systems
205	Plant Management Systems
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management
102	Soil, Plant, Water, Nutrient Relationships

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
2008	200	200

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Extension Educators

What has been done

Offered workshops, field days, and conferences

Results

Increased knowledge of participants

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
307	Animal Management Systems
205	Plant Management Systems

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
2008	50	50

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Extension Educators

What has been done

Offered references, program materials

Results

Increased number of sustainable ag topics

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity
604	Marketing and Distribution Practices
123	Management and Sustainability of Forest Resources
307	Animal Management Systems
216	Integrated Pest Management Systems

102	Soil, Plant, Water, Nutrient Relationships
601	Economics of Agricultural Production and Farm Management
205	Plant Management Systems
131	Alternative Uses of Land

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
2008	200	200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ohio farmers

What has been done

Change of practices

Results

Improved farm economics, environmental awareness, social sustainability

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
102	Soil, Plant, Water, Nutrient Relationships
601	Economics of Agricultural Production and Farm Management
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
- Public Policy changes

Brief Explanation

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

Increased learning, requests for more information

Key Items of Evaluation

Number of participants, increase of knowledge, changed practices

Program #34

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 Sources	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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	10.0	0.0	0.0	0.0
Actual	0.5	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
20719	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
20719	0	0	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

The program ended a 3 year cycle in 2007.

In 2008, opened registration for Veterinary practitioners to a professional educational program aimed to revitalize research-based knowledge/skills. Eleven 3-day modules were prepared to bring participants together in a step wise comprehensive program focused on dairy production medicine. Expert speakers were recruited to interact in a face-to-face environment with the new group in 2009. An e-mail listserv is used to allow participants to communicate with each other at any time over the three year period.

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	25	0	0	0
2008	0	0	0	0

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

Patent Applications Submitted

Year Target

Plan: 0

2008 : {No Data Entered}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	{No Data Entered}	{No Data Entered}	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of participants at each session

Not reporting on this Output for this Annual Report

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

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Better understanding of economics, nutrition, milk quality, cow comfort, and facilities; Interpersonal & Leadership skills; and Business & economic skills

Not reporting on this Outcome for this Annual Report

Outcome #3

1. Outcome Measures

A thorough understanding of all aspects in a modern dairy operation

Not reporting on this Outcome for this Annual Report

Outcome #4

1. Outcome Measures

Participants recognize OSU as leader in area

Not reporting on this Outcome for this Annual Report

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

Not reporting on this Outcome for this Annual Report

Outcome #6

1. Outcome Measures

Improved economic viability for dairy veterinary practitioners and their dairy clients

Not reporting on this Outcome for this Annual Report

Outcome #7

1. Outcome Measures

Improved milk quality on client farms

Not reporting on this Outcome for this Annual Report

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Other (Extremely Busy People)

Brief Explanation

{No Data Entered}

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 #35**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: 2008	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
145034	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
145034	0	0	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**

- 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 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.

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
2008	2100	10000	25	1000

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	1	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Standard evaluation of materials and workshops

Year	Target	Actual
2008	50	150

Output #2

Output Measure

- Database of individuals contacted with appropriate demographics

Year	Target	Actual
2008	50	25

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
2008	2	2

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
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Protection of water, soil, and air resources in agricultural production is a priority for livestock and agronomic entities as well as the local and state-wide communities they serve. Environmental compatibility and compliance in agricultural production will result in enhanced water and soil quality and reduce air quality concerns resulting in a direct, positive influence on the natural resources that support all Ohio citizens. Adaptation of best management practices and new technologies to support environmental sustainability requires a commitment toward cutting edge basic and applied research as well as use of appropriate mechanisms to deliver research results through high-quality, meaningful educational programs that target specific audiences and deliver material in a ready-to-use, easy to access manner.

What has been done

A number of educational and demonstration programs were offered in 2008 that directly focused on the impact of livestock on the environment. These programs included the following events, including the number of participants directly influenced by the program: Certified Livestock Managers training (n = 150) directed at compliance with existing laws for CAFO and AFO operations in Ohio. Mortality Composting Certification (n = 173) addressing proper disposal of production mortality on livestock and poultry operations. Ohio Livestock Environmental Assurance Programs (n = 100) offered as on-line and in-person training in the principles of effective animal and environment interactions. Air Quality and Ventilation Training (n = 190) program directed toward improvement of air quality within and outside of swine production units as related directly to pig and human health, cost of heating and cooling, and mitigation of air quality issues from swine operations. Manure pit and lagoon cover workshop (n = 75) directed toward the establishment of optimal methods of reducing odor and gas emissions from manure storage facilities as well as establishing efforts to work with carbon credits.

Results

Results from the 2008 efforts include collection of program reviews which provided answers to questions regarding the value of the programs, speakers, technologies, and practices that would be observed at the farm level production site. Surveys of Ventilation Training workshops indicate that over 1/3 of the Ohio's annual pig production was represented by the attendees to the work shops and that realized economic impacts would average over \$1000 per person in attendance.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
401	Structures, Facilities, and General Purpose Farm Supplies
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
307	Animal Management Systems

Outcome #2

1. Outcome Measures

Implementation and increased use of developed, science-based systems models and technology.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Science-based research is the guiding force to effective educational programs and adoption of new technologies at the livestock production level. Use of sound science in design and implementation of research as well as a guiding factor in education serves the livestock producer, allied industry consultant, and governmental policy makers in decision making processes that will assure the public that these animal enterprises meet strict environmental guidelines.

What has been done

Recent research conducted through Ohio State University Extension has focused on application of manure to growing crops (wheat and corn) with new technologies being tested and application rates evaluated in relation to crop yields. These data have allowed for enhanced understanding of rates of manure application and timeliness of application in relation to crop development. Manure Science Review (n = 350) has served as a method of demonstration of on-farm technologies and delivery of manure management information to livestock producers. Farm Science Review (n=750) manure management and application demonstrations have focused on injection methods to reduce odor and loss of nutrients to the air.

Results

In 2008, ten educational workshops were held to discuss Swine Facility Ventilation Training with 190 participants and over 1/3 of the Ohio's annual pig production represented. Certified Livestock Training programs (n= 150 participants) utilize the latest in manure management, applications, and nutrient utilization information for Ohio's largest livestock enterprises. A Manure Covers program (n = 75 participants) was developed to address odor dissipation and nutrient recovery options for improvement of air quality within Ohio. A conservation tillage expo (n=700 participants) and education program was held to provide demonstration access to technology to combine agronomic practices with manure/nutrient management practices in Ohio

4. Associated Knowledge Areas

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities
112	Watershed Protection and Management
102	Soil, Plant, Water, Nutrient Relationships
404	Instrumentation and Control Systems
302	Nutrient Utilization in Animals
401	Structures, Facilities, and General Purpose Farm Supplies
307	Animal Management Systems
141	Air Resource Protection and Management
133	Pollution Prevention and Mitigation

Outcome #3

1. Outcome Measures

Protect the environment from degradation due to livestock production.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Livestock production, like any other industry, has a significant role in the quality of the natural environment that serves all of human and animal kind. Livestock producers are interested in assuring that the environment in which the live supports the greater good of society. To maintain a workable and sustainable environmental balance, livestock producers are actively seeking training, education, and knowledge regarding the tools, technologies, and science necessary to complement a strong, environmentally sustainable, profitable livestock enterprise. Cooperation between livestock and grain production is now on the rise as the natural resources and nutrients consumed and nutrient output in the form of manure from livestock production are now being judiciously utilized as fertilizer in replacement of chemical or fossil-fuel based alternatives. Community support for livestock production is also a focus for the industry, as the need to communicate and be a good neighbor is a priority.

What has been done

Proper disposal of livestock mortalities is critical to environmental compliance. Through OSU Extension efforts detailed Livestock Mortality Composting programs (n = 173 participants) have been offered at the local level to assure both training and certification of operators. Communication with the constituents, producers and allied industry supports enhances the effectiveness of education efforts. Through the Farm Science Review (n = 300), Manure Science Review (n = 350), Livestock Environmental Assurance (n=100) and the Conservation Tillage Conference (n = 700), OSU Extension Professionals have met with, taught, discussed, demonstrated, and surveyed key producers, citizens, political officials, and youth on the critical issues related to environmental compatibility, economic stability, production efficiency, and community responsibility.

Results

Through the strong, timely programs offered through OSU Extension 150 livestock producers representing Ohio's largest farms have received state-mandated education and certification through the Certified Livestock Managers Training program. Mortality Composting Training has resulted in 173 new certified production entities within Ohio for the 2008 calendar year. Over 100 producers have become certified in the Ohio Livestock Environmental Assurance Program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
401	Structures, Facilities, and General Purpose Farm Supplies
404	Instrumentation and Control Systems
141	Air Resource Protection and Management
112	Watershed Protection and Management
405	Drainage and Irrigation Systems and Facilities
102	Soil, Plant, Water, Nutrient Relationships
307	Animal Management Systems
302	Nutrient Utilization in Animals

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

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)

Evaluation Results

Primary assessment tools utilized to measure impact have been surveys of attendees. Through these surveys, various measures of impact were assessed including assessment of intended changes in practices, appropriateness of topics, speaker evaluations, and suggested topic needs. In addition, producers in the Ventilation Trailer Workshops were asked to assess the impact of ventilation changes on their swine production enterprise. In 2008, the total value was estimated to be over \$200,000 or an average of over \$1000 per attendee.

Key Items of Evaluation

Efforts to conduct additional, more detailed survey instruments are underway. Included will be attempts to complete follow up surveys of producers to more accurately assess economic impact and assurance of environmental compliance.

Program #36**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	10%		10%	
133	Pollution Prevention and Mitigation	10%		10%	
135	Aquatic and Terrestrial Wildlife	10%		10%	
136	Conservation of Biological Diversity	5%		5%	
511	New and Improved Non-Food Products and Processes	15%		15%	
605	Natural Resource and Environmental Economics	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	4.3	0.0	1.3	0.0
Actual	4.5	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
186472	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
186472	0	0	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**

- 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 who are interested in learning more about their woodlands and how to manage them 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/companies/enterprises who utilize forest resources in the production of a marketable product including paper mills, saw mills, loggers, timber buyers, consulting foresters, Christmas tree producers, maple product producers, 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	6000	33000	0	0
2008	5200	43570	160	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1**Output Measure**

- Develop curriculum – We plan to continually update the curriculum to meet the changing needs of our clientele. As an example, curriculum development is currently in process for programs addressing 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
2008	15	9

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
2008	30	24

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
2008	3	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
2008	3	3

Output #5**Output Measure**

- Provide web site for information dissemination and workshop registration – The Ohio Woodland Stewards website provides fact sheet and bulletin informational links along with electronic versions of the newsletter, programming calendar, links to supplemental websites, and online class and workshop registration. Visitors to the site are tracked according to the web site server log

Year	Target	Actual
2008	1	1

Output #6**Output Measure**

- Conduct research in support of programming efforts – research focusing on the impact of woodland management practices on the character of the resulting woodlands, the impact of EAB, the management and impact of selected wildlife species, and Christmas tree and maple production practices that increase the efficiency and economic returns of these enterprises.

Year	Target	Actual
2008	3	3

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, the Ohio Forestry Association, and a variety of other Federal, State, and local agencies and organizations and commodity associations to more increase impact of educational programming.

Year	Target	Actual
2008	15	15

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
2008	2	10

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	A major goal is to provide information to our clients enabling them to make informed decisions concerning the management of their natural resources and, where appropriate, connect them with professionals who can provide individual assistance.
2	An increase in the number of natural resource managers developing a management plan for their woodland or woodland enterprise.
3	An increase in the number of woodland owners seeking professional assistance when marketing timber, an increase in the number of individuals receiving information on which to base management decisions concerning their forest resource based enterprise.

Outcome #1**1. Outcome Measures**

A major goal is to provide information to our clients enabling them to make informed decisions concerning the management of their natural resources and, where appropriate, connect them with professionals who can provide individual assistance.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	3000	2800

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Most private non-industrial woodland owners need technical information to effectively manage their woodlands.

What has been done

24 workshops were delivered providing technical forest management information to Ohio's private non-industrial woodland owners.

Results

In evaluations, attendees reported receiving extremely valuable information that would aid them in making and implementing management decisions on their forests.

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
125	Agroforestry
135	Aquatic and Terrestrial Wildlife
123	Management and Sustainability of Forest Resources
605	Natural Resource and Environmental Economics
133	Pollution Prevention and Mitigation
136	Conservation of Biological Diversity
511	New and Improved Non-Food Products and Processes

Outcome #2**1. Outcome Measures**

An increase in the number of natural resource managers developing a management plan for their woodland or woodland enterprise.

Not reporting on this Outcome for this Annual Report

Outcome #3**1. Outcome Measures**

An increase in the number of woodland owners seeking professional assistance when marketing timber, an increase in the number of individuals receiving information on which to base management decisions concerning their forest resource based enterprise.

Not reporting on this Outcome for this Annual Report

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

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)

Evaluation Results

Written evaluations of the effectiveness of individual programs are carried for each program; results are used to modify / improve subsequent offerings. During 2008, evaluations of programs and presenters centered around 3.6 on a scale from 1 (low) to 4 (high). An extensive, in-depth evaluations of overall program (from 1991 to present) will be undertaken during 2009.

Key Items of Evaluation