2008 Virginia Polytechnic Inst. & State University and Virginia State University Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

Virginia Cooperative Extension (VCE), a partnership between Virginia Polytechnic Institute and State University (VT) and Virginia State University (VSU), the Virginia Agricultural Experiment Station (VAES) and the Virginia State University Agricultural Research Station (VSUARS), enables people to improve their lives through research and education using scientific knowledge focused on the issues and needs of the citizens of Virginia. Recognizing that knowledge is power, VCE serves people where they live and work. Audiences are involved in designing, implementing, and evaluating needs-driven programs. VCE is a dynamic organization which stimulates positive personal and societal change leading to more productive lives, families, farms, and forests, as well as a better environment in urban and rural communities.

VCE's GOALS are to: 1) develop and transfer new knowledge in applied and basic life sciences, 2) perform relevant, objective, and timely research, 3) improve the quality of life for communities and citizens in the Commonwealth, 4) use a systems approach to programming, with task-oriented work teams that respond to the needs of individuals, groups, and organizations, 5) work with at-risk, underserved, and underrepresented audiences who need specialized attention, 6) fully integrate a culturally diverse paid and volunteer staff in planning, implementing, and evaluating programs, and 7) recruit and collaborate with public and private partners to better utilize resources, heighten impact, and reach a more diverse audience.In particular, VSU's Extension program goals are to: 1) improve local and state economies by helping small and limited-resource farmers and citizens garner resources to own, operate, and sustain small businesses, 2) educate and empower socially disadvantaged farmers to produce, distribute, and market, organic, locally grown, and ethnic foods to feed Virignia's citizens, 3) ensure safe food supplies by teaching small-scale growers and farm families effective food safety practices, 4) address health issues and nutrition practices that confront limited-resource urban and rural citizens, 5) help youth, families, and seniors manage money to survive during challenging economic times, and 6) enable parents and families to leave their children in high quality and safe child-care environments.

PLANNING AND REPORTING: VAES, VSUARS, and VCE address a broad range of problems and issues facing citizens of Virginia through focused research and educational programming. This is accomplished and reported in VAES through the Current Research Information System (CRIS) and the College of Agricultural and Life Sciences planning and reporting system (eFARS). This system used by VT and VSU faculty, includes annual program plans and reports focused on faculty goals, programs, outcomes, outputs, and other data. This system also provides accurate FTEs, contacts, outputs, and outcomes for each planned program. The foundation for research and Extension programs are built on identification of strategic issues through an annual situation analysis. This analysis is accomplished with the help of local advisory groups including Extension Leadership Councils and trends and emerging issues identified by Extension specialists. Situation analysis is a process of collaboratively determining what problems exist at local, regional, and state levels, and then deciding which ones are issues of major public concern. This analysis becomes the background and rationale for deciding which problems and issues will be addressed and reported on by VAES, VSUARS, and VCE.

VAES, VSUARS, and VCE GOALS: Strategic goals form the foundation for research and educational program development. Goals are determined with the involvement of advisory groups. This year's goal areas included: 1) agricultural and environmental sustainability, 2) food, nutrition, and health, 3) biodesign and bioprocessing, 4) the green industry, 5) infectious diseases, and 6) community viability. The VSUARS in particular provides knowledge and technology to small-scale and limited-resource farmers and rural communities to enable them to produce abundant and safe food, while enhancing their economic well-being and quality of life. The primary research goal overall for Virginia is to develop relevant basic and applied research data to form the basis for Extension programming. A wide range of long and short term research projects are undertaken to provide a continuous flow of new or more fully developed knowledge to provide science-based information to enhance the quality of life for citizens. The overall education goal is to bring about change in people's knowledge, understanding, abilities, or behavior related to an issue and/or broader changes in economic, environmental, or social conditions. Progress towards these goals is recorded by planned program at the individual and team levels.

REPORTING REQUIREMENTS: All Extension faculty (agents, specialists, and administrators) and program assistants submit individual program reports. Also, county/city employees supervised by VCE and conducting Extension programs submit annual program reports. Summary reports are developed from the individual reports. All research faculty are required to propose peer reviewed Experiment Station projects submitted to USDA/CSREES, and entered into CRIS. Researchers prepare annual progress and termination reports reviewed by the VAES director before being submitted to CRIS. In addition, all research and Extension faculty are required to submit an annual report through eFARS. This locally developed system documents teaching, research, and Extension accomplishments and impacts for individual, unit, college, and organizational review. Updates to eFARS and contact reporting in 2008 continue to better align planning and reporting with the ten planned programs presented in this report.For example, for a number of planned programs, projected direct and indirect contacts were greatly inflated compared to

the actual number of contacts reported. The reporting system is now aligned to insure more accurate baseline, actual, and projection contact data.

In response to CSREES and external merit reviews of the 2007 report and the 2009-2013 plan of work for Virginia, the number and type of outcomes for some planned program teams has been changed. Therefore, a number of the outcomes originally planned for 2008 are not reported on and more appropriate outcomes have been added.

Total Actual Amount of professional FTEs/SYs for this State

Year:2008	Extension		Research	
	1862	1890	1862	1890
Plan	350.5	11.8	197.0	10.3
Actual	375.1	15.9	209.9	13.5

II. Merit Review Process

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

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

2. Brief Explanation

This year, a merit review was initiated with Tennessee and Maryland. Planning and reporting experts reacted to the Virginia planning and reporting efforts. The review recognized areas of excellence, and areas for improvement. Suggestions were incorporated into this year's planning and reporting. Additional merit review efforts are listed below.

Review Process for Research

Virginia Agricultural Experiment Station

Rationale and Review Committee Structure - Research under the Hatch, McIntire-Stennis, and Animal Health and Disease Acts is conducted in three colleges that constitute the Virginia Agricultural Experiment Station (VAES): 1. College of Agriculture and Life Sciences, 2. College of Natural Resources, and 3. Virginia-MarylandRegionalCollege of Veterinary Medicine.

For each VAES project proposal submitted, the assistant or associate VAES director in the project leader's college chairs the review (hereafter referred to as the chair). The chair selects the project review committee consisting of three or more members proficient in the subject of the proposed project. They may be chosen from outside the university if recommended by the department/unit head or deemed appropriate by the chair. Faculty from other units within the university may be eligible for VAES support. This research is reviewed by this policy, must fit within the mission of VAES, and is approved by the director. The VAES director or College of Agriculture and Life Sciences assistant director or associate director chairs the project review committee.

Proposal Development - The project leader prepares the proposal as specified in Essentials of a Project Proposal in the Administrative Manual for the Hatch (Experiment Station) Act as Amended, the Administrative Manual for the McIntire-Stennis Cooperative Forestry Program, and the Administrative Manual for the Continuing Animal Health and Disease Research Program (1992), Appendix F. Early in the new project development process, the project leader isstrongly encouraged to initiate a subject search using the USDA/CSREES Current Research Information System (CRIS).

The proposed research project should be reviewed by a statistician to assure the experimental design and statistical analyses are adequate. The project leader may meet with a member of the StatisticsConsultingCenter or the department/unit head may designate someone with statistical expertise to serve as a departmental reviewer. The project leader then submits the proposal to his/her department/unit head for peer review in accordance with departmental procedures. If the research involves animals, human subjects, or recombinant DNA, the project leader is responsible for submitting the required protocol forms to the appropriate university review committee(s). Proposals are not forwarded to USDA/CSREES without required approvals.

Proposal Submission and Review Procedures - The department/unit head transmits the departmentally approved project proposal to the chair of the project review committee for that college with the following items transmitted to the chair electronically: 1.) Four copies of the proposal (if not transmitted electronically), 2.) Four copies of the project leader's vita [2-page maximum] (if not transmitted electronically), 3.) The Project Certification Form, 4.) A Research Project Review Form, 5.) Verification of statistical review, and 6.) List of three or more suggested peer reviewers. The chair selects reviewers and distributes copies of the proposal to the Project Review Committee, which returns the Project Review Forms and comments to the chair by a specified date (after at least three weeks).

Proposal selection criteria include: 1.) proposed research relevance to the goals of the department and college, the needs of the people the research would serve, and the priorities established by task forces, work groups, or commodity research committees, 2.) objectives and procedures are clearly stated, 3.)the proposed duration is realistic for the proposed research, 4.) the appropriate or desirable individuals are cooperating on this project, 5.) the project lists impacts to Virginia (and elsewhere) or anticipated economic importance, and 6.) the project leader's vita indicates the level of competence required for the proposed research.

Each reviewer recommends the proposal be: 1.) approved with no changes, 2.) approved with minor changes, 3.) revised and resubmitted, or 4.) rejected.

The chair convenes the committee, the project leader, and the department head to review the proposal. The chair forwards reviewers' comments to the project leader and department head prior to the oral review. The oral review may be omitted for revised/replacement projects, at the discretion of the chair, if a majority of the review forms are checked by the reviewers as "approved with no changes" or "approved with minor changes." If an oral review is not conducted, the chair provides a written summary of the review committee comments to the project leader with a copy to the department/unit head and the review committee. An oral review is required for a project leader’s initial VAES Project.

Faculty located at off-campus Agricultural Research and Extension Centers (ARECs) submit proposals to the center director who contacts the appropriate department head on campus regarding departmental policy for securing a peer review before the proposal is sent to VAES for review. The center director forwards the proposal and departmental review, if applicable, to the VAES director, who serves as chair. The chair forwards the proposal to the review committee and the subject-matter department head, who is invited to attend the oral review.

Final Submission - The project leader complies with the recommendations of the Project Review Committee and submits the revised proposal to the department/unit head, accompanied by a letter delineating the changes made in response to the recommendations of the reviewers and/or a rebuttal for any recommendations, which the Project Leader does not accept. The project leader enters CRIS Forms AD-416 and AD-417 on the CRIS website.

The chair signs Form AD-416 and transmits the above items to the VAES director accompanied by a letter listing names of the reviewers and date of the oral review (if applicable). For McIntire-Stennis proposals, the Administrative-Technical Representative (A-TR) must sign Form AD-416, certifying the proposal complies with the purposes of the McIntire-Stennis Act.

The VAES director meets with the chair, department head, and project leader if there are any questions or concerns. When the project leader, the department/unit head, the chair of the project review committee, and the director agree the proposed project should be accepted, the director approves it, assigns a project number, enters Form CSREES-2008, and transmits the proposal, CRIS Forms AD-416, AD-417, and CSREES-2008 electronically to CRIS/CSREES/USDA. The CSREES project reviewer may contact the director, assistant/associate director, or project leader with questions or for additional information. If a proposed project is deferred, the CSREES project reviewer notifies the director, who confers with the project leader, department/unit head, and chair of the project review committee to resolve concerns.

After approval by CSREES, the director sends copies of Forms CSREES-166 (Project Review and Comment Sheet), AD-416, AD-417, and CSREES-2008 to the chair of the project review committee, department/unit head, and project leader. These documents, the proposal, and all pertinent correspondence are retained in the official project file in the VAES director's office for three years after termination of the project.

Program Review of VSU Agricultural Research

In March 2007, all programs at the School of Agriculture including those in Agricultural Research were reviewed by external experts. A six-member team selected by USDA-CSREES visited VirginiaStateUniversity to conduct the review over a four-day period. The team reviewed programs, listened to faculty presentations, visited facilities, and talked to administrators. At the end of their visit, they made an oral presentation of their findings to faculty, staff and administrators. They also submitted a written report on the state of the School of Agriculture programs and made recommendations on the future direction of agricultural research at VSU. Implementation of these recommendations has already started.

Development of Proposals - Any applicant at ARS who desires to submit a proposal for consideration must first complete and submit a Request for Approval to Submit Proposals Form to the Director of Research. The Director of Research reviews the pre-proposal and notifies the applicant about a decision whether the proposal can be developed fully or not. All appropriate University and funding agencies' policies, procedures and guidelines should be adhered to when developing a proposal. Proposal development and submission deadlines are governed by the following: 1) Review and approval of Request for Approval to Submit Proposal Form takes one working day, and 2) University review and approval takes up to five working days.

Review of Full Evans-Allen Proposal - A full proposal is submitted by applicant(s) to the Director of Research for review by external anonymous experts in the respective fields. The Director of Research’s Office facilitates this process. The reviewers could be from Virginia Tech, other Land Grant Universities, or State and Federal agencies. The proposal is reviewed for addressing the needs of the state and people of Virginia and the United States, the degree of relevance of the proposed research to the land-grant mission and priorities of the University, the need for initiation of research in new areas, and other matters related to grantsmanship. The reviewers are asked to pay particular attention to scientific and technical merit, opportunities for cooperation in the proposed research with other individuals and units within the University and the Virginia clientele.

Functions of the reviewers are: 1) to review all proposals for scientific and technical merit, 2) to ensure that all proposals fulfill the land-grant mission and priorities of the University, 3) to ascertain that what is being proposed lies within the full range of expertise and capability of the investigators and the University, not withstanding their official duties, responsibilities, and assignments, and 4) to assist applicants with acceptable proposals in locating outside peers to further review the proposals, if necessary for substance and overall quality. Based on the external reviewers’ comments, the Director advises the applicant to address the concerns about the proposal or develop another one that incorporates the relevant suggestions.

Extension Review Process

The review process for Extension covers all programs conducted by VCE. VCE Planned Program Teams (PPT) develop Extension programs. The PPTs review programs on an annual basis and make decisions to maintain, modify, or create new programs to meet the needs identified through external and internal stakeholder input. An annual situation analysis conducted by local Extension units with volunteer Extension Leadership Councils and other groups and a booklet of emerging trends and issues provided by specialists informs this process. Details on the annual programming cycle is found at: http://www.ext.vt.edu/vce/support/documents/VCEProgCycleTasksandActionSteps7-28-08.pdf

VCE addresses a broad range of problems and issues facing citizens of the Commonwealth through focused educational programming. This is accomplished and reported through VCE's ten PPTs and State Program Leaders who serve as partners for each PPT. A web-based planning and reporting system organized by the ten PPTs includes outputs and outcomes operationalized by annual program plans and reports. Plans are built on strategic issues through situation analysis. This process collaboratively determines social, economic, and environmental problems at local, regional, and state levels. This becomes the background and rationale for deciding which problems and issues will be addressed with VCE time, energy, and human and fiscal resources.

Problems and issues identified through situation analysis are communicated throughout VCE and educational program plans are developed by interdisciplinary PPTs composed of specialists and agents. These teams are organized around and reflect the breadth and scope of priority problems and issues facing the citizens of the Commonwealth. Program proposals identify programming outputs, outcomes, and an evaluation plan to be conducted by the PPTs. The program proposals are reviewed by VCE programming leadership.

Program proposals from PPTs are distributed to all agent and specialist faculty on the VCE intranet and electronic planning

"buy in" process. Faculty select programs for their situation by providing specific information, including the amount of time they plan to devote to the program. At the end of the year, each local unit and campus faculty member completes an annual accomplishment report documenting program relevance, response, and results through a narrative and impact statements.

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 selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Other (focus groups, listening sessions, issue forums, key informant interviews)

Brief Explanation

Virginia Cooperative Extension works with stakeholders to receive input though local Extension Leadership Councils and many other citizen groups at local and regional levels.The citizen groups reflect the socio-economic composition of their communities and focus on conducting programs which produce outcomes based on priority needs.

A systematic analysis of educational needs is integral for VCE program planning. Through situation analysis, needs of stakeholders are assessed, analyzed, and then shape program direction and plans. Traditional methodologies include surveys, key informant interviews, issue forums, listening sessions and focus group interviews. To encourage participation, surveys are conducted with paper and web-based response options. Issue forums, listening sessions, and focus group interviews are held in multiple locations throughout service areas in convenient and comfortable environments for non-traditional and traditional stakeholders. Specific efforts are made to assess needs where underrepresented populations reside, and to market input sessions through communication channels used by targeted sectors of the population.

In 2008 VCE updated its situational analysis in all 107 units. Based on the situational analysis, the 10 leading state issues were Positive Youth Activities, Profitable Agriculture and Natural Resource Production, Diet, Health, and Nutrition Across the Lifespan, Family/Business Money Management, Agriculture and Natural Resource Water Quality Issues, Parenting/Child Development, Life Skills/Decision Making, Future Land Use, Before and After School Youth Programming, and Teen Leadership and After School Programming.

Representation on local Extension Leadership Councils (ELCs) include all VCE programming areas – 4H/Youth Development (4H), Family and Consumer Sciences (FCS), Agriculture and Natural Resources (ANR), and Community Viability.Currently, all 107 Extension units in Virginia have an organized local ELC and all Agriculture Research and Extension Centers (ARECs) have active advisory councils.

At the state level, VCE works with stakeholders through the state Leadership Council (VCELC). The group includes volunteers representing 22 planning districts in Virginia, at-large members appointed by the director of VCE, leaders representing Virginia'sdiverse population, businesses, agencies, organizations, VCE District Directors, chairs of VCE FCS, and 4H leadership councils, VCE Director from VT, VCE Administrator from Virginia State University, and deans of VSU and VT Colleges of Agriculture including the associate dean for research.

State and local ELC meetings are held at times and locations convenient for the membership. To increase participation, state ELC members were surveyed for preferred meeting times, days of the week, and meeting frequency. Virginia is a large, diverse state and as such, meeting locations are geographically distributed to ease travel burdens for members. Travel expenses are covered by VCE administration for meeting attendance. A faculty member works directly with the VCELC to assist with organizational development and logistics.

The VSU Extension program works with stakeholders through the VCELC for the systematic analysis of educational needs to plan Extension programs. To ensure that adequate stakeholder input is received from limited-resource and underserved audiences, VSU Extension is also informed by a VSU Agricultural Advisory Committee. Formed in 2008, the 15-member committee consists of members from agricultural commodity groups, the agri-business community, and public education. Other members include Extension professionals and volunteers, farmers, and a local legislator who advocates for the VSU School of Agriculture. All members work closely with or are aware of the needs of VSU's clients. The Agricultural Advisory Committee informs teaching, research, and Extension programs within the School of Agriculture. VCE advisory committee member guidelines were used as a basis for selecting VSU Agriculture Advisory members. Committee members represent the Extension program areas of 4-H, agriculture and natural resources, and family and consumer sciences and are invited to serve by the Extension Administrators and Dean of the School of Agriculture.

VCE and the ARECs have long facilitated grassroots involvement, buy-in, and ownership in local programs. VCE formally connects with the grassroots of the state through partnerships with local volunteer ELCs. For the Virginia Agriculture Experiment Station (VAES), volunteer advisory councils provide stakeholder input. These partnerships represent the diversity of local clientele, communities, and industries across the Commonwealth.

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 External Focus Groups
- Open Listening Sessions
- Use Surveys
- Other (Extension Leadership Councils)

Brief Explanation

The Virginia Agricultural Experiment Station (VAES) conducts research relevant to the needs and priorities of the citizens of the Commonwealth. Research projects are established based on the input of advisory committees at each of the thirteen Agricultural Research and Extension Centers (ARECs) distributed across the state. The twelve academic departments within the College of Agriculture and Life Sciences each maintain stakeholder groups and the College has its own advisory committee of producers, commodity groups, and agribusiness leaders that provide important feedback to VAES.

VAES provides research-based input to the VCE programming process through faculty research and Extension specialists and administratively through AREC directors and statewide Extension program leaders. VCE formally establishes connectivity with thegrassroots of the state through partnerships known as Extension Leadership Councils (ELCs). At the local level, this partnership represents the diversity of each county and city in which VCE exists as a resource.Representation includes VCE programming areas (4-H/Youth Development, Family and Consumer Sciences, Agriculture and Natural Resources and Community Viability), community leaders, and other organized community, agricultural, and youth associations and entities who partner with VCE.

Extension staff and Leadership Council members work as equal partners to determine needs, establish program priorities, plan and implement solutions, identify and secure resources, market VCE and its programs, and evaluate and report program results/impacts to program stakeholders.Currently, all 107 Extension units in Virginia report having an organized local ELC.At the state level, local connectivity is achieved through the Virginia Cooperative Extension Leadership Council (VCELC). The partnership includes volunteer leaders representing the 22 planning districts of Virginia, at-large members appointed by the director and administrator, all VCE District Directors, all chairpersons of VCE state program leadership councils for FCS and 4-H, the VCE Director (VT), the VCE Administrator (VSU), the director of governmental relations at VT, and the deans of the 1862 and 1890 land grant colleges.

Extension provides a formal mechanism for VSU and VT to receive stakeholder input for Extension and research programs.The situation analysis process in communities examines and determines what issues, problems, and opportunities exist that VCE resources should address(http://www.ext.vt.edu/vce/support/process/situation.html).An essential component of the process includes development of a unit profile (http://www.ext.vt.edu/vce/support/unitprofiledata.html). The unit profile developed by local agents is shared with ELCs to determine which key informants should be involved in situation analysis (http://www.ext.vt.edu/vce/support/keyinterviews.doc).

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
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting specifically with non-traditional groups
- Other (focus groups, key informant interviews, public issues forums, listening sessions)

Brief Explanation

Following identification of primary and secondary audiences for Extension programming, Extension faculty focus on understanding the nature of challenges and opportunities facing the unit from a community and resident perspective. This situation analysis activity assesses peoples' knowledge, attitudes, and other perspectives on issues and problems they think impact their lives both positively and negatively. In addition, the situation analysis allows the ELC to connect with groups, agencies, and organizations to form collaborations to address the issues and problems expressed. Four methods (http://www.ext.vt.edu/vce/support/process/situation.html#needs) are utilized for assessing community and resident perspectives:

1) public issues forums/listening sessions, 2) focus Groups, 3) key informant interviews, and 4) surveys

See stakeholder input, page one for specific examples.

3. A statement of how the input was considered

- In the Budget Process
- To Identify Emerging Issues
- In the Action Plans
- To Set Priorities
- Other (staff professional development)

Brief Explanation

A VCE situation analysis process systematically analyzes demographic, economic, agricultural, health, environmental, and other factors affecting people and their communities. Each VCE unit conducts and updates a formal situation analysis annually. This analysis serves as a major foundation for educational program planning throughout VCE. Extension staff and ELC members work together in the situation analysis process to determine needs and then establish program priorities, plan and implement solutions, identify and secure resources, market VCE and its programs, and evaluate and report program results/impacts to program stakeholders.

A variety of people representative of the population are involved in the situation analysis process. Deciding "what should be" or "which is more desirable" of several program options through the consensus judgments made by individuals. Both users and nonusers of VCE are vital participants in situation analysis. An aggressive recruitment effort ensures underserved groups and minorities are represented in the process.

From the research perspective, each AREC with its respective advisory council conducts a research and educational needs assessment. This assessment mirrors the VCE situation analysis process.The communities of interest include a wide variety of commodity and agricultural associations including those groups representing fruit, vegetable, forage, field crop, poultry, livestock, agri-business, crop protection, biological farming, aquaculture, equine, nursery, and processed food industry interests.

In 2008 key stakeholders including the Virginia Agri-business Council, Virginia Farm Bureau, and area producers received on-site tours of each of the 13 ARECs in Virginia.This included demonstrations and discussions of current projects and programs and listening sessions to receive input and identify needs.

Each of the 13 ARECs also hosted one or more field days to showcase projects and results to the public.The plots and projects are toured, the latest research is presented and discussed, and input is solicited from stakeholders to assess future needs.

VCE agents also gather stakeholder input through local government reports. Although county and city governments differ on preferred report formats, timing, and audience, these reports inform governmental officials and constituents of VCE educational programming efforts and allows them to provide direct feedback on educational needs.

The College of Agriculture and Life Sciences conducts listening sessions with key stakeholders and agricultural commodity groups to ensure stakeholder input at the college level. These individuals and groups have a direct link and relationship to the work of the College, including VCE and VAES. Each professionally facilitated session uses similar formats including requesting input about perceptions of the College programs and questions applying specifically to stakeholders and their industry needs. This process provides information specific enough to take appropriate action. College listening session questions routinely include:

1. What are your perceptions of the College programs?
2. What are the issues facing you (or your industry) and your community?
3. Who is addressing those issues?
4. Is there a role for the College in addressing these issues?The following listening sessions were conducted in the last four years with plans for follow-up sessions:

Farm Bureau Young Farmer
Poultry industry
VT College of Agriculture and Life Sciences Leadership Council
Grape and wine industry
Equine industry
Christmas Tree Growers Association
Virginia Agribusiness Council
Green Industry
Crop Production and Protection industry

Strong linkages with a wide variety of stakeholder groups are formed by VCE faculty serving as ex-officio members of local, regional and state agricultural associations. Faculty members serve on the Virginia Department of Agriculture and Consumer Service’s Board of Agriculture, the Council for Rural Virginia, the Virginia Association of Counties, the Virginia Municipality League, the State Land Evaluation Advisory Committee, The Virginia Association of Soil and Water Conservation Districts, The Foundation for Agriculture Innovation and Rural Sustainability, Virginia Agri-business Council, Virginia Farm Bureau, and many other state level organizations.Information generated by these associations, groups, and their processes are used to shape Extension and research programs in Virginia.Research and Extension faculty also serve on the Virginia Agriculture Council along with industry representatives.The council represents all producers and citizens and provides resources and inputs for research and education projects.

Brief Explanation of what you learned from your Stakeholders

In 2008 VCE updated its situational analysis in all 107 units. Based on the situational analysis and input from stakeholders the 10 leading state defined issues were Positive Youth Activities, Profitable Agriculture and Natural Resource Production, Diet, Health, and Nutrition Across the Lifespan, Family/Business Money Management, Agriculture and Natural Resource Water Quality, Parenting/Child Development, Life Skills/Decision Making, Future Land Use, Before and After School Youth Programming, and Teen Leadership and After School Programming.

Other issues selected by communities included Commercial and Consumer Horticulture, Affordable Housing/Home Maintenance, Aging/Caregiving, Career Awareness, Entrepreneurship, Youth Workforce Preparation, Alternative Agriculture Enterprises, Leadership Development/Volunteer Management, Urban and Suburban Water Quality, Food Safety/Food Preservation, Violence and Other Risk Prevention for Youth, Youth Health and Wellness, Entrepreneurship and Financial Planning, Reaching Limited Resource and Diverse Audiences, Workforce Preparation, Education for Local Government Officials, Pest Management, Farm Transition, Healthy Home Environments, Science and Technology Literacy, Cultural and Global Awareness, Farm Labor, and Healthy Relationships.

Input from stakeholder groups is considered in identifying current and emerging issues, budgeting, setting priorities for programs, and developing an implementation plan.

Extension specialists and researchers working with state associations and clientele groups identified just under 100 state program topics and issue topics which fall into the 10 planned program areas. The topics and issues created by the specialists and the state situation analysis results will be used in programming decisions by agents, specialists, program teams, and administrators.

IV. Expenditure Summary

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
6518746	1994815	4276434	2259509

2. Totaled Actual dollars from Planned Programs Inputs

	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	8958020	1127047	4290792	2259554
Actual Matching	8964653	802661	13004374	2451101
Actual All Other	21694452	385547	33537771	376583
Total Actual Expended	39617125	2315255	50832937	5087238

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

Carryover	3642868	398963	0	231964

V. Planned Program Table of Content

Program #1

V(A). Planned Program (Summary)

1. Name of the Planned Program

Agricultural and Food Biosecurity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
136	Conservation of Biological Diversity	15%	15%	15%	0%
307	Animal Management Systems	15%	15%	15%	0%
311	Animal Diseases	10%	10%	10%	0%
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	5%	5%	5%	0%
315	Animal Welfare/Well-Being and Protection	10%	10%	10%	0%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.	10%	10%	10%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	15%	15%	15%	0%
902	Administration of Projects and Programs	5%	5%	5%	0%
903	Communication, Education, and Information Delivery	15%	15%	15%	0%
	Total	100%	100%	100%	0%

V(C). Planned Program (Inputs)

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

Year: 2008	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	4.5	0.6	4.2	0.0
Actual	4.3	1.0	4.9	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**
101551	86057	73046	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
101627	67661	221384	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
245936	5000	786600	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct research studies;

Conduct presentations, workshops, meetings, trainings;

Conduct biosecurity audits;

Develop publications, curriculum, resources;

Partner with other states to develop multistate cooperation;

Provide consultation, leadership, facilitation;

Partner with the livestock, poultry, food, and horticulture industries.

2. Brief description of the target audience

Nursery/landscape personnel;

Master Gardeners;

Gardening Public;

Food Processors;

Food Producers;

Food Handlers;

Consumers;

Livestock and Poultry Producers;

Integrated Poultry Operation Personnel and Management;

Extension Educators;

Policy Makers.

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	12000	50	0
2008	915	1674	46	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	5	10	
2008	0	10	10

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational meetings, workshops, conferences, and training sessions

Year	Target	Actual
2008	60	71

Output #2

Output Measure

- Number of commercial poultry operations audited for adherence to the Virginia Poultry Federation Biosecurity Guidelines

Year	Target	Actual
2008	7	7

Output #3

Output Measure

- Number of newsletters, fact sheets, publications and other print resources

Year	Target	Actual
2008	20	12

Output #4

Output Measure

- Number of websites

Year	Target	Actual
2008	2	1

Output #5

Output Measure

- Number of research studies conducted

Year	Target	Actual
2008	4	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number of animal premises registered in conjunction with the National Animal Identification System
2	Number of commercial poultry growers adopting biosecurity practices to lower the risk of disease transmission
3	Number of food companies who register with FDA and prepare a food biosecurity plan
4	Percent reduction in the number of invasive NIS sold
5	Number of participants gaining knowledge on the invasive NIS
6	Number of VCE agents offering biosecurity trainings
7	Number of soybean growers made aware of Soybean Rust detection and control.
8	Number of projects helping farmers gain health certificates to ship fish across state lines

Outcome #1

1. Outcome Measures

Number of animal premises registered in conjunction with the National Animal Identification System

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	2000	2117

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Johne's disease is a chronic gastrointestinal disease of ruminants with significant economic impact on dairy and beef cattle operations in Virginia. There is concern the organism causing Johne's disease is involved in causation of Crohn's Disease in humans. The United States Department of Agriculture's implementation of the voluntary, National Animal Identification System will protect the health of the U.S. livestock industry and preserve consumer confidence. The pillar of this process is the registration of individual farms, or premises into a national data base.

What has been done

VCE partnered with VDACS and APHIS to carry out the Virginia Johne's Disease Control and Prevention Program. The group uses the Federal Johne's Control Guidelines to implement on-farm control programs. The educational program, National Animal Identification System, involves Extension specialists from several departments, as well as local Extension agents. The primary focus of the program has been to provide education to livestock industries regarding NAIS, and to facilitate registration of individual farms and animal premises as the first step of preparedness for NAIS.

Results

In 2008, over 2117 premises were registered.

4. Associated Knowledge Areas

KA Code	Knowledge Area
902	Administration of Projects and Programs
307	Animal Management Systems
311	Animal Diseases
903	Communication, Education, and Information Delivery

Outcome #2

1. Outcome Measures

Number of commercial poultry growers adopting biosecurity practices to lower the risk of disease transmission

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	150	250

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In Virginia, poultry and egg production contributed approximately $834 million to the economy in 2006, accounting for approximately 34% of all farm commodities. With the continuing threat of disease outbreak in the poultry industry, including widely recognized and publicized Avian Influenza (AI), the importance of biosecurity measures to prevent and limit disease spread are critical.

What has been done

A Biosecurity Audit Program was developed and is reviewed quarterly by the Virginia Poultry Disease Task Force with representatives from academia, industry, and regulatory agencies. As part of this program, commercial poultry producers in Virginia participate in biannual audits of their biosecurity practices. The external Biosecurity Audit team assesses all segments of live production for the commercial broiler, turkey, and egg producers in Virginia to identify biosecurity risks and opportunities for improvements in the control of disease outbreak or spread.

Results

In 2008, seven biosecurity audits were conducted of commercial poultry producers in Virginia. Middle management communicated that as a result of audit reports provided to each company, other company personnel and growers were educated on the identified biosecurity risks, corrective measures were taken by company personnel and growers, and awareness of biosecurity practices was increased. Audits performed this year also provided evidence that additional biosecurity practices and guidelines have been implemented in individual companies in response to suggestions and educational material provided. Since the audits were initiated, the average audit scores (percentage of maximum score achieved) of those companies participating every year have improved from 85% in 2004 to 96% in 2008.

4. Associated Knowledge Areas

KA Code	Knowledge Area
315	Animal Welfare/Well-Being and Protection

Outcome #3

1. Outcome Measures
Number of food companies who register with FDA and prepare a food biosecurity plan

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)

In accordance with federal regulations, food processing facilities must be registered for biosecurity purposes. The registration helps ensure that foods are produced in a safe, wholesome manner. Recent food borne disease outbreaks from food produced in commercial facilities has underscored the importance of this registration.

What has been done

During 2008, three training sessions were held with food processors and food distributors. The topics of these sessions included, Hazard Analysis and Critical Control Point System (HACCP), recall, and biosecurity procedures.

Results

The training sessions increased the awareness of food regulations by food producers. In many cases this was the first exposure these individuals had to food microbiology and food safety principles. Participants increased their knowledge of the value of regulations to produce products in a safe manner. Continual learning and improvement in food safety also adds economic value for the facility.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals

Outcome #4

1. Outcome Measures

Percent reduction in the number of invasive NIS sold

Not reporting on this Outcome for this Annual Report

Outcome #5

1. Outcome Measures

Number of participants gaining knowledge on the invasive NIS

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	300	300

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The USDA Risk Management Agency (RMA), which provides a crop insurance program for growers, observed that crop loss claims in legumes were mainly losses from pests and diseases. The RMA asked research agencies to develop a Pest Information Platform for Extension and Education (PIPE) program for legumes. Increased losses were suspected to involve viruses, as claims increased when the Asian soybean aphid was introduced, as it is known to transmit viruses of legumes. Virus assays by available ELISA and PCR methods are accurate and sensitive, but were judged to be prohibitively costly in time and materials to be used by the PIPE and plant disease diagnostic laboratories nationwide.

What has been done

Initial research conducted in 2007 from a USDA Critical Issues grant program enabled research by my lab and Agdia, Inc. and development of a self-contained kit that was distributed to collaborating diagnostic labs nationwide. Improvements were made in the kit and the protocol for 2008. In both years, special training modules were prepared and delivered to diagnosticians and scientists to enable them to complete assays in their labs.

Results

The capacity of diagnostic laboratories to conduct virus diagnosis was enhanced nationwide in 2007. The PIPE funded a second year of the project in 2008 to provide a repeat of the pilot year of the project, and additional assessment of the potential role of viruses in losses claimed by growers. The TBIA assay kits were used to test two samplings of over 150 sentinel plots of common bean or other cool season or warm season legumes for 4-6 viruses. In Virginia, snap beans on the Eastern Shore were sampled. The results of virus assays were linked to a web-based platform for reporting data on viruses and other diseases of legumes (http://sbr.ipmpipe.org/cgi-bin/sbr/public.cgi) and reported on a public website. Special funding allowed improvement of the assays, but were received too late in the season to make changes in the kits that were distributed. Information on virus identity and incidence, using this method of detection, will contribute to the biosecurity of the nation's legume crops, and contribute to regional and national distribution data on viruses.

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity

Outcome #6

1. Outcome Measures

Number of VCE agents offering biosecurity trainings

Not reporting on this Outcome for this Annual Report

Outcome #7

1. Outcome Measures

Number of soybean growers made aware of Soybean Rust detection and control.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In 2006 Soybean Rust was diagnosed to be the next major threat to U.S soybean production. Today the disease has made its home in the Gulf States in the U.S where weather patterns are favorable for the disease to thrive from one year to the next.

Soybeans in 2008 became the number one cash crop in Virginia and 30,000 acres were planted in Sussex in 2008. Extension Plant Pathologists are concerned about this disease attacking our soybeans. Researchers suggest the disease attacks plants during the blooming/fruiting stage and if not treated can reduce yield by 75-85%.

What has been done

Educational programs, educational newsletters and scouting techniques were initiated to assist growers with the life cycle, detection, and more importantly identifying the right class of approved fungicides to apply to soybeans when rust is close to the growing area to reduce crop loses.

Growers are urged to plant small plots of early maturing soybeans first, because they will attract the disease first before moving into larger acres of later maturing soybeans.

VCE Specialists and ANR Agents presented educational management practices at the Tri-County crop conference, pesticide recertification classes, field days and scouting techniques.

Results

For the last two years Soybean Rust was confirmed in Sussex late in the growing season, but posed no threat to the crop because the disease came in when the crop was maturing.

VCE Extension Plant Pathologists and USDA-APHIS has developed and maintained a Soybean Rust Hotline that tracks the movement of the disease during the growing season to alert Specialist and ANR Agents of outbreaks and keep growers informed.

Seventy-five percent of area growers will become more familiar with the life cycle of the disease and have a listings and rates of approved fungicides available to growers if the disease is heading to our area.

Fifty percent of area growers will learn how to scout soybeans, properly identify the disease and submit leaf samples for positive ID from the lab during the growing season. Growers were provided with research information on how to manage Soybean Rust.

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity
903	Communication, Education, and Information Delivery

Outcome #8

1. Outcome Measures

Number of projects helping farmers gain health certificates to ship fish across state lines

2. Associated Institution Types

•1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As the aquaculture industry matures, it is presented with new and challenging issues concerning the transport of fish across state lines. Viral Hemorrhagic Septicemia (VHS) epizootic has resulted in many states requiring fish health certifications based on lists of prohibited fish pathogens. These pathogens are parasitic, bacterial, and viral. Certification can be quite costly for the fish farmer. Virology, the most costly of the testing, can cost up to $2,000 per 150 fish submitted for testing.

What has been done

Virginia State University Fish Health Diagnostic Laboratory assisted producers with the certification process. The VSU Diagnostic Lab with the Maryland Department of Agriculture, Animal Health Laboratory, provided bacterial and parasitic pathogen testing at no cost to producers and diagnostic information to VDACS Veterinary Services. The VSU Lab conducted the sampling for viral testing and submitted samples to the Maryland lab.

Results

The VSU Fish Health Diagnostic Laboratory assisted fish farmers in obtaining fish health certificates, which allowed Virginia's fish farmers to ship live fish to other states for stocking. If farmers sent fish directly to the Maryland lab, virology testing would cost over $1200 for 150 fish samples. By partnering with the Maryland lab, services were provided at significantly reduced costs to participating farmers. The VSU Fish Health Diagnostic lab testing saved fish farmers between $500 and $1000 for each fish health certificate.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Competing Programmatic Challenges

Brief Explanation

Many outcomes reported against in previous years have been moved to other planned program areas.

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

1. Evaluation Studies Planned

- Retrospective (post program)
- Before-After (before and after program)
- Time series (multiple points before and after program)

Evaluation Results

Key Items of Evaluation

Program #2

V(A). Planned Program (Summary)

1. Name of the Planned Program

Agricultural Systems

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%	10%	0%
111	Conservation and Efficient Use of Water	10%	10%	10%	0%
112	Watershed Protection and Management	10%	10%	10%	0%
131	Alternative Uses of Land	10%	10%	10%	0%
205	Plant Management Systems	10%	10%	10%	0%
307	Animal Management Systems	10%	10%	10%	0%
402	Engineering Systems and Equipment	10%	10%	10%	0%
403	Waste Disposal, Recycling, and Reuse	10%	10%	10%	0%
601	Economics of Agricultural Production and Farm Management	10%	10%	10%	0%
605	Natural Resource and Environmental Economics	10%	10%	10%	0%
	Total	100%	100%	100%	0%

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	52.2	1.7	20.0	0.0
Actual	24.5	6.2	56.2	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
584219	309983	420228	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
584651	313307	1273611	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1414856	150000	8974393	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct research experiments that educate and solve applied problems;

Establish partnerships to identify needs and develop solutions;

Conduct workshops, both traditional and hands-on, and meetings to provide training for farmers and educators;

Organize and conduct state and regional conferences;

Establish on-farm demonstrations;

Develop enterprise budgets;

Develop products, curriculum, and resources for use by educators and directly by producers;

Conduct assessments as needed to evaluate progress.

2. Brief description of the target audience

Commercial producers;

4-H youth;

Master Gardeners;

State and federal agency personnel;

Extension Educators;

Policy makers;

Consumers;

Supermarket chain store buyers;

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	310000	2240000	77000	560000
2008	58477	91150	15741	2989

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	1

Patents listed

Value-added granulated organic fertilizer. U.S. Provisional Patent ARK007/08304

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	5	10	
2008	13	35	48

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educator training workshops

Year	Target	Actual
2008	24	22

Output #2

Output Measure

- Number of field research experiments

Year	Target	Actual
2008	14	26

Output #3

Output Measure

- Number of on-farm demonstrations

Year	Target	Actual
2008	14	26

Output #4

Output Measure

- Number of producer training workshops

Year	Target	Actual
2008	200	240

Output #5

Output Measure

- Number of existing and future nutrient management planners and educators trained

Year	Target	Actual
2008	400	180

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number of certified organic farms
2	Number of acres of certified organic production
3	Gross income derived from sales of organic products
4	Number of hits on Mid Atlantic Water Quality Website to increase awareness of water quality
5	Increase in the amount of land based on a percent of cropland acres, subject to best management practices (e.g., nutrient management plans, conservation plans, etc.)
6	Percent reduction in the transport of N, P, and sediment to the Chesapeake Bay and its tributaries.
7	Percent increase in gross income from non-organic farming agriculture
8	Increase in percent of cropland acres managed with reduced tillage to improve water conservation
9	Number of socially disadvantaged farmers who apply for and participate in USDA farm programs
10	Number of socially disadvantaged, beginning farmers who learn about new alternative enterprises

Outcome #1

1. Outcome Measures

Number of certified organic farms

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	130	135

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Understanding the process to transition from traditional agriculture production systems to organic and sustainable systems is difficult. Very little guidance is provided by in-state agricultural organizations. Producers need timely and accurate recommendations to help them transition to economically viable organic and alternative agriculture systems.

What has been done

Organic or sustainable agriculture operations have been provided with ongoing assistance and crop recommendations in an intensive effort to ease their organic and sustainable production costs and improve profits. Formal trainings and informal educational events have been held to train workers and stakeholders. Specialists and agents jointly provide intensive on-site recommendations.

Results

Educational efforts have helped farmers transition to, and function within organic production systems. An additional five farms joined the list of certified organic producers (from 130 to 135) with many more in the transition years. Reporting on a few case studies: Two operations have reported increased profits over the past five years in excess of 300%. One operation has gone from net sales of less than $100,000/yr. to over 600,000/yr. in five years. Three operations have reported increased sales and profitability of between 150-200%.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
205	Plant Management Systems
102	Soil, Plant, Water, Nutrient Relationships
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

Number of acres of certified organic production

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	7000	7800

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Organic production techniques and the associated ability to market products as certified organic can increase the value associated with these products.

What has been done

VCE educational events and demonstrations have been conducted to educate stakeholders and those interested in organic production. Specialists and agents work together to deliver these programs.

Results

According to the Virginia Agricultural Statistics Service, the number of acres of certified organic production in Virginia has increased from 7,000 to 7,800.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures
Gross income derived from sales of organic products

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	8000000	5000000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Organically raised products often garner a premium from consumers enhancing producer's profitability.

What has been done

Organic or sustainable agriculture operations receive ongoing assistance and crop recommendations from VCE. Specialists and agents conducted a number of training programs, field demonstrations, and experiments to support producer efforts.

Results

Total sales of organic products sold in Virginia were estimated to be $5 million last year. This is up by more than 16% over previous years.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
205	Plant Management Systems
102	Soil, Plant, Water, Nutrient Relationships

Outcome #4

1. Outcome Measures

Number of hits on Mid Atlantic Water Quality Website to increase awareness of water quality

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	4850	3962

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Water quality in the Chesapeake Bay and its tributaries is a major issue in Virginia and the Bay states. A lot of effort and tax dollars have been spent on strategies to reduce pollution to surface waters. Nitrogen, phosphorus, and sediment come from both agriculture and urban lands causing algae blooms and turbidity. All citizens need to understand their contribution to water pollution and how they can be involved in Bay restoration efforts.

What has been done

The Mid-Atlantic Water Quality Working Group developed a website as a major interface and source for water quality research and reporting for the region.

Results

In the last year, the site was accessed by almost 4000 individual users.

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
112	Watershed Protection and Management
111	Conservation and Efficient Use of Water
403	Waste Disposal, Recycling, and Reuse
102	Soil, Plant, Water, Nutrient Relationships

Outcome #5

1. Outcome Measures

Increase in the amount of land based on a percent of cropland acres, subject to best management practices (e.g., nutrient management plans, conservation plans, etc.)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	325000	340000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Chesapeake Bay Program and cooperating states seek to achieve large reductions in nutrient loadings to the Bay by 2010. In seeking to meet the Commonwealth's 2010 targets for nutrient loss reductions from crop farms, a number of best management practices (BMP's) were recommended and producers received cost share funding to implement most of them. Specifically, five BMP's have been targeted for adoption because they are believed to offer the greatest potential benefit.

What has been done

Agents and specialists conducted workshops, meetings, field days, and experiments to demonstrate BMPs to producers. These events not only demonstrated how to successfully implement these practices, but helped solve production problems that might otherwise limit adoption. The economic impacts of these practices are evaluated in most cases. Experimental data are also being collected to support the environmental benefits of these practices.

Results

Agricultural BMP's are currently cost-shared on over 40% of the acres in Virginia. These practices are probably implemented on many more acres because this approach does not account for BMP's implemented without cost share or outside programs. The adoption of agriculture BMP's has been increasing at an additional 5% of acres annually.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
131	Alternative Uses of Land
205	Plant Management Systems
102	Soil, Plant, Water, Nutrient Relationships
605	Natural Resource and Environmental Economics

Outcome #6

1. Outcome Measures

Percent reduction in the transport of N, P, and sediment to the Chesapeake Bay and its tributaries.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

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)

By 2010, Virginia is committed to making significant reductions of sediment, nitrogen, and phosphorus to the Chesapeake Bay waters. The tributary strategies developed for each major watershed are counting on agriculture to provide the largest share of reductions because pound for pound agriculture can do it more efficiently.

What has been done

Agents and specialists throughout VCE are advocating for use of no-till crop production where feasible. Studies have shown that compared to conventionally tilled fields, losses of sediment can be reduced by 99%, nitrogen by 94%, and phosphorus by 92%. A number of demonstrations detailing appropriate techniques and methods of no-till crop production have been conducted.

Results

In 2000, the Northeast Extension District had less than 10,000 acres in continous no-till crops. By 2007, a survey showed the District had increased to over 280,000 acres (83%) of total grain cropland in continous no-till. During the same time period the statewide continuous no-till crop acreage increased from 5% to 41% (440,000 acres).

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
102	Soil, Plant, Water, Nutrient Relationships
605	Natural Resource and Environmental Economics
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
131	Alternative Uses of Land
402	Engineering Systems and Equipment

Outcome #7

1. Outcome Measures

Percent increase in gross income from non-organic farming agriculture

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	7	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Improved financial security of individuals, families, and agricultural businesses is critical for the long-term economic health of Virginia. Profitable and successful farms and small businesses are the cornerstone of robust families and the communities in which they live. Crop and livestock producers need to balance farm and feed resources to maximize profits.

What has been done

Agents and specialists conducted on-farm demonstrations, field days, and workshops that demonstrated profitable practices to producers. Crop variety and management evaluations, profitable dairy production strategies meetings, beef production programs, and many other specialty crop and animal production meetings and demonstrations were held.

Results

Overall agricultural profitability has been growing, 1-8%, annual for the last several years in Virginia.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
102	Soil, Plant, Water, Nutrient Relationships
605	Natural Resource and Environmental Economics
307	Animal Management Systems
205	Plant Management Systems

Outcome #8

1. Outcome Measures

Increase in percent of cropland acres managed with reduced tillage to improve water conservation

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	50	50

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

By 2010, Virginia is committed to making significant reductions of sediment, nitrogen and phosphorus to the Chesapeake Bay waters. The tributary strategies developed for each major watershed are counting on agriculture to provide the largest share of reductions because pound for pound agriculture can do it more efficiently.

What has been done

New Kent/Charles City VCE, in partnership with Colonial SWCD, secured funds to conduct a rainfall simulation study on a field that had been in continuous no-till production for 10 years, corn, wheat and double crop soybean rotation. The study simulated a 2' per hour rainfall event on both undisturbed long term no-till soil vs. newly tilled soil at which time water samples from runoff were collected and analyzed. The undisturbed long-term continuous no-till plots reduced water runoff by 74%; reduced sediment loss by 99% (3,100 lbs. from tilled plots vs. 18 lbs. from no-till plots); reduced Nitrogen loss by 94%; and phosphorus loss by 92%. Additional funds were secured to measure water and nutrient movement down through the soils of both long-term no-till and tilled soils, to see if the nitrogen and phosphorus were leaching through the soil with the water that infiltrated instead of running off. This study showed the increase in soil organic matter, over time, in the top 2 inches of soil (1% in tilled soil vs. 2% in long-term no-till soil) in long-term no-till soil was able to bind the nitrogen and phosphorus making it available for plant uptake. Other research plots using winter annual small grains and legumes showed that timely Fall planting of rye or rye + hairy vetch could make six tons of dry matter per acre that would be recycled to help build soil organic matter. The nitrogen uptake from the rye cover exceeded 120 lbs. per acre and 250 lbs. per acre with the rye + hairy vetch, and hairy vetch alone. This nitrogen, taken up by the winter annual cover crops, was removed from potential soil leaching losses and made available for the next crop.

Results

The results from the three year cover crop study helped promote the State Best Management Practices (BMP) Cover Crop Cost-share Program in New Kent and Charles City Counties. Cover crop acreage in these counties went from 200 acres in 2004 to over 3,500 acres in 2008. At 100 lbs. nitrogen uptake per acre over 7,500 acres (3 years) means 750,000 lbs. of nitrogen were removed from the soil profile vulnerable to leaching and runoff losses. In 2000, the Northeast Extension District had less than 10,000 acres in continuous no-till crops. By 2007, a survey showed that statewide continuous no-till crop acreage increased from 5% to 41% (440,000 acres). Long-term continuous no-till cropping is proven to increase soil organic matter, trap nitrogen, prevent erosion, and help ground water recharge.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management

Outcome #9

1. Outcome Measures

Number of socially disadvantaged farmers who apply for and participate in USDA farm programs

2. Associated Institution Types

•1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	77

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the US Agriculture Census (2002), there are nearly 2,500 socially disadvantaged farmers in Virginia, including African Americans, Hispanics, Asians, Pacific Islanders, Native Americans, and women. Socially disadvantaged farmers have had limited or no access to USDA farm programs to help them successfully acquire, own, operate, and retain a profitable farm business. Understanding and access to government farm programs in a timely manner are fundamental keys to ensuring the on-going profitability and preservation of socially disadvantaged farm businesses.

What has been done

To address this issue, Virginia State University personnel have continued to promote awareness and increase participation of socially disadvantaged farmers in USDA farm programs administered by the Natural Resource Conservation Service (NRCS), Risk Management Agency (RMA), Farm Services Agency (FSA), as well as other local governmental farm and landowner incentive programs. In 2008, Virginia State University Small Farm Outreach and Technical Assistance Program conducted four regional informational meetings to provide outreach and disseminate information on USDA Agriculture Programs available to socially disadvantaged farmers

Results

As a result of this educational outreach, the program informed 287 individuals on USDA Farm Loan Programs, USDA Conservation Reserve Programs, Rural Business Cooperative Programs, and other government programs and services. Of these 287 individuals, 77 socially disadvantaged farmers received one-on-one, direct technical assistance to apply for and participate in USDA Farm Services Agency Farm Loan Programs and USDA Natural Resource Conservation Service Conservation Reserve Programs, Forestry Programs, Environmental Quality Incentives Program, and the Small Scale Initiative Program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
131	Alternative Uses of Land
111	Conservation and Efficient Use of Water
601	Economics of Agricultural Production and Farm Management
605	Natural Resource and Environmental Economics
307	Animal Management Systems
102	Soil, Plant, Water, Nutrient Relationships
403	Waste Disposal, Recycling, and Reuse

402	Engineering Systems and Equipment
112	Watershed Protection and Management

Outcome #10

1. Outcome Measures

Number of socially disadvantaged, beginning farmers who learn about new alternative enterprises

2. Associated Institution Types

•1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	144

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the 2002 Virginia Census of Agriculture, there has been a hundred-fold increase in new (beginning) socially disadvantaged farm operations, from 1,241 in 1997, to 2,490 in 2002. To successfully compete with existing farm businesses and achieve long-term success, beginning socially disadvantaged farmers need networking, educational outreach and technical assistance.

What has been done

To address the needs of beginning socially disadvantaged farmers in Virginia, Virginia State University personnel worked closely with local minority farmers to conduct eight on-farm demonstrations on meat goat production, small fruit production, forage production, cut flower production, and poultry egg production. Participating farms received educational information and training on new enterprise production and marketing methods.

Results

Each local farm demonstration hosted a field day. As a result of these educational field day events, 144 socially disadvantaged farmers and landowners learned about the production and marketing of environmentally sound, innovative and cost-efficient alternative enterprises. Eight producers reported a range of income increase from 10% to 100% as result of adopting a new alternative enterprise in 2008.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management
307	Animal Management Systems
605	Natural Resource and Environmental 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

Brief Explanation

The high cost of feed and inputs for animal and row crop agriculture have adversely affected the relative profitability of these industries. This has had a major impact on the overall profitability of agriculture in Virginia. A severe drought has also affected nearly all agricultural systems in the state in 2008.

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

1. Evaluation Studies Planned

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

Evaluation Results

See outcomes section

Key Items of Evaluation

Program #3

V(A). Planned Program (Summary)

1. Name of the Planned Program

Animals and Animal Products

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%	15%	15%
302	Nutrient Utilization in Animals	15%	15%	15%	15%
303	Genetic Improvement of Animals	10%	10%	10%	10%
305	Animal Physiological Processes	10%	10%	10%	10%
307	Animal Management Systems	20%	20%	20%	20%
308	Improved Animal Products (Before Harvest)	10%	10%	10%	10%
311	Animal Diseases	15%	15%	15%	15%
315	Animal Welfare/Well-Being and Protection	5%	5%	5%	5%
	Total	100%	100%	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	30.8	4.0	27.0	1.0
Actual	37.7	3.0	33.2	4.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
901776	167085	648646	596634
1862 Matching	1890 Matching	1862 Matching	1890 Matching
902443	238753	1965893	627827
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2183912	19000	5309551	166295

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct research experiments; Conduct workshops, meetings, trainings; Develop publications, curriculum, resources; Pprovide consultation, leadership, facilitation; Partner with industry; Conduct needs assessment and impact analysis.

2. Brief description of the target audience

The target audience includes animal owners, youth, Extension educators, allied industry personnel, consumers, policy makers, and academic 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	125000	470000	30000	60000
2008	87190	149016	39150	7045

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	5	10	
2008	44	56	100

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational meetings, workshops, conferences, training sessions, and field days

Year	Target	Actual
2008	840	670

Output #2

Output Measure

- Number of fact sheets, publications, newletters, and other print resources

Year	Target	Actual
2008	3000	795

Output #3

Output Measure

- Number of web sites, applications, modules

Year	Target	Actual
2008	50	61

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Percent increase in beef cattle marketed through value-added programs
2	Number of additional beef producers trained and certified for quality assurance/best management practices
3	Percent of participating farms reducing phosphorus over previous year in dairy animal waste
4	Percent of dairy herds improving milk quality by reducing herd average somatic cell score
5	Number of swine producers receiving continuing education credit for waste management permit requirements
6	Number of youth gaining knowledge related to animal agriculture through youth animal projects and events
7	Percent increase in sheep population in Southwest Virginia as a result of favorable lamb marketing arrangements
8	Number of farmers joining the Virginia Aqua-farmer Network
9	Number of research projects that will result in development of lost-cost alternatives for small-scale, limited resource producers to enhance the genetic base of goat and sheep herds.

Outcome #1

1. Outcome Measures

Percent increase in beef cattle marketed through value-added programs

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	20	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Adding value to Virginia's beef cattle operations is critical to sustainability of Virginia agriculture and rural communities. Adopting improved health, management, and marketing practices for Virginia feeder cattle adds value to the Commonwealth's second largest agricultural commodity.

What has been done

Virginia Cooperative Extension partnered with the Virginia beef industry to develop a program which encourages the use of scientifically-based cattle health and management procedures for feeder cattle. The Virginia Quality Assured (VQA) program is a cooperative effort among the Virginia Cattlemen's Association, Virginia Department of Agriculture and Consumer Services, VA-MD Regional College of Veterinary Medicine, VCE, and producer organizations. Producers that handle their cattle in this manner are eligible to market their calves through the VQA certified feeder cattle program.

Results

In 2008, a total of 10,301 calves were marketed through the VQA program. Producers received a premium of $49.01 per calf resulting in $504,802 of additional income for Virginia beef producers. Over twelve years of the VQA program, producers have marketed over 88,000 head of feeder cattle resulting in $2.85 million in value-added income.

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
303	Genetic Improvement of Animals
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection

Outcome #2

1. Outcome Measures

Number of additional beef producers trained and certified for quality assurance/best management practices

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	125	865

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Virginia Beef Quality Assurance Program (BQA) educates and certifies beef producers in best management practices to improve the safety and quality of beef. The program provides information to beef producers on coupling animal management techniques with accepted scientific knowledge to raise cattle under optimum management and environmental conditions. BQA guidelines enhance trust and confidence in the entire beef industry.

What has been done

The Virginia BQA is a founding member of the Mid-Atlantic BQA, an eight state consortium of Extension and industry personnel that work together to create similar training materials and programming across the region. The National BQA Guidelines and the National Manual for all cattle producers (beef and dairy) outline areas of cattle management and record keeping. These guidelines are updated periodically to reflect new information, technologies, and regulations.

Results

The total number of certified producers in Virginia stands at 4,510 which makes Virginia one of the national leaders in BQA. During 2008 there were 865 producers either certified or re-certified. These producers came from 58 counties and four surrounding states. It is estimated the certified producers represent over half of the cattle produced in Virginia. Added value of cattle produced on BQA certified farms is $1.5 to $2.0 million annually.

4. Associated Knowledge Areas

KA Code	Knowledge Area
315	Animal Welfare/Well-Being and Protection
307	Animal Management Systems
301	Reproductive Performance of Animals
311	Animal Diseases
308	Improved Animal Products (Before Harvest)
303	Genetic Improvement of Animals

Outcome #3

1. Outcome Measures

Percent of participating farms reducing phosphorus over previous year in dairy animal waste

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	25	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Water quality is a significant issue in the Mid-Atlantic especially in the Chesapeake Bay drainage area. Phosphorus is a nutrient of concern by federal and state agencies. Reduction of phosphorus excretion results in less potential for pollution due to water runoff from fields.

What has been done

The Phosphorus Feeding Incentive Program is a collaborative program between Virginia Cooperative Extension, Virginia Tech Department of Dairy Science, and the Virginia Department of Conservation and Recreation. The program utilizes research-based dietary management of dairy cattle and an incentive program to reduce phosphorus feeding on dairy farms, thereby decreasing phosphorus run-off and potential pollution.

Results

In 2008, the program had 160 enrolled herds, representing 24,522 dairy cows or 25% of Virginia dairy cows. There was a measured reduction in the amount of phosphorus fed and thus excreted of 2.65 pounds per cow per year or 32.6 total tons of phosphorus. In addition, approximately $100,000 has been approved for incentive payments to Virginia dairy farms and free feed testing has contributed thousands of dollars in support of better feeding management to reduce environmental pollution potential from dairy farms.

4. Associated Knowledge Areas

KA Code	Knowledge Area
305	Animal Physiological Processes
302	Nutrient Utilization in Animals

Outcome #4

1. Outcome Measures

Percent of dairy herds improving milk quality by reducing herd average somatic cell score

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	20	75

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Improved milk quality is a useful objective in all areas of production of milk from the farm through processing to marketing. Producers benefit through healthier cows that survive longer and through quality milk premiums. Higher quality milk leads to increased shelf life, improved flavor, and improved consumer acceptance, benefiting processors and consumers.

What has been done

The educational focus shifted in 2008 to improving milk equipment function and culturing of bedding, water, and milk samples from individual cows. Two training session were conducted to train area dairy agents to use newly purchased portable equipment to monitor vacuum levels and pulsator performance in milk parlors. Six milk culturing workshops were conducted with approximately 65 producers throughout the state in 2007 and 2008 to train in aseptic collecting of milk samples from individual cows. Each producer sampled up to ten individual cows in their own herds with samples processed at the Virginia Tech Mastitis Laboratory. A follow up workshop discussed sample results, spread, control, and treatment of bacteria types observe.

Results

Procurement of and training in use of milk equipment evaluation equipment is too recent (fall 2008 and Winter 2009) to have produced results. Sixty-five producers were trained to collect milk samples from individual cows. A majority of these producers reported that use of cultures from the Virginia Tech Mastitis Lab enabled them to reduce bulk tank milk somatic cell scores and to reduce preliminary incubation counts. State-wide evaluation of somatic cell counts in milk samples of individual cows processed through DHI showed a lower herd average somatic cell score for 319 herds processed by DHI in December 2008 (SCC of 2.9) versus 324 herds processed in December 2007 (SCC of 3.0).

4. Associated Knowledge Areas

KA Code	Knowledge Area
305	Animal Physiological Processes
311	Animal Diseases
303	Genetic Improvement of Animals

Outcome #5

1. Outcome Measures

Number of swine producers receiving continuing education credit for waste management permit requirements

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	25	55

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

State regulations dictate that all swine producers maintaining a no-discharge permit are required to receive periodic continuing education in manure management and environmental protection. The Extension Swine Specialist collaborates with the Virginia Department of Conservation and Recreation (DCR) in developing and delivering this continuing education program. The training is essential for large producers to maintain their permits and stay in compliance with environmental regulations.

What has been done

Continuing education sessions were held and also included continuing education for certified nutrient management planners. The educational focus included bio-secure animal mortality disposal and manure application.

Results

Fifty-five producers received continuing education credits. A direct impact of the continuing education programs has been the ability of producers holding waste management permits to maintain those permits and operate their farms in an environmentally sound manner through a two year permit. Indirectly these and related programs facilitated approval of swine dead stock composting as a best management practice eligible for state and federal conservation cost-share programs and resulted in reduction in use of burial for dead stock disposal.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals

Outcome #6

1. Outcome Measures

Number of youth gaining knowledge related to animal agriculture through youth animal projects and events

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	33000	32168

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Livestock projects (beef, sheep, swine, dairy, equine, and poultry) and educational events provide a vehicle for educating youth about the importance of animal agriculture to society and are instrumental in developing life skills in youth. Participation in youth livestock projects serve as a foundation for stimulating career choices in agriculture, and provide a vehicle for the dissemination of knowledge to the public.

What has been done

Training of youth occurs locally by Extension agents, volunteer 4-H leaders, and agriculture educators. State contests are coordinated by campus-based Extension specialist faculty with assistance from Extension agents, volunteers, and agriculture educators. Comprehensive competition is held at the state level for youth age 9-19. In these events, youth are asked to evaluate animal quality, identify items, rank groups of items, perform calculations, and justify their decisions to others.

Results

Youth participation in animal projects and embryology totaled 29,514 in 2008. An additional 2,654 youth participated in state-level livestock and horse contests. The ability to observe and evaluate, ability to make decisions, and communication skills were enhanced by the students' participation in these events. Program participants in the Youth Cattle Working Contest (educates and tests youth on best management/quality assurance practices) rated the overall value of the event at 4.2 on a 1-5 scale (5 = 'information and skills I will use a lot').

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Percent increase in sheep population in Southwest Virginia as a result of favorable lamb marketing arrangements

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	10	42

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Declining burley tobacco production has resulted in economic losses to local communities in Southwest Virginia. With a prime climate, suitable topography, and an abundance of forage the region is well suited for livestock production systems as an alternative to tobacco.

What has been done

Research and Extension efforts at the Southwest Agricultural Research and Extension Center demonstrated the profitability and utility of hair sheep in low-input, easy-care production systems. Results of this research have been disseminated throughout the region through field days, publications, and demonstrations.

Results

Sheep numbers in Southwest Virginia increased 42% in 2008 according to USDA. With the renewed interest in sheep, Virginia Cooperative Extension assisted local sheep producers with production and marketing endeavors. Direct sales to a local grocery chain increased from 225,000 pounds sold to 275,000 pounds sold. As a result, over $885,000 of lamb was purchased from local producers in 2008 resulting in an additional $125,430 value being returned to producers compared to traditional marketing endeavors.

4. Associated Knowledge Areas

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

Outcome #8

1. Outcome Measures

Number of farmers joining the Virginia Aqua-farmer Network

2. Associated Institution Types

•1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	28

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

With profits from traditional agricultural crops declining steadily, Virginia farmers need to explore the economic viability of freshwater shrimp as an alternative market. Many tobacco dependent farmers could seek new opportunities to generate income using ponds located on their property.

What has been done

VSU Extension provided technical assistance and educational programs to support the growth and development of a shrimp nursery that is placing freshwater shrimp in farmers' ponds. Through an MOU developed between VSU and the Virginia Aqua-farmer Network and the Virginia Aquaculture Association, VSU provided technical assistance and human and financial support to establish a cooperative of Virginia aqua-farmers.

Results

Tobacco dependent farmers utilized the Virginia Aqua-farmer Network (VAN) and VSU Aquaculture Programs to significantly increase freshwater shrimp harvests. Since 2007, VAN membership has increased from six to 28 members. The president of VAN credits the support of VSU in helping increase VAN membership and the sale of freshwater shrimp. In 2008, 15 farms generated $153,000 in fresh sales of freshwater shrimp.

4. Associated Knowledge Areas

KA Code	Knowledge Area

302	Nutrient Utilization in Animals
308	Improved Animal Products (Before Harvest)
307	Animal Management Systems

Outcome #9

1. Outcome Measures

Number of research projects that will result in development of lost-cost alternatives for small-scale, limited resource producers to enhance the genetic base of goat and sheep herds.

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Rising concern for farm biosecurity and the need to move germplasm efficiently between geographically separate locations is increasing the need for assisted reproductive technologies in small ruminant production.

What has been done

VSU's Ag Research State conducted research to improve the existing assisted reproductive technology for goat and sheep. In 2008, experiments were conducted to evaluate the effect of egg yolk concentrate on the motility of buck semen, the quality of ram and buck semen stored at 4 degrees C and impact of processing liquid semen on its motility and viability.

Results

Results indicate that post-thaw motility of buck semen was improved by 12% using a high egg yolk compared to a low egg yolk. Solid state storage did not improve retention of sperm motility and viability compared to liquid storage of buck and ram semen maintained at 4 degrees C for up to 96 hours. Solid storage also failed to increase the pregnancy rate in does and ewes using intra-uterine insemination after 74 hours of storage. The processing of liquid semen indicated that progressive motility and viability declined by 20% and 11% respectively. Findings from these experiments are providing valuable information for the development of low-cost alternatives for assisted reproduction in sheep and goats that will allow small-scale, limited resource producers to introduce unique animal germplasm to their operation through the use of artificial insemination, and hence improve the genetic base of their herds.

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
301	Reproductive Performance of Animals
305	Animal Physiological Processes
307	Animal Management Systems
303	Genetic Improvement of Animals

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.)
- Other (land values near urban areas)

Brief Explanation

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

1. Evaluation Studies Planned

- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

Program #4

V(A). Planned Program (Summary)

1. Name of the Planned Program

Biotechnology and Genomics

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%	0%	5%	5%
135	Aquatic and Terrestrial Wildlife	5%	0%	5%	5%
136	Conservation of Biological Diversity	5%	0%	5%	5%
201	Plant Genome, Genetics, and Genetic Mechanisms	25%	0%	25%	25%
206	Basic Plant Biology	5%	0%	5%	5%
212	Pathogens and Nematodes Affecting Plants	5%	0%	5%	5%
302	Nutrient Utilization in Animals	5%	0%	5%	5%
303	Genetic Improvement of Animals	5%	0%	5%	5%
304	Animal Genome	10%	0%	10%	10%
311	Animal Diseases	10%	0%	10%	10%
721	Insects and Other Pests Affecting Humans	10%	0%	10%	10%
722	Zoonotic Diseases and Parasites Affecting Humans	10%	0%	10%	10%
	Total	100%	0%	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	1.0	0.0	10.0	0.0
Actual	1.9	0.0	1.1	1.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
44205	0	31796	52000
1862 Matching	1890 Matching	1862 Matching	1890 Matching
44237	0	96367	100000
1862 All Other	1890 All Other	1862 All Other	1890 All Other
107055	0	178773	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Processes of research studies, Dissemination of research results, Papers and citations, Commercialization of techniques and products, Development and implementation of educational programs/workshops, Dissemination of educational programs/workshops, Conduct research experiments, Conduct workshops, meetings, Develop products, curricula, resources, Conduct assessments/evaluation, Provide training, Work with media and establish and sustain partnerships.

2. Brief description of the target audience

Research scientists, Graduate students, and Teachers

V(E). Planned Program (Outputs)

1. Standard output measures

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

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	250	1250	0	0
2008	238	1620	75	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	4

Patents listed

1. Expression System for Enzymes that Desaturate Fatty Acids
2. Filed disclosure with VTIP entitled: Genetic basis of the low phytate trait in the soybean line CX1834.
3. Method of Purifying Acidic Proteins Expressed in Plants
4. Reverse Engineering Genome-Scale Metabolic Network Reconstructions for Organisms With Incomplete Genome Annotation and a Completed Network for the Solventogenic Clostridium Acetobutylicum ATCC 824'

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	10	
2008	0	65	65

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research projects in program areas

Year	Target	Actual
2008	10	25

Output #2

Output Measure

- Number of peer reviewed research papers published

Year	Target	Actual
2008	30	65

Output #3

Output Measure

- Number of presentations

Year	Target	Actual
2008	40	100

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number of samples evaluated by current and improved plant diagnostics methods related to biotechnology and leading to better detection and control procedures by producers
2	Number of projects determining parameters for environmental risk assessment for growth hormone transgenic Atlantic salmon
3	Number of projects addressing genetic improvement of aquaculture stocks through biotechnology
4	Number of projects on characterization of genes regulating wood formation in Arabidopsis and poplar
5	Number of projects maximizing tree growth and architecture for biomass production per unit of land area
6	Number of projects exploring genomics for developing disease resistant soybean cultivars
7	Number of projects focused on understanding the genetic basis of cyprinid herpes virus-3 resistance in common carp
8	Number of projects focused on identification of a potential marker in chickens for avian coccidiosis response
9	Number of projects exploring novel chemicals to block transmission of mosquito-borne infectious diseases
10	Number of projects addressing measures of dietary control of nutrient transporter expression in chickens
11	Number of projects exploring modulation of pathogenesis in disease vector mosquitoes by small RNAs
12	Number of projects exploring genomics of parasitic plants

Outcome #1

1. Outcome Measures

Number of samples evaluated by current and improved plant diagnostics methods related to biotechnology and leading to better detection and control procedures by producers

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Number of projects determining parameters for environmental risk assessment for growth hormone transgenic Atlantic salmon

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Transgenic Atlantic salmon in production aquaculture pose benefits, but may escape from contained aquaculture facilities into the wild, where they pose genetic risks to wild populations and ecological risks to receiving ecosystems. Regulatory authorities need reliable estimates of genetic and ecological risks to reach defensible decisions on whether and how to permit commercial production of transgenic salmon expressing an introduced growth hormone gene.

What has been done

Genetic and ecological risks are being assessed in a stream mesocosm and in the laboratory. The goal is to quantify key aspects of survival and reproductive fitness, levels of circulating growth hormone and insulin-like growth factor I, and innate immune response to stress and immunological challenge, and utilizing the project's empirical data to predict the net fitness of growth hormone-transgenic Atlantic salmon.

Results

High rates of precocious maturity were found in both transgenic and non-transgenic salmon, although transgenic salmon seems to transmit the transgene less frequently than expect by chance. Transgene expression begins as early as the eyed-egg stage, several months before enhancement of growth rate is observed. Starvation and hypoxia experiments showed that transgenic fish respond more quickly and dramatically to stress.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife

Outcome #3

1. Outcome Measures

Number of projects addressing genetic improvement of aquaculture stocks through biotechnology

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Application of genetic principles plays an important and growing role in the development of aquaculture. While selective breeding using only performance-level (phenotypic) information has clear utility, with recent advances in molecular genetics and genomics, it now can be complemented by a genomics-based (genotypic) approach to breeding. That is, the tools of molecular genetics may be used to characterize the inheritance and expression of traits of interest, and that knowledge may be used to inform selective breeding.

What has been done

Genetic variation is being characterized for three economically important traits in two globally important aquaculture species as (1) the ability to effectively utilize plant-based feeds by rainbow trout, (2) the resistance to cold water disease in rainbow trout, and (3) the resistance to herpes virus 3 in common carp.

Results

Observation of family-based variation in growth rate suggested that rainbow trout can be selected to grow rapidly on plant-based diets. Family-based analysis revealed genetic markers linked to resistance to bacterial cold water disease, suggesting the possibility of marker-assisted selection of resistant stocks. Frequencies of DNA sequence variants at Toll-like receptor genes differed among strains of common carp that are susceptible and resistant to herpes virus 3.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
304	Animal Genome
303	Genetic Improvement of Animals
302	Nutrient Utilization in Animals

Outcome #4

1. Outcome Measures

Number of projects on characterization of genes regulating wood formation in Arabidopsis and poplar

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Intensively managed forest tree plantations are growing in importance in the U.S. and worldwide to meet the increasing demand for traditional wood products while preserving native forests. At the same time, development of dedicated woody perennial lignocellulosic bioenergy crops is needed to displace petroleum consumption. Thus it is important to understand regulation of wood or biomass formation in species such as poplar in order to maximize biomass yield and quality.

What has been done

A multi-investigator research project has begun that combines functional studies of key regulators of wood formation, quantitative and cell-specific gene expression studies, and mapping protein-protein interactions important for wood formation in poplar. An Arabidopsis model first identified all genes expressed in xylem, and results are being extended to poplar, a species that also has a complete genome sequencing effort in progress.

Results

Gene expression studies and functional genomic studies in transgenic poplar have revealed roles for NAC family transcription factors in poplar wood formation. This research identified an Arabidopsis gene that negatively regulates lignocellulose production and programmed cell death in xylem. This study also identified two proteases required for rapid degradation of cellular contents during the differentiation of xylem vessels. The researchers have cloned 200 genes involved in wood formation in poplar. These will be used to identify protein-protein interactions important to wood formation. Results from these investigations can be incorporated into bioengineering and breeding strategies for manipulating economically important aspects of the structure of wood.

4. Associated Knowledge Areas

KA Code	Knowledge Area
206	Basic Plant Biology
201	Plant Genome, Genetics, and Genetic Mechanisms
136	Conservation of Biological Diversity

Outcome #5

1. Outcome Measures

Number of projects maximizing tree growth and architecture for biomass production per unit of land area

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Trees are the greatest producers of biomass. Tree productivity is closely tied to the time of fall bud set and spring bud break and tree crown architecture. Optimizing crown form for dense plantings will be crucial for maximizing biomass production per unit land area.

What has been done

A research team has been formed with major objectives to: (1) study the function of candidate genes controlling architecture and phenology using transgenic poplar, (2) study the environmental regulation of these genes, and (3) correlate sequence variations in these genes and quantitative variation in branching traits.

Results

This research has produced transgenic poplars with overexpression and RNAi transgenes as well as transgenics with poplar promoter-reporter gene constructs. A whole-genome microarray expression study of bud dormancy from budset to budflush has been completed, revealing over 4,000 regulated genes.

4. Associated Knowledge Areas

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

Outcome #6

1. Outcome Measures

Number of projects exploring genomics for developing disease resistant soybean cultivars

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Worldwide loss due to pathogens on all major crops is estimated to be in tens of billions of dollars annually. In soybeans, annual loss due to stem and root rot disease (caused by Phytophthora sojae) alone is estimated to be $1-2 billion dollars. Development of resistant crop plants is the most practical and environment-friendly solution for addressing disease problems. Although conventional approaches have been successful in this arena, there are some limitations, especially in breeding for complex diseases that are controlled by several genes.

What has been done

The advent of molecular marker technology and the availability of dense linkage maps have provided opportunities for tagging genes or QTLs (Quantitative Trait Loci) controlling complex resistance to diseases. Using such technologies the researchers are developing molecular 'tags' for disease resistance genes for subsequent use in marker-assisted selection (MAS) programs to facilitate their incorporation into elite backgrounds and to accelerate development of high-yielding and disease-resistant soybean cultivars.

Results

This project included conducted extensive research studying soybean resistance to virus diseases. The researchers have identified several genes controlling resistance to soybean mosaic virus and developed DNA markers to facilitate their incorporation into high-yielding soybean lines. Plans are to develop more breeder-friendly and high-throughput markers for these virus resistance genes should further enhance their usefulness to the soybean breeding community by facilitating the incorporation of these genes with genes controlling resistance to other soybean diseases

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Number of projects focused on understanding the genetic basis of cyprinid herpes virus-3 resistance in common carp

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Common carp, the most important aquaculture species in the world, is susceptible to an economically important disease caused by cyprinid herpes virus 3, or CyHV-3. Understanding the genetic basis for resistance is crucial for defining a strategy for breeding carp resistant to the disease.

What has been done

The research has established families and crosses between susceptible and resistant lines to characterize variation in viral resistance and possible underlying genetic mechanisms. The researchers are scanning variation at candidate genes such as major histocompatibility complex and Toll-like receptors that are involved in viral resistance in other fish species.

Results

PCR primers were developed for three Toll-like receptor genes and used to identify six single-nucleotide polymorphisms. Frequencies of these variants differed among susceptible and resistant strains.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
303	Genetic Improvement of Animals

Outcome #8

1. Outcome Measures

Number of projects focused on identification of a potential marker in chickens for avian coccidiosis response

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Coccidiosis is an intestinal disease caused by a number of species of the parasite Eimeria. Infection causes considerable economic loss to the poultry industry due to poor weight gain or feed conversion. The disease can be controlled through good management practices or the use of anticoccidial drugs. With an emphasis on reduction of drug use, however, alternative methods of control need to be developed, such as identification of genetic markers for disease resistance.

What has been done

Aviagen Inc. has identified two lines of chickens that differ in their sensitivity to coccidiosis. A research project has been established with the objective of to examine the expression profiles of intestinal genes, using DNA microarrays, in the two lines of chickens challenged with Eimeria maxima.

Results

Expression of the antimicrobial peptide, LEAP-2, was correlated with severity of infection. As the number of intestinal lesions increased the expression of LEAP-2 decreased. LEAP-2 is a member of the family of host defense immune proteins. We hypothesize that upon infection, Eimeria maxima causes a decrease in the expression of the host defense gene LEAP-2, which leads to infection. A provisional patent application for this discovery has been filed by VTIP.

4. Associated Knowledge Areas

KA Code	Knowledge Area
304	Animal Genome
311	Animal Diseases

Outcome #9

1. Outcome Measures

Number of projects exploring novel chemicals to block transmission of mosquito-borne infectious diseases

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Mosquito-borne infectious diseases are posing a growing threat to human and livestock health. Using pesticides for mosquito control is an effective way to disrupt the disease transmission. Frequent application of pesticides, however, leads to rapid spreading of tolerance/resistance in mosquito field population, requiring higher dosage in pest management. This practice greatly increases the cost and incurs adverse effects to the environment.

What has been done

This study aims to elucidate the signaling pathway through which the insect juvenile hormone (JH) prepares newly emerged adult mosquitoes to become competent for blood feeding and reproduction. Chemical intervention that blocks this signaling pathway will arrest this maturation process, providing an alternative approach to preventing the transmission of mosquito-borne diseases. The research is a foundation for developing new types of mosquito pesticides.

Results

Using an in vitro assay, researchers identified a group of mosquito genes specifically regulated by JH at this stage. To understand the comprehensive impact of this hormone on gene regulation, researchers have established a transgenic mosquito strain in which JH is rapidly depleted in the adults. Comparison between the transgenic and wild-type mosquitoes will reveal the molecular targets of JH and effects of this hormone on development of the mosquito host seeking and mating behaviors. In addition, researchers discovered that activation of the JH target genes depends on two transcriptional regulators that interact with each other only in the presence of JH. Researchers are testing whether this protein complex directly binds to JH, and whether their transcriptional activity is enhanced by JH and repressed by JH antagonists.

4. Associated Knowledge Areas

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

Outcome #10

1. Outcome Measures

Number of projects addressing measures of dietary control of nutrient transporter expression in chickens

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The assimilation of nutrients from feed is an important regulator of growth in poultry. Thus understanding the expression of genes involved in nutrient uptake would increase our basic understanding of this physiological process.

What has been done

Aviagen Inc. has developed two chicken lines that have been selected for growth on different diets, i.e., corn-soybean (Aviagen line A) or wheat (Aviagen line B). These lines show different growth rates when fed a corn-soy or wheat based diet. The study investigated the effect of dietary protein composition on the expression of genes involved in nutrient uptake in these two selected lines of chickens.

Results

In 2008, a feeding trial was conducted to examine the effect of dietary protein composition (whey protein concentrate, partial whey hydrolysate, free amino acids identical to the composition of whey) on growth and expression of nutrient transporters. Expression of five amino acid transporters and one peptide transporter was increased in line B chicks fed the whey hydrolysate diet. In addition there was a greater villus height to crypt depth ratio in line B chicks consuming the whey hydrolysate diet. These results demonstrate that protein composition can alter intestinal morphology and the expression of nutrient transporters.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals

Outcome #11

1. Outcome Measures

Number of projects exploring modulation of pathogenesis in disease vector mosquitoes by small RNAs

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Arthropod-borne viral diseases are the cause of unacceptable levels of morbidity and mortality in humans and domesticated animals and as such are a tremendous economic and health burden. Novel control strategies will only be realized through increases in our understanding of the biology of disease vectors and vector-pathogen relationships. A distinguishing characteristic arbovirus infections of the vector host is the establishment of a persistent, nonpathogenic state in which viral titers are modulated to lower levels in mosquito cells.

What has been done

The Virginia Tech College of Agriculture and Life Sciences has designated infectious and vector-borne diseases and the development of methods to reduce their effects on animals and humans as a key program initiative. By understanding how both virus infectivity and pathogenicity are controlled in the disease vector, it may be possible to produce mosquitoes that, when infected with arboviruses, have significantly shortened life spans, thus, abrogating transmission to humans.

Results

This research identified virus-derived small interfering RNAs (viRNAs), 21 nt in length, in Aedes aegypti infected with the mosquito-borne virus, Sindbis (SINV). viRNAs had an asymmetric distribution that spanned the length of the SINV genome. To determine the role of viRNAs in controlling pathogenic potential, mosquitoes were infected with recombinant alphaviruses expressing suppressors of RNA silencing. Decreased survival was observed in mosquitoes in which the accumulation of viRNAs was suppressed. These results suggest that an exogenous siRNA pathway is essential to the survival of mosquitoes infected with alphaviruses and, thus, the maintenance of these viruses in nature.

4. Associated Knowledge Areas

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

Outcome #12

1. Outcome Measures

Number of projects exploring genomics of parasitic plants

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Parasitic plants of the family Orobanchaceae are devastating agricultural pests, with particular impact in developing nations. They may completely destroy crop yields, yet are extremely difficult to control. Despite the scientific and economic importance of these plants, little information is available on the genes and genomes of parasitic species, and this lack of information hampers our ability to understand parasitism in plants and to develop effective parasite control strategies.

What has been done

This project conducted functional genomic analyses of parasitic plants and will use a comparative genomic analysis of three related genera that span the spectrum of parasitism: a facultative parasite (Triphysaria versicolor), a photosynthetically competent obligate parasite (Striga hermonthica), and an obligate holoparasite (Orobanche ramosa). The project will sequence genes expressed during key life stages of each species, conduct comparative analyses of the sequences, and make the data publicly accessible.

Results

Each of the three parasitic plant species has been grown to obtain tissues from key life stages spanning seed germination to flowering. Some of these stages are extremely small and require great effort to collect, and several students have gained experience growing plants and recognizing developmental changes. Eventually the large sets of gene sequences generated from these parasites will revolutionize the types of experiments that can be done with parasitic weeds.

4. Associated Knowledge Areas

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

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

Goals were basically met. There is considerable overlap of scientists working in this Planned Program and several others, namely 1-3 and 8-10, as biotechnology and genomica are used in addressing a wide range of activities in agricultural research. Government regulations and public policy affect the development and use of transgenic plants, but may encourage the use of other products of biotechnology for human or animal disease management.

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

1. Evaluation Studies Planned

- Other (research)

Evaluation Results

Key Items of Evaluation

Program #5

V(A). Planned Program (Summary)

1. Name of the Planned Program

Economics and Commerce

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	10%	10%	10%	0%
602	Business Management, Finance, and Taxation	10%	10%	10%	0%
603	Market Economics	10%	10%	10%	0%
604	Marketing and Distribution Practices	10%	10%	10%	0%
605	Natural Resource and Environmental Economics	10%	10%	10%	0%
607	Consumer Economics	10%	10%	10%	0%
608	Community Resource Planning and Development	10%	10%	10%	0%
610	Domestic Policy Analysis	10%	10%	10%	0%
801	Individual and Family Resource Management	10%	10%	10%	0%
802	Human Development and Family Well-Being	10%	10%	10%	0%
	Total	100%	100%	100%	0%

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	30.0	0.0	11.8	2.2
Actual	33.6	1.0	17.9	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
802853	142232	577491	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
803447	52330	1750238	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1944341	2000	2860364	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research and educational programs will be conducted to support the needs of Virginians and Virginia's farm and small business managers. Research in personal finance issues and evaluation of programming will be conducted to improve Virginians' financial literacy. Financial literacy curriculum will be developed using proven delivery methods to improve the financial security of individuals and families. Research will be conducted to develop knowledge of production and market systems. Research-based information will be disseminated via media and informational meetings. Decision aids, workshops, detailed curriculum, and distance educational methods will be used to support change in the overall behavior of learners.

2. Brief description of the target audience

Individuals, families, owners and managers of farms, and small businesses; local, state, and federal personnel and policy makers; and private sector service supplies are the targeted audiences.

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	44000	98000	6900	22000
2008	45818	489885	22685	968

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	5	10	
2008	17	27	44

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of education programs planned in farm and agribusiness management and risk management

Year	Target	Actual
2008	20	80

Output #2

Output Measure

- Number of education programs planned in marketing and direct marketing

Year	Target	Actual
2008	20	31

Output #3

Output Measure

- Number of education programs planned in public policy education

Year	Target	Actual
2008	10	38

Output #4

Output Measure

- Number of farmers creating succession/transition plans for their farm business

Year	Target	Actual
2008	100	67

Output #5

Output Measure

- Number of individuals and families completing basic financial management strategies such as budgeting, setting financial goals, establishing a saving/investing program, implementing practices to reduce the chance for identity theft after receiving instruction

Year	Target	Actual
2008	3000	7642

Output #6

Output Measure

- Number of individuals and families creating plans to handle care receiving and care giving as they age such as advance directives, durable powers of attorney and long-term care planning

Year	Target	Actual
2008	100	68

Output #7

Output Measure

- Number of individuals and families creating home-based and micro businesses

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	Percentage of transitional plans completed by farm family program participants
2	Percentage of farmers, agricultural business managers and leaders, food processors, government agencies, and agribusiness firm program participants making more informed business and economic decisions
3	Percentage of individuals and family program participants completing basic financial management strategies such as budgeting, setting financial goals, establishing a saving/investing program after receiving financial instruction.
4	Percentage of individuals and family program participants creating plans to handle care receiving and caregiving as they age such as advance directives, durable powers of attorney and long-term care planning.
5	Percentage of individuals and family program participants creating home-based and micro businesses.
6	Number of socially disadvantaged and limited resource farms reducing risk.
7	Number of participants who increase knowledge of national and global market economic forces through distance delivery of multi-state economic outlook educational programs
8	Number of individuals and family program participants gaining knowledge of home-based and micro business opportunities and management
9	Increase the number of farmers, agricultural business managers and leaders, food processors, government agencies, and agribusiness firm program participants making more informed business and economic decisions

Outcome #1

1. Outcome Measures

Percentage of transitional plans completed by farm family program participants

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	60	67

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Relevance: VCE's 2004 Situational Analysis ranked the sustainability and viability of the family farm as a major issue. Developing a business into a solid operation is the main focus for most families; however, transition planning is typically ignored or deferred until a family crisis arises. Asset ownership and management control is changing nationwide as the U.S. farm population ages. Virginia Tech economists expect that in the next 20 years 70% of Virginia farms will change hands as the current generation of farmer/landowners retires or die. The average age of Virginia farmers is 56+ years (VDACS, 2009). Though the majority of current farming landowners desire to keep their farm in farming and transfer the farm within the family, that desire cannot be achieved without multifaceted planning. Basic management principles and long-range business planning are crucial to the long-term survival of family-owned/operated businesses. Most farmers have incomplete or nonexistent succession plans and transitioning the farm to the next generation is more involved than a traditional estate plan, encompassing profitability, and the desires of the current and next generation, family relationships, and the plans implemented throughout the years. Without a concerted effort, transitioning to the next generation can fail. It takes careful planning and communication for a business to succeed and thrive during/after inter-generational transfers.

What has been done

Farm business management (FMB) agents and faculty at Virginia Tech have developed a comprehensive approach to managing farm business transition. VCE is currently in the third year of the 'farm transition management' efforts.' These efforts are operating at different stages within the state. Over these years the curriculum has been refined to provide farm families with information on the complex issues of intra-family communication, goal setting, business evaluation, tax planning, retirement budgeting estate planning, and insurance/retirement planning. In the Shenandoah Valley the Northwest District FBM staff conducted one five-part 'Managing the Farm Transition Workshop' series and concluded two other workshops that began in 2007 for those farm families who were interested in developing a farm transition plan for their farm. In the Northern Piedmont an introductory seminar was held to provide a broad overview of the farm transition process for family members interested in learning more about the efficient transfer of farm operations between generations. The overview seminar was followed by a three-part of in-depth in depth series that condensed the five-part series offered in the Shenandoah Valley. All of the workshops contained certain key elements necessary for the development of a successful farm transition plan. This series provides opportunities for homework and case study that encourage the development of a transition plan. The program is marketed as small group functions of 10-15 farms to encourage engagement by both the 'outgoing' and 'incoming' generation.

Results

Participants of the multi-part workshop series gained an appreciation for the amount of time, effort, and planning that goes into keeping a family-operated business successful over time. They learned how various aspects of management interrelate and complement each other and fit into a transition management plan. Thirty-three farms from four locations completed the 'Managing the Farm Transition Workshop' series in 2008. Comments made on the 2008 evaluations showed the take-home points to be 'Communication is most important,' 'Action (vs. doing nothing)' is necessary and 'There are many options as one develops their transition plan.' Most participants began to act on many of the components of their plan. Four situations highlight the success, multiple issues, and time-spans involved in managing a transition:

1) Quoted on an evaluation about the 2007-2008 workshop; '...It came at a time when land was transferred to me because of my mother's death. Wanting this to remain an active farm operation, I didn't have answers as to how to make this happen. Your program enlightened us... It proved to be right for our situation, and is now in place and land is being transferred to my nephew. We have since learned the importance of involving a CPA with our attorney...for buildings to be re-depreciated - an appraisal must be made to determine value for tax purposes...'

2) Four months after completing the series, a couple was directed to a family mediator to address problems within their blended family. This situation had become so bad that family break-up and probably dissolution of the farm was a real possibility. The mediator helped the farmer and family members clarify their goals and develop a course of action that has kept the farm together.

3) Non-farming family members decided to take an active interest in the preservation and operation of the farm by becoming more involved in the day-to-day operation and beginning the process of deciding on new enterprises. This involvement by the family was pondered on and slowly incubated for a year post workshop before they initiated further planning.

4) Three years after participating in the original series a farmer requested detailed information on tax implications of transition decisions he and his family were finally discussing.

A follow-up survey of past Northern Piedmont workshop participants indicated that though only 29% had developed a written farm transition plan, most of the participants had completed multiple components of their plan: 85% of participants have prepared a will.

A primary result of the 2008 Farm Transition Management Programming is that VCE is maintaining an active role in providing farmers with both the knowledge necessary and a blue-print to develop their farm transition plan even though a farm's progress on a plan is measured in years not rather than a hastily prepared document. Past participants continue to refer to the materials provided and use VCE agents and specialists as a resource to bounce ideas off of as they reach a point in their life where they feel they can continue the process of developing or refining their plan. Participants continue to tell friends and VCE receives inquires concerning when and where we will conduct the next workshop series. 100% of all past participants of workshops have indicated on evaluation that they recommend this program to their friends and fellow farm families.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
802	Human Development and Family Well-Being

Outcome #2

1. Outcome Measures

Percentage of farmers, agricultural business managers and leaders, food processors, government agencies, and agribusiness firm program participants making more informed business and economic decisions

Not reporting on this Outcome for this Annual Report

Outcome #3

1. Outcome Measures

Percentage of individuals and family program participants completing basic financial management strategies such as budgeting, setting financial goals, establishing a saving/investing program after receiving financial instruction.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	80	75

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The impact of the current economic crisis has been felt across Virginia. In 2007, Virginia ranked 16th in the nation in non-business bankruptcy filings with over 17,386 Virginians filing. In the first Quarter of 2008 Virginia ranked 13th with non-business filings for that quarter at 6,134. The foreclosure rates are up with one in every 567 homes in foreclosure. Over 740,000 Virginians live in poverty. Over 26,000 families receive TANF aid each month. On a seasonally adjusted basis, Virginia's unemployment rate moved from 4.4 percent in October 2008 to 4.8 percent in November 2008. Virginia's civilian labor force was down by 3,300 individuals from October to 4,136,400 in November 2008.

What has been done

Virginia Cooperative Extension offered basic financial education programming to low and middle income Virginians in a number of settings and to special audiences such as people who are incarcerated and first-time home-buyers. In addition, VCE offers one-on-one counseling and foreclosure mitigation services in some areas. Extension also offers the pre-discharge personal financial management class required under the federal bankruptcy code. Agents and specialists also contributed to the national eXtension website community of practice - Financial Security for ALL.

Results

According to those who completed three to six month follow-ups surveys, an average of 75% of respondents made one or more behavior changes based on the classes they took. Changes included starting emergency funds, increasing saving and investments, writing a spending plan, writing financial goals, and paying down debt.

4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics
801	Individual and Family Resource Management

Outcome #4

1. Outcome Measures

Percentage of individuals and family program participants creating plans to handle care receiving and caregiving as they age such as advance directives, durable powers of attorney and long-term care planning.

Not reporting on this Outcome for this Annual Report

Outcome #5

1. Outcome Measures

Percentage of individuals and family program participants creating home-based and micro businesses.

Not reporting on this Outcome for this Annual Report

Outcome #6

1. Outcome Measures

Number of socially disadvantaged and limited resource farms reducing risk.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	396

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Over 90 percent of farm operations in the United States are considered small farms (sales less than $250,000), and nearly 10 percent of small farms are considered limited resource (gross sales less than $100,000), with over 80 percent of limited resource farms having a negative profit margin. Unfortunately, many limited resource farms are unaware of their financial conditions masked by non-farm income. Virginia Cooperative Extension can assist limited resource farmers in using risk management tools to operate financially sound and profitable small farm businesses.

What has been done

Virginia State University personnel and USDA collaborators delivered educational outreach opportunities (hands-on demonstrations, computer training, and risk management workshops) and direct technical assistance to socially disadvantaged and limited resource farmers in 24 Virginia counties.

Results

In 2008, Virginia State University's Small Farm Outreach and Technical Assistance Program provided direct technical assistance to 396 limited resource farmers to improve farm production and marketing, writing business and marketing plans, and applying for USDA farm program funds. As a result of participating in our educational outreach and technical assistance programs, 182 limited resource farms saved a total $139,150 (average savings per farm: $765), and 175 limited resource farms earned a total of $151,400 (average increased income per farm: $865).

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
801	Individual and Family Resource Management
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management
603	Market Economics

Outcome #7

1. Outcome Measures

Number of participants who increase knowledge of national and global market economic forces through distance delivery of multi-state economic outlook educational programs

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	490

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

National and global market economic forces regularly affect agricultural commodities and the economy. In light of reductions in Extension experts in land-grant institutions across the U.S. and ever tightening operating budgets, it has become increasingly difficult to deliver quality educational programs that are timely and relevant due to limited resources.

What has been done

A grant for $50,000 was obtained from USDA to conduct economic outlook educational programs. The project utilized the internet to deliver four interactive educational seminars via remote speakers using live video conferencing and on-site presenters to enhance use of limited resources.

Results

As a direct result of the four seminars 272 agriculture producers, 79 Extension educators, and 139 agricultural community influencers from Virginia, North Carolina, Tennessee, West Virginia, and Maryland attended the seminars. Four-hundred twenty-seven sequential learners extended learning activities via other distance learning techniques such as website downloads and compact disc media. As a direct result of this project participants interviewed three and six months after the meeting reported just over $456,085 in decreased input costs and $443,030 in increased profits for a total of $899,085. Experts from 11 land grant universities and three industry groups made presentations. The use of video conferencing technology saved over $68,500 in travel and per diem costs that would have been incurred had all the experts come to the four meetings.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices
801	Individual and Family Resource Management
603	Market Economics
610	Domestic Policy Analysis

Outcome #8

1. Outcome Measures

Number of individuals and family program participants gaining knowledge of home-based and micro business opportunities and management

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}	74

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Today more and more people want to know where their food comes from and they increasingly shop at locally owned food-based businesses or at one of Virginia's 142 farmers markets. Agriculture contributes over $55 billion to the state's economy and since 2005, Virginia has seen a 61 percent increase in established farmers markets.

What has been done

To assist Virginia's food entrepreneurs manage successful small businesses and farmers market managers maintain successful community-based farmers markets, Extension agents and specialists completed two full-day workshops on the technical and non-technical skills needed to sustain profitable food markets. In addition, four short presentations on Virginia Farm Bureau's 'Save Our Food' campaign were made at local farmers markets. Three separate presentations described the economic impact of farmers markets, how farmers markets spur entrepreneurship and how local food marketing campaigns create profitable food and agricultural businesses were given to Virginia Main Street community organizers at a statewide conference. Northern District Community Viability also partnered with the Virginia Organic Producers and Consumers Association to host a Food and Farm Expo to showcase local farmers and food entrepreneurs.

Results

In total, 74 individuals attended the two full-day workshops and 35 post-program evaluations were completed by 47 percent of the participants. Results showed that 100 percent of respondents increased their understanding and knowledge of successful food-based business practices and would recommend this workshop to others. Eighty-five percent of participants thought the value of the technical business-development information was excellent. Eighty-seven percent of respondents stated they had much better knowledge about the strategies to solve conflicts while 100 percent of respondents had a better understanding of their role as a farmers' market manager. Additionally, 100 percent of respondents had a better understanding of their role as a community facilitator and an increased understanding of the cultural groups they serve. As a result of the four presentations at Virginia farmers markets, Virginia Farm Bureau found that over 30 media outlets shared information with their audience and communities, improving resident's knowledge about the importance of supporting local farmers markets and small food-based businesses.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
801	Individual and Family Resource Management

Outcome #9

1. Outcome Measures

Increase the number of farmers, agricultural business managers and leaders, food processors, government agencies, and agribusiness firm program participants making more informed business and economic decisions

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1140

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The movement of purchasing fresh, locally grown foods is an emerging trend transforming Virginia and the United States. In Virginia, many opportunities exist for the sale of locally grown foods to the public via restaurants, farmers' markets grocery stores, universities ... Developing awareness and infrastructure between these entities and the farmer is imperative for a community food system to thrive and the farmers that rely on these markets.

What has been done

Virginia Cooperative Extension partnered with agricultural agencies, environmental groups, restaurants, institutions, and private companies, to develop a BUY FRESH, BUY LOCAL food guide and establish a local farmers market.

Results

A Local guide was delivered to 80,000 households in the northern piedmont. Orchardist indicated increased sales as a result of the guide. 700 students were served local salad, beef, and apples; the school plans to continue sourcing locally grown products to serve its students and faculty. In addition a local a local farmer's market doubled the number of vendors and increased sales five fold to $264,000 in the last 10 years.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
601	Economics of Agricultural Production and Farm Management
603	Market 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
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

Continued state budget cuts, loss of subject matter personnel and field staff have limited the number of individuals working in this area and program outputs.

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

Evaluation Results

Key Items of Evaluation

Program #6

V(A). Planned Program (Summary)

1. Name of the Planned Program

Families, Youth, and Communities

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	20%	20%	0%	0%
802	Human Development and Family Well-Being	30%	30%	0%	0%
806	Youth Development	50%	50%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	107.0	3.0	0.0	0.9
Actual	125.3	2.0	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
2992776	160757	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2994993	46231	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
7247880	10500	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities include Entrepreneurial Education, Asset-based Economic Development, Leadership, Civic Engagement, 4-H Camping programs, 4-H After-School programs, 4-H In-school programs, 4-H Clubs, 4-H Special Interest groups, 4-H Cloverbud groups, district 4-H trainings, local 4-H trainings, home school education, child care provider education, parent education, online education and distance learning, community viability work, and specialized trainings and workshops to qualify instructors and to train trainers.

In response to the CSREES and external merit reviews of the 2007 report and 2009-2013 plan of work for Virginia, the number of outcomes have been reduced for this planned program. Therefore, a number of the outcomes originally planned for 2008 are not reported on.

2. Brief description of the target audience

-Youth between the ages of 5 -19

- Parents

- Child care providers

- Providers of After-school care

- Community organizations

- Community partners

- Community leaders and government officials

- Donors

- K-12 Educators

- Volunteers

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	86000	178000	761000	1600000
2008	201910	422526	646454	632467

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	5	0	
2008	73	0	73

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of trainings, educational workshops, and on-line education sessions for VCE's targeted audiences

Year	Target	Actual
2008	5000	5834

Output #2

Output Measure

- Number of fact sheets, publications and curricula on youth development, families, and communities

Year	Target	Actual
2008	1013	72

Output #3

Output Measure

- Number of members in in-school, after-school, community clubs, special interest activities, 4-H military programs, and camps

Year	Target	Actual
2008	104150	77642

Output #4

Output Measure

- Number of citizens receiving entrepreneurial education

Year	Target	Actual
2008	150000	1824

Output #5

Output Measure

- Number of youth and adults engaged in leadership development education

Year	Target	Actual
2008	2000	3948

Output #6

Output Measure

- Number of clubs where youth are involved in structured after school programming

Year	Target	Actual
2008	600	3708

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Percentage of trained volunteers and citizens participating in leadership development indicating increased knowledge, skills, and attitudes as a result of participation
2	Percentage of 4H volunteers (both youth and adult) that demonstrate an increase in knowledge and use of positive youth development skills and concepts when working with youth
3	Percentage of youth/adults engaged in the 4H program that demonstrate an increase in knowledge and skills related to specific projects and/or subject matter
4	Number of volunteers completing master training that gain knowledge and skills enabling them to accept leadership roles within the organization
5	Percentage of 4H campers that demonstrate an increase in specific life skills as a result of camp participation
6	Percentage of youth involved in the 4H program that indicate an increase in specific life skills
7	Percent increase in life skill development among senior 4H members as a result of participation in State 4H Congress
8	Percentage of youth and adults involved in the 4H community club program that indicate increased knowledge and skills related to community involvement and improvement
9	Percentage of senior 4H members indicating that attendance at State 4H Congress enabled them to perform better at school or work
10	Percent of parents increasing knowledge in understanding child development
11	Percent of parents increasing knowledge of effective parenting practices
12	Percent of parents increasing knowledge in nurturing children
13	Percent of parents adopting practices in nurturing children
14	percent of parents increasing knowledge in guiding children
15	Percent of parents adopting practices in guiding children
16	Percent of parents using available community resources to meet their needs
17	Percent of parents adopting practices to reduce family conflict and manage stress
18	Percent of childcare providers/teachers able to describe the stages of physical, cognitive, and social development of young children
19	Percent of childcare providers able to state and implement techniques used to observe and record children's behavior
20	Percent of childcare providers enrolled in professional associations
21	Percent of childcare providers who adopt/include one new physical activity in their program
22	Percent of childcare providers who adopt one or more healthy food practices in their program
23	Percent of childcare providers preparing an emergency plan for home or center
24	Percent of childcare providers increasing knowledge and implementing effective guidelines for program operation
25	Percent of childcare providers implementing one strategy to improve relationships with enrolled families
26	Percentage of childcare providers who increase knowledge of core competencies, improve the child's learning environment, or improve program management practices.
27	Percent of parents increasing knowledge in effective parenting practices to include nurturing and guidance, understanding child development, and awareness of available community resources to meet family needs
28	Percent of parents adopting developmentally appropriate effective parenting practices to include nurturing and guidance and utilizing community resources to meet family needs and to reduce family conflict and manage stress
29	Number of youth and adults demonstrating an increase in knowledge and/or skills in animal sciences.
30	Number of youth participating in the family sciences 'Safe at Home: Safe Alone' curriculum demonstrate learning safe practices to create a secure home environment.
31	Number of youth through communication and expressive arts programming demonstrate increase self-efficacy in public speaking, presentations, visual arts, and performing arts.
32	Number of 4-H youth participating in foods, nutrition, and health programs demonstrate healthy living choices in foods, nutrition, physical fitness, at-risk health behaviors, and general health.
33	Number of volunteers completing a training program and successfully leading a youth development program, activity, event, or club.

34	Number of youth indicating increased knowledge and/or skills related to leadership.
35	Number of youth indicating increased knowledge/skills related to Character Counts and/or number demonstrating the use of value skills developed.
36	Number of youth, or parents of youth, reporting a positive change in life skills as a result of participation in a 4-H camp.
37	Number of youth engaging in 4-H clubs demonstrating increased leadership, teamwork, goal setting, and general life skill development.
38	Number of youth reporting positive attitude change and/or aspirations about learning and careers in a 4-H project area.
39	Number of youth participants in 4-H natural resources and environmental education programs demonstrate environmentally responsible behavior.
40	Number of youth indicating increased knowledge/skills related to economic education and/or entrepreneurship.
41	Number of youth increasing participation in science and technology educational programming/clubs.
42	Number of youth reporting positive attitude change and/or aspiration related to volunteering and community service.

Outcome #1

1. Outcome Measures

Percentage of trained volunteers and citizens participating in leadership development indicating increased knowledge, skills, and attitudes as a result of participation

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	70	100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Communities face increasing operational costs, stagnant revenue, growing taxpayer demands, and a lack of citizens who accept community leadership roles. In a recent statewide situation analysis, 114 issues related to the need for training in leadership, ethics/values, and community development were listed.

What has been done

The VCE Community Viability (CV) team researched Virginia's existing leadership programs, examined programs offered by Extension in other states, and analyzed audiences served, benefits received, and training gaps. In 2007 CV developed Innovative Leadership: Building Community Connections and offered it in 2008. The curriculum provides six training modules enabling individuals to build their leadership skills, increase their awareness of community issues, network with other leaders, and become more engaged in community, civic, and governmental activities. In 2008, 13 agents/specialists were certified as leadership trainers.

Results

Danville Pittsylvania County Chamber of Commerce selected this program as its educational component for the Neighborhood Leadership Institute. Within one year, 108 residents completed the training and engaged in dialogue with government officials, at least 20 projects were designed/presented to local leaders, and four other regions are scheduled to offer the program in 2009. At the conclusion of the 18-hour training program, 100% of the program graduates indicated an increase in knowledge related to leadership development as a result of their participation. Approximately 20% of the program graduates have enrolled in other leadership programs and/or accepted a leadership role within their community. A network of graduates was created and information is being shared regarding community leadership activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

Percentage of 4H volunteers (both youth and adult) that demonstrate an increase in knowledge and use of positive youth development skills and concepts when working with youth

Not reporting on this Outcome for this Annual Report

Outcome #3

1. Outcome Measures

Percentage of youth/adults engaged in the 4H program that demonstrate an increase in knowledge and skills related to specific projects and/or subject matter
Not reporting on this Outcome for this Annual Report

Outcome #4

1. **Outcome Measures**
   Number of volunteers completing master training that gain knowledge and skills enabling them to accept leadership roles within the organization
   Not reporting on this Outcome for this Annual Report

Outcome #5

1. **Outcome Measures**
   Percentage of 4H campers that demonstrate an increase in specific life skills as a result of camp participation
   Not reporting on this Outcome for this Annual Report

Outcome #6

1. **Outcome Measures**
   Percentage of youth involved in the 4H program that indicate an increase in specific life skills
   Not reporting on this Outcome for this Annual Report

Outcome #7

1. **Outcome Measures**
   Percent increase in life skill development among senior 4H members as a result of participation in State 4H Congress
   Not reporting on this Outcome for this Annual Report

Outcome #8

1. **Outcome Measures**
   Percentage of youth and adults involved in the 4H community club program that indicate increased knowledge and skills related to community involvement and improvement
   Not reporting on this Outcome for this Annual Report

Outcome #9

1. **Outcome Measures**
   Percentage of senior 4H members indicating that attendance at State 4H Congress enabled them to perform better at school or work
   Not reporting on this Outcome for this Annual Report

Outcome #10

1. **Outcome Measures**
   Percent of parents increasing knowledge in understanding child development
   Not reporting on this Outcome for this Annual Report

Outcome #11

1. **Outcome Measures**
   Percent of parents increasing knowledge of effective parenting practices
   Not reporting on this Outcome for this Annual Report

Outcome #12

1. **Outcome Measures**
   Percent of parents increasing knowledge in nurturing children
   Not reporting on this Outcome for this Annual Report

Outcome #13

1. **Outcome Measures**
   Percent of parents adopting practices in nurturing children
   Not reporting on this Outcome for this Annual Report

Outcome #14

1. **Outcome Measures**
   percent of parents increasing knowledge in guiding children
   Not reporting on this Outcome for this Annual Report

Outcome #15

1. **Outcome Measures**
   Percent of parents adopting practices in guiding children
   Not reporting on this Outcome for this Annual Report

Outcome #16

1. **Outcome Measures**
   Percent of parents using available community resources to meet their needs
   Not reporting on this Outcome for this Annual Report

Outcome #17

1. **Outcome Measures**
   Percent of parents adopting practices to reduce family conflict and manage stress
   Not reporting on this Outcome for this Annual Report

Outcome #18

1. **Outcome Measures**
   Percent of childcare providers/teachers able to describe the stages of physical, cognitive, and social development of young children
   Not reporting on this Outcome for this Annual Report

Outcome #19

1. **Outcome Measures**
   Percent of childcare providers able to state and implement techniques used to observe and record children's behavior
   Not reporting on this Outcome for this Annual Report

Outcome #20

1. **Outcome Measures**

   Percent of childcare providers enrolled in professional associations

   Not reporting on this Outcome for this Annual Report

Outcome #21

1. **Outcome Measures**

   Percent of childcare providers who adopt/include one new physical activity in their program

   Not reporting on this Outcome for this Annual Report

Outcome #22

1. **Outcome Measures**

   Percent of childcare providers who adopt one or more healthy food practices in their program

   Not reporting on this Outcome for this Annual Report

Outcome #23

1. **Outcome Measures**

   Percent of childcare providers preparing an emergency plan for home or center

   Not reporting on this Outcome for this Annual Report

Outcome #24

1. **Outcome Measures**

   Percent of childcare providers increasing knowledge and implementing effective guidelines for program operation

   Not reporting on this Outcome for this Annual Report

Outcome #25

1. **Outcome Measures**

   Percent of childcare providers implementing one strategy to improve relationships with enrolled families

   Not reporting on this Outcome for this Annual Report

Outcome #26

1. **Outcome Measures**

   Percentage of childcare providers who increase knowledge of core competencies, improve the child's learning environment, or improve program management practices.

2. **Associated Institution Types**

   - 1862 Extension
   - 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	82

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There are an estimated 599,000 children under the age of six in Virginia. Of these, approximately 62% are routinely cared for by someone other than their parents. Current statistics indicate that one in five Virginia children enter Kindergarten without the basic skills needed to succeed. Yet research shows that the first five years of life are crucial to children's long term cognitive, social and emotional development. Additionally, every dollar invested in high quality childcare and early childhood education returns $7 to $8 to society by reducing cost related to crime, special education and welfare and increasing revenues through improved employee productivity.

What has been done

To enhance the quality of early childhood care and education, Family and Consumer Sciences Agents conducted childcare provider trainings throughout Virginia. Participants from family day homes, childcare facilities, public school pre-K, Head Start and other groups attended these events to learn about effective guidelines for successful early childhood program operations.

Results

From one select area within the state, 186 providers caring for approximately 2814 children in 11 counties and cities participated in at least one of the two four hour trainings. Knowledge for the workshops was assessed by a post evaluation and behavior change was identified by a six month follow-up evaluation. As a result of attending these training sessions, participants reported the following knowledge gains: 72% learned new ideas to help children get along with others; 81% learned new activities to promote early language and literacy development; 79% children learned healthy food choices and new activities to increase physical activity; and 75% learned new ideas for dealing with stress at work. On a six month follow-up survey, 27% of the participants surveyed returned the completed survey. These assessments showed: 82% of providers made changes to help children get along with others; 64% started including activities to help children explore the world around them through math and science; 82% started procedures that will help control illness in their center; 45% started using more movement activities in their center; 45% started using more activities to help children learn to read. In addition to this knowledge gained and behavior changes, participants shared the following comments: Because of this workshop I learned ways to make reading more interesting. Because of this workshop I will pay more attention to different cultures and take them into consideration. Because of this workshop I learned how to teach children to respect each other. Because of this workshop I will teach children how to wash their hands properly. Because of this workshop I will start sending out seasonal newsletters.

4. Associated Knowledge Areas

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

Outcome #27

1. Outcome Measures

Percent of parents increasing knowledge in effective parenting practices to include nurturing and guidance, understanding child development, and awareness of available community resources to meet family needs

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	781

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In Virginia, 31 children died from abuse and neglect in 2006. That same year, there were 47,130 reported victims of abuse/neglect. Research indicates that living in poverty, unemployment, inadequate housing and conflict between parents are stressors that interfere with a parent's ability to effectively raise children. Nearly one in five children under age six lives in poverty and the number is growing. Poor children often suffer academically and enter adulthood lacking the skills to compete in the global labor market. As adults, they are more likely to suffer from poor health and participate in crime and other antisocial behavior and less likely to be gainfully employed.

What has been done

To identify parenting issues in Virginia, agents partnered with local schools and agencies to identify issues. As a result, educational programming focused on effective parenting techniques, communication and positive discipline. The programs were provided to an array of audiences, including DSS referred or court ordered parents, teen parents, workplace audiences, welfare to work audiences, Title I parents, preschool public education program parents, alternative school students, grandparents and other relatives raising grandchildren or kin, and workshops for women in local battered women's shelter care.

Results

Seven hundred eight-one individuals participated in parent education programs across the state. Seventy-eight percent of these parents increased their knowledge of effective parenting practices to include nurturing and guidance, understanding child development, and awareness of available community resources to meet family needs.

4. Associated Knowledge Areas

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

Outcome #28

1. Outcome Measures

Percent of parents adopting developmentally appropriate effective parenting practices to include nurturing and guidance and utilizing community resources to meet family needs and to reduce family conflict and manage stress

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	781

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In Virginia, 31 children died from abuse and neglect in 2006. That same year, there were 47,130 reported victims of abuse/neglect. Research indicates that living in poverty, unemployment, inadequate housing and conflict between parents are stressors that interfere with a parent's ability to effectively raise children. Nearly one in five children under age six lives in poverty and the number is growing. Poor children often suffer academically and enter adulthood lacking the skills to compete in the global labor market. As adults, they are more likely to suffer from poor health and participate in crime and other antisocial behavior and less likely to be gainfully employed.

What has been done

To identify parenting issues in Virginia, agents partnered with local schools and agencies to identify parenting issues. As a result, educational programming focused on effective parenting techniques, communication and positive discipline were provided to an array of audiences, including DSS referred or court ordered parents, teen parents, workplace audiences, welfare to work audiences, Title I parents, preschool public education program parents, alternative school students, grandparents and other relatives raising grandchildren or kin, and workshops for women in local battered women's shelter care.

Results

Seven hundred eighty-one individuals participated in parent education programs across the state. Eighty-three percent of these participants adopted developmentally appropriate effective parenting practices to include nurturing and guidance and utilizing community resources to meet family needs.

4. Associated Knowledge Areas

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

Outcome #29

1. Outcome Measures

Number of youth and adults demonstrating an increase in knowledge and/or skills in animal sciences.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1689

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Teachers who embrace hands-on learning in science recognize certain desirable outcomes and endorse student-centered instructional approaches. Research has confirmed many of the benefits of hands-on learning and documented a variety of unanticipated benefits. Science teachers from public and private schools within Virginia contacted Extension 4-H agents for hands-on activities to enhance their teaching and to help them meet Virginia Standards of Learning requirements.

What has been done

The 4-H embryology curriculum was introduced to teachers. This project focused on responsibility and caring for another living thing, as well as introducing youth to scientific processes. One thousand six hundred eighty-nine youth were enrolled in this project from sixteen schools in Virginia. A hatchery in Virginia donated fertilized eggs for the project.

Results

In a post program evaluation, teachers who participated in the project expressed the following:
* 80% agreed the project assisted with meeting the Virginia Standard of Learning requirements.
* 94% noticed an increase in student's level of responsibility and caring as a result of the project.
* 95% noticed students having a greater respect for life and the value of living things after participating in the project.
*96% felt the curriculum helped emphasize a hands-on experience with living things.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #30

1. Outcome Measures

Number of youth participating in the family sciences 'Safe at Home: Safe Alone' curriculum demonstrate learning safe practices to create a secure home environment.

2. Associated Institution Types

•1862 Extension
•1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	5183

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Northern Virginia is a fast growing area with a significant school-aged population. A large percentage of the Northern Virginia workforce commutes out of their home county for employment. The average commute is 40 minutes, although 25% of commuters travel more than 60 minutes to work. This results in many children home alone after school, and parents working a significant distance away, not accessible in an emergency. Research indicates that children who stay home alone are at risk for loneliness, boredom, and early sexual activity.

What has been done

The 4-H 'Safe At Home Safe Alone' curriculum teaches children in fourth grade safe practices for times home alone. Collaborating with 55 elementary guidance counselors, Virginia 4-H recruited volunteers, oversaw curriculum implementation, promoted the program, provided curriculum, and trained volunteers to teach youth.

Results

One hundred fifty-three volunteers and school staff delivered the 'Safe at Home Safe Alone' program to 5,183 fourth graders in 50 elementary schools; volunteering 2,280 hours. Eighty-three youth surveys were returned and showed 100% of youth reporting an increase in life skill knowledge about issues of safety and well-being when home alone. One youth made this comment: I learned the importance of saying no to friends, phone safety, not leaving my key outside the house, not going into a burning building, being prepared and calm in emergencies, and having a first aid plan. Eighty 4-H adult volunteers returned surveys assessing the program. 100% of surveys said the curriculum was adequate in teaching youth life skills needed when home alone. One guidance counselor wrote, 'After seeing the pre-tests I was shocked at how little information these students have been given. It was scary to me to think of them being so unprepared to be on their own.' Another wrote, 'one child told me that as a result of the home safety walk-through, their parents bought a flashlight and a fire extinguisher, because they didn't have them.'

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #31

1. Outcome Measures

Number of youth through communication and expressive arts programming demonstrate increase self-efficacy in public speaking, presentations, visual arts, and performing arts.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	18380

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Communication and self-expression are important life skills related to the family, school and work. Skills learned through competitive events include collecting and organizing information, clearly stating thoughts, being confident in front of groups, and increased self esteem and self confidence.

What has been done

Virginia 4-H offers several opportunities in oral and written communication and expressive arts, including oral presentations, public speaking, talent performances, science fair presentations, and dramatic reading. These opportunities are offered on the unit, district, and state levels.

Results

4-H presentation contests enabled 209 youth to demonstrate proper presentation techniques. Youth reported that by giving a presentation they were better able to speak in front of a group (69%), gather information and supplies necessary for public presentations (87%); organize thoughts (70%); teach and show others (75%), and feel better about themselves because of what they had achieved (78%). Youth reported developing better organizational skills (74%); they felt more confident in their abilities to speak in front of a group (75%); they understood how to give a speech while learning how to communicate better (60%); and they felt greater self-confidence (83%). Youth involved in 4-H science fairs reported understanding the scientific process (90%); gaining skills in self-motivation (79%); developing critical thinking skills (71%); honing skills in developing and giving an oral presentation (64%); and feeling good about their accomplishments (89%).

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #32

1. Outcome Measures

Number of 4-H youth participating in foods, nutrition, and health programs demonstrate healthy living choices in foods, nutrition, physical fitness, at-risk health behaviors, and general health.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	802

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the National Institute of Health, the number of overweight children has doubled in the last decade. Thirty-nine percent of Virginia's children are overweight, well above the national average of 14.8%. Childhood obesity is a growing trend and has no age limits. Children as young as two are already struggling with their weight. In fact, 14% of children ages 2 to 5 are already overweight according to statistics from the 2006 Pediatric Nutrition Surveillance System.

What has been done

Through 4-H's Healthy Lifestyles and Food and Nutrition curriculum, 4-H is addressing the state's childhood obesity problem by introducing healthy habits and physical activity into 4-H participation. By providing high quality, research-based education, Virginia 4-H is increasing knowledge, improving attitudes, and building skills directed at reducing the prevalence of childhood obesity.

Results

Studies show that youth who develop healthy habits early are more likely to practice these habits throughout their lives. In one area of the state, of the 802 youth enrolled in Healthy Lifestyles and Food and Nutrition curriculum in 2008, 100% indicated they have incorporated at least one health or nutrition practice into their daily lives. Furthermore, 95% of youth indicated an increase in knowledge regarding the benefits of physical activity, the importance of healthy food options, diseases related to obesity, and the importance of eating the correct portion sizes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #33

1. Outcome Measures

Number of volunteers completing a training program and successfully leading a youth development program, activity, event, or club.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	13378

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Volunteers are essential to the success of Virginia Cooperative Extension programming. Volunteer support is important in fulfilling programmatic objectives for 4-H, such as providing care, guidance, respect, knowledge and wisdom to youth participants. Trained 4-H volunteers are needed to fill these roles and engage youth in civic and 4-H club activities to help youth develop the essential elements identified as positive outcomes including mastery, generosity, independence and belonging.

What has been done

In Virginia, 93 faculty and staff supported volunteers through group training sessions and numerous individual sessions. Topics included communication, club/project management, risk management, VCE policies and procedures and youth development basics. Volunteer opportunities ranged from one time occasional volunteers to long-term volunteers who contribute to positive youth development. Most volunteers work directly with enrolled 4-H youth.

Results

Adult volunteers served as role models by accepting responsibility for the organizational management of club operations, recruiting and encouraging participation, and contributing to community well being. In Virginia 4-H, volunteers leaders contributed to the success of the 4-H youth development program through every delivery method (community clubs, in-school clubs, after school clubs, military 4-H clubs, special interest programs, camping, and school enrichment). In 2008, 13,378 Virginia 4-H volunteers contributed 401,352 hours to support 128,142 4-H youth, influencing 5,122 clubs in 2008. (The 2008 Virginia Average Hourly Value of Volunteer Time is $19.72 *)
* http://www.vaservice.org/go/volunteer/statistics/

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #34

1. Outcome Measures

Number of youth indicating increased knowledge and/or skills related to leadership.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	3824

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Research shows that opportunities to serve as a leader help youth develop decision making, conflict management, responsibility, and other life skills. Throughout the year, 4-H teens serve as leaders for younger youth at unit, district, and state events. However, many of these teens lack leadership skills necessary to lead others and therefore do not always make the best decisions when working with younger youth.

What has been done

Virginia 4-H facilitated leadership training for teens 13 - 19 years of age. The life skills addressed included building character, demonstrating team-work skills, developing new and better ideas to address the needs of campers participating in camp, and the ability to work with others.

Results

As a result of this 4-H leadership development effort, 169 teens participated in 106 hours of training. Seventy-nine teens reported positive attitude change in responsibility, decision making, conflict management, and problem solving. Seventy teens reported gaining knowledge in the importance of accepting differences in others. Additionally, 125 teens indicated improvement in critical thinking and teamwork as a result of participation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #35

1. Outcome Measures

Number of youth indicating increased knowledge/skills related to Character Counts and/or number demonstrating the use of value skills developed.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	20433

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Seventy percent of the Brazilian population is indigent creating a haven for crime and violence. According to a 2005 report prepared by Judge Ricardo Roesler, the violence index at schools is very high and has been growing at a frightening, uncontrollable rate. Surveys cited a lack of values among youth in Brazilian families, lack of future opportunities, enticement of the young by drug dealers, impunity of crimes committed by youth, and the lack of programs focused on rehabilitation of young people.

What has been done

A team of six 4-H faculty taught Character Counts in two states in Brazil during a 24 day visit to address rising youth violence. At the invitation of the Brazilian Judges Association, the team expanded on similar educational events in 2004 and 2006 by training over 250 Joinville teachers in basic and advanced Character Counts curriculum, laying the foundation for wider implementation. In Passos, Minas Gerais, the team trained 125 teachers in basic Character Counts.

Results

VCE 4-H Faculty conducted qualitative research through focus groups with 125 Brazilian teachers, administrators, parents and students to access the impacts of Character Counts. Teachers reported students became more ethical, volunteerism increased in the schools, and communities, students and parents showed more respect for one another and school facilities, violence decreased, schools generated more private funding, and school academic performance improved. Additionally, schools developed a greater sense of community spirit. One interpreter said 'she had been away from teaching for three years and she was amazed at how much has been done with Character Counts and how the schools have improved since implementation.' Other teachers said they had not realized how much positive impact they had made in two years until the focus group members met sharing how much the program had positively changed them. Upon adopting Character Counts, businesses and industry contributed financially to the schools because the government did not provide adequate funding. Because volunteerism is not a cultural priority in Brazil, comments were shared regarding increased volunteerism.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #36

1. Outcome Measures

Number of youth, or parents of youth, reporting a positive change in life skills as a result of participation in a 4-H camp.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	12273

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Virginia 4-H has had an established camping program for over 90 years and strong participation has been one of the major goals. Four-H camp allows youth to make new friends and become more independent. However, more precise information is needed on specific skill development by junior campers and teen leaders who serve as counselors for the program. This skill development information could be used by parents and local leaders to be more fully informed about the educational value of 4-H camp, as well as by camp programmers to adapt their program to help intensify the skill development process.

What has been done

One 4-H three county camping group in Virginia conducted an evaluation to determine what skills were developed at camp and the educational value of the teen training process. To identify these skills, the agents conducted a qualitative research project using data from junior camper and teen counselor focus groups, observation of campers/teens, a follow-up parent telephone survey, and a post camp teen/adult surveys.

Results

Through qualitative analysis, 316 junior 4-Hers indicated development in team building skills, communication skills, environmental awareness, and increased physical activity. Campers also stressed the importance of socialization with other campers in a safe atmosphere. When asked if campers showed any behavioral changes upon arriving home, parents responded the youth seemed more responsible as well as they did not complain about increased walking or exercising and seemed to be much more caring when relating to siblings. Teens reported they noticed a decrease in the bullying of campers when compared to what they had observed at school; they saw a physically disadvantaged youth supported, helped and encouraged when the same child was tormented at school. These teens attributed this stronger acceptance for this youth on the emphasis on character education at camp. Teens highlighted the increased management and responsibility of supervising other youth by verbal/nonverbal communication as improved skills. Teens also reported the importance of understanding the developmental ages/stages of youth and responding to their needs in the appropriate manner.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #37

1. Outcome Measures

Number of youth engaging in 4-H clubs demonstrating increased leadership, teamwork, goal setting, and general life skill development.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	43525

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

4-H club participation provides skill development opportunities including leadership, citizenship, problem solving and planning. For young people who choose to be part of a 4-H Club, research shows youth are more likely to be 'educationally motivated, have higher self-esteem and communicate more maturely than their peers.' (Cornell University, 2008)

What has been done

4-H agents with the aid of trained volunteers, manage viable 4-H club programs to assist youth and communities. Virginia 4-H has 43,525 youth participating in 2099 4-H Clubs. Club participation represents afterschool, project, community, and military clubs.

Results

The following increases were reported from 4-H club participation: leadership skills (42%), teamwork skills (56%), goal setting skills (73%), and general life skill improvement (100%). Leaders reported that 75% of 4-H'ers completed project accomplishment books that indicated the impact the projects had in their life.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #38

1. Outcome Measures

Number of youth reporting positive attitude change and/or aspirations about learning and careers in a 4-H project area.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	175

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Potential first generation college students are at a distinct disadvantage for college entry. Their familial connections have not had the experiences necessary to guide them through the college entrance process. According to the U.S. Department of Education, 45% of first generation college students' parents have less than a high school diploma. This issue is pronounced among minority and low-income youth. According to a study by UCLA, the number of first generation college students enrolling is increasing.

What has been done

Virginia Tech Student Affairs and 4-H collaborate to educate youth, parents, and volunteers on the college entrance process and transitioning to high school and college by offering College Days programs in targeted communities involving Extension 4-H units and districts. 4-H agents recruit youth grades 9-12 to participate in campus outreach program. Youth gain knowledge on college admission, selecting a major, the importance of college attendance/graduation, and learning styles.

Results

In a post-program evaluation, most participants found the sessions to be important for making college decisions and helpful to the success of their futures. Participants stated they benefited from an important lesson in the admissions session; 100% of participants indicated that all the sessions were very helpful in planning for their future college and/or career choices. Seventy-five percent of respondents reported positive change in their ability to prepare for college (researching colleges, completing applications, researching financial aid, SAT's/ACT's, etc.).

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #39

1. Outcome Measures

Number of youth participants in 4-H natural resources and environmental education programs demonstrate environmentally responsible behavior.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	2493

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In 2008, U.S. Congressional legislation was enacted entitled: No Child Left Inside. Also, as the state of Virginia becomes more urbanized, there are fewer opportunities for youth to experience the outdoors. With the world's many environmental challenges, it is important that youth learn to appreciate and conserve their natural resources.

What has been done

4-H began a collaborative effort with Virginia Tech's College of Natural Resources service learning class to develop the 'Wild about Nature' environmental education program. This program supplements student learning in the standards of learning related to Virginia's Natural Resources, addresses the need for education that reconnects youth to the environment, and provides future environmental educators with opportunities to develop a teaching philosophy on natural resources education. 4-Holunteers were trained in Project Learning Tree and WET and Virginia Tech students led 4-H environmental education after-school programs in elementary schools.

Results

Over 50 workshops were offered to participants. Participants reported a 100% increase in their awareness of the importance of demonstrating environmentally responsible behavior, while 75% were able to recognize the major elements of a habitat. Thirty-two percent of participants understood the factors affecting wetlands and 24% understood forestry practices and how they affect watersheds. Of the youth who participated in the 4-H terrarium project, all were able to recognize how terrariums are made and why they are important to the environment.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #40

1. Outcome Measures

Number of youth indicating increased knowledge/skills related to economic education and/or entrepreneurship.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	323

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The current state of the economy has focused attention on the need for personal financial literacy training. The President has appointed a Financial Literacy Commission and the U.S. Department of Treasury now has an Office of Financial Education. The Virginia General Assembly approved SB 950 directing the Virginia Board of Education to 'establish objectives for economic education and financial literacy'.

What has been done

Reality Store is an educational simulation that helps students become aware of their need for skills in financial planning and provides motivation for success in school and in secondary education. Volunteers were recruited and trained to implement the program. This program is a hands-on, experiential learning educational program.

Results

Program participation yielded the following: 84% found their future occupation is tied to their current school performance and community involvement and 59% stated the Reality Store program gave them an increased awareness of making smart financial decisions. Three and six month post-event surveys revealed 88% made regular savings deposits, 76% used their financial goals, and 62% continued to utilize spending plans. A parent survey revealed that 75% of the participants' parents felt the event improved their child's knowledge about managing money. Additionally, 84% indicated a need to change the way they spend their money on food, entertainment, and clothing. Program participants indicated the following: 'It makes you respect your parents.'; 'I realized that you have to manage your money'; 'It showed me you have to work hard to live good'; I will try harder in school so that I do not have to be a farmer'; 'I had a low paying job because I didn't have very much education.'

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #41

1. Outcome Measures

Number of youth increasing participation in science and technology educational programming/clubs.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	32571

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Young people are not prepared with the necessary science, engineering and technology (SET) workforce skills to compete in the 21st century (Rising above the Gathering Storm, 2006). At the core of this challenge is our nation's proficiency in SET. Virginia educators have struggled with teaching critical thinking skills and students' understanding of complex processes. Virginia's Science SOL's tests students' understanding the scientific method yet students have very little background knowledge of the scientific method or scientific design.

What has been done

4-H agents developed the science fair project to enhance students' understanding of the scientific method by developing a science fair project. The target audience was elementary and middle school students. Youth from diverse ethnic and cultural, socio-economic, and geographic backgrounds, who may or may not have an interest in science, engineering and technology (e.g., church youth programs, 4-H camp members or other community programs), were targeted for recruitment for the SET 4-H clubs.

Results

Because of this program, science scores are now increasing with several students receiving a perfect score on the science SOL test. The average fifth grade Virginia's Standard of Learning test score rose from 441-456 in one school in a specific district where a SET 4-H club was conducted. One thousand two hundred and twelve students were surveyed on their performance and 75% agreed they should have started sooner in preparing their projects. Some 90% of students felt that the project helped them develop good displays for the fair and 75% of the students agreed that the project was helpful in understanding how to do the scientific method. Participants stated they are getting started right away for next year; it was so exciting constructing the robot and programming it to do the different challenges, gained hands-on experience solving real-world problems, learned from and interacted with teen/adult mentors, and worked as a group to overcome obstacles and meet challenges. All of the youth made comments about how hard teamwork and problem solving is when you have 10 different ideas. They learned to listen to everyone's ideas and then started trying out everyone's ideas, which led ultimately to their solution.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #42

1. Outcome Measures

Number of youth reporting positive attitude change and/or aspiration related to volunteering and community service.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	550

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the Independent Sector in 1996, teenagers volunteer 2.4 billion hours annually and teenage service is worth $34.3 million to the U.S. Economy. Youth who volunteer just one hour a week are 50% less likely to abuse drugs, alcohol, cigarettes, or engage in destructive behavior. To become productive and contributing individuals who can be effective in leading tomorrow's world, young people must develop positive leadership knowledge, attitudes, skills, and aspirations.

What has been done

The State 4-H Cabinet, consisting of officers and ambassadors from across the Commonwealth, are elected by their peers to fill the highest leadership positions teens attain in Virginia 4-H. Cabinet members plan, organize, and facilitate leadership trainings, workshops, teen weekends, 4-H Congress, and a visit to the General Assembly. All of these efforts are done on behalf of the 4-H'ers they represent. Members are immersed in activities and situations that promote public speaking, trust-building, team-building, exploration, responsibility, problem solving, and an appreciation for diversity. Virginia 4-H'ers also participates in and leads community service projects.

Results

Of the 23 Cabinet members in 2008, 100% completed at least two service-learning and outreach projects and 68% completed four or more. All (100%) provided leadership and guidance to unit and/or district leadership events and 83% represented Virginia 4-H at district, state, and national events. This group also planned, led, and delivered the annual statewide 4-H teen weekend. Concerning community service, 90% of 62 youth at teen weekend reported a positive attitude change related to volunteering for civic activities, community service, and/or philanthropy. All youth reported gaining knowledge and/or skills related to the relationship they had with a caring adult. In addition, 95% of youth indicated an improved attitude and/or aspirations toward participating in partnerships with caring adults. One club leader commented on this club's community service projects by stating 4-H members gained, 'the understanding that there are those serving our country who are not at home with their families and that there are those less fortunate and that in our abundance, we should give to help those in need. '

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

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.)
- Other (postage and printing budget reductions)

Brief Explanation

In 2008, there were vacancies in 4-H and Family and Consumer Sciences agent and specialist positions that were not filled. Some of those positions are still in the search process and others have been subject to a statewide hiring freeze due to local and state budget constraints. These vacancies impeded meeting some of the outputs and outcomes in this planned program for 2008. Indirect youth contacts are lower than planned due to reductions in postage and printing budgets.

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

Evaluation Results

Character Counts in Brazil - Based on the 2004 and 2006 efforts by VCE 4-H Agents, VCE 4-H Faculty conducted a qualitative research project through focus groups with teachers, administrators, parents and students to access the impacts of Character Counts efforts since 2004. Due to the Character Counts program, teachers reported students became more ethical, volunteerism increased in the schools and communities, students and parents showed more respect for one another and school facilities, violence decreased (gangs, negative behavior, and bullying), schools generated more private funding, and school academic performance improved.In addition, Character Counts schools formed a greater sense of community spirit.One interpreter said "she had been away from teaching for three years and she was amazed at how much has been done with Character Counts and how the schools have improved since the implementation of Character Counts." Other teachers said they had not realized how much of a positive impact they had made in two years until the focus group members met; sharing how much the program had positively changed them.In some schools, upon adopting Character Counts, businesses and industry contributed financially to the schools because the government did not provide adequate funding.Because volunteerism is not a cultural priority in Brazil, comments were shared about the increased volunteerism in schools and gardening facilities.One parent shared, "her volunteerism began in her daughter's school as a result of attending remedial classes with her child; this relationship fostered continued volunteerism."Another impact of the initiation of volunteerism included one parent collecting recyclable plastics to sell for the purchase of computers for her child's school.These impacts and changes in culture were a direct result of Character Counts implementation.

Key Items of Evaluation

See above text box.

Program #7

V(A). Planned Program (Summary)

1. Name of the Planned Program

Food, Nutrition, and Health

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	10%	10%	10%	10%
502	New and Improved Food Products	5%	5%	5%	5%
702	Requirements and Function of Nutrients and Other Food Components	25%	25%	25%	25%
703	Nutrition Education and Behavior	25%	25%	25%	25%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.	5%	5%	5%	5%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	20%	20%	20%	20%
724	Healthy Lifestyle	10%	10%	10%	10%
	Total	100%	100%	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	40.0	2.0	45.0	3.0
Actual	40.3	2.0	32.8	3.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
962945	137792	692645	575118
1862 Matching	1890 Matching	1862 Matching	1890 Matching
963658	34777	2099244	427919
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2332052	121335	5238042	64477

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct educational classes, workshops, meetings, and trainings. Develop products, curriculum, resources.Facilitate coalitions and/or task forces.Conduct assessments and community surveys. Partner with community agencies and institutions to facilitate programs and community development.Create/revise social systems and public policies. Conduct research studies.Disseminate program and research results through papers, reports, and media. Develop and implement marketing strategies using various outlets to promote program participation. Disseminate research-based information to consumers using a variety of media and technology resources. Cooperate with media and other community agencies to seek effective means of reaching new and non-traditional audiences. Respond to consumer inquiries.

2. Brief description of the target audience

Childhood Nutrition & Fitness - young children (2 - 5 years), school-aged children, adolescents, parents, caregivers, school faculty of young children, youth, adolescents, and Extension educators.

Chronic Disease -young adults (ages 25 – 59), older adults (age 60 and older), caregivers of older adults, adults with type 2 diabetes, parents and caregivers of individuals with type 2 diabetes, senior center and meal site staff and volunteers, and Extension educators.

Food Safety - retail and food service employees, retail and food service management, temporary food vendors, child care providers, young adults (ages 25-59), older adults (ages 60 and older), commercial food processors, and Extension educators.

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	190500	325000	100000	40000
2008	132248	105626	146646	4030

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	5	10	
2008	2	53	55

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Food Safety - Number of ServeSafe classes offered by Extension educators in Virginia

Year	Target	Actual
2008	12	57

Output #2

Output Measure

- Adult Nutrition and Chronic Disease Prevention - Number of diabetics and family members participating in Dining with Diabetes program offered in cooperation with a local health care provider

Year	Target	Actual
2008	80	56

Output #3

Output Measure

- Childhood Nutrition & Fitness - Number of pre-school aged youth participating in Food Friends and Mighty Moves program and other Extension educational programs at childcare centers

Year	Target	Actual
2008	200	1981

Output #4

Output Measure

- Childhood Nutrition & Fitness - Number of elementary and middle school-aged youth participating in the Virginia Cooperative Extension Healthy Weights for Healthy Kids program or other nutrition education programs for youth

Year	Target	Actual
2008	10000	56912

Output #5

Output Measure

- Childhood Nutrition & Fitness - Number of adolescents participating in Virginia Cooperative Extension nutrition education programs

Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Childhood Nutrition & Fitness - Number of youth participating in Virginia Cooperative Extension school-based wellness initiatives or efforts to address local school wellness policies aimed at improving available foods and physical activity opportunities

Year	Target	Actual
2008	200	17294

Output #7

Output Measure

- Adult Nutrition and Chronic Disease Prevention - Number of adults participating in at least one session on adult nutrition, fitness, or health

Year	Target	Actual
2008	2500	3512

Output #8

Output Measure

- Food Safety - Number of home-based food business workshops conducted for food product formulation, facility planning, food processing and safety, product evaluation, food packaging and labeling, and record keeping

Not reporting on this Output for this Annual Report

Output #9

Output Measure

- Food Safety - Number of shortcourses provided on food safety practices including HACCP training and recall workshops to industry personnel, consumer organizations, Extension Agents and to local, state, and federal health inspectors

Year	Target	Actual
2008	5	8

Output #10

Output Measure

- Number of Serv Safe Essentials classes offered by Extension educators in Virginia

Year	Target	Actual
2008	6	40

Output #11

Output Measure

- Number of So Easy to Preserve classes offered by Extension educators in Virginia

Year	Target	Actual
2008	1	17

Output #12

Output Measure

- Number of Cooking for Crowds classes offered by Extension educators in Virginia

Year	Target	Actual
2008	8	25

Output #13

Output Measure

- Number of internet products analyzed for microbial and chemical contamination

Not reporting on this Output for this Annual Report

Output #14

Output Measure

- Food Safety - Number of food products evaluated for their safety by the 'Food Processor Technical Assistance Program' to prevent foodborne illness across the commonwealth

Year	Target	Actual
2008	{No Data Entered}	294

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Childhood Nutrition & Fitness - Number of select elementary or middle school-aged youth who gain knowledge and awareness of nutrition, physical activity, and positive body image and improve at least one program-related behavior after participation in Healthy Weights for Healthy Kids or other Virginia Cooperative Extension nutrition education programs
2	Childhood Nutrition & Fitness - Number of pre-school aged youth participating in Food Friends and Mighty Moves program or other Extension educational programs at childcare centers who try more new foods, consume more fruits, vegetables, or wider variety of foods, or increase physical activities after participation in the program
3	Adult Nutrition and Chronic Disease Prevention - Number of individuals with diabetes who have lowered their Hemoglobin A1c level by at least 0.5, three months after participating in a Dining with Diabetes program offered in cooperation with a local health care provider
4	Adult Nutrition and Chronic Disease Prevention - Number of adults participating in at least one class on adult nutrition, fitness, or health who indicate their intent to make one change in their dietary intake, food purchasing behavior, or level of physical activity
5	Food Safety - Number of managers, supervisors, and food handling personnel from restaurants, public school and hospital cafeterias, daycare centers, nursing homes, university foodservice, correctional centers, and other foodservice industries who increase knowledge and skills in safe food handling practices by 30%
6	Food Safety - Number of Virginia food producers and processors to implement (pre and post harvest) HACCP, quality assurance programs and processing technology that will provide for increased food safety and processing efficiency
7	Food Safety - Number of home-based business entrepreneurs who are provided with assistance and training who increase awareness and knowledge in producing safe high acid and acidified foods
8	Food Safety - Number of consumers and at-risk populations, including civic/community groups, senior citizens, child care providers, youth, 4-H youth, Master Food Preservers, and volunteer cooks at fund-raising events, who increase their knowledge of foodborne illness, safe food handling practices, and food preservation
9	Childhood Nutrition and Fitness - Number of adolescents or high school students who improve their diet and physical activity after participation in Virginia Cooperative Extension nutrition education programs
10	Childhood Nutrition and Fitness - Number of children who report eating healthier foods and being more physically active as a result of Virginia Cooperative Extension school-based wellness initiatives or efforts to address local school wellness policies to improve available foods and physical activity opportunities
11	Adult Nutrition and Chronic Disease Prevention - Number of adults participating in at least one class on adult nutrition, fitness, or health who within three months report one change in their dietary intake (i.e., increase their servings of fruits, vegetables, whole grains, or dairy products or decrease their servings of sweets or fats)
12	Adult Nutrition and Chronic Disease Prevention - Number of adults participating in at least one class on adult nutrition, fitness or health who within three months report one change in physical activity (i.e. walking, strength training, using fewer labor-saving devices, incorporating more activity into daily living)
13	Adult Nutrition and Chronic Disease Prevention - Number of adults participating in at least one class on adult nutrition, fitness, or health who within three months report one change in their food purchasing behavior (i.e., reading labels, using unit pricing to stretch food dollars, purchasing whole grains versus enriched grains, choosing products lower in sodium)
14	Food Safety - Increase in the number of food handlers (managers, supervisors, and food handling personnel from restaurants, schools, hospital cafeterias, daycare centers, nursing homes, university food service, correctional centers, civic/community groups and volunteers) who increase knowledge and skills in safe food handling practices
15	Food Safety - Increase in number of home-based business entrepreneurs that increase awareness and knowledge in producing safe high acid and acidified food products
16	Food Safety - Increase in the number of Virginia food producers and processors to implements pre and post harvest safety and quality assurance programs resulting in increased food safety and processing efficiency
17	Chronic disease prevention, obesity research - Number of discoveries from completed obesity related research projects which focus on examining obesity from its root causes to its association with disease.
18	Nutrition, Physical Activity and Health - Increase in number of youth and adults that make lifestyle changes which improve their dietary quality and/or physical activity level after participation in VCE programs
19	Chronic disease prevention - Increase in number of individuals with diabetes who have lowered their Hemoglobin A1c level at least 0.5., three months after participating in a diabetes education program offered in collaboration with a local Extension educator or health care provider.

20	Physical Activity - Research - Increase in number of Extension agents that plan to implement statewide standardized physical activity programming in their counties as part of a statewide research program.
21	Number of research projects to ensure a safe and secure food system
22	Research discoveries that suggest food applications for health promotion and disease prevention through improving human nutrition.

Outcome #1

1. **Outcome Measures**

Childhood Nutrition & Fitness - Number of select elementary or middle school-aged youth who gain knowledge and awareness of nutrition, physical activity, and positive body image and improve at least one program-related behavior after participation in Healthy Weights for Healthy Kids or other Virginia Cooperative Extension nutrition education programs

Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**

Childhood Nutrition & Fitness - Number of pre-school aged youth participating in Food Friends and Mighty Moves program or other Extension educational programs at childcare centers who try more new foods, consume more fruits, vegetables, or wider variety of foods, or increase physical activities after participation in the program

Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**

Adult Nutrition and Chronic Disease Prevention - Number of individuals with diabetes who have lowered their Hemoglobin A1c level by at least 0.5, three months after participating in a Dining with Diabetes program offered in cooperation with a local health care provider

Not reporting on this Outcome for this Annual Report

Outcome #4

1. **Outcome Measures**

Adult Nutrition and Chronic Disease Prevention - Number of adults participating in at least one class on adult nutrition, fitness, or health who indicate their intent to make one change in their dietary intake, food purchasing behavior, or level of physical activity

Not reporting on this Outcome for this Annual Report

Outcome #5

1. **Outcome Measures**

Food Safety - Number of managers, supervisors, and food handling personnel from restaurants, public school and hospital cafeterias, daycare centers, nursing homes, university foodservice, correctional centers, and other foodservice industries who increase knowledge and skills in safe food handling practices by 30%

Not reporting on this Outcome for this Annual Report

Outcome #6

1. **Outcome Measures**

Food Safety - Number of Virginia food producers and processors to implement (pre and post harvest) HACCP, quality assurance programs and processing technology that will provide for increased food safety and processing efficiency

Not reporting on this Outcome for this Annual Report

Outcome #7

1. **Outcome Measures**
   Food Safety - Number of home-based business entrepreneurs who are provided with assistance and training who increase awareness and knowledge in producing safe high acid and acidified foods
   Not reporting on this Outcome for this Annual Report

Outcome #8

1. **Outcome Measures**
   Food Safety - Number of consumers and at-risk populations, including civic/community groups, senior citizens, child care providers, youth, 4-H youth, Master Food Preservers, and volunteer cooks at fund-raising events, who increase their knowledge of foodborne illness, safe food handling practices, and food preservation
   Not reporting on this Outcome for this Annual Report

Outcome #9

1. **Outcome Measures**
   Childhood Nutrition and Fitness - Number of adolescents or high school students who improve their diet and physical activity after participation in Virginia Cooperative Extension nutrition education programs
   Not reporting on this Outcome for this Annual Report

Outcome #10

1. **Outcome Measures**
   Childhood Nutrition and Fitness - Number of children who report eating healthier foods and being more physically active as a result of Virginia Cooperative Extension school-based wellness initiatives or efforts to address local school wellness policies to improve available foods and physical activity opportunities
   Not reporting on this Outcome for this Annual Report

Outcome #11

1. **Outcome Measures**
   Adult Nutrition and Chronic Disease Prevention - Number of adults participating in at least one class on adult nutrition, fitness, or health who within three months report one change in their dietary intake (i.e., increase their servings of fruits, vegetables, whole grains, or dairy products or decrease their servings of sweets or fats)
   Not reporting on this Outcome for this Annual Report

Outcome #12

1. **Outcome Measures**
   Adult Nutrition and Chronic Disease Prevention - Number of adults participating in at least one class on adult nutrition, fitness or health who within three months report one change in physical activity (i.e. walking, strength training, using fewer labor-saving devices, incorporating more activity into daily living)
   Not reporting on this Outcome for this Annual Report

Outcome #13

1. Outcome Measures

Adult Nutrition and Chronic Disease Prevention - Number of adults participating in at least one class on adult nutrition, fitness, or health who within three months report one change in their food purchasing behavior (i.e., reading labels, using unit pricing to stretch food dollars, purchasing whole grains versus enriched grains, choosing products lower in sodium)

Not reporting on this Outcome for this Annual Report

Outcome #14

1. Outcome Measures

Food Safety - Increase in the number of food handlers (managers, supervisors, and food handling personnel from restaurants, schools, hospital cafeterias, daycare centers, nursing homes, university food service, correctional centers, civic/community groups and volunteers) who increase knowledge and skills in 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	{No Data Entered}	1490

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Center for Disease Control and Prevention (CDC) estimates that annually, 76 million people in the United States become sick with foodborne illnesses: 325,000 are hospitalized, and 5,000 die each year. Foodborne illnesses are typically caused by improperly-prepared food. People who become sick with such illnesses are prone to be less productive in both their professional and home lives.

What has been done

In Virginia, VCE conducts both the 16 hour and six hour ServSafe courses for managers and employees trainings, as well as a four hour food safety program which targets individuals that occasionally prepare and serve large quantities of food for the public through fundraisers or church events.

Results

Over 682 restaurants, schools, daycare centers, churches, civic groups and public service organizations sent individuals to one of these trainings. Of those who completed feedback forms, 85% increased their knowledge of food safety practices by at least 30%. Two hundred and one participants responded to a three to six-month follow-up survey. Of respondents, 100% adopted at least one new food safety practice. Of those who adopted a new food safety practice, 100% improved time and temperature practices, 99% made changes to prevent food contamination, and 96% made changes to personal hygiene practices.

4. Associated Knowledge Areas

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

Outcome #15

1. Outcome Measures

Food Safety - Increase in number of home-based business entrepreneurs that increase awareness and knowledge in producing safe high acid and acidified food products

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}	225

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Food processors in Virginia need guidance on formulation and regulation of their products to produce safe and wholesome food products in compliance with state and federal laws.

What has been done

Food products and processes are analyzed and recommendations are delivered. As a Process Authority for acidified foods, food processors receiving guidance are able to file required processing documents with the FDA. In the absence of this guidance, processors could not legally sell their products.
Education includes:
- Regulations for processed food products
- Formula and process modifications which comply with regulations or improve safety.
- Filing and maintenance of required documentation.

Results

During 2008, education was provided to 1,584 individuals by phone or e-mail. Additionally, food products produced by 225 food businesses (92% Virginia-based) were analyzed and recommendations provided. Of the products tested, 33 had a significant food safety issue that, left uncorrected, may have resulted in unsafe food in the marketplace. Approximately 200 of these products had a significant quality issue that may have resulted in significant economic loss for the processor. For many of these products, this program acted as an FDA-recognized Process Authority.

We were instrumental in aiding Virginia Food Processors in correcting deficiencies. Without those corrections, these companies would have suffered severe enforcement actions from FDA including fines and injunctions.

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
502	New and Improved Food Products

Outcome #16

1. Outcome Measures

Food Safety - Increase in the number of Virginia food producers and processors to implements pre and post harvest safety and quality assurance programs resulting in increased food safety and processing efficiency

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	136

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Center for Disease Control and Prevention estimates that annually, 76 million people in the United States become sick with foodborne illnesses including 325,000 that are hospitalized, and 5,000 that die each year. These illnesses are the results of improperly grown, processed, or otherwise prepared foods.

What has been done

HACCP is a leading food safety program in the United States. Implementation of this program is required by law for juice, meat, poultry, and seafood processors. This program is voluntary, but widely adopted, for other food processors such as dairy. The Good Agricultural Practices (GAPs) training focuses food safety training in the areas of pre-plant, harvest, post-harvest, transportation, worker hygiene, and record-keeping was performed in workshop format.

Results

In 2008, 75 people representing industry members from four states and regulatory personnel from the Virginia Department of Consumer Services, and the U.S. Food and Drug Administration were trained in HACCP. Both industry and regulatory personnel received the same training that resulted in better communication between the industry and regulators. Federal and state inspectors have indicated that this HACCP training has significantly improved the safety and quality of seafood products processed by the industry in Virginia. Sixty-one fresh fruit and vegetable producers in Virginia were trained in the principles of GAPs through workshops and the most common cause of fresh produce-associated illness is Salmonella. The USDA-Economic Research Service estimates that each Salmonella illness in the U.S. costs $1,821, on average, in medical costs, lost productivity, and premature death. If each person trained in GAPs in Virginia this year prevents just one illness, then the total savings to the Commonwealth is estimated to be $111,081 annually.

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.

Outcome #17

1. Outcome Measures

Chronic disease prevention, obesity research - Number of discoveries from completed obesity related research projects which focus on examining obesity from its root causes to its association with disease.

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}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Approximately two-thirds of the U.S. population is overweight and more than one billion people worldwide are overweight or obese. Obesity increases the risk of type 2 diabetes and cardiovascular Diseases, and is associated with a low quality of life and early mortality. In turn, obesity-related illnesses place a significant burden on the economy by increasing rates of health care usage and associated costs. Obesity has been estimated to account for as much as 9.1 percent of all total health care expenditures and results in about 39.2 million lost work days each year.

What has been done

The complexity of obesity expands beyond the simple etiology of energy imbalance to include genomic, molecular, cellular, and organ c components that interact with individual preferences, family and community context, work life, economics, and the local, state, and national policy landscape. Scientists from a variety of backgrounds need intensive interdisciplinary approaches to understand obesity from its root causes to its association with disease. Further, this strategy is needed to design and implement innovative and effective prevention and treatment programs that can be disseminated on a broad scale to have a positive public health impact.

Results

Obesity is a strategic priority outlined under the discovery scholarship domain of Virginia Tech's 2006-2012 Strategic Plan. As such, the College of Agriculture and Life Sciences has been recruiting and hiring outstanding faculty to complement existing strengths in the obesity area both within the College and across the University. The commitment is to conduct innovative interdisciplinary research focused on improving health by reducing obesity and its consequences in the Commonwealth and the nation through learning, discovery, and engagement.

4. Associated Knowledge Areas

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

Outcome #18

1. Outcome Measures

Nutrition, Physical Activity and Health - Increase in number of youth and adults that make lifestyle changes which improve their dietary quality and/or physical activity level after participation in VCE programs

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	89895

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Recent data show that an estimated 17% of children and adolescents aged 6 to 19 years old are overweight. Over the past thirty years the number of overweight children and teens has nearly tripled, with the rate expected to continue to rise. Trends among preschool-aged youth are consistent with these prevalence rates. Childhood overweight proves to be a multi-factorial condition involving personal characteristics and risk factors, such as dietary intake and physical activity, parenting styles and family characteristics, and community, demographic, and social characteristics.

What has been done

Virginia Cooperative Extension Family and Consumer Science programs offer research-based education on a wide variety of topics to help individuals eat better, be more physically active, and save money. Although programs ultimately aim to prevent overweight and obesity among children and help maintain weight and prevent chronic disease among adults and older individuals, the programs specifically aim to improve diet and physical activity. In 2008, a total of 89,896 Virginians were reached by Family and Consumer Science Extension agents, specialists, and affiliated faculty through radio, television, community presentations, and other avenues.

Results

Of those participating in more intensive and long-term programs, 9,938 reported improvements in one or more diet or physical activity related behaviors, depending on the program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #19

1. Outcome Measures

Chronic disease prevention - Increase in number of individuals with diabetes who have lowered their Hemoglobin A1c level at least 0.5., three months after participating in a diabetes education program offered in collaboration with a local Extension educator or health care provider.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1070

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Diabetes is the sixth leading cause of death in Virginia. Over 400,000 Virginians have been diagnosed with diabetes and another 132,000 Virginians have diabetes and don't know it. Diabetes has a high cost in money, loss of productivity, and quality of life. In Virginia, diabetes leads to 11,700 hospitalizations each year at a cost of nearly $173 million.

What has been done

In 2008 FCS agents cooperated with the Virginia Department of Health and local health care professionals to offer Dining with Diabetes. This program helps people learn more about self care, appropriate food choices, and life style patterns that will prevent or slow the complications of their diabetes.

Results

In one instance, Dining with Diabetes was implemented at three locations enrolling a total of 56 persons with diabetes and family members. On program completion 97% of participants recognized the need for an annual eye exam, an annual foot exam, and a specialized blood test three to four times per year. In one other instance using a post evaluation, 85% of participants reported they learned to choose healthy foods, read nutrition labels, particiapte in physical activity, and advocate for their health. Women with diabetes also obtained proper footware at little or no cost.

At the first class 29% of participants were using a meal planning method to control their carbohydrate intake on most days of the week as compared to 50% two months following completion of the program.

At the first class 28% of participants reported engaging in 30 minutes or more of physical activity on most days as compared with 76% two months following completion of the program.

The program also measured hemoglobin A1c, an indicator of average blood sugar levels over the two months prior, and helped participants understand the importance of this blood test in managing their diabetes. Research shows that people who decrease their hemoglobin A1c may require fewer physician visits in the years following and could save at least $685 per year in health care costs. Of the 21 participants who completed the A1c testing:

54% improved their diabetes management
28 % maintained their good diabetes management

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #20

1. Outcome Measures

Physical Activity - Research - Increase in number of Extension agents that plan to implement statewide standardized physical activity programming in their counties as part of a statewide research program.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	30

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Physical inactivity is one of the primary behavioral causes of death in the United States and contributes to the 483.8 billion dollars spent each year for the management and treatment of cardiovascular diseases and diabetes. At the same time, behavior change programs that can lead to sustained increases in physical activity at the population level are lacking.

What has been done

Virginia Cooperative Extension's Family and Consumer Sciences Physical Activity Leadership Team is partnering with Virginia Tech's Translational Obesity Research Program to address the problem of physical inactivity in Virginia. In 2008 The Leadership Team developed an integrated research and practice approach and plans for addressing the problem of physical inactivity in Virginia.

Results

As a result of the work of this integrated Physical Activity Leadership Team, VCE will offer two evidence-based programs to Virginians starting in 2009. The Team developed promotional materials, a program implementation manual, an agent training plan, an evaluation plan, and content for a public website to support the dissemination of the FIT Extension program through local Family and Consumer Sciences (FCS) agents. The Team also partnered with Human Kinetics, the marketer of the Active Living Every Day (ALED) program, to provide an opportunity for FCS agents to become certified to deliver the ALED program. A total of thirty-two agents will be trained on these two physical activity programs (18 on Fit Extension and 14 on ALED) in February of 2009. Physical activity programs are expected to begin at the local level as early as March 2009.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #21

1. Outcome Measures

Number of research projects to ensure a safe and secure food system

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In the United States, many food items including meat products can be marketed directly to consumers by producers or distributors across the country through the Internet. Some Internet companies are advertised as family-owned ranches or small-scale plants that sell specialty meat items. This business approach satisfies consumers' desires to procure perceived high-quality products directly from producers or stores by mail delivery. This practice in general reduces the steps associated with getting products to the consumers; however, it may also bypass some inspection and testing procedures traditionally established by buyer or government agencies. Presently, food safety data related to food products in this emerging market is lacking.

What has been done

This study evaluated the microbial quality of ground beef and ground beef patties sold in Virginia and U.S. retail markets. A total of 152 ground beef products, consisting of locally purchased raw ground beef (LRG) and frozen beef patties (LFP) and Internet procured frozen ground beef (IFG) and frozen beef patties (IFP), were tested. Results showed that LFP had significantly lower levels of aerobic mesophiles, psychrotrophs, and coliforms than LRG, IFG, and IFP. Furthermore, IFG had greater E. coli numbers than LRG and LFP. No sample was contaminated with E. coli O157:H7 but one duplicate set of summer LFP samples contained Salmonella. Listeria spp. was present in 25 and 29% of samples from local and Internet markets, respectively. About 5.0, 11.1, 10.5, and 7.9% of LRG, LFP, IFG, and IFP samples were contaminated with L. monocytogenes.

Results

This study identified differences in microbial quality between local and Internet products. It also showed that Internet meat products are either equally or more likely to have excessive microbial contamination, including E. coli, than locally purchased fillets. Thus effective education and/or Extension education is needed to support the healthy development of this emerging market.

4. Associated Knowledge Areas

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

Outcome #22

1. Outcome Measures

Research discoveries that suggest food applications for health promotion and disease prevention through improving human nutrition.

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Virginia tobacco production has steadily declined over the last few years such that the production level is almost identical to that of the years following the end of the Civil War. To maintain local agrarian based economies in Virginia, it is imperative to investigate profitable alternative crops. Vegetable soybean, tomato, and grape are major crops grown in Virginia that have the potential to replace tobacco. This study investigates waste byproducts of processing, called pomace, for value-adding and health beneficial components including vitamins, carotenoids, phenolic antioxidants, phytosterols, and essential fatty acids including the omega-3 linolenic acid (18:3n-3).

What has been done

Pomace from grape, apple, and tomato, and soybean seeds and pods grown in Virginia were collected from local producers and analyzed for value-adding components and properties. The components measured included fat content, fatty acid composition, and individual phenolic acids. The properties included antioxidant activities such as the oxygen radical absorbance capacity (ORAC) assay, neutral DPPH radical scavenging activity, ABTS positive radical scavenging activity, and total phenolic content (TPC). Extracts of the pomace and soybean samples were further evaluated for antiproliferation effects against three human cancer cell lines including HT-29 and Caco-2 colon cancer cells and Hep-G2 liver cancer cells. Water, 50% acetone, and 80% acetone extracts of chardonnay grape pomace were also evaluated for ORAC, DPPH, ABTS, and TPC and antiproliferation effects against HT-29 cells.

Results

Results indicate the seed content of 16 different grape pomaces ranged from approximately 19 to 73% of the total pomace weight. The fatty acid composition of the grape, apple, and tomato pomace was similar to previous studies of oil and flour extracts. Grape pomace extract had the highest antioxidant activities in all tests followed by the apple pomace and tomato pomace. Antiproliferation effects against human HT-29 and Caco-2 colon cancer cells and human Hep-G2 liver cancer cells were significant and correlated to antioxidant activities. Grape pomace extract had the strongest antiproliferation effects followed by apple pomace and tomato pomace. The 50 and 80% acetone extracts of chardonnay grape pomace had significant antioxidant activities and antiproliferation effects against HT-29 colon cancer cells. The 80% acetone extract had the highest antioxidant activities and antiproliferation effects followed by the 50% acetone extract and the water extract. The results from this study suggest possible food applications for grape pomace in health promotion and disease prevention through improving human nutrition.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

This year a major revision of the programs outcomes was completed.This was done to better align the research and Extension goals with the specialists involved in the program.In this effort, previous outcomes were not reported against, and all new outcomes were added to the state defined outcomes section of the report.

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

Key Items of Evaluation

Most programs completed more effective follow-up surveys for their programming in order to provide deeper impact from the programming.

Program #8

V(A). Planned Program (Summary)

1. Name of the Planned Program

Natural Resources and Environment

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%	10%	10%
102	Soil, Plant, Water, Nutrient Relationships	10%	10%	10%	10%
104	Protect Soil from Harmful Effects of Natural Elements	10%	10%	10%	10%
111	Conservation and Efficient Use of Water	5%	5%	5%	5%
112	Watershed Protection and Management	10%	10%	10%	10%
123	Management and Sustainability of Forest Resources	10%	10%	10%	10%
124	Urban Forestry	10%	10%	10%	10%
131	Alternative Uses of Land	10%	10%	10%	10%
133	Pollution Prevention and Mitigation	10%	10%	10%	10%
135	Aquatic and Terrestrial Wildlife	10%	10%	10%	10%
403	Waste Disposal, Recycling, and Reuse	5%	5%	5%	5%
	Total	100%	100%	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	0.5	50.0	0.0
Actual	29.3	0.3	36.4	1.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
699868	56993	503414	177783
1862 Matching	1890 Matching	1862 Matching	1890 Matching
700386	24543	1525729	404009
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1694933	55000	5810115	39836

V(D). Planned Program (Activity)

1. Brief description of the Activity

Primary outputs from this program include the following:

-- Develop and deliver educational programs such as short courses, workshops, field days and tours, seminars, etc.

-- Conduct applied research and link with Extension

-- Develop and maintain demonstration areas

-- Develop collaborative partnerships with government officials, state agencies, non-governmental organizations, etc.

-- Develop and disseminate educational materials such as extension bulletins, journal articles, conference proceedings, trade journal articles, DVD's, etc.

-- Develop and maintain web-based educational materials such as short courses, web sites, discussion boards, etc.

2. Brief description of the target audience

Farmers, forest owners, loggers, Christmas tree growers, youth, homeowners, mill owners and workers, private consultants and companies, local governmental officials, waste water treatment operators, state and federal agencies, nongovernmental organizations, professional associations and societies, and community groups.

V(E). Planned Program (Outputs)

1. Standard output measures

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

Year	Direct Contacts Adults Target	Indirect Contacts Adults Target	Direct Contacts Youth Target	Indirect Contacts Youth Target
Plan	170000	2000000	5000	5000
2008	66650	198931	39685	1505

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	5	10	
2008	5	48	53

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs offered

Year	Target	Actual
2008	2000	1100

Output #2

Output Measure

- Number of educational materials and curriculas developed

Year	Target	Actual
2008	25	82

Output #3

Output Measure

- Number of applied research projects

Year	Target	Actual
2008	15	200

Output #4

Output Measure

- Acres of land exposed to educational programming efforts.

Year	Target	Actual
2008	100000	300000

Output #5

Output Measure

- Identifiable impacts reported by agents/specialists

Year	Target	Actual
2008	40	35

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number of individuals with increased knowledge of best management practices in forestry, agriculture, and other potential soil and water-impacting land management industries.
2	Number of individuals with increased knowledge of sustainable landscape practices
3	Number of individuals adopting at least one improved management practice toward achieving sustainability
4	Number of individuals adopting one or more sustainable landscape management practices
5	Number of mills reporting increased profitability, improved safety indicators, or improved efficiency
6	Number of agricultural, forest, or disturbed land acres with improved management practices
7	Research projects focused on achieving greater harmony between agriculture and the environment
8	Number of individuals add value to woodlands by producing botanical herbs

Outcome #1

1. Outcome Measures

Number of individuals with increased knowledge of best management practices in forestry, agriculture, and other potential soil and water-impacting land management industries.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	500	889

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In Virginia, forested land parcels are becoming more fragmented due to the ever increasing population and development pressures from Northern Virginia and Raleigh, North Carolina in the South. Virginia loses an estimated 30,000 acres of forested land annually to development. As parcels become smaller, there are more landowners attempting to produce both timber and non-timber forest products from the land. Past landowner education classes have shown that landowners in the central part of the state own smaller parcels of land compared to three years ago. Forested land parcels averaged 62 acres in size in 2008 compared to 90 acres in 2005.

What has been done

Two advisory groups were formed to plan and deliver two Woods in Your Backyard shortcourses to assist small landowners with sustainable forestry needs. Topics range from social interactions to mapping and activities for improving overall tree health on forested parcels.

Results

Two shortcourses were conducted and were attended by 28 and 24 landowners respectively. All 52 landowners completed a series of activities that led to developing a plan for their woodlot based on stated objectives. Through these plans, 940 acres were improved by at least one new management objective including (in order of priority) water quality improvement, thinning trees for health improvement and income, and improving edge for wildlife cover through plantings of shrub trees and native warm season grasses.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
124	Urban Forestry
104	Protect Soil from Harmful Effects of Natural Elements
135	Aquatic and Terrestrial Wildlife
403	Waste Disposal, Recycling, and Reuse
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
111	Conservation and Efficient Use of Water
101	Appraisal of Soil Resources

Outcome #2

1. Outcome Measures

Number of individuals with increased knowledge of sustainable landscape practices

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	250000	50000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Northern Neck of Virginia is in transition from a very rural, agriculture-based community to a waterfront retirement destination for former urban and suburban individuals. As a result of this shift in population demographics, VCE has seen a marked increase in requests for horticultural educational information to help citizens ameliorate problems related to plant diseases, insects, shoreline erosion, pesticide safety, and plant health care.

What has been done

VCE Master Gardener Volunteers, under the supervision and leadership of ANR agents, implemented 114 Extension Master Gardener Helpdesk sessions in three Northern Neck VCE offices. They also held 22 plant clinics throughout the region. This series of helpdesks and plant clinics addressed individual questions with research-based recommendations that helped solve horticultural issues.

Results

Through this series of help desks and plant clinics, VCE Master Gardener Volunteers responded to the horticultural education needs of 2,282 people. The majority of issues were related to integrated pest management, plant health, and shoreline erosion. Oral evaluations revealed that most participants believed the information they received would help them sustain and improve their landscapes, save them from unneeded work and expenses, reduce soil erosion on their properties, and minimize pollution resulting from their horticultural activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
111	Conservation and Efficient Use of Water
124	Urban Forestry
133	Pollution Prevention and Mitigation

Outcome #3

1. Outcome Measures

Number of individuals adopting at least one improved management practice toward achieving sustainability

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	250	558

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Land parcilization continues in Virginia with small acre properties becoming increasingly important to the overall environmental health of the Commonwealth. Seventy-three percent of Virginia's privately owned forestland is in ownership of 10 acres or less, yet little assistance has been available to these landowners. Additionally, most small acre owners are first-time landowners with little knowledge of the natural systems they value. Planning and professional assistance for these landowners leads to better stewardship, however, smaller acreage owners are even less likely than larger acreage owners to have written plans or seek assistance.

What has been done

The varied backgrounds of small acre owners requires the use of innovative and sophisticated communication methods to convey the benefits and responsibilities of owning forests. An Extension publication, entitled The Woods In Your Backyard, published in 2006 serves as a manual and workbook for small acreage owners. Workshops for landowners and trained volunteers on this topic were initiated in 2007. Since then, six two-part workshops have been delivered in northern Virginia. The participatory workshops require homework completion toward plan development. This equips small acreage landowners with a management planning tool and knowledge to implement practices.

Results

Of the 167 participants, who averaged five acres each, 70% plan to complete a written plan. According to exit evaluations, 92% intend to better manage natural areas and 53% plan to convert excessive lawn to natural areas. Most participants (92%) described on a post-survey at least one action they plan to take in the next two months. Within two months, all participants began the planning processes and six completed a written plan for their property. Many made a new contact with a local natural resource professional. Unsolicited feedback shows a change in attitude and action to result in more best land management practices. In follow-up communication, one participant said, 'We have begun many of the improvements. It is a particular pleasure for us to replace non-native plants with native species and we have been actively removing invasive species.'

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
403	Waste Disposal, Recycling, and Reuse
133	Pollution Prevention and Mitigation
111	Conservation and Efficient Use of Water
104	Protect Soil from Harmful Effects of Natural Elements
102	Soil, Plant, Water, Nutrient Relationships
135	Aquatic and Terrestrial Wildlife
101	Appraisal of Soil Resources

Outcome #4

1. Outcome Measures

Number of individuals adopting one or more sustainable landscape management practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	200000	50000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Much of the non-point source pollution that flows into the waters of Virginia can be attributed to improper use of chemicals and fertilizers, poor animal management, and improper land development by citizens, farmers, homeowners and municipalities. Many landowners, farmers, and corporate and municipal planners are not aware of the value of urban, agricultural, and land development Best Management Practices (BMPs). Adoption of these practices has been identified in the Viginia Water Cleanup Plan and the Tributary Strategies as essential to the effort to improve Virginia's waters.

What has been done

A series of BMP Programs, Bayscapes, and Low Impact Development (LID) Workshops were held for farmers, citizens, students, and corporate and municipal planners. Randolph-Macon College and Union Bankshares Corporation assisted with these efforts. Eighty-seven farmers were contacted to provide information on BMPs in cooperation with the Farm Service Agency and the Soil and Water Conservation District. Fifty-five citizens and corporate planners attended a Low Impact Development Tour of Union Bankshares headquarters and Randolph Macon College. Thirty-one students at Randolph Macon were educated in LID and participated in a hands-on LID Workshop at Union Bank. Newspaper articles and fact sheets were written to address watershed issues. The Non-Point source Workgroup and the Rappahannock River Basin Commission served conduits to municipal planners. A no-till vegetable research program was also established at Mt. Olympus Farm.

Results

A number of low impact structures and facilities have been constructed as a direct result of the programs at Union Bank and Randolph Macon College. The environmental engineer in Caroline County became a regular contributor to the program and encouraged the building of more low impact structures in the county. Thirty-five Master Gardeners and Randolph Macon students landscaped two bio-retention structures at Union Bank. Volunteer work in this program has been valued at $8,000 -10,000.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
112	Watershed Protection and Management
135	Aquatic and Terrestrial Wildlife
133	Pollution Prevention and Mitigation
104	Protect Soil from Harmful Effects of Natural Elements
124	Urban Forestry
111	Conservation and Efficient Use of Water

Outcome #5

1. Outcome Measures

Number of mills reporting increased profitability, improved safety indicators, or improved efficiency

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	10	55

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Loggers participating in past trainings offered by Virginia Cooperative Extension and the Sustainable Timber Harvesting and Resource Professional (SHARP) Logger program have repeatedly expressed a need for in-woods skidder safety training. Long considered one of the nation's most dangerous occupations, skidder operators account for four out of every ten logging related injuries. One-half of in-woods logging injuries resulted in one or more days of lost time at work.

What has been done

A 'Skidder Safety and Efficiency ' planning team including the Extension natural resource agents, an Extension distric program leader, Virginia Department of Forestry, Forestry Mutual Insurance, an industry procurement forester, and the chair of the Sustainable Forestry Initiative (SFI) committee put together a training format for loggers. Following the training a script was developed to produce a training DVD to address geographic differences across the state and to reach a larger target audience of loggers. Total funding exceeded $20,800 and in-kind contributions of approximately $6,000.

Results

A skidder safety and efficiency training reached 20 skidder operators and their immediate supervisors representing 17 logging firms from 21 counties participated in full day training sessions. The Skidder Safety and Efficiency training DVD was used by logging crews in Virginia and throughout the Mid-Atlantic and Southeast regions. This project also resulted in the production of Extension publication 420-122 with 35 copies already distributed to clients. A six-month follow-up survey was conducted with 15 of the 20 participants that could be contacted to assess changes made to enhance overall safety and production efficiency. Fifty percent of the participants increased their production by two loads per week (approximately $1,000) which averaged $4,000 each month for the crews. Forty percent of the crews involved in the training were insured under Forestry Mutual Insurance Company and claims from October 2007 - October 2008 were down 30% from the previous year with these specific crews. Most claims involved mounting and dismounting equipment which was a component in the field training. Three loggers commented on their training evaluation that they would stop and think before 'jumping off the machine next time.'

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
403	Waste Disposal, Recycling, and Reuse
133	Pollution Prevention and Mitigation

Outcome #6

1. Outcome Measures

Number of agricultural, forest, or disturbed land acres with improved management practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	50000	400000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Sixty-one percent of Virginia is forested (15.8 million acres). Between 2001-2004, this acreage decreased by 26,000 acres a year. Current estimates predict Virginia will lose over a million acres of forestland in the next 25 years. Of the 15.8 million acres of forestland, 13 million acres are privately owned. The single largest category of owners is the 384,000 individuals or families who own in excess of 10.1 million acres. While family ownership ranges from a few acres to a few thousand acres, most parcels are relatively small. About half of the land owned by families is in parcels of 75 acres or less. Many of these owners have little or no experience with forest management. Proper management is essential to the health and productivity of Virginia's forests, and to ensure a sustainable stream of forest-related products.

What has been done

To ensure these forest parcels are well-managed and provide a sustainable stream of needed forest resources, the Virginia Forest Landowner Education Program Offers a series of Fall Forestry and Wildlife Field Trips. These tours expose participants to a variety of forestry and wildlife management practices.

Results

In 2008, 91 non-industrial private landowners attended one of the field tours. In Montgomery County, 80 percent of the participants indicated they increased their understanding of forest management practices and 65% stated they would contact a forest management professional. Follow-up surveys will be sent to participants one to two years following the tour.

4. Associated Knowledge Areas

KA Code	Knowledge Area
104	Protect Soil from Harmful Effects of Natural Elements
403	Waste Disposal, Recycling, and Reuse
102	Soil, Plant, Water, Nutrient Relationships
123	Management and Sustainability of Forest Resources
111	Conservation and Efficient Use of Water
124	Urban Forestry
112	Watershed Protection and Management
135	Aquatic and Terrestrial Wildlife
133	Pollution Prevention and Mitigation

Outcome #7

1. Outcome Measures

Research projects focused on achieving greater harmony between agriculture and the environment

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Manure from confined animal operations and biosolids from municipal treatment plants are used as supplemental fertilizers for crop production. Many types of antibiotics are used for therapeutic and veterinary purposes. However, the body only absorbs a finite amount of these chemicals, thus most are eliminated along with body waste. Water bodies that receive water treatment plant effluents from urban areas and those that receive runoff from confined animal operations can contain antibiotics. Runoff from agricultural fields that receive manure as supplemental fertilizer can also contribute to the antibiotic level in water bodies. Presently there is limited information on the fate of different antibiotics in the environment.

What has been done

This study examined the potential uptake of four antibiotics: amoxyciline, tetracycline, oxy-tetracycline and tylosin by three plant species; lettuce, turnip, and vegetable soybean. Seedlings were exposed to solutions containing 0, 100, 200, and 500 mg/L of each antibiotic. Extracts of tissue samples of these seedlings were analyzed using High Pressure Liquid Chromatograph.

Results

Results indicated no significant uptake of antibiotics except at 200 and 500 mg/L concentrations whereby trace amounts (0.1 mg/L) of tetracycline and tylosin were detected in turnip and vegetable soybean tissues. Visual observation after two months of growth showed no deleterious effects on plants due to antibiotics. This study contributes to the body of knowledge on the fate of antibiotics in the environment. Such knowledge helps to develop measures that abate the transport of antibiotics from farms to water bodies.

4. Associated Knowledge Areas

KA Code	Knowledge Area

403	Waste Disposal, Recycling, and Reuse
112	Watershed Protection and Management

Outcome #8

1. Outcome Measures

Number of individuals add value to woodlands by producing botanical herbs

2. Associated Institution Types

•1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	30

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There are over twelve million acres of privately owned woodlands in Virginia. Many of these forest lands are being cut down and converted to housing developments, public roads, and commercial development. Privately owned forests in Virginia have great potential for the future development of ecotourism, sustainable energy, and carbon sequestration. One of the main reasons privately owned woodlands are sold for development is the income gained from the forest. Landowners may increase income from forest land by growing botanical herbs such as American ginseng and goldenseal on the forest floor under the natural shade provided by hardwood trees without reduction of forest lands. In November of 2007, dried roots of American ginseng sold for $800 per pound and dried roots of goldenseal sold for $30 to $40 per pound.

What has been done

Using a $10,000 grant provided by the Renewable Resources Extension Act through USDA, Virginia State University established on-farm demonstrations at 30 privately owned woodland locations throughout Virginia to promote in ginseng and goldenseal production. Extension agents, Agriculture Management Agents with the VSU Small Farm Outreach Program, and cooperating landowners assisted in the demonstration project. Each participating landowner received a pound of stratified ginseng seeds, 250 goldenseal planting roots, and technical assistance. Two educational workshops were held to provide hands-on instruction in site selection and planting of ginseng and goldenseal.

Results

Thirty Virginia landowners established commercial production of ginseng and/or goldenseal as a new commercial enterprise. As a result of this program, approximately 200 additional landowners learned about production and marketing of these botanical herbs. Six Extension agents and three VSU Agriculture Management agents received extensive training in site selection and planting of botanical herbs. They now directly consult with landowners regarding these high value crops.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
131	Alternative Uses of Land
123	Management and Sustainability of Forest 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.)

Brief Explanation

Numerous external factors affect both the outcomes and the ability to support educational programs behind the outcomes. Natural disasters can siphon off funds and create new issues related to natural resources and the environment. Virginia forestry has been impacted by drought conditions for the past two years.Hurricane blowdown can flood the market with low cost wood, and create fuel buildup and insect and disease problems. Floods and droughts have unique problems, and both greatly affect natural resources issues. Funding for Extension programs have been reduced for the past two years and have impacted the ability to develop and deliver new programs. Finally, new laws and regulations create new issues and opportunities, and also cause other issues to fade away. In most cases new regulations resulted in a need for more education for those affected by the regulations.

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.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

A study was completed in the spring of 2008 on the impacts of our Virginia Forest Landowner Education Program (VFLEP).The highlights of the findings are:

When comparing groups of forest land owners, our study results indicated significant differences for those who attended the programs.The groups of landowners were segmented into three groups of forest owners:(a)those who have not attended any educational programs, (b) those who have attended our shortcourses through the VFLEP, and (c) those who attended some other type of educational program. The evaluation determined the differences between the groups (if any) in terms of adoption of sustainable forestry practices on the ground. There were eight categories of practices. Here are a few of them:

-Adoption rate for management plan:Group (a) was 12%, Group (b) was 41%, and Group (c) was 22%.Differences were significant.

-Adoption rate for sustainable woodland management practices:Group (a) was 75%, Group (b) was 94%, and Group (c) was 83%.Differences were significant.

-Adoption rate for use of technical assistance:Group (a) was 35%, Group (b) was 73%, and Group (c) was 44%.Differences were significant.

-Group (b), those who attended a VFLEP adopted at a higher rate, a good measure of success.

Key Items of Evaluation

Program #9

V(A). Planned Program (Summary)

1. Name of the Planned Program

Pest Management

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	10%	0%	10%	10%
211	Insects, Mites, and Other Arthropods Affecting Plants	10%	0%	10%	10%
212	Pathogens and Nematodes Affecting Plants	10%	0%	10%	10%
213	Weeds Affecting Plants	10%	0%	10%	10%
216	Integrated Pest Management Systems	20%	0%	20%	20%
403	Waste Disposal, Recycling, and Reuse	10%	0%	10%	10%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.	10%	0%	10%	10%
723	Hazards to Human Health and Safety	10%	0%	10%	10%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	10%	0%	10%	10%
	Total	100%	0%	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	30.0	0.0	24.0	1.7
Actual	35.4	0.0	19.9	1.5

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
845385	0	608084	283998
1862 Matching	1890 Matching	1862 Matching	1890 Matching
846011	0	1842959	404009
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2047345	0	3182155	73480

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct workshops, meetings, field tours, demonstrations.

- Develop training media, training manuals, curriculum, resources.

- Provide training.

- Provide counseling.

- Conduct assessments, facilitate meetings, and document stakeholder input.

- Partner with other state and federal agencies including VDACS, USDA, EPA.

- Conduct pesticide disposal events and related activities.

- Conduct on-line courses and hands-on activities.

- Conduct research experiments and surveys.

- Asian Soybean Rust/Soybean Aphid website.

- Ag Pest Advisory.

- Phone Assisted Hotlines.

2. Brief description of the target audience

- Consumers, landowners, homeowners, producers, producer groups.

- Pesticide applicators seeking certification under federal and state laws.

- Pesticide regulators, boards, commissions, and enforcement officials.

- Local government, councils, and community groups.

- Universities, colleges, K-12, youth aged 13-18, schools.

- Advocacy and consumer protection groups and associations.

- Pesticide safety educators, pest management specialists, and related experts.

- Authors, journalists, other media specialists.

- Institutional, industrial, and vector control groups and individuals.

- Health/medical, environmental, and emergency response personnel and organizations.

- Farm workers, migrants, and day-laborer groups and individuals.

- Researchers, scientists, pesticide toxicologists, extension educators and related experts.

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	20000	100000	625	2300
2008	62008	56671	2431	66

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	1

Patents listed

Insecticidal Carbamates Exhibiting Species-Selective Inhibition of Acetylcholinesterase (AChE).

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	5	10	
2008	11	45	56

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of outreach citations incorporating information on the most effective IPM strategies and systems for use on selected commodities and/or at selected sites

Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of private applicators trained for certification

Year	Target	Actual
2008	750	773

Output #3

Output Measure

- Number of commercial applicators trained for certification

Year	Target	Actual
2008	750	791

Output #4

Output Measure

- Number of private applicators trained for recertification

Year	Target	Actual
2008	2000	2197

Output #5

Output Measure

- Number of commercial applicators trained for recertification

Year	Target	Actual
2008	1000	1575

Output #6

Output Measure

- Number of non-certified applicators trained

Year	Target	Actual
2008	2000	3551

Output #7

Output Measure

- Number of stakeholders enrolled in the IPM Stakeholder Network

Year	Target	Actual
2008	100	210

Output #8

Output Measure

- Number of trainers and regulatory officials trained

Year	Target	Actual
2008	300	567

Output #9

Output Measure

- Educational media website hits communicated through the Pesticide Safety Education website

Year	Target	Actual
2008	1000000	5700000

Output #10

Output Measure

- Number of research citations incorporating information on the most effective IPM strategies and systems for use on selected commodities and/or at selected sites.

Year	Target	Actual
2008	250	158

Output #11

Output Measure

- Number of presentations on IPM related topics.

Year	Target	Actual
2008	500	886

Output #12

Output Measure

- Number of volunteer hours dedicated to pest management programming

Year	Target	Actual
2008	8000	8665

Output #13

Output Measure

- Number of extended learners with four or more hours of contact related to pest management

Year	Target	Actual
2008	5000	25244

Output #14

Output Measure

- Amount of revenue generated in dollars for pest management Extension and research programming

Year	Target	Actual
2008	500000	3269520

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number of individuals gaining knowledge of IPM through training course completion and/or examination
2	Number of applicators who gain knowledge in pesticide safety through certification training and pass the state certification exam(s)
3	Number of applicators who gain additional knowledge in pesticide safety through re-certification training and sufficient credit to maintain their certification
4	Number of applicators, farm workers, and the general public who gain knowledge in general pesticide safety who are not seeking certification as pesticide applicators
5	Number of trainers who gain knowledge in pesticide safety and pesticide curriculum and program training in established train-the-trainer workshops
6	Threshold number of pesticide drift violations prosecuted by VDACS
7	Threshold number of personal protective equipment violations prosecuted by VDACS
8	Number of applicators successfully maintaining their pesticide applicator certification to legally apply pesticides in the Commonwealth
9	Crop acreage impacted by the continued availability of viable pest management tools as a result of pest management strategic planning activities and the communication of pest management information to policymakers
10	Number of localities participating in a pesticide waste disposal program.
11	Number of localities participating in a pesticide container recycling program.
12	Number of research projects addressing pest control and energy efficiency
13	Number of samples evaluated by current and improved plant diagnostics methods related to biotechnology and leading to better detection and control procedures by producers (This outcome was moved from the Biotechnology and Genomics Planned Program to the Pest Management Planned Program)

Outcome #1

1. Outcome Measures

Number of individuals gaining knowledge of IPM through training course completion and/or examination

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	2000	8194

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

U.S. Department of Agriculture (USDA) and the US Environmental Protection Agency (EPA) mandate the safe use of pesticides by commercial, private,and public applicators. USDA and EPA ask Cooperative Extension nationwide to address this mandate. To obtain or maintain their certification (license) in Virginia, applicators are required to complete and repeat a set curriculum of study which includes integrated pest management content as one of 15 components.

What has been done

In 2008, study materials, workshops, demonstrations, online courses, and other education opportunities including web-based content were provided to applicators and others seeking to complete courses and training as pesticide applicators. Many were required to do so by federal and state pesticide control laws.

Results

As a result, over 8194 individuals gained knowledge on integrated pest management and pesticide safety by participating in preparation courses and reading study materials to comply with pesticide control laws. By compliance, many pesticide applicators were permitted to continue their livelihoods as commercial applicators, farmers and trainers.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Number of applicators who gain knowledge in pesticide safety through certification training and pass the state certification exam(s)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1000	1564

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

U.S. Department of Agriculture (USDA) and the US Environmental Protection Agency (EPA) mandate the safe use of pesticides by commercial, private, and public applicators. USDA and EPA ask Cooperative Extension nationwide to address this mandate. To obtain their certification (license) in Virginia, applicators are required to either study approved training manuals developed by VCE or attend a workshop to learn this content.

What has been done

In 2008, private and commercial applicator certification preparation workshops were sponsored by VCE in 15 different regional locations across Virginia. In addition, an online course was offered to registered technicians (and their employers) across Virginia to help them qualify for their registered technician license. VCE also maintained 24 different training manuals to support self study by applicators (the most popular prep option). Workshops were attended by 791 commercial and 773 private applicators. Manuals were sold to over 2,000 applicators in 2008.

Results

In 2008, over 1,564 private pesticide applicators, 2,366 commercial applicators and 3,383 non-certified applicators participated in over 250 workshops in 2008. As a result, many of these individuals were able to continue their livelihood as either commercial pesticide applicators or farmers by complying with state and federal laws requiring them to be certified applicators to apply pesticides.

4. Associated Knowledge Areas

KA Code	Knowledge Area
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
213	Weeds Affecting Plants
403	Waste Disposal, Recycling, and Reuse
112	Watershed Protection and Management
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
212	Pathogens and Nematodes Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants
723	Hazards to Human Health and Safety
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

Number of applicators who gain additional knowledge in pesticide safety through re-certification training and sufficient credit to maintain their certification

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	4000	3772

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

U.S. Department of Agriculture (USDA) and the US Environmental Protection Agency (EPA) mandate the safe use of pesticides by commercial, private, and public applicators. USDA and EPA ask Cooperative Extension nationwide to address this mandate. To maintain their certification (license) in Virginia, applicators are required to recertify every two years. Most do so by attending Extension sponsored venues (workshops, demonstrations, field days, and similar events).

What has been done

In 2008, private and commercial applicator workshops were sponsored by VCE in over 90 localities. Extension sponsored over 179 workshops for private applicators. Those workshops were attended by 2,197 private applicators. Extension either sponsored or supported other stakeholders who sponsored over 75 workshops for 1,575 commercial applicators.

Results

Over 2,197 private pesticide applicators, and 1,575 commercial applicators attended over 250 workshops in 2008. As a result, many of these individuals were able to continue their livelihood as either commercial pesticide applicators or farmers by complying with state and federal laws requiring them to be certified applicators to apply pesticides in Virginia.

4. Associated Knowledge Areas

KA Code	Knowledge Area
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
216	Integrated Pest Management Systems
723	Hazards to Human Health and Safety
112	Watershed Protection and Management
213	Weeds Affecting Plants
403	Waste Disposal, Recycling, and Reuse
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.

Outcome #4

1. Outcome Measures

Number of applicators, farm workers, and the general public who gain knowledge in general pesticide safety who are not seeking certification as pesticide applicators

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	950	3551

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

U.S. Department of Agriculture (USDA) and the US Environmental Protection Agency (EPA) mandate the safe use of pesticides by commercial, private, and public applicators. USDA and EPA ask Cooperative Extension nationwide to address this mandate. Part of this audience includes non-certified applicators not required to comply with the state and federal certification standards, are farmworkers, gardeners, or others who have potential exposure to pesticides where they work or garden, or are in the process of preparing to become a certified applicator.

What has been done

In 2008, non-certified applicators were encouraged to attend demonstrations, workshops, and other educational activities associated with pesticide safety education and integrated pest management. It is estimated that non-certified applicators attended over 300 such venues to seek knowledge on pest management and pesticide safety.

Results

In 2008, over 3,383 non-certified applicators received training in pesticide safety, worker protection, personal protection, and environmental protection. As a result, many of these individuals were able to continue their activities as either commercial pesticide applicators, farmers, farmworkers, or home gardeners by complying with state and federal laws requiring them to apply pesticides safely.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
403	Waste Disposal, Recycling, and Reuse
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
216	Integrated Pest Management Systems
213	Weeds Affecting Plants
212	Pathogens and Nematodes Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants
112	Watershed Protection and Management

Outcome #5

1. Outcome Measures

Number of trainers who gain knowledge in pesticide safety and pesticide curriculum and program training in established train-the-trainer workshops

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	100	567

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

U.S. Department of Agriculture (USDA) and the US Environmental Protection Agency (EPA) mandate the safe use of pesticides by commercial, private, and public applicators. USDA and EPA ask Cooperative Extension nationwide to address this mandate. To successfully conduct pesticide safety education and compliance assistance it is necessary to maintain a network of trainers and pesticide enforcement personnel. Train-the-trainer workshops and online courses are the primary means to maintain this network.

What has been done

In 2008, Virginia Cooperative Extension (VCE) cooperated with the USDA Pesticide Recordkeeping Branch to conduct a national online course in pesticide recordkeeping for 482 pesticide regulatory investigators. In addition, VCE conducted its annual train-the-trainer workshop in pesticide safety education for 85 Extension agents and specialists. VCE also maintained online courses for Master Gardeners and regional use in pesticide safety education (train-the-trainer and regulatory investigator training).

Results

In 2008, 482 pesticide regulatory inspectors from 30 states were trained using the online national pesticide recordkeeping training course. As a result of completing the course, investigators were qualified to inspect farms for pesticide records to help farmers comply with federal pesticide recordkeeping law. Also, in 2008, 85 Virginia Extension agents and specialists participated in the Virginia Pesticide Safety Educators Workshop. This train-the-trainer workshop qualified these agents and specialists to train pesticide applicators and to maintain their state pesticide certification in demonstration and research pest control. Agents and specialists who attended the workshop used the content and knowledge gained to train over 2,970 private pesticide applicators, 2,366 commercial applicators and 3,551 non-certified applicators in over 250 workshops in 2008. As a result, many of these individuals were able to continue their livelihood as either commercial pesticide applicators or farmers by complying with state and federal laws requiring them to be certified applicators to apply pesticides.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
216	Integrated Pest Management Systems
112	Watershed Protection and Management
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
723	Hazards to Human Health and Safety
213	Weeds Affecting Plants
212	Pathogens and Nematodes Affecting Plants
403	Waste Disposal, Recycling, and Reuse
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.

Outcome #6

1. Outcome Measures

Threshold number of pesticide drift violations prosecuted by VDACS

Not reporting on this Outcome for this Annual Report

Outcome #7

1. Outcome Measures

Threshold number of personal protective equipment violations prosecuted by VDACS

Not reporting on this Outcome for this Annual Report

Outcome #8

1. Outcome Measures

Number of applicators successfully maintaining their pesticide applicator certification to legally apply pesticides in the Commonwealth

Not reporting on this Outcome for this Annual Report

Outcome #9

1. Outcome Measures

Crop acreage impacted by the continued availability of viable pest management tools as a result of pest management strategic planning activities and the communication of pest management information to policymakers

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	10000	248000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The federal food quality protection act (FQPA) requires EPA to regulate pesticides based on a standard that impacts both food and non-food crop pest management. Growers across the US are impacted by regulatory decisions based on FQPA and a period of transition places them, especially those growing specialty crops, in jeopardy of not having viable pest management solutions.

What has been done

In 2008, Virginia Tech Agricultural Experiment Station, Virginia Cooperative Extension, the Southern Region Integrated Pest Management (IPM) Center, USDA's Office of Pest Management Policy, and various stakeholder groups in the region cooperated to identify the critical pest management needs of growers and communicate those needs through multiple communication channels including direct response to EPA and USDA crop pest management requests, development of crop pest management profiles, the development of pest management strategic plans, and the development of IPM Elements. IPM Elements will allow us to standardize pest management strategies throughout the industry.

Results

During 2008, there were 11 requests from USDA/EPA/IPM Centers for stakeholder input to potential changes in regulations that could impact the grower's ability to maintain viable pest management and IPM programs on various high-value crops. Stakeholders were contacted and detailed responses were provided to each of the requests, either on behalf of growers or directly from growers as a result of the contacts. An IPM priorities database was maintained and an IPM stakeholder network on the website was shared with USDA and the Southern Region IPM Center. The IR-4 specialty crop pest management network was also supported by providing responses to IR-4 for information on specialty crop needs and participating in IR-4 programs throughout the year. Extension agents in 90 localities incorporated IR-4 and IPM Center information into Extension programs as a result of attending the workshops on pesticide safety education and pest management in 2008. The projoect also included work with the Mount Rogers Christmas Tree Growers and the Virginia Christmas Tree Growers Association to write an IPM Elements document. As a result of work with honey bee stakeholders, a pest management strategic plan was published that involved beekeepers, state apiarists, researchers and Extension faculty from Virginia, North Carolina, South Carolina, Maryland, West Virginia, Delaware, New Jersey, and Pennsylvania. Information shared through the program website and listserv impacted over 17,653 users (5.7 million hits). Meetings with stakeholders resulted in communication of drift management and pest management information to key growers and local citizens. Four quarterly meetings with the state pesticide control board resulted in an increased knowledge of pest management issues and expansion of the IPM stakeholders network for Virginia. Two pest management publications were published that support pest management decision making and relay grower needs to key stakeholders dealing with pesticide regulation. Crops included swine and honey bees.

4. Associated Knowledge Areas

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

Outcome #10

1. Outcome Measures

Number of localities participating in a pesticide waste disposal program.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	25	29

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The disposal of canceled, banned, or unwanted agricultural and commercial pesticides poses a significant challenge to agricultural producers and other pesticide users due to its high cost. The proper disposal of waste pesticides eliminates a potential threat to health and the environment.

What has been done

Virginia's Pesticide Disposal Program is a cooperative effort between the Virginia Department of Agriculture and Consumer Services and the Virginia Pesticide Control Board, with participation from Virginia Cooperative Extension and the Division of Consolidated Laboratory Services. The program assists agricultural producers, licensed pesticide dealers and pest control firms, golf courses, and homeowners with the proper disposal of unwanted pesticides. The program is available at no cost to eligible participants. In 2008, disposal programs were conducted to benefit 29 localities in Southwest Virginia.

Results

In 2008, 32,036 pounds of canceled, banned or unwanted agricultural and commercial pesticides were collected and subsequently destroyed. Since its inception, Virginia's Pesticide Disposal Program has collected and destroyed a total of 1,439,451 pounds of pesticides.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse

Outcome #11

1. Outcome Measures
Number of localities participating in a pesticide container recycling program.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	10	21

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Disposing of used plastic pesticide containers, in a manner that does not threaten the environment, poses a challenge for agricultural producers and custom applicators. Typically, pesticide applicators dispose of their empty, clean plastic pesticide containers by hauling them to the local sanitary landfill.

What has been done

Virginia's Plastic Pesticide Container Recycling Program is a cooperative effort among Virginia Department of Agriculture and Consumer Services (VDACS), Pesticide Control Board, Virginia Cooperative Extension, and local governments. The program is administered by local governments under national guidelines developed by the Ag Container Recycling Council. Grant monies are provided to participating local government to defray the costs. Recycling sites are established in participating localities to accept properly rinsed plastic pesticide containers. Other sites will be established as the program expands. All pesticide containers are inspected by trained local personnel. Containers are granulated by a contractor with assistance from VDACS and local personnel. Granulated chips are transported to recycling facilities and fabricated into items such as pallets, fence posts, field drain tiles and parking stops.

Results

Virginia's container recycling program began in 1993 in six localities with more than 35,000 containers recycled. The number of participating localities has steadily increased from six in 1993 to twnety-one in 2008. In addition, individual pesticide dealers also participate in the program. In 2008, eight pesticide dealers either hosted a recycling site for the locality or collected their own containers for granulation. A total of 76,957 plastic pesticide containers were recycled in 2008, for a total of 930,687 recycled since 1993. This equates to over one million pounds of plastic collected for refabrication.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse

Outcome #12

1. Outcome Measures

Number of research projects addressing pest control and energy efficiency

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Production of tomatoes in greenhouses and high tunnels could provide an alternative source of income to small and limited resource farmers during the colder months. But high costs of pest control and energy are two major limiting factors in growing tomatoes in greenhouses and high tunnels.

What has been done

This project addresses pest control and energy efficiency. Insect pests such as thrips and their natural enemies (rove beetles) were monitored in three commercial tomato greenhouses visually and using sticky card counts. An LI-6400 portable photosynthetic system was used to measure photosynthetic rates at various temperatures and light levels.

Results

Results showed that rove beetles were found up to 10 weeks after release, indicating some reproduction in the greenhouse. However, none were recovered from growing media sampled three months after release of the beetles. Relatively small numbers of thrips were found in the media, indicating thrips pupation may be occurring mostly on the tomato plants or other areas. Under low light intensities (<200 PAR), greenhouse air temperatures above 18Ã‚Â°C resulted in decreased photosynthesis in mature upper canopy leaves of the variety Trust.
This project supports limited-resource greenhouse vegetable growers that do not use artificial lighting during the winter months. Most produce high-value vine-ripened tomatoes for the late winter to early summer market. Costs for natural enemies were reduced by at least 50% by using only effective natural enemies and at the proper time. Periods of cloudy weather were correlated with tomato blossom drop and disease that reduced tomato production. Analysis of tomato leaf photosynthetic response at low temperatures and increased CO2 during these periods may result in a management strategy that will reduce plant stress and maintain production.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants

Outcome #13

1. Outcome Measures

Number of samples evaluated by current and improved plant diagnostics methods related to biotechnology and leading to better detection and control procedures by producers (This outcome was moved from the Biotechnology and Genomics Planned Program to the Pest Management Planned Program)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Accurate diagnosis is essential for implementing appropriate plant disease control tactics in commercial crops, as well as in home landscapes and gardens. Without professional diagnostic services, many plant problems are misdiagnosed. This often results in ineffective
and/or unnecessary pesticide applications, which may harm human health, the environment and non-target organisms. Growers may also use the wrong pesticide to control a particular pest or pathogen or use it at an inappropriate time in the absence of accurate diagnosis.

What has been done

The VT Plant Disease Clinic is a support laboratory for Virginia Cooperative Extension (VCE) agents. Symptomatic plant samples of any type may be submitted for diagnosis and control recommendations. Typically, growers contact their local VCE office. When the VCE agent is unable to diagnose a particular problem or needs verification of a preliminary diagnosis, the sample is submitted to the Plant Disease Clinic. After diagnosing the problem, an electronic diagnostic report is sent to the VCE agent, who then gives the information to the grower.

Results

In 2008 the VT Plant Disease Clinic provided diagnoses and control recommendations for 1546 plant samples and responded to 133 electronic plant problem inquiries. Agents in 98 of the 106 Virginia counties used the lab's services in 2008 and received reports, on average, within 5.1 days. In cases where pesticides are recommended, growers are educated about the appropriate pesticide to use and application times for effective disease control. Thus pesticide use is implemented when it will be most effective and avoided in cases where it would be too late or inappropriate for effective control.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)
- Other (Stakeholder cooperation, violations)

Brief Explanation

Recent decreases in cotton and peanut acreage have reduced grower participation at meetings.This trend is expected to continue.Economic stresses have had a negative effect on grower attitudes.The Salmonella peanut contamination problem is likely to have a negative effect on peanut production.

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 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

During April and May 2008, three field faculty and one specialist sought feedback from small grain growers in Virginia regarding their awareness and practice changes regarding management of grain aphids and barley yellow dwarf virus in wheat. Of those who attended field days, 28 growers from 19 different counties in the northeast part of the state provided this information to the VCE team.Ninety-six percent of 28 respondents were now more familiar with barley yellow dwarf virus and the aphid vectors. Eighty-nine percent of 28 respondents were now more familiar with the production practices and environmental conditions that place fields at more risk for developing barley yellow dwarf. Eighty-two percent of 28 respondents use fall/early winter applications of a pyrethroid insecticide on fields identified as at-risk based on VCE educational program efforts to control aphids and barley yellow dwarf. Ninety-two percent of 24 respondents are satisfied with the level of aphid and virus control they are obtaining.

Key Items of Evaluation

Of the nineteen respondents that say they are increasing their wheat/barley yields by controlling aphids and virus, their yield has increased by 8.2 bushels an acre, with a maximum estimate of more than 30 bushels an acre. With a 2008 price of barley at $4 per bushel, this is an increase of $26 per acre. With a 2008 price of wheat at $6.50 per bushel, this is an increase of approximately $52 per acre. Respondents grew more than 3,700 acres of barley in 2008 and more than 13,900 acres of wheat. For this group of farmers, yield increases in barley brought $96,200 for barley and yield increases in wheat brought $722,800 – in association with controlling aphids and virus.

Program #10

V(A). Planned Program (Summary)

1. Name of the Planned Program

Plants and Plant Products

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%	10%	10%
201	Plant Genome, Genetics, and Genetic Mechanisms	10%	10%	10%	10%
202	Plant Genetic Resources	15%	15%	15%	15%
205	Plant Management Systems	25%	25%	25%	25%
216	Integrated Pest Management Systems	5%	5%	5%	5%
403	Waste Disposal, Recycling, and Reuse	5%	5%	5%	5%
511	New and Improved Non-Food Products and Processes	10%	10%	10%	10%
601	Economics of Agricultural Production and Farm Management	10%	10%	10%	10%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%	10%	10%	10%
	Total	100%	100%	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	30.0	0.0	5.0	1.5
Actual	42.8	0.3	7.5	3.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1022442	66148	735442	574021
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1023200	25059	2228949	487337
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2476142	22712	1197778	32495

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct research experiments on genetic improvement and manipulation of plants, bioprocessing, production systems, and BMP effectiveness. Contribute presentations and scholarly publications to regional, national, and international scientific organizations. Engage with clientele to adapt research products to the production environment. Conduct multi-county and in-depth educational programs and short courses on new plants and plant products, their management, food safety issues, and associated best management practices (BMPs). Collaborate with other state specialists to develop regional publications in these areas. Maintain demonstration plots of cultural practices, techniques and germplasm adaptability of selected crops. Publish (listserv, web, and mailing) newsletters to provide practical information on pest management, cultural practices, and other research-based aspects of plant management.

2. Brief description of the target audience

Target audience will include Extension educators, commercial producers, policy makers, small businesses, pesticide applicators, homeowners and other plant and food product consumers. Youth, their parents and limited income consumers are targeted through 4-H horticulture programs and community gardening efforts.

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	25000	28000	500	500
2008	167987	273321	44153	6235

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

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	2

Patents listed

1. Plant Variety Protection Certificate Issued to Jamestown SRW wheat cultivar
2. Plant Variety Protection Certificate Issued to SRW Wheat Cultivar USG 3555.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	5	10	
2008	2	68	70

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational presentations conducted

Year	Target	Actual
2008	300	979

Output #2

Output Measure

- Number of volunteers

Year	Target	Actual
2008	4000	8478

Output #3

Output Measure

- Number of research studies completed on biofuels or novel biobased products

Year	Target	Actual
2008	5	17

Output #4

Output Measure

- Number of research publications on biofuels or novel bio-based products

Year	Target	Actual
2008	5	36

Output #5

Output Measure

- Number of research citations

Year	Target	Actual
2008	150	68

Output #6

Output Measure

- Number of outreach citations

Year	Target	Actual
2008	150	507

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number of commercial producers educated about new plants, cultivated varieties, production techniques or BMPs
2	Number of commercial producers adopting new plants, cultivated varieties, production techniques, or BMPs
3	Number of noncommercial gardeners/producers educated about new techniques or BMPs
4	Number of noncommercial gardeners adopting new techniques or BMPs
5	Number of new cultivated varieties released
6	Research projects developing a novel algal culture system to produce biofuel from microalgae
7	Number of inner city residents increasing knowledge of vegetable production using an above-round soil containment system
8	Number of pounds of fresh produce collected for the hungry for food banks
9	Number of vegetable growers enhancing profitability
10	Research projects improving drip irrigation of flue-cured tobacco
11	Number of tons of sludge recycled on cropland
12	Number of research projects enhancing crop profitability

Outcome #1

1. Outcome Measures

Number of commercial producers educated about new plants, cultivated varieties, production techniques or BMPs

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	800	12468

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

During the past 20 years over 100 small and part-time farmers have established commercial production of fresh cut flowers as a new enterprise. The majority of them grow specialty cut flowers in open fields during the frost-free growing season. These growers are not able to produce cut flowers during the cold winter months. Most of them cannot afford to build expensive greenhouses for year round production. Flower growers who depend only on field production miss early season and late season marketing opportunities.

What has been done

Extension Specialists at VSU built two 20' X 100' high tunnels, one in Lancaster County and one in Washington County on cooperating farms to demonstrate a low cost system for cool season production of fresh cut flowers. A 20' x 100' high tunnel costs about $4,000. These structures provided the minimal protection required for production of cool season cut flowers: sweet peas, anemones, ranunculus, English stock, tall snapdragons and freesia, which were harvested and sold to local florists. Field day programs were held at each location.

Results

Cut flower growers throughout Virginia learned that unheated greenhouses called high tunnels can be used for production of cut flowers during the winter months at relatively low cost. These growers learned which species of cut flowers are most easily grown in cool temperatures for profitable sales. Over 60 people learned about construction methods used to establish a 20'x 100' high tunnel. Each of the two cooperating farm families earned over $1,000 profit from selling the cut flowers they grew in the high tunnels in the winter of 2007-2008. About 600 landowners learned about the economic costs and returns of cool season production of fresh cut flowers in unheated high tunnels.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
216	Integrated Pest Management Systems
511	New and Improved Non-Food Products and Processes
403	Waste Disposal, Recycling, and Reuse
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
202	Plant Genetic Resources

Outcome #2

1. Outcome Measures

Number of commercial producers adopting new plants, cultivated varieties, production techniques, or BMPs

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	80	877

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

It has been estimated by the Virginia-North Carolina Peanut Variety and Quality Evaluation Program that untimely digging of peanuts may reduce yields by 300 to 400 pounds per acre. To avoid this loss in yield, peanut producers must determine the balance between digging too soon and too late. With late dry weather this year, many producers were concerned there would be a delay in maturity of their peanut crop.

What has been done

VCE conducted a peanut pod blasting clinic in Isle of Wight County, Virginia. All peanut producers from Isle of Wight County and surrounding counties were invited to bring samples to the clinic for evaluation of maturity. The program assisted agricultural producers with determining maturity of their peanuts based on the pod blasting technique developed by the North Carolina Extension Service, which determines maturity of the peanut using the pod mesocarp color. The pod mesocarp color was exposed using a pressure washer to remove the outside covering of the peanut pod. Approximately 150 to 200 peanuts were arranged by mesocarp color on a peanut profile board, which helps in determining maturity based on the number of peanuts and their arrangement on the board.

Results

Producers asked that the clinic be offered continuously to help them better manage their peanut crop and avoid lost yield.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
202	Plant Genetic Resources
511	New and Improved Non-Food Products and Processes
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
403	Waste Disposal, Recycling, and Reuse
205	Plant Management Systems
102	Soil, Plant, Water, Nutrient Relationships
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Number of noncommercial gardeners/producers educated about new techniques or BMPs

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	500000	547530

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Homeowners and green industry professionals sustain significant financial losses due to incorrect selection, planting, and maintenance of landscape materials. They frequently use excessive and inappropriate amounts of lawn and garden chemicals and fertilizers. These practices not only cost homeowners and professionals time and money, but they often are harmful to the environment.

What has been done

Through the Master Gardener Volunteer Program, agents recruit, train, and manage a volunteer staff that serves the general public and landscape professionals by educating them about the proper selection, planting, and maintenance of landscape and lawn materials. Participants are recruited from the general public, county and city employees, and the green industry. These volunteers are initially trained through a 50 hour Master Gardener course that the agent plans and conducts with the help of guest instructors from Extension and local communities.

Results

In 2008, Master Gardener volunteers statewide reported 269,080 contributed hours and contacted over 500,000 clients while serving the horticultural needs in their communities. The financial worth of these volunteers is $5.3 Million (The Virginia Employment Commission).

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
511	New and Improved Non-Food Products and Processes
403	Waste Disposal, Recycling, and Reuse
601	Economics of Agricultural Production and Farm Management
205	Plant Management Systems
202	Plant Genetic Resources
102	Soil, Plant, Water, Nutrient Relationships

Outcome #4

1. Outcome Measures

Number of noncommercial gardeners adopting new techniques or BMPs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	5500	2653

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Homeowners seeking high quality turf must deal with the challenges of poor soils and unfavorable weather conditions. The advice they receive from the popular media is often improper, irrelevant to local conditions, or conflicting. As a result, their collective activity has the potential to negatively impact the water quality within the Chesapeake Bay watershed.

What has been done

Residents were offered the opportunity to enroll in the SMART Lawns program. This program teaches residents best management practices for turf that protect water quality. Master Gardener volunteers received specialized training in turf management. These volunteers measured the square footage of turf being maintained by program participants, took soil samples, identified pests and problem areas, and made customized recommendations to residents regarding their lawn care practices to improve the overall health and appearance of their lawns.

Results

A total of 107 citizens participated in the SMART Lawns program during 2008. Collectively, they were responsible for 931,874 sq.ft. (21.4 acres) of turf. Program impacts were measured through a post-program survey. Of the 50 individuals returning the survey, 86% implemented at least two best management practices as a result of their participation in the program. About one-half (26) of these respondents increased their lime applications as recommended by a soil analysis, core-aerated during the fall (27), and made herbicide applications at the recommended times (26). Forty percent reported they increased their mower settings to three inches, and about one-third (15) indicated they had stopped bagging clippings.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
216	Integrated Pest Management Systems
202	Plant Genetic Resources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
403	Waste Disposal, Recycling, and Reuse
102	Soil, Plant, Water, Nutrient Relationships
511	New and Improved Non-Food Products and Processes
205	Plant Management Systems

Outcome #5

1. Outcome Measures

Number of new cultivated varieties released

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Improvements in crop adaptability, disease resistance, and product quality helps wheat growers increase economic returns through higher yields, better quality, and reduced fungicide applications.

What has been done

Two hard red winter wheat lines evaluated in Virginia tests over a number of years were released by Virginia Tech as cultivars. One winter durum wheat cultivar developed at Virginia Tech was released. Three broadly adapted, high yielding SRW wheat cultivars (Shirley, SS 5205 and Renwood 3434) with unique combinations of disease resistance were released.

Results

These high value specialty wheat cultivars and management data provide producers and end users with alternative high value wheat cultivars and recommended production protocols. Better cultivars and reduced fungicide use facilitates a safe and abundant food supply and benefits the environment.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
202	Plant Genetic Resources
201	Plant Genome, Genetics, and Genetic Mechanisms
511	New and Improved Non-Food Products and Processes
216	Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

Research projects developing a novel algal culture system to produce biofuel from microalgae

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Producing biofuels from microalgae has attracted increasing attention in recent years. Microalgae are ideal sources for biofuel production as they accumulate large amounts of lipid and have high biomass productivity. However, the current technology of producing biofuel from microalgae is not economical due to limitations such as low oil yield, high biomass-harvesting cost, contamination by undesirable native species, and difficulty extracting oil from algal biomass.

What has been done

This study addresses the above critical challenges through enhancing the lipid yield of selected algal species, developing an attachment-based culture system for harvesting algal biomass at low cost, and developing a one-step process to directly produce biodiesel fuel from raw algal biomass.

Results

The research has shown the polystyrene foam substrate can provide a surface for algal growth that forms a thick layer of 'algal mat'. The algal biomass can be harvested by simply scrapping the biomass from the surface. The harvested biomass can be used for making biodiesel through a novel one-step conversion process, without the need for algal oil extraction. The biodiesel fuel made from algal biomass has the same quality as that made from traditional oil feedstock such as soybean oil or canola oil.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Number of inner city residents increasing knowledge of vegetable production using an above-round soil containment system

2. Associated Institution Types

•1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many low-income and limited resource families in urban neighborhoods do not eat as many fresh vegetables as they should to maintain healthy nutrition. Low-income urban residents often cannot afford to buy fresh produce. These low-income urban families could gain great benefits from having a home vegetable garden. Unfortunately, many of them do not have a yard that is suitable for a vegetable garden. Most government assisted housing consists of apartments.

What has been done

VSU Extenson established 12 vegetable gardens in Petersburg, Virginia. These gardens were planted using an above-ground soil containment system called Cell-u-gro. The Cell-u-gro garden consists of a liner, a drainage pad and a baffled grid of 'cells' which each contain 1.5 quarts of soilless medium. Each urban family received one, two or three of the 8' X 20' units. These above-ground gardens were also established at three churches and at one school.

Results

Twelve urban families improved their nutrition by growing their own fresh vegetables in above-ground soil containment systems. At one site, three of the garden units were built on a rooftop. The participants grew vegetables, herbs and flowers. These above ground gardens were incredibly productive. Even the participants who had never grown plants before were extremely successful and pleased with their results. About 200 city residents learned that the Cell-u-gro units could be used to successfully establish gardens in parking lots, in a driveway, on a patio, on a side porch or on top of a roof. Thirty of the 8' X 20' Cell-u-gro units were built in 2008.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
216	Integrated Pest Management Systems

Outcome #8

1. Outcome Measures

Number of pounds of fresh produce collected for the hungry for food banks

2. Associated Institution Types

•1862 Extension
•1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	40000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the U.S. Department of Agriculture, one in ten households in the United States experiences hunger or the risk of hunger. Over 203,000 people, one in six children, are at risk of hunger in Northern Virginia (U.S. Census, 2000). In the past year, the demand for hunger assistance has increased and research shows that hundreds of hungry children and adults are turned away from food banks each year due to a of lack of resources.

What has been done

Master Gardener volunteers played an instrumental role providing fresh produce to local food banks through the Plant a Row program. Master Gardener volunteers collected fresh produce, eggs, meats, pastries and coffee from local farmer's markets throughout the growing season. After the farmer's market pick up, the produce was delivered to food banks that provide emergency food assistance for the local community.

Results

Thirty Master Gardeners volunteered 611.25 hours for this project, making over 2,265 contacts. Master Gardener volunteers collected over 40,000 pounds of fresh produce from vendors at farmers, markets. The equivalent value of this produce for farmers/marketers who receive a tax deduction for their donations, based on receiving $1.60 per pound, equals a total of $64,000.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
403	Waste Disposal, Recycling, and Reuse

Outcome #9

1. Outcome Measures

Number of vegetable growers enhancing profitability

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	70

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Vegetable producers in southeast Virginia grow a wide assortment of produce, usually for direct markets, such as roadside stands or farmers markets. Because the acreage of most SE Virginia vegetable farms is small (often less than 10 acres), it is important that a majority of their produce is marketable. It is critical that vegetable growers have the most up to date information on production practices, pest management, and variety selection in order to make informed decisions about their operations.

What has been done

An Extension sponsored commercial vegetable short course delivers the most up to date production information to area growers. Topics include variety selection for the small farmer, pest management options, and production information. Specialists from across Virginia deliver information based on field research they have conducted, including information on new varieties, up to date pest management options, greenhouse management of transplants, and watermelon production.

Results

A written evaluation revealed that 100% of the 70 participants in the course experienced a significant knowledge gain as a direct result of the program. Moreover, 85% of the participants believed the program would contribute to the overall profitability of their operations in the 2009 growing season.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
202	Plant Genetic Resources
601	Economics of Agricultural Production and Farm Management
102	Soil, Plant, Water, Nutrient Relationships
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
216	Integrated Pest Management Systems

Outcome #10

1. Outcome Measures

Research projects improving drip irrigation of flue-cured tobacco

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The use of irrigation has been the foundation of the traditional quality of flue-cured tobacco in Virginia and is a major factor involved in the consistency of production between seasons. The rolling topography of tobacco fields in Southside Virginia presents challenges to uniform irrigation. In addition, high fuel prices and availability of adequate water have caused growers to more closely consider the economic return on irrigation tobacco.

What has been done

The use of drip irrigation was evaluated in a series of on-farm tests. Topography issues have been addressed through more detailed systems design. To reduce damage, an innovative drip tape installation procedure was developed to place the drip tape in the row-ridge during the last cultivation pass. Similarly, equipment was evaluated for mechanical removal and retrieval of the tape from the soil at season's end. The drip irrigation trials also incorporated soil moisture probes that provided continuously data via an internet based monitoring system.

Results

The capability for real-time, remote monitoring of soil moisture provided an enormous management tool to schedule field irrigations. Compared to traditional traveling gun irrigation and overhead sprinklers, drip irrigation reduced water usage by approximately one-half and the fuel usage by irrigation pumps by 80%. The tape retrieval system dramatically reduced (more than 10-fold) the labor necessary for tape removal and provided a more convenient and timely method.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
102	Soil, Plant, Water, Nutrient Relationships
601	Economics of Agricultural Production and Farm Management
216	Integrated Pest Management Systems
403	Waste Disposal, Recycling, and Reuse

Outcome #11

1. Outcome Measures

Number of tons of sludge recycled on cropland

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	15000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

For more than two decades the City of Norfolk Moores Bridges Water Treatment plant has produced sludge high in lime. The calcium carbonate equivalency of the sludge is high ranging from 43 to 50%. The city was investigating alternative disposal methods to reduce the high cost associated with hauling and disposing in the regional landfill. Landfill fees are set to increase significantly in 2009.

What has been done

Laboratory analysis showed the material met pollution limits for land application with a high calcium carbonate equivalency. The Virginia DEQ allows the material to be land applied if it meets standards for agricultural use. This project evaluated the material relative to EPA sewage sludge regulations and developed recommendations for using the material for cropland and horticultural use. A field trail was conducted to determine if the material could be evenly spread, using conventional equipment, at desired agricultural rates for field crops.

Results

Based on Extension agent recommendations for using the material and DEQ approval, the City of Norfolk is contracting to have up to 15,000 tons of the material recycled each year. The City of Norfolk will significantly reduce hauling and landfill disposal costs. Farmers will have a lower cost liming alternative. The value of the recycled lime in 15,000 tons of the material exceeds $100,000. This is the first time in Virginia that water treatment plant sludge will be recycled for beneficial agriculture and horticulture purposes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
102	Soil, Plant, Water, Nutrient Relationships
403	Waste Disposal, Recycling, and Reuse
205	Plant Management Systems

Outcome #12

1. Outcome Measures

Number of research projects enhancing crop profitability

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Virginia farmers face challenges in today's competitive agricultural environment. Farmers who depended on tobacco as a cash crop are especially affected. Tobacco acreage has been on a downward trend for decades and production has plummeted in the U.S. over the past eight years due to the decline in the number of smokers and competition from imports. Vegetable soybean [Glycine max (L.) Merr.] is one of the potential crops that can contribute to the income of small farmers who were adversely affected by declining tobacco production. The demand for vegetable soybean (edamame) is growing because it is a cholesterol-free source of protein and has very low saturated fat content. Lack of suitable cultivars is one of the limiting factors for widespread production of vegetable soybean in Virginia.

What has been done

A project at VSU is developing vegetable soybean cultivars suitable to Virginia conditions. Specific objectives of the project were to evaluate vegetable soybean breeding lines for yield, agronomic traits, and nutritional values such as sugars, protein, and fatty acid profiles. Entries of 218 breeding lines in three sets (early, medium and late maturity groups) were evaluated in replicated trials for seed yield, seed size, plant height, lodging and shattering. Seed samples were also analyzed for protein, oil and individual sugars, amino acids and fatty acid profiles.

Results

Results showed there were significant differences ($P < 0.05$) among the breeding lines for all traits studied. The mean seed yield of early maturity groups ranged from 987 kg/ha to 2225 kg/ha with an overall mean of 1427 kg/ha. The protein content ranged from 38% to 46% and sucrose content ranged from 30 to 121 mg/g. There were 67 lines in medium maturity group and their mean seed yield ranged from 1074 to 2646 kg/ha with an overall mean of 1557 kg/ha. The protein content ranged from 39% to 46% while sucrose content ranged from 40 to 125 mg/g. In the late maturity group, there were 69 lines and the mean seed yield ranged from 1334 to 2397 kg/ha with an overall mean of 1658 kg/ha. The protein content of these lines ranged from 37 to 44% and sucrose content ranged from 40 to 126 mg/g. This research show the availability of suitable vegetable soybean cultivars will enable Virginia farmers to produce this crop profitably.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
202	Plant Genetic 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.)

Brief Explanation

Drought conditions reduced crop production and yields in many areas of the state. Drought also impacted commercial and residential turf management. The downturn in state and national economic conditions reduced crop marketability and therefore, farm profitability in many areas of the state.

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

Evaluation Results

Key Items of Evaluation