

2009 University of Tennessee Research and Extension and Tennessee State University Extension Combined Annual Report of Accomplishments and Results

Status: Submitted

Date Submitted: 04/01/2010

I. Report Overview

1. Executive Summary

This report consists of the FY 2009 results and accomplishments of the Tennessee Agricultural Research and Extension System. The University of Tennessee Extension and the Tennessee Agricultural Experiment Station (UT AgResearch) comprise the 1862 institution and the Tennessee State University Cooperative Extension Program and the Tennessee State University Institute for Agricultural and Environmental Research comprise the 1890 institution.

This report represents the combined efforts of the University of Tennessee (UT) Extension, the Tennessee Agricultural Experiment Station (UT AgResearch), and the Tennessee State University (TSU) Cooperative Extension Program. UT and TSU Extension extend the knowledge and expertise of the state's two land grant institutions to the 5.9 million people of Tennessee through agents and specialists in all 95 counties. Our work is providing education that produces solutions to societal, economic and environmental issues. Engagement of the state's citizens occurs where they live, work and play through hundreds of programs which are planned, conducted and evaluated by UT and TSU Extension. In FY 2009, Extension continued its excellence in economic development and outreach.

Economic Development: Extension's educational programs in 4 H youth development, agriculture and natural resources, family and consumer sciences and resource development produce substantial returns for Tennessee. Using research, questionnaires, observations and sales records, an estimated impact is \$386 million for FY 2009.

The recurring economic impacts were estimated at over \$121 million. These recurring economic values include increased revenue, increased savings and one time capital purchases associated with three Extension programs: Crop Variety Trials, forage systems, and 4-H camping. Using the United States Department of Defense formula, an estimated 2,426 jobs in Tennessee were created or maintained because of the recurring economic impacts produced by Extension.

The one time, non recurring economic values were estimated at over \$265 million from seven Extension programs. The programs included in this analysis were nutrition education, health literacy, Tennessee Saves, 4-H scholarships, farm financial planning, genetic improvement for cattle, and volunteerism.

Outreach: UT and TSU Extension professionals and the volunteers they recruited, trained and managed made over 4.9 million direct contacts through group meetings, on site visits, phone calls, direct mail, and client visits to local Extension offices. In addition, indirect educational methods included mass media, exhibits, and Internet resources. UT Extension had over 400,000 downloads of educational materials from its websites.

Data for the Extension portion of this report utilized the Extension reporting system, System for University Planning, Evaluation and Reporting (SUPER). This reporting system, and the process of statewide, outcome based measurement, is still new for Extension. In some cases, the targets set were too ambitious given our resources. In setting the initial outcome targets, a host of factors, including staff vacancies and retirements, were not considered.

UT AgResearch efforts included varietal support for the state's nursery industry, steady advances in biomass production and processing to reduce dependence on foreign oil, extensive testing and development of agronomic crop varieties to meet consumer and farmer needs, and improvements in the reproductive health of various livestock populations. We improved the state's critical hardwood lumber processing industry. We continued to provide nationwide leadership in soil erosion modeling and no till agriculture. We used beneficial insects to protect ecosystems in the Great Smoky Mountains, and helped lead the national public policy conversation through our agricultural and natural policy research centers. We also helped safeguard the public with important food safety research, and promoted technologies to minimize wastewater impact.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	657.0	43.0	328.0	0.0
Actual	450.0	43.0	307.0	0.0

II. Merit Review Process

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

- Internal University Panel
- External University Panel
- Expert Peer Review

2. Brief Explanation

The merit review and peer review processes established in the latest Plan of Work were fully implemented in FY 2009. In addition, UT Extension conducted an external university panel review with program development and evaluation specialists from Virginia Tech and the University of Maryland. This review panel found that the Tennessee Plan of Work was of exceptional quality. The panel's major suggestion was to continue a strong needs assessment and evaluation process focused on measuring substantial outcome indicators.

UT AgResearch merit review was strengthened by the continued use of our online workplan submission process. Workplans are the core of many planned research programs -- the details of how the project actually gets done on the ground. Our evolving online system allows rapid interactive review and revision of workplans between PI, department head, research center director, Deans, and compliance officers. With a central document repository, all those involved can literally be "on the same page," no matter where they are located.

III. Stakeholder Input

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

- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey specifically with non-traditional groups
- Survey of selected individuals from the general public
- Other (Local and State Advisory Councils)

Brief explanation.

In FY 2009, UT and TSU Extension made 13,272 contacts for needs assessment purposes, with these methods highlighted:

- 366 advisory committee meetings
- 129 focus groups
- 1084 interviews with key informants

Tennessee Extension Agents placed special emphasis on involving youth and other under represented groups in needs assessment activities. Of these needs assessment contacts, 20% were young people under 18 years of age. A special accomplishment was the involvement of racial and ethnic minority groups; 1,586 contacts (12% of total) represented racial-ethnic minority groups.

Each AgResearch department has an advisory group, while most research and education centers have

advocacy groups. These groups meet once or more each year (typically at least twice). Current research activities and plans for future activities are reviewed at each meeting. Reactions and suggestions from the groups are received and factored into the research agenda setting process. Membership in each group is by invitation of the department head or center director, and typically consists of industry and regional representatives, local leaders, scientific peers, commodity group members, and other relevant stakeholders.

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
- Open Listening Sessions
- Needs Assessments

Brief explanation.

All Extension Agents receive instruction in selecting needs assessment strategies and in selecting individuals for Advisory Committees. Community leaders selected for Advisory Committees are chosen to represent the diversities (i.e., gender, age, racial/ethnic, socio-economic, political, educational, etc.) of the county or area served. Extension Agents recruit individuals who have participated in past and current Extension programs; and they recruit individuals who have not used Extension to serve on local advisory committees and participate in open listening sessions.

Our critical stakeholders include a gradually-more-aware Tennessee public; federal, state, and local legislators and opinion leaders, industry and academic research partners, and the residents around our 10 regional research centers (the regional field laboratories).

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 specifically with non-traditional individuals

Brief explanation.

The System for University Planning, Evaluation and Reporting (SUPER) tracks Extension's needs assessment efforts across Tennessee. In FY 2009, Extension conducted 129 different focus groups and 1084 interviews with key informants. Regarding interviews with key informants, 33% involved individuals who were not previously active in Extension (defined as those not previously on an Extension mailing list). These individuals were identified in various ways such as asking Advisory Committee members and community leaders to suggest names.

UT AgResearch holds periodic meetings with various research user groups at the department, research center, and Institute level, as well as an annual meeting of academic department heads, research center directors, and selected principal investigators. This session is very helpful in refining our focus as we share different perspectives on the expressed needs of various constituents.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief explanation.

The State Action Agendas (state plans of work) delineated programs, curricula, partners and resources for addressing stakeholder concerns. Individual plans were created and implemented by Extension Agents and Specialists based on the results of the needs assessment. The plans were monitored and adjusted by Regional Program Leaders and Department Heads. In FY 2009, stakeholder input was used to identify volunteer leaders, identify new audiences, and identify and secure locations for Extension programs. Stakeholder input was used to modify three programs, as described below:

- Science, Engineering and Technology programs were given greater emphasis in 4-H youth development clubs, project groups, and school enrichment.
- UT Extension became a partner in the Tennessee Farmland Legacy Partnership, a coalition of government agencies, farmer organizations, and community groups working to keep the state's farmland viable. Collaborators include Cumberland Region Tomorrow (a grassroots planning organization in Middle Tennessee), Tennessee Department of Agriculture, The Land Trust for Tennessee, and USDA Natural Resources Conservation Service.
- The economic downturn caused additional hardship via rising unemployment as 1 of 10 working Tennesseans lost their jobs; and through shrinking investment value as many workers saw their 401(k) values drop by 30 to 40%. Stakeholder input was instrumental in changing the focus of Extension's Tennessee Saves programming from savings and investment education to coping with economic loss.

In research, partly due to the previous PR firm's recommendations and brainstorming sessions, we made changes in our "branding" to "UT AgResearch", updated our website layout, and increased the quantity of available research content. A public-facing new hire is now in place, to address a lack of stakeholder connection in the west Tennessee area.

Brief Explanation of what you learned from your Stakeholders

The Extension statewide needs assessment analysis showed that four strategic priorities were producing measurable results, and that these priorities should continue for the foreseeable future:

- Promoting healthy lifestyles;
- Protecting our food, environmental and agricultural resources;
- Preparing youth for a diverse and demanding future; and
- Building and sustaining personal and family financial skills.

Extension stakeholders report strong interest in three areas: (1) farmland viability and related issues of local food systems; (2) science, engineering and technology programs for youth; and (3) coping with personal and family economic loss.

Research feedback shows a strong continuing interest in the entire biofuels/bioenergy spectrum, even with declining fuel prices, particularly to provide new income streams for farmers and new state job opportunities. Food safety also continues to be very much "on the table" -- recurring news stories and large-scale public health and economic impacts seem to be on the public's mind.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
8275433	2641203	5234546	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	8275425	2641200	5273113	0
Actual Matching	35945203	2641200	30648772	0
Actual All Other	12768841	0	9169279	0
Total Actual Expended	56989469	5282400	45091164	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from				
Carryover	2572340	0	0	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	4-H Positive Youth Development
2	Agronomic Crop Systems
3	Animal Systems
4	Childhood Obesity
5	Economic Infrastructure and Commerce
6	Environmental and Water Quality Impacts
7	Family Economics
8	Food Safety
9	Forestry, Wildlife, and Fishery Systems
10	Global Food Security and Hunger
11	Health and Safety
12	Horticultural Systems
13	Human Development
14	Sustainable Energy
15	Climate Change

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

4-H Positive Youth Development

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
803	Sociological and Technological Change Affecting Individuals, Families and Communities	50%	50%	0%	
806	Youth Development	50%	50%	0%	
	Total	100%	100%	0%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	237.0	6.0	0.0	0.0
Actual	135.0	12.0	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
2482629	792360	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
10783562	792360	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
486973	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

In FY 2009, this planned program was expanded from a single focus on "preparing for the world of work" to include science, engineering, and technology. This change was made based on stakeholder feedback.

Clubs/Project Groups - In FY 2009, 65 Tennessee counties organized over 2,500 4-H clubs where workforce preparation was the major emphasis. Project work was emphasized, and the experiential learning model will be used to highlight jobs and careers aligned with 4-H projects. Curricula emphasized practical skills which align with jobs and careers. Major science, engineering and technology projects included plant science experiments, including education in biofuels and other alternative forms of energy.

School Enrichment - Various school enrichment programs in 50 Tennessee counties focused on workforce preparation. Youth will be exposed to jobs and careers with the goal to set a goal for their future job or career. Media Mass media will be used to inform parents, participants and stakeholders about program opportunities and achievements. To increase science literacy education among Extension 4-H Agents, an "Energizing Tennessee" tour was held to provide professional development on the production and use of various forms of energy, including hydroelectric and wind.

2. Brief description of the target audience

Tennessee youth in grades 4-12 were targeted for this program. To encourage participation of underserved and minority youth, the majority of programs were delivered in public schools.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	30000	0	350000	250000
Actual	313722	0	1776602	611715

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

Patent Applications Submitted

Year: 2009
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	15	0	
Actual	15	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of volunteers utilized in delivering this program.

Year	Target	Actual
2009	4000	7256

Output #2

Output Measure

- Number of exhibits produced.

Year	Target	Actual
2009	200	1553

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Achieving Goals: Number of youth who now put their goal in writing.
2	Achieving Goals: Number of youth who now report they set high goals.
3	Achieving Goals: Number of youth who report that they now achieve goals they set for themselves.
4	Achieving Goals: Number of youth who are now making plans to achieve their goals.
5	Achieving Goals: Number of high school youth who have set a goal for their job or career.
6	Communicating: Number of youth who can express ideas with a poster, exhibit, or other display.
7	Communicating: Number of youth who can now share their ideas through writing.
8	Communicating: Number of youth who can use technology to help themselves express ideas.
9	Communicating: Number of youth who have learned at least five jobs in which communication skills are important.
10	Communicating: Number of youth who are now better listeners.
11	Communicating: Number of youth who have explored careers in communications.
12	Communicating: Number of youth who report they have improved photography skills.
13	Communicating: Number of youth who report they have learned skills in visual communications.
14	Communicating (Public Speaking): Number of youth who can deal with their nervousness when giving a speech or talk.
15	Communicating (Public Speaking): Number of youth who can select a topic for a speech or talk.
16	Communicating (Public Speaking): Number of youth who can speak loudly enough to be heard when giving a speech or talk.
17	Communicating (Public Speaking): Number of youth who feel comfortable sharing their thoughts and feelings in a speech or talk.
18	Youth Gain Science Process Skills Through Tennessee Extension 4-H SET Programs

Outcome #1

1. Outcome Measures

Achieving Goals: Number of youth who now put their goal in writing.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	24532

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

Achieving Goals: Number of youth who now report they set high goals.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	20838

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Achieving Goals: Number of youth who report that they now achieve goals they set for themselves.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2500	9158

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #4

1. Outcome Measures

Achieving Goals: Number of youth who are now making plans to achieve their goals.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2500	14693

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #5

1. Outcome Measures

Achieving Goals: Number of high school youth who have set a goal for their job or career.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
-------------	----------------------------	---------------

2009

500

1171

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #6

1. Outcome Measures

Communicating: Number of youth who can express ideas with a poster, exhibit, or other display.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	16301

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #7

1. Outcome Measures

Communicating: Number of youth who can now share their ideas through writing.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	16400

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #8

1. Outcome Measures

Communicating: Number of youth who can use technology to help themselves express ideas.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
-------------	----------------------------	---------------

2009 15000 15701

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #9

1. Outcome Measures

Communicating: Number of youth who have learned at least five jobs in which communication skills are important.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	16268

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #10

1. Outcome Measures

Communicating: Number of youth who are now better listeners.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10000	7297

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #11

1. Outcome Measures

Communicating: Number of youth who have explored careers in communications.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
-------------	----------------------------	---------------

2009 10000 5089

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #12

1. Outcome Measures

Communicating: Number of youth who report they have improved photography skills.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	12157

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #13

1. Outcome Measures

Communicating: Number of youth who report they have learned skills in visual communications.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10000	12111

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #14

1. Outcome Measures

Communicating (Public Speaking): Number of youth who can deal with their nervousness when giving a speech or talk.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	30000	32034

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #15

1. Outcome Measures

Communicating (Public Speaking): Number of youth who can select a topic for a speech or talk.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	30000	33275

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #16

1. Outcome Measures

Communicating (Public Speaking): Number of youth who can speak loudly enough to be heard when giving a speech or talk.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	30000	33400

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #17

1. Outcome Measures

Communicating (Public Speaking): Number of youth who feel comfortable sharing their thoughts and feelings in a speech or talk.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	30000	26349

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #18

1. Outcome Measures

Youth Gain Science Process Skills Through Tennessee Extension 4-H SET Programs

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The National Science Foundation's (NSF) "Science and Engineering Indicators 2006" concluded that most Tennessee 4,8 and 12th grade students did not demonstrate proficiency in the knowledge and skills taught at their grade level in science and mathematics.

What has been done

4-H youth development programs were conducted in school classrooms, afterschool programs, and community centers to improve science literacy skills among young people. Programs emphasized included plant science, animal science, and energy, including biofuels and hyroelectric power.

Results

This program was evaluated using post-test only questionnaires and observations from public school teachers. Over 1,000 youth participants can now record data accurately; use science terms to share results; and analyze

results of a scientific investigation.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Competing Public priorities

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)

Evaluation Results

To evaluate this program, our main tool was the Program Evaluation Network. This is an online software that contains 36 valid and reliable questionnaires with statewide standards. Local Extension 4-H Agents use these questionnaires to evaluate their programs, typically, in the case of 4-H programs, as a post-test only. As shown by the outcomes achieved over the past four years, the Program Evaluation Network has been helpful at not only describing our impacts, but also improving our programs. In 2009, Extension personnel from 10 states studied the Program Evaluation Network through online meetings to determine how to improve program evaluation in their states.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Agronomic Crop 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
205	Plant Management Systems	50%	50%	0%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%	5%	0%	
212	Pathogens and Nematodes Affecting Plants	5%	5%	0%	
601	Economics of Agricultural Production and Farm Management	40%	40%	0%	
Total		100%	100%	0%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	80.0	10.9	50.0	0.0
Actual	31.5	3.0	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
579280	184884	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2516164	184884	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
390978	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The Extension portion of this report is organized via the Innovation-Decision Process (Rogers, 1995). This planned program mainly represents cotton and row crops management, marketing and irrigation. Based on needs assessments conducted by Extension Specialists, the following practices were targeted: conservation-tillage; planting insect-tolerant crops; planting herbicide-tolerant crops; spaying crops with foliar fungicide to manage disease; using recommended varieties (based on UT field trial results)

Knowledge: Newspaper articles, radio programs, websites and newsletters were used to build awareness of UT Extension

resources and practices for more profitable production. Mass media was used to highlight pests and pesticides in a timely manner.

Persuasion: Farm visits and group meetings were used to showcase practices.

Decision: Group meetings and classes were held in which Extension specialists taught detailed production information to producers.

Implementation: On-farm demonstrations were conducted, particularly in the 31 West Tennessee counties, to highlight research-based practices. Integrated research and extension projects were conducted such as result demonstrations and test plots in almost all of the 31 West Tennessee counties.

Confirmation: Farm visits and telephone calls assisted producers to continue use of the practices, respond to environmental factors, and realize greater profits.

2. Brief description of the target audience

The primary audience for this program is Tennessee row crop producers, and the secondary audience is the professionals, business owners/cooperatives, and government officials who serve row crop producers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	45000	200000	10000	200000
Actual	40032	218540	768	218540

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

Patent Applications Submitted

Year: 2009
 Plan: 1
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	15	36	
Actual	15	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of exhibits displayed to promote awareness and participation in this planned program.

Year

Target

Actual

2009

15

2

Output #2

Output Measure

- Number of research-based publications distributed as part of this program.

Year	Target	Actual
2009	5000	13648

Output #3

Output Measure

- Exploitation of the strong resistance mechanism in epazote to the plant parasitic nematode, *Meloidogyne incognita* (Bernard).
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	Row Crops Production: Number of participants who implemented one or more management practices based on data provided by UT (e.g., conservation tillage, plant population, growth retardants, IPM strategies, disease and weed control).
2	Row Crops Production: Number of producers, farm workers and other ag professionals who received pesticide certification, recertification and pesticide safety training.
3	Row Crops Production: Number of participants who improved their income by following the recommended best management practices for crop production, including plant pest management.
4	Row Crops Production: Number of producers using recommended varieties of soybeans or corn.
5	Increase in potassium fertilizer rate recommendation by UT Extension to achieve optimal yield in early maturing, determinate cotton grown with no tillage (Gwathmey).
6	Grower adoption of recommendations to control glyphosate-tolerant pigweed in soybeans in West Tennessee (Steckel).
7	Identify disease and nematode resistance genes and incorporate them into high yielding soybean lines (Arelli).

Outcome #1

1. Outcome Measures

Row Crops Production: Number of participants who implemented one or more management practices based on data provided by UT (e.g., conservation tillage, plant population, growth retardants, IPM strategies, disease and weed control).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	416

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #2

1. Outcome Measures

Row Crops Production: Number of producers, farm workers and other ag professionals who received pesticide certification, recertification and pesticide safety training.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	250	297

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Row Crops Production: Number of participants who improved their income by following the recommended best management practices for crop production, including plant pest management.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	200	298

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

Row Crops Production: Number of producers using recommended varieties of soybeans or corn.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Increase in potassium fertilizer rate recommendation by UT Extension to achieve optimal yield in early maturing, determinate cotton grown with no tillage (Gwathmey).

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Grower adoption of recommendations to control glyphosate-tolerant pigweed in soybeans in West Tennessee (Steckel).

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Identify disease and nematode resistance genes and incorporate them into high yielding soybean lines (Arelli).

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Competing Programmatic Challenges

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Other (Third-Party)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Animal 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
301	Reproductive Performance of Animals	15%	15%	0%	
303	Genetic Improvement of Animals	10%	10%	0%	
307	Animal Management Systems	60%	60%	0%	
311	Animal Diseases	15%	15%	0%	
	Total	100%	100%	0%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	63.0	1.2	36.0	0.0
Actual	36.0	3.0	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
662034	211296	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2875616	211296	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1512000	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

We will conduct applied and basic research in animal health, nutrition, physiology and genomics to address high priority problems of the livestock industries. We will disseminate information gained from these studies to producers, veterinarians, and others associated with the animal industries through outreach programs and publications.

The Master Beef Producer Program was led by a team of University of Tennessee Extension specialists and agents, with the support and involvement of representatives of state agencies, businesses and organizations that have an interest in the state's cattle industry. Master Beef Producer programs were taught by agents who completed the comprehensive training curriculum. Industry professionals, veterinarians, and other local industry leaders were included as a part of the teaching team. The Master Beef Producer Program:

1. Included a series of 12 educational sessions focused on cow-calf production and issues facing the beef industry. These were conducted at various off-campus locations accessible to Tennessee beef producers. These sessions included hands-on demonstrations, mini-lectures, discussions, question and answer sessions, etc.
2. Enhanced the profitability and competitiveness of cow-calf operations by providing essential, technical information.
3. Provided participants with a beef production reference manual supporting the educational information presented in the sessions.
4. Allowed producers to interact with experts and encouraged sharing of ideas with other producers.

2. Brief description of the target audience

Producers, veterinarians, and others associated with the animal industry.

Tennessee cattle producers are primarily cow-calf operators. All of the state's cow-calf operators composed the target audience for this planned program.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	10000	15000	5000	0
Actual	103111	2635406	29533	0

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

Patent Applications Submitted

Year: 2009
 Plan: 1
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	10	30	
Actual	10	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of exhibits displayed to promote awareness of and participation in this planned program.

Year	Target	Actual
2009	5	125

Output #2

Output Measure

- Number of research-based publications distributed as part of this program.

Year	Target	Actual
2009	2500	6019

Output #3

Output Measure

- Improved summer pregnancy success in dairy cattle due to heat stress management, pregnancy rate (Edwards).
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Development of a 'hand-held' diagnostic device for Johne's disease by merging our diagnostic method and microfluidic technology (Speer).
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	Beef Production and Marketing: The increase in value of feeder calves as result of cooperative marketing or marketing through an alliance (including use of BQA guidelines).
2	Beef Production and Marketing: Number of beef producers who utilized improved sires, artificial insemination or other genetic improvement methods.
3	Beef Production and Marketing: Number of beef producers who have improved knowledge about genetic improvement, nutrition, health, reproduction and other topics covered by Master Beef Program.
4	Adoption of reproduction-enhancing media additive for cattle embryo transfer, annual uses in Tennessee (Schrack).
5	Reduction in mastitis in Tennessee dairy cattle by genetic marker screening, percent reduction (Oliver).
6	Educational assistance was provided to beef producers resulting in increased Tennessee Department of Agriculture cost-share assistance for improved facilities, equipment and genetics.
7	Beef Production and Marketing: Investment at the farm level in improved genetics (improved sires or semen).
8	Dairy producer involvement in the Tennessee Quality Milk Producer (TQMP) program (Oliver).
9	Economic Impact of Tennessee Extension Livestock and Forage Systems Program

Outcome #1

1. Outcome Measures

Beef Production and Marketing: The increase in value of feeder calves as result of cooperative marketing or marketing through an alliance (including use of BQA guidelines).

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1000000	6144240

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #2

1. Outcome Measures

Beef Production and Marketing: Number of beef producers who utilized improved sires, artificial insemination or other genetic improvement methods.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	350	2541

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals

Outcome #3

1. Outcome Measures

Beef Production and Marketing: Number of beef producers who have improved knowledge about genetic improvement, nutrition, health, reproduction and other topics covered by Master Beef Program.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	300	300

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals

303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases

Outcome #4

1. Outcome Measures

Adoption of reproduction-enhancing media additive for cattle embryo transfer, annual uses in Tennessee (Schrick).

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Reduction in mastitis in Tennessee dairy cattle by genetic marker screening, percent reduction (Oliver).

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Educational assistance was provided to beef producers resulting in increased Tennessee Department of Agriculture cost-share assistance for improved facilities, equipment and genetics.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	7000000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code **Knowledge Area**
307 Animal Management Systems

Outcome #7

1. Outcome Measures

Beef Production and Marketing: Investment at the farm level in improved genetics (improved sires or semen).

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	7000000	7362630

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code **Knowledge Area**
303 Genetic Improvement of Animals

Outcome #8

1. Outcome Measures

Dairy producer involvement in the Tennessee Quality Milk Producer (TQMP) program (Oliver).

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Economic Impact of Tennessee Extension Livestock and Forage Systems Program

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Livestock sales in Tennessee total over \$1 billion annually. Tennessee has 3.5 million acres of forages, 2.1 million head of beef cattle, 210,000 horses and 102,000 goats. Total economic impact of the livestock sector is \$5 billion annually in the state. To remain viable in a competitive marketplace, livestock and forage producers must improve their management efficiency, sustainability and productivity. Tennesseans need education in maintaining or improving production efficiency, marketing, product quality and food safety.

What has been done

UT Extension conducted 1670 field days, demonstrations and group meetings in FY 2009 to teach Tennessee livestock producers to be more competitive. Practices taught included beef quality assurance (BQA) and improving feeding methods to reduce wastage/spoilage.

Results

The economic impact of this program was estimated at \$32,493,668 based on questionnaires and observation of producer adoption. The economic estimate included five practices: managing calves according to BQA guidelines, covering round hay bales, using bulls with greater genetic potential, using hay feeding rings, and improved marketing (such as the use of alliances).

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

{No Data Entered}

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

1. Evaluation Studies Planned

- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Other (Ongoing)

Evaluation Results

The UT Extension Evaluation Specialist completed an economic analysis of this planned program in FY 2009. The economic impact of this program was estimated at \$32,493,668 based on questionnaires and observations of producer adoption by local Extension Agents. The economic estimate included five practices: managing calves according to BQA guidelines, covering round hay bales, using bulls with greater genetic potential, using hay feeding rings, and improved marketing (such as the use of alliances).

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Childhood Obesity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
701	Nutrient Composition of Food	5%	5%	0%	
702	Requirements and Function of Nutrients and Other Food Components	0%	0%	80%	
703	Nutrition Education and Behavior	95%	95%	20%	
Total		100%	100%	100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	143.0	2.5	32.0	0.0
Actual	90.0	10.0	8.2	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
1655086	528240	152270	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
7189041	528240	676698	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
6610870	0	378473	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Obesity has reached epidemic proportions in Tennessee with two of three adults and four of ten school age children overweight or obese. Obesity is the leading risk factor for many chronic diseases such as diabetes, arthritis, heart disease, hypertension, and some types of cancer. The economic and psychosocial costs of obesity and the underlying health issues are impacting all of society. Medical care costs are escalating and creating an economic burden for families, employers, and insurance entities. It is important for Extension and Research to implement programs to reverse this trend.

2. Brief description of the target audience

This program targets children and youth and those who care for them, including parents, teachers, and child care providers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	100000	300000	100000	0
Actual	194784	5970798	636891	0

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

Patent Applications Submitted

Year: 2009
 Plan: 1
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	30	
Actual	5	6	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of exhibits displayed to promote program awareness and participation.

Year	Target	Actual
2009	250	1410

Output #2

Output Measure

- Number of research-based publications distributed as part of this program.

Year	Target	Actual
2009	300	24229

Output #3

Output Measure

- If petroleum prices continue to increase, we may identify several applications for chitosan to replace cellulose in the pharmaceutical or plastics industries (Zivanovic).
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Provide proof-of-concept for using casein micelles as controlled release carriers for antimicrobials in food (Harte).
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	Safe Food Handling Practices for Consumers: Number of participants surveyed more often washed items that came in contact with raw meat, chicken or seafood with hot, soapy water before continuing to cook.
2	Safe Food Handling Practices for Consumers: Number of participants surveyed who more often washed their hands with soap and warm running water before eating.
3	Safe Food Handling Practices for Consumers: Number of participants surveyed who more often washed their hands with soap and warm running water before preparing food.
4	Tennessee Shapes Up: Number of participants who learned how to use the Healthy Plate to balance their diet.
5	Tennessee Shapes Up: Number of participants who decreased consumption of high-fat foods such as chips, fast food, fried foods, sausage, bacon, bologna, hot dogs, etc.
6	Tennessee Shapes Up: Number of participants who decreased consumption of high-sugar foods and sweetened beverages, such as soft drinks, Kool Aide type beverages, sweetened tea, etc.
7	Tennessee Shapes Up: Number of participants who increased consumption of dairy foods.
8	Tennessee Shapes Up: Number of participants who increased consumption of fruits.
9	Tennessee Shapes Up: Number of participants who increased consumption of vegetables.
10	Tennessee Shapes Up: Number of participants increased consumption of whole grains.
11	Tennessee Shapes Up: Number of participants who improved their blood sugar.
12	Tennessee Shapes Up: Number of participants who improved their cholesterol levels.
13	Pending chitosan being granted GRAS (Generally Recognized As Safe) status, our research will lead to applications in edible films and food additives with anti-microbial and thickening properties (Zivanovic).
14	Adoption of a homogenization pasteurization process as an alternative to thermal processing by small or mid-sized juice processors (Davidson).
15	Healthy Steps: Extension's Obesity Prevention Program for Tennessee Pre-School Students
16	Power U: Extension's Obesity Prevention Program for Tennessee 4th Grade Children
17	Demonstrated that Angiotensin II (a hypertensive hormone) increases fat synthesis and insulin signaling pathways in adipocytes (Moustaid-Moussa).

Outcome #1

1. Outcome Measures

Safe Food Handling Practices for Consumers: Number of participants surveyed more often washed items that came in contact with raw meat, chicken or seafood with hot, soapy water before continuing to cook.
Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Safe Food Handling Practices for Consumers: Number of participants surveyed who more often washed their hands with soap and warm running water before eating.
Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Safe Food Handling Practices for Consumers: Number of participants surveyed who more often washed their hands with soap and warm running water before preparing food.
Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Tennessee Shapes Up: Number of participants who learned how to use the Healthy Plate to balance their diet.
Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Tennessee Shapes Up: Number of participants who decreased consumption of high-fat foods such as chips, fast food, fried foods, sausage, bacon, bologna, hot dogs, etc.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	6000	9195

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #6

1. Outcome Measures

Tennessee Shapes Up: Number of participants who decreased consumption of high-sugar foods and sweetened beverages, such as soft drinks, Kool Aide type beverages, sweetened tea, etc.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	6000	10408

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #7

1. Outcome Measures

Tennessee Shapes Up: Number of participants who increased consumption of dairy foods.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	6000	9297

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #8

1. Outcome Measures

Tennessee Shapes Up: Number of participants who increased consumption of fruits.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	6000	18838

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #9

1. Outcome Measures

Tennessee Shapes Up: Number of participants who increased consumption of vegetables.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	6000	18838

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #10

1. Outcome Measures

Tennessee Shapes Up: Number of participants increased consumption of whole grains.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	6000	6700

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #11

1. Outcome Measures

Tennessee Shapes Up: Number of participants who improved their blood sugar.

Not Reporting on this Outcome Measure

Outcome #12

1. Outcome Measures

Tennessee Shapes Up: Number of participants who improved their cholesterol levels.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	6000	7077

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #13

1. Outcome Measures

Pending chitosan being granted GRAS (Generally Recognized As Safe) status, our research will lead to applications in edible films and food additives with anti-microbial and thickening properties (Zivanovic).
Not Reporting on this Outcome Measure

Outcome #14

1. Outcome Measures

Adoption of a homogenization pasteurization process as an alternative to thermal processing by small or mid-sized juice processors (Davidson).
Not Reporting on this Outcome Measure

Outcome #15

1. Outcome Measures

Healthy Steps: Extension's Obesity Prevention Program for Tennessee Pre-School Students

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Too many young children are gaining unhealthy amounts of weight leading to chronic disease at increasingly younger ages.

What has been done

Healthy Steps, a nutrition and physical activity curriculum was implemented in 35 Tennessee counties in 2009. 4,473 direct contacts were made in Voluntary Pre-K, Head Start and center-based classrooms; 141,675 indirect contacts were made through exhibits, newspaper articles, publications and television. In addition 1,553 preschool teachers and volunteers delivered education.

Results

- Surveys were completed by teachers at the end of the program to document program outcomes.
- *192 of 209 (92%) of teachers surveyed reported preschool children in their classes were more actively engaged in physical activity.
- *152 of 157 (97%) of teachers reported preschool children in their classes were more willing to taste fruit.
- *193 of 214 (90%) of teachers reported preschool children in their classes were more willing to taste vegetables.
- *129 of 154 (84%) of teachers reported preschool children in their classes were more willing to taste whole-grain foods.
- *120 of 135 (89%) of teachers reported using nutrition educational activities from Healthy Steps at least once a week.
- *116 of 144 (81%) of teachers reported using physical activities from Healthy Steps at least three times per week.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #16

1. Outcome Measures

Power U: Extension's Obesity Prevention Program for Tennessee 4th Grade Children

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Tennessee youth are among the most obese in the nation. This has serious health consequences and may impact their ability to be productive members of society.

What has been done

The Power U program was implemented in 29 Tennessee Counties. This included 161 classrooms implementing Power U. There were a total of 700 group meetings with 15,285 educational contacts. There were an additional 10,992 educational contacts through exhibits, newspaper articles, TV and radio programs, and other promotional items.

Results

Impact data was collected using a behavior checklist survey and through teacher and parent comment: 72% (n= 2752) increased intake of whole grains; 71% (2830) decreased their intake of high-sugar foods including beverages; 88% (2890) increased the time they spent in physical activity; 87% (3087) increased their intake of fruit and vegetables. Exposure to a variety of fruits and vegetables at a young age increases their likelihood of the food's adoption and is important for healthy prevention of obesity. Increasing physical activity and decreasing intake of sugar helps maintain caloric balance essential for healthy weight.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #17

1. Outcome Measures

Demonstrated that Angiotensin II (a hypertensive hormone) increases fat synthesis and insulin signaling pathways in adipocytes (Moustaid-Moussa).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

{No Data Entered}

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

1. Evaluation Studies Planned

- Retrospective (post program)

Evaluation Results

Impact data was collected using a behavior checklist survey and through teacher and parent comment: 72% (n= 2752) increased intake of whole grains; 71% (2830) decreased their intake of high-sugar foods including beverages; 88% (2890) increased the time they spent in physical activity; 87% (3087) increased their intake of fruit and vegetables. Exposure to a variety of fruits and vegetables at a young age increases their likelihood of the food's adoption and is important for healthy prevention of obesity. Increasing physical activity and decreasing intake of sugar helps maintain caloric balance essential for healthy weight.

Key Items of Evaluation

Impact data was collected using a behavior checklist survey and through teacher and parent comment: 72% (n= 2752) increased intake of whole grains; 71% (2830) decreased their intake of high-sugar foods including beverages; 88% (2890) increased the time they spent in physical activity; 87% (3087) increased their intake of fruit and vegetables. Exposure to a variety of fruits and vegetables at a young age increases their likelihood of the food's adoption and is important for healthy prevention of obesity. Increasing physical activity and decreasing intake of sugar helps maintain caloric balance essential for healthy weight.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Economic Infrastructure 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	30%	30%	12%	
602	Business Management, Finance, and Taxation	4%	4%	8%	
603	Market Economics	4%	4%	12%	
604	Marketing and Distribution Practices	26%	26%	28%	
607	Consumer Economics	6%	6%	0%	
608	Community Resource Planning and Development	10%	10%	40%	
609	Economic Theory and Methods	10%	10%	0%	
610	Domestic Policy Analysis	10%	10%	0%	
Total		100%	100%	100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	72.6	5.9	19.0	0.0
Actual	22.5	2.0	19.2	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
413771	132060	555742	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1797260	132060	1923352	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
321901	0	218422	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research analysis will include assessment of market potential, market feasibility studies for new agri-industry ventures, buyer and consumer preferences studies, market segmentation analysis and buyer profiling, analysis of new product acceptance, analysis of marketing alternatives, and analysis of valuation of product attributes. To evaluate the impacts of various policies, management strategies, or economic conditions on a farm's bottom line and financial strength, we propose to develop a set of representative farms that encompass major segments of agriculture in Tennessee. Methods for evaluating risk include risk-based econometric models, risk-based mathematical programming models, generalized stochastic dominance criteria, dynamic optimization, and subjective probability assessment criteria.

The Extension MANAGE program helped families analyze their total farming business so they can make informed decisions regarding their future. Extension staff trained in farm and financial management help families to: review their current financial situation; capitalize on strengths and reduce weaknesses in the farm business; develop individualized farm and financial plans; explore alternatives both on and off the farm; evaluate capital investment opportunities including land and/or machinery purchases; analyze likely consequences of changing the scope of enterprises; and determine appropriate production practices.

In addition to individualized farm and financial planning assistance, Extension offered hundreds of workshops to help farmers improve their financial situation. For example, workshops were provided in improved marketing, goal-setting, and strategic planning. The educational program was provided at no cost to participating farm families in all 95 Tennessee counties.

Food safety and security research will be conducted using advanced econometric methods to analyze national consumer survey data.

2. Brief description of the target audience

- Limited-resource and small farmers
- Farmers transitioning from tobacco to other crops
- Policy-makers at the state, federal, and municipal level
- Businesses looking to expand or relocate to Tennessee

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	10000	25000	5000	0
Actual	16114	197950	268	0

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

Patent Applications Submitted

Year: 2009

Plan: 0

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	5	9	
Actual	5	26	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of exhibits displayed to promote program awareness and participation.

Year	Target	Actual
2009	15	7

Output #2

Output Measure

- Numer of research-based publications distributed as part of this program.

Year	Target	Actual
2009	5000	44626

Output #3

Output Measure

- Provide analysis of Tennessee watersheds to determine suitability for water quality trading (Clark).
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Widespread availability of report on spurring economic development by attracting retirees to rural communities (Parks).
Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Research results indicate that video board sale prices were higher than prices on traditional auctions for similar cattle. Electronic ID, Process Verification, and Beef Quality Assurance programs were not significant in affecting price. Weighing cattle on the ground at the farm resulted in significantly lower prices compared to weighing on the ground after a haul. Gathering cattle the night before weighing had a positive effect on price compared to gathering the morning of weighing. Providing hay and water to cattle while penned overnight for weighing reduced the price received compared to dry lot. These additions to the knowledge base are directly and immediately applicable by feeder cattle producers (McLemore).

Year	Target	Actual
2009	{No Data Entered}	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Land Ownership Information Program: Number of African-American landowners who increased their knowledge of property rights and responsibilities.
2	Land Ownership Information Program: Number of African-American landowners who developed farm management plans.
3	Land Ownership Information Program: Number of African-American landowners who developed estate plans to reduce the financial and legal risks farm family businesses face as they transition between generations.
4	Farm Financial Analysis and Planning: Number of farm families and rural business operators who implemented partial budgeting decisions (examples include sell calves now or later, evaluating equitable leasing arrangements and mach
5	Farm Financial Analysis and Planning: Number of farm families and rural business operators implementing improved record systems.
6	Farm Financial Analysis and Planning: Number of farm families who developed whole farm plans to improve their farm financial performance.
7	Farmer-owned biomass cooperative to help capture economic advantage of bioenergy production (Tiller).
8	Impact of senior migration on job and business establishment (Lambert).

Outcome #1

1. Outcome Measures

Land Ownership Information Program: Number of African-American landowners who increased their knowledge of property rights and responsibilities.

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	30	64

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
607	Consumer Economics

Outcome #2

1. Outcome Measures

Land Ownership Information Program: Number of African-American landowners who developed farm management plans.

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	30	64

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
607	Consumer Economics

Outcome #3

1. Outcome Measures

Land Ownership Information Program: Number of African-American landowners who developed estate plans to reduce the financial and legal risks farm family businesses face as they transition between generations.

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	30	64

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

607 Consumer Economics

Outcome #4

1. Outcome Measures

Farm Financial Analysis and Planning: Number of farm families and rural business operators who implemented partial budgeting decisions (examples include sell calves now or later, evaluating equitable leasing arrangements and mach

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	300	623

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

Farm Financial Analysis and Planning: Number of farm families and rural business operators implementing improved record systems.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	300	406

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #6

1. Outcome Measures

Farm Financial Analysis and Planning: Number of farm families who developed whole farm plans to improve their farm financial performance.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	250	184

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Farmer-owned biomass cooperative to help capture economic advantage of bioenergy production (Tiller).

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Impact of senior migration on job and business establishment (Lambert).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

A study looking at senior migration into the Southeastern US examined the impact of migrating cohorts on changes in job and business establishment growth.

Results

Results suggest that the correlation between job growth and in-migration of this cohort was uniformly positive in non-metropolitan counties where job growth was low to moderate, but not significant in non-metropolitan counties where job growth was highest. A comparison of the distributions revealed that the pay-off in terms of job growth could be relatively large (a 1 - 3% increase in jobs) in counties with relatively low population densities with access to urban centers, and non-core counties with relatively low or very low population densities. However, there was a considerable amount of variability associated with these pay-offs, suggesting that decision makers considering senior recruitment as a job development strategy might consider senior recruitment as a component of a broader package of economic development strategies.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

1. Evaluation Studies Planned

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

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Environmental and Water Quality Impacts

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	0%	0%	6%	
102	Soil, Plant, Water, Nutrient Relationships	0%	0%	31%	
104	Protect Soil from Harmful Effects of Natural Elements	0%	0%	1%	
111	Conservation and Efficient Use of Water	0%	0%	1%	
112	Watershed Protection and Management	0%	0%	12%	
123	Management and Sustainability of Forest Resources	0%	0%	4%	
131	Alternative Uses of Land	0%	0%	2%	
132	Weather and Climate	0%	0%	4%	
133	Pollution Prevention and Mitigation	0%	0%	13%	
135	Aquatic and Terrestrial Wildlife	0%	0%	4%	
205	Plant Management Systems	0%	0%	5%	
307	Animal Production Management Systems	0%	0%	2%	
403	Waste Disposal, Recycling, and Reuse	0%	0%	9%	
605	Natural Resource and Environmental Economics	0%	0%	3%	
901	Program and Project Design, and Statistics	0%	0%	3%	
Total		0%	0%	100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	40.0	0.0
Actual	0.0	0.0	26.7	0.0

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

Extension		Research	
Smith-Lever 3b & 3c 0	1890 Extension 0	Hatch 562214	Evans-Allen 0
1862 Matching 0	1890 Matching 0	1862 Matching 2478872	1890 Matching 0
1862 All Other 0	1890 All Other 0	1862 All Other 1112524	1890 All Other 0

V(D). Planned Program (Activity)

1. Brief description of the Activity

We will develop economic and policy data by accessing existing sources, generating data from computer models, and surveying market participants. This data will be analyzed using appropriate statistical and econometric methods. Watershed scale model assessments will be conducted utilizing biophysical farm (field) level estimates of alternative management practices (AMPs). Changes in water quality in impaired watersheds resulting from the evaluation of AMPs will be measured. The cost of meeting different water quality standards at different points within a watershed and the potential impact of different environmental policies on Tennessee's agriculture will be evaluated using a regional economic model. A model used to project land use change will estimate the probability of land development of individual parcels as a function of parcel-level attributes.

Work will be continued on the erosion, sediment transport, and contaminant transport capabilities of the RUSLE2 soil erosion model.

Hourly rainfall data for selected watersheds will be obtained and from the nearest tipping bucket gauge and concatenated into a 5-year time series for each pixel in satellite and radar data to overlay on watershed maps.

Soil samples will be thoroughly characterized in terms of elemental composition, particle size, mineralogy, and other soil chemical characteristics using standard techniques to define the P reservoirs in the soils. The expense of measuring soil hydraulic properties by agricultural producers and fellow researchers will be decreased.

Additional recommendations will be developed for septic tank effluent and the municipal and county regulations affecting the disposal of subsurface sewage.

Background information on the water quality in various watershed areas, including one containing an Animal Agriculture Environmental Research Unit will continue to be collected. This collection of baseline environmental data will be used to evaluate the impact of a dairy production unit on the area.

2. Brief description of the target audience

This is currently a research-only targeted program, so the target audience is weighted toward basic/applied research clients.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	0	0	0	0
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2009

Plan: 0

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	20	
Actual	0	29	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Reduce water-flux measurement error of heat-pulse probe, percent error (Lee).
Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Developed remotely-controlled acoustic monitoring system for monitoring grassland birds on no-entry zones in military installations (Buehler).

Year	Target	Actual
2009	{No Data Entered}	1

Output #3

Output Measure

- A new multivariate analysis using Laser Induced Breakdown Spectroscopy (LIBS) improved heavy metal (copper and zinc) prediction in soils by 15% in calibration and 10% in prediction (Lee).

Year	Target	Actual
2009	{No Data Entered}	1

Output #4

Output Measure

- *Beauveria bassiana*, a fungus known for its ability to parasitize various crop insect pests, can also reduce losses due to fungal pathogens that attack plant roots. Preliminary evidence suggests that disease suppression is due partly to induced resistance in the plant (Ownley).

Year	Target	Actual
2009	{No Data Entered}	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percent of Tennessee major row-crop acreage under some form of no-till or conservation tillage (Tennessee Agriculture 2007).
2	Greenhouse and nursery crop use of bioactive natural products in place of conventional pesticide on tomato, percent of operators adopting (Gwinn).
3	USDA offices using RUSLE2 modeling software for conservation planning, new USDA programs, construction site erosion, and other natural resource conservation issues (Yoder).

Outcome #1

1. Outcome Measures

Percent of Tennessee major row-crop acreage under some form of no-till or conservation tillage (Tennessee Agriculture 2007).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	89	91

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Greenhouse and nursery crop use of bioactive natural products in place of conventional pesticide on tomato, percent of operators adopting (Gwinn).
Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

USDA offices using RUSLE2 modeling software for conservation planning, new USDA programs, construction site erosion, and other natural resource conservation issues (Yoder).
Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Public Policy changes
- Competing Public priorities

Brief Explanation

{No Data Entered}

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

1. Evaluation Studies Planned

- Before-After (before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Family Economics

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	100%	100%	0%	
	Total	100%	100%	0%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	28.0	3.4	0.0	0.0
Actual	18.0	1.0	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
331017	105648	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1437808	105648	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
657283	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

UT and TSU Extension supported 10 regional and local social marketing campaigns for Tennessee Saves and supported by coalitions of volunteers across Tennessee. The Tennessee toolkit for savings lesson plans and activities for teaching financial and savings education was used in schools, workplaces, community centers and other locations to teach youth and adults. UT Extension maintained a partnership with national Extension "Financial Security in Later Life" initiative and with the "America Saves" national organization and other national and state partners, including the TN Jumpstart Coalition.

Extension deployed its On My Own curriculum and youth Tennessee Saves in over 100 financial education simulations throughout the state to reach 30,000 youth with savings and financial education. Additional classes, newsletters, news releases and community events were conducted for adult audiences.

2. Brief description of the target audience

Youth and adults were targeted for this program. UT Extension is a national leader in creating, testing and validating family economic programs for reaching different target audiences, such as youth ages 9-18, young adults, coalition members and consumers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	30000	400000	30000	400000
Actual	31724	1289094	42503	1289094

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

Patent Applications Submitted

Year: 2009

Plan: 0

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	2	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of exhibits displayed to promote program awareness and participation.

Year	Target	Actual
2009	45	164

Output #2

Output Measure

- Number of research-based publications distributed as part of this program.

Year	Target	Actual
2009	15000	46220

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	TN Saves: Number of participants who determined their net worth.
2	TN Saves: Number of participants who estimated their retirement income needs.
3	TN Saves: Number of participants identified ways to increase savings.
4	TN Saves: Number of participants identified ways to reduce debt.
5	TN Saves: Number of participants who set financial or retirement goals.
6	Youth Financial Education Simulation: Number of participants who felt more strongly that they needed to get a good education.
7	Youth Financial Education Simulation: Number of participants who learned better how to plan their spending.
8	Youth Financial Education Simulation: Number of participants who learned how education will affect the kind of job they can get.
9	Youth Financial Education Simulation: Number of participants who learned how having a family can affect their lifestyle.
10	Youth Financial Education Simulation: Number of participants who learned how much money it takes to get by.
11	Youth Financial Education Simulation: Number of participants who learned how payroll deductions are taken from gross pay.
12	Youth Financial Education Simulation: Number of participants who learned how to keep a checkbook register.
13	Youth Financial Education Simulation: Number of participants who learned how to write a check.
14	TN Saves: Number of participants who followed a spending plan.
15	Youth Financial Education Simulation: Number of participants who planned to get more education after high school.
16	TN Saves: Number of participants who initiated or increased savings.
17	TN Saves/Youth Financial Education Simulation: Participants began or increased savings an average of \$ ___ per month.
18	Youth Financial Education Simulation: Number of participants who made a change in career plans.

19	Youth Financial Education Simulation: Number of participants who made a change in financial behavior.
20	TN Saves: Number of participants who made a change in a financial practice to avoid being a victim of fraud or predatory practices.
21	Youth Financial Education Simulation: Number of participants who made a spending plan.
22	TN Saves: Number of participants who reduced debt.
23	TN Saves: Participants reduced debt an average of \$ ___ per month.
24	Extension's Tennessee Saves Program Produces \$5.5 Million Economic Impact in FY 2009

Outcome #1

1. Outcome Measures

TN Saves: Number of participants who determined their net worth.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10000	11005

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #2

1. Outcome Measures

TN Saves: Number of participants who estimated their retirement income needs.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10000	10202

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #3

1. Outcome Measures

TN Saves: Number of participants identified ways to increase savings.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
-------------	----------------------------	---------------

2009 10000 10202

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #4

1. Outcome Measures

TN Saves: Number of participants identified ways to reduce debt.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10000	10202

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #5

1. Outcome Measures

TN Saves: Number of participants who set financial or retirement goals.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	20000	24000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #6

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who felt more strongly that they needed to get a good education.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	11023

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #7

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who learned better how to plan their spending.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	11243

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #8

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who learned how education will affect the kind of job they can get.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	11243

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #9

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who learned how having a family can affect their lifestyle.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	11287

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #10

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who learned how much money it takes to get by.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	11087

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #11

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who learned how payroll deductions are taken from gross pay.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	9689

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #12

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who learned how to keep a checkbook register.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	9216

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #13

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who learned how to write a check.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	8355

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #14

1. Outcome Measures

TN Saves: Number of participants who followed a spending plan.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	6000	1576

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #15

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who planned to get more education after high school.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	10202

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #16

1. Outcome Measures

TN Saves: Number of participants who initiated or increased savings.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10000	12708

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #17

1. Outcome Measures

TN Saves/Youth Financial Education Simulation: Participants began or increased savings an average of \$ ____ per month.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	250	84

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #18

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who made a change in career plans.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	8000	3028

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

801 Individual and Family Resource Management

Outcome #19

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who made a change in financial behavior.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15000	5284

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #20

1. Outcome Measures

TN Saves: Number of participants who made a change in a financial practice to avoid being a victim of fraud or predatory practices.
Not Reporting on this Outcome Measure

Outcome #21

1. Outcome Measures

Youth Financial Education Simulation: Number of participants who made a spending plan.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	8000	4132

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #22

1. Outcome Measures

TN Saves: Number of participants who reduced debt.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	12000	10976

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #23

1. Outcome Measures

TN Saves: Participants reduced debt an average of \$ ___ per month.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	75	49

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #24

1. Outcome Measures

Extension's Tennessee Saves Program Produces \$5.5 Million Economic Impact in FY 2009

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Because they spend too much and save too little, many Tennesseans will not have enough money to live securely throughout life. The economic downturn caused additional hardship via rising unemployment as 1 of 10 working Tennesseans lost their jobs; and through shrinking investment value as many workers saw their 401(k) values drop by 30-40 percent.

What has been done

Counties across Tennessee reported 123,245 direct educational contacts, including 74,149 contacts via group meetings and financial education programs. Of the total educational contacts, approximately 50% were made through youth programs. An additional 4,627,787 Tennesseans were reached with the message of the importance of savings and financial responsibility through media and exhibits. UT and state partners conducted Tennessee Saves Days at Legislative Plaza and the Governor proclaimed Tennessee Saves Week.

Results

Annual economic impact through savings and debt reduction associated with UT and TSU Extension programs was \$5,566,218. This impact comes from increased savings or investment (\$4,410,338) and debt reduction (\$1,155,880).

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy

Brief Explanation

The economic downturn caused additional hardship via rising unemployment as 1 of 10 working Tennesseans lost their jobs; and through shrinking investment value as many workers saw their 401(k) values drop by 30-40 percent. The focus of Tennessee Saves programming shifted from savings and investment education to coping with economic loss.

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

1. Evaluation Studies Planned

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

Evaluation Results

Post program surveys were conducted of all participants in group educational settings for all Extension family economics programs. Results of this evaluation indicated that:

- 85% increased their financial management skills overall.

- 70% felt more confident that they could build wealth.
- 82% became more motivated to begin or increase contributions to savings or investment plans.
- 86% identified ways to increase savings.

Key Items of Evaluation

The focus of Tennessee Saves programming shifted from savings and investment education to coping with economic loss. Impact comparisons from previous years indicated that clientele themselves planned spending more carefully and paid less attention to investment than in past year. For example, participants saying they were confident they could build wealth after educational programs dropped from 77.0 percent in 2008 to 70.8 percent in 2009. Those motivated to begin or increase savings dropped slightly, as did those setting new financial or retirement goals. However, in follow-up surveys regarding behavior change, 8 percent more than the previous year said they followed a spending plan and a full 14 percent more said they kept a record of their spending. While the overall amount saved per respondent dropped, significantly larger numbers were trying to save and reduce debt.

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Food Safety

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	0%	0%	5%	
133	Pollution Prevention and Mitigation	0%	0%	3%	
205	Plant Management Systems	0%	0%	8%	
307	Animal Production Management Systems	0%	0%	3%	
308	Improved Animal Products (Before Harvest)	0%	0%	4%	
311	Animal Diseases	0%	0%	8%	
312	External Parasites and Pests of Animals	0%	0%	2%	
315	Animal Welfare, Well-Being and Protection	0%	0%	2%	
501	New and Improved Food Processing Technologies	0%	0%	12%	
502	New and Improved Food Products	0%	0%	8%	
503	Quality Maintenance in Storing and Marketing Food Products	0%	0%	2%	
511	New and Improved Non-Food Products and Processes	0%	0%	2%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.	0%	0%	2%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	100%	100%	30%	
722	Zoonotic Diseases and Parasites Affecting Humans	0%	0%	4%	
806	Youth Development	0%	0%	5%	
Total		100%	100%	100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	9.0	1.0	39.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c 165508	1890 Extension 52824	Hatch 916365	Evans-Allen 0
1862 Matching 718904	1890 Matching 52824	1862 Matching 3596423	1890 Matching 0
1862 All Other 250000	1890 All Other 0	1862 All Other 1108646	1890 All Other 0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Safe Food Handling for Consumers: Extension used a number of strategies to increase safe food handling practices in homes, child care centers, senior citizen centers, and other locations. Extension agents conducted demonstrations, especially targeting SNAP recipients in DHS offices, food banks, schools, and local housing authorities. A typical demonstration included the use of food thermometers, and in many cases, distributing food thermometers to all audience members. Extension agents used mass media to encourage safe food handling practices such as washing hands prior to preparing food and eating.

On the research side, areas of interest include targeting leading foodborne human pathogens, using milk byproducts for drug delivery, delivery systems of antimicrobials/nutraceuticals, protecting infants from bacterial illness, teaching food safety early, studying antibiotic resistance in livestock, using nanocatalysts to reduce trans-fatty acid formation, technologies for developing protein ingredients, and identifying genetic markers for mastitis susceptibility.

2. Brief description of the target audience

The Centers for Disease Control estimates that 76 million people get sick, more than 325,000 are hospitalized, and 5,000 Americans die each year from foodborne illness. In 2000, the Economic Research Service (ERS) estimated the cost from five bacterial foodborne pathogens as \$6.9 billion, which includes medical costs, productivity losses from missed work, and an estimate of the value of premature death. Therefore, the major target audience for this food safety planned program was consumers, especially those most vulnerable to unsafe food practices such as SNAP recipients, children, and the elderly. Secondary audiences were producers and food handlers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	18236	376232	1365	0

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

Patent Applications Submitted

Year: 2009

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan			
Actual	5	40	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of exhibits displayed to promote safe food handling practices for consumers.

Year	Target	Actual
2009	{No Data Entered}	39

Output #2

Output Measure

- Number of reserach-based publications distributed by Exten sion agents and specialists to encourage safe food handling by consumers.

Year	Target	Actual
2009	{No Data Entered}	7615

Output #3

Output Measure

- Chlorine bleach can be used to decontaminate intentionally contaminated foods (i.e., Anthrax) to prevent further distribution (Davidson).

Year	Target	Actual
2009	{No Data Entered}	1

Output #4

Output Measure

- Developed sanitary operating procedures for daycare programs in Tennessee (Davidson).

Year	Target	Actual
2009	{No Data Entered}	1

Output #5

Output Measure

- Established that heat-resistance of E Coli is dependent on pre-treatment (growth conditions) prior to heating (Davidson).

Year	Target	Actual
2009	{No Data Entered}	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Extension Targets Safe Food Handling for Consumers
2	Extension Helps Consumers to Preserve Foods Safely at Home

Outcome #1

1. Outcome Measures

Extension Targets Safe Food Handling for Consumers

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In 2000, the Economic Research Service (ERS) estimated the cost from five bacterial foodborne pathogens as \$6.9 billion, which includes medical costs, productivity losses from missed work, and an estimate of the value of premature death.

What has been done

Extension used a number of strategies to increase safe food handling practices in homes, child care centers, senior citizen centers, and other locations. In FY 2009, Tennessee Extension agents conducted 16,344 group meetings and demonstrations to educate consumers on safe food handling practices.

Results

Because of this Extension program: 15,201 participants surveyed more often washed their hands with soap and warm running water before preparing food; 3,873 participants now separate raw, cooked and ready-to-eat foods while storing and preparing; and 1,949 participants surveyed used a thermometer to check the internal temperature of food.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Extension Helps Consumers to Preserve Foods Safely at Home

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Preserving foods at home using safe methods can prevent the growth of bacteria that cause foodborne illness.

What has been done

Extension made 11,767 direct contacts with food preservation education during 2009; 5,844,817 contacts were made using indirect methods such as exhibits, newspaper articles, publications, radio, television, and web sites.

Results

Observations and surveys were used to determine if learners followed safe food preservation recommendations. Seventy-one dial-gauge lids were tested in 2009. Three hundred thirty-seven of 421 participants (80%) surveyed canned pickles following a tested recipe, 360 of 443 (81%) canned tomatoes following a tested recipe, and 363 of 673 (54%) canned vegetables following a tested recipe. Three hundred thirty-seven of 421 participants (80%) surveyed processed pickles in a water-bath canner, 334 of 411 (81%) processed tomatoes in a water-bath or pressure canner, and 369 of 458 (81%) participants surveyed processed vegetables in a pressure canner.

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

- Economy

Brief Explanation

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

1. Evaluation Studies Planned

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

Evaluation Results

Adult participants who receive food safety education will complete survey questions on "Your Opinions About Food Safety" (short term attitude/knowledge outcomes) or "Food Handling and Eating Preferences Questionnaire" (intermediate outcomes) before and after education. Adult participants who receive food preservation training will report changes in behaviors using the "Food Preservation Survey" following the end of educational sessions. Impacts from EFNEP adult and youth programs will be reported through the national EFNEP Reporting System.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Forestry, Wildlife, and Fishery 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
123	Management and Sustainability of Forest Resources	76%	76%	35%	
125	Agroforestry	7%	7%	0%	
133	Pollution Prevention and Mitigation	0%	0%	10%	
135	Aquatic and Terrestrial Wildlife	12%	12%	30%	
301	Reproductive Performance of Animals	0%	0%	2%	
305	Animal Physiological Processes	0%	0%	8%	
605	Natural Resource and Environmental Economics	5%	5%	12%	
610	Domestic Policy Analysis	0%	0%	3%	
	Total	100%	100%	100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	11.0	4.7	67.0	0.0
Actual	4.5	1.0	21.8	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
82754	26412	270127	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
359452	26412	1595098	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
640341	0	1072731	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

In FY 2009, UT and TSU Extension again partnered with the Tennessee Forestry Association to plan and conduct group meetings to inform forest landowners of issues pertaining to forestry and wildlife. Topics included management and marketing. Volunteers were recruited and trained to present at group meetings. These volunteers provided information, demonstrated equipment and provide dmaterials for demonstrations. UT and TSU Extension provided education at local, regional and statewide events, such as the Tennessee Forest Festival to inform the general public about forest management issues. Demonstartions were held for landowners and forestry workers. Extension Agents and Specialists educated attendees at County Forestry Landowners Association. UT and TSU Extension worked closely with private consultants, Tennessee Wildlife Resources Agency employees, Tennessee Division of Forestry and others in forestry related industries to conduct educational programs and activities for professionals and landowners.

Research efforts include biological control of Hemlock Woolly Adelgid, seeking to create innovative tools for the formation of durable, high-performance composite materials, establishing new statistical methods to advance intelligent manufacturing practices, evaluating methods of increasing oak seedling success, identifying approaches and services to landowners that would enable them to realize a wide range of expected benefits of landownership while fostering stewardship and sustainability of private forest lands in Tennessee, evaluating the effects of deer on agricultural production, monitoring target avian species and relating specific population parameters to factors affecting forest health and sustainability, and evaluating existing aquaculture production systems adapted to Tennessee's climate and geography.

2. Brief description of the target audience

The target audiences for this program were forest landowners, the professionals and volunteers who serve them, as well as those who enjoy the state's wildlife resources.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	15000	30000	1000	30000
Actual	31463	163741	23935	163741

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

Patent Applications Submitted

Year: 2009
 Plan: 1
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	10	40	
Actual	10	26	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Release of Hemlock Woolly Adelgid predators reared in Tennessee (Parkman).

Year	Target	Actual
2009	200000	120000

Output #2

Output Measure

- Golden-winged warbler conservation strategy in place for the Cumberland Mountains of Tennessee (Buehler).

Year	Target	Actual
2009	0	1

Output #3

Output Measure

- Identify whether or not amphibians are suitable hosts of E coli, and determine aquatic factors that contribute to infectivity (Gray).

Year	Target	Actual
2009	0	1

Output #4

Output Measure

- Engage in discussions with TVA to consider advancing reservoir drawdowns, as a means of increasing mudflat habitat and slowing population loss of migrating shorebirds (Gray).
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	Forest Landowner Education: Number of landowners who now understand the ecology of forest development and succession (using forest management plans or contacting a professional forester.)
2	Forest Landowner Education: Number of landowners who improved profitability (marketing) of forest ownership.
3	Acres of production of freshwater prawn in Tennessee as an alternative income source (Wilson).
4	Extension Works for Healthy Hardwoods in Tennessee

Outcome #1

1. Outcome Measures

Forest Landowner Education: Number of landowners who now understand the ecology of forest development and succession (using forest management plans or contacting a professional forester.)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	283

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources

Outcome #2

1. Outcome Measures

Forest Landowner Education: Number of landowners who improved profitability (marketing) of forest ownership.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	235

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources

Outcome #3

1. Outcome Measures

Acres of production of freshwater prawn in Tennessee as an alternative income source (Wilson).

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Extension Works for Healthy Hardwoods in Tennessee

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Tennessee's private forest owners need to understand and apply scientific forest management practices to maintain healthy hardwoods in the state.

What has been done

UT and TSU Extension have been instrumental in formation and support of County Forestry Associations (CFAs) involving 48 counties since 1999. The FY 2009 focus was "Income Opportunities for Family Forests." In partnership with the Division of Forestry, the Tennessee Forestry Association and Woodmizer Portable Sawmills, four regional field days were conducted. A total of 194 landowners attended the field days representing 62,080 acres of forest land.

Results

Participants indicated a high value to the education, with 64% claiming they had implemented management forest management practices addressed. Of those, 83% utilized the services of a natural resource professional.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other (Observation)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Global Food Security and Hunger

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	10%	
202	Plant Genetic Resources and Biodiversity	0%	0%	2%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	4%	
204	Plant Product Quality and Utility (Preharvest)	0%	0%	2%	
205	Plant Management Systems	50%	50%	12%	
206	Basic Plant Biology	0%	0%	5%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%	5%	6%	
212	Pathogens and Nematodes Affecting Plants	5%	5%	17%	
213	Weeds Affecting Plants	0%	0%	2%	
215	Biological Control of Pests Affecting Plants	0%	0%	2%	
216	Integrated Pest Management Systems	0%	0%	5%	
301	Reproductive Performance of Animals	0%	0%	9%	
302	Nutrient Utilization in Animals	0%	0%	1%	
303	Genetic Improvement of Animals	0%	0%	3%	
305	Animal Physiological Processes	0%	0%	5%	
306	Environmental Stress in Animals	0%	0%	1%	
307	Animal Production Management Systems	0%	0%	3%	
311	Animal Diseases	0%	0%	9%	
315	Animal Welfare, Well-Being and Protection	0%	0%	2%	
601	Economics of Agricultural Production and Farm Management	40%	40%	0%	
Total		100%	100%	100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	27.0	2.0	98.4	0.0

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

Extension		Research	
Smith-Lever 3b & 3c 496525	1890 Extension 158472	Hatch 1914430	Evans-Allen 0
1862 Matching 2156712	1890 Matching 158472	1862 Matching 11290261	1890 Matching 0
1862 All Other 0	1890 All Other 0	1862 All Other 1938523	1890 All Other 0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The Extension portion of this report is organized via the Innovation-Decision Process (Rogers, 1995). This planned program mainly represents corn, soybeans, wheat and commercial fruits and vegetables. Based on needs assessments conducted by Extension Specialists, the following practices were targeted: conservation-tillage; planting insect-tolerant crops; planting herbicide-tolerant crops; spraying crops with foliar fungicide to manage disease; using recommended varieties (based on UT field trial results)

Knowledge: Newspaper articles, radio programs, websites and newsletters were used to build awareness of UT Extension resources and practices for more profitable production. Mass media was used to highlight pests and pesticides in a timely manner.

Persuasion: Farm visits and group meetings were used to showcase practices.

Decision: Group meetings and classes were held in which Extension specialists taught detailed production information to producers.

Implementation: On-farm demonstrations were conducted to highlight research-based practices.

Confirmation: Farm visits and telephone calls assisted producers to continue use of the practices and respond to environmental factors.

In the area of agronomic research, molecular, marker-assisted and traditional breeding techniques will be utilized to develop genetic lines and varieties of corn, soybeans, and wheat which are adapted, high-yielding, and disease resistant. Varieties of these crops and cotton will be rigorously evaluated in replicated field research plots at our Research and Education Centers and with producer cooperators in selected counties. Likewise, cropping systems research addressing tillage systems and rotation schemes will be conducted to develop production system information.

We will conduct surveillance for exotic and invasive organisms using both conventional and molecular technologies. We will research the effects of biological, cultural and chemical control technology for efficacy and effect on productivity of cropping systems under study. We will search for new organisms to use in integrated control programs for pests and diseases of those agronomic systems that are predicted to be in danger of severe damage from new, emerging, and re-emerging pests and diseases.

Economic data will be developed from field experiments on agricultural experiment stations, through surveys of producers, and through simulation modeling. Data will be analyzed using standard methods for estimating yield response functions, budgeting, optimization techniques, risk analysis procedures, simulation modeling, and other methods of economic analysis as appropriate.

In the area of food animal research, surveillance of possible disease vectors will be maintained throughout the insect season, suspected vectors will be tested for appropriate viruses. Risk factor analysis test results will be compared between sites where disease risk is high vs. those where disease risk is low. Larval development habitats of stable flies will be characterized for seasonal and moisture preference, and the ability of flies to provide surveillance data for E.coli 015747 will be tested.

Mastitis-susceptible and mastitis-resistant dairy cows will be used to identify potential genes, immune components, and other factors associated with and responsible for mastitis resistance. Virulence factors that allow mastitis pathogens to invade the udder, multiply there and produce harmful substances that result in inflammation, reduced milk production and altered milk quality will be determined.

A series of trials will use pigs to test various feeding regimens and feed additives to determine effects on the number of antibiotic resistant foodborne pathogens occurring in those animals and their environment. Additional studies will detect the

prevalence of antibiotic resistant bacteria associated with cattle and surrounding environments. These studies should help determine strategies to limit such foodborne risks.

2. Brief description of the target audience

The target audience were farmers (in Tennessee and elsewhere) growing corn, soybeans, wheat and commercial fruits and vegetables, as well as livestock producers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	41066	822313	560	0

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

Patent Applications Submitted

Year: 2009

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan			
Actual	2	90	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research-based publications distributed as part of Extension programs to increase yield or address other areas of global food security and hunger.

Year	Target	Actual
2009	{No Data Entered}	8927

Output #2

Output Measure

- Agronomic testing of corn, soybean, wheat, grain sorghum and oats, varieties tested. (Allen)

Year	Target	Actual
------	--------	--------

2009 {No Data Entered} 500

Output #3

Output Measure

- Demonstrated a positive nutritional impact of a common herbicide currently labeled for use on sweet corn (Kopsell).

Year	Target	Actual
2009	{No Data Entered}	1

Output #4

Output Measure

- Improved genetic technologies to fingerprint and identify novel Phytophthora species (Lamour).

Year	Target	Actual
2009	{No Data Entered}	1

Output #5

Output Measure

- In trials during the rainy harvest season of 2009, it was discovered that applying too much boll opener to cotton that was not not mature resulted in loss of 300-350 lbs of lint per acre. That variation can determine if a producer is still in business the following year (Main).

Year	Target	Actual
2009	{No Data Entered}	1

Output #6

Output Measure

- Reproduction-enhancing media additive for cattle embryo transfer has been sublicensed to a leading supplier (Schrick).

Year	Target	Actual
2009	{No Data Entered}	1

Output #7

Output Measure

- UT AgResearch Soybean Breeding & Genetics Program developed a series of high yielding new conventional (non-GMO) lines with excellent resistance to multiple races of soybean cyst nematode (Pantalone).

Year	Target	Actual
2009	{No Data Entered}	1

Output #8

Output Measure

- Supplementing a snap bean fungicide seed treatment with a bacterial biocontrol agent increased the number of healthy plants per row and increased snap bean yield by over 500 lb per acre. A change in potash fertilizer, from muriate of potash to sulfate of potash, increased the number of healthy soybean plants per row and increased soybean yield by nearly two bushels per acre. A combination of two biocontrol agents increased both broccoli growth and yield; the yield increase was equal to the increase obtained with

the in-furrow fungicide standard (Canada).

Year	Target	Actual
2009	{No Data Entered}	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Wheat: Number of acres utilized precision agriculture technologies for variable rate application of plant growth regulators, defoliant or pesticides.
2	Wheat: Number of producers who adopted UT recommended resistance management strategies to control pests (weeds, insects, diseases).
3	Soybeans: Number of producers who learned soybean best management practices that can improve production potential (e.g., conservation tillage, winter covers, plant population, row spacing, planting dates, plant growth regulators, harvest, variety selection, irrigation, fertility).
4	Soybeans: Percentage increase in Tennessee soybean yield by using recommended crop management strategies for insects, weeds or plant diseases.
5	Corn: Percentage increase in Tennessee corn yield by using recommended crop management strategies for insects, weeds or plant diseases.
6	Corn: Number of producers who reported harvesting higher corn yields and/or better quality crops using university trial results.
7	Extension Produces \$68 Million Economic Impact through Corn, Soybeans and Wheat Production Programs
8	Soybean breeding improvements (Pantalone)

Outcome #1

1. Outcome Measures

Wheat: Number of acres utilized precision agriculture technologies for variable rate application of plant growth regulators, defoliant or pesticides.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	42860

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

Wheat: Number of producers who adopted UT recommended resistance management strategies to control pests (weeds, insects, diseases).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	550

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Soybeans: Number of producers who learned soybean best management practices that can improve production potential (e.g., conservation tillage, winter covers, plant population, row spacing, planting dates, plant growth regulators, harvest, variety selection, irrigation, fertility).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	705

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #4

1. Outcome Measures

Soybeans: Percentage increase in Tennessee soybean yield by using recommended crop management strategies for insects, weeds or plant diseases.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	16

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #5

1. Outcome Measures

Corn: Percentage increase in Tennessee corn yield by using recommended crop management strategies for insects, weeds or plant diseases.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	17

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #6

1. Outcome Measures

Corn: Number of producers who reported harvesting higher corn yields and/or better quality crops using university trial results.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1022

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #7

1. Outcome Measures

Extension Produces \$68 Million Economic Impact through Corn, Soybeans and Wheat Production Programs

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Results from the UT Extension variety testing program have helped farmers increase yields by identifying the varieties that will perform best in local conditions.

What has been done

UT Extension crop variety testing data is used extensively by 80% of the state's row crop producers to select the seed that they use to plant their crops.

Results

The higher yields resulted in approximately \$68.2 million additional income to Tennessee farmers in 2009.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #8

1. Outcome Measures

Soybean breeding improvements (Pantalone)

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

These high yielding varieties contribute favorably to improving producers' livelihoods.

What has been done

A sustained effort continues to produce new soybean varieties.

Results

The gross seed sales of UT AgResearch soybean varieties developed by our program exceeded \$1 million for 2009.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

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

1. Evaluation Studies Planned

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 11

1. Name of the Planned Program

Health and Safety

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
402	Engineering Systems and Equipment	5%	5%	0%	
724	Healthy Lifestyle	70%	70%	0%	
805	Community Institutions, Health, and Social Services	25%	25%	0%	
Total		100%	100%	0%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	48.4	3.9	9.0	0.0
Actual	13.5	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
248262	79236	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1078356	79236	20915	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
386900	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Dining with Diabetes was a three-session course offered throughout the state. This course was taught by Extension Family and Consumer Sciences Agents who coordinated with local health officials to target people with diabetes and/or their caregivers.

Arthritis Self-Help was delivered in six sessions. Each session was two-hours in length. Participants were provided with the book, *The Arthritis Helpbook*, written by Kate Lorig and James Fries. This evidence-based program was designed to increase the self-confidence of participants to manage their arthritis. It was delivered by Extension, in partnership with the Tennessee Chapter of the Arthritis Foundation, the Tennessee Department of Health's Arthritis Control Program, and the University of Tennessee Medical Center's Department of Family Medicine. Specific efficacy-enhancing strategies used in this program include:

- Contracting: Weekly contracting helps participants master something new.
- Feedback: Opportunity is provided to report and record progress and explore different behaviors.
- Modeling: People learn more and try harder when they are motivated by people whom they perceive to be like themselves. Program participants and the trainer serve as models. The course has an emphasis on modeling.
 - Reinterpreting Symptoms and Changing Beliefs: People are pretty rational. They act based on beliefs. If people believe arthritis is a wear and tear disease, then they may not think they can exercise. If they think that nothing can be done for their arthritis, they are probably right. Throughout this program, there is a great emphasis on changing such beliefs.
 - Persuasion: By seeing others in the class contract and succeed, even the most reluctant participant will often choose to take part. It is hard not to go along with others. The facilitator urges participants to do a little more than they are doing now, such as walking four blocks instead of two.

Tai Chi also targeted arthritis sufferers. Extension offered this exercise instructional program to individuals throughout the state. Research indicates that this regimen builds strength and helps those with arthritis to reduce pain and increase mobility.

Agrosecurity: Extension collaborated with state and local agencies to review and update community emergency management plans that are required by the Tennessee Emergency Management Agency.

Homeland Security/Disaster Preparedness: Consumers, families and individuals were taught through various group meetings, visits and mass media. Key practices taught were disaster preparedness for family finances and food safety.

2. Brief description of the target audience

The target audience was inclusive of consumers and limited resource individuals and families. The Dining with Diabetes program targeted individuals with this chronic disease and the caregivers, health professionals and volunteers who serve them. The Agrosecurity program targets producers and agribusinesses.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	20000	80000	20000	40000
Actual	54568	193024	19532	193024

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

Patent Applications Submitted

Year: 2009
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	4	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of exhibits built and displayed to promote program awareness and participation.

Year	Target	Actual
2009	25	161

Output #2

Output Measure

- Number of research-based publications distributed as part of this program.

Year	Target	Actual
2009	800	51746

Output #3

Output Measure

- Test market production of cotton-enhanced spun-melt fabric hospital gowns through a major textile and medical appliances company (Wadsworth).
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	Disaster Preparedness for Food Safety: Number of participants surveyed who know how much food they need on hand in case of an emergency.
2	Disaster Preparedness for Food Safety: Number of participants and their families who now have an adequate supply of safe water and food in case of an emergency.
3	Arthritis Self-Help Course: Number of participants surveyed who have less pain from their arthritis.
4	Arthritis Self-Help Course: Number of participants surveyed who have less stiffness from their arthritis.
5	Arthritis Self-Help Course: Number of participants surveyed who take fewer medications for their arthritis pain.
6	Dining with Diabetes: Number of participants surveyed who reduced weight.
7	Dining with Diabetes: Number of participants surveyed who reduced A1c.
8	Dining with Diabetes: Number of participants surveyed who reduced blood cholesterol.
9	Dining with Diabetes: Number of participants surveyed who reduced blood pressure.
10	Dining with Diabetes: Number of participants surveyed who eat at least five servings of fruits and vegetables each day.
11	Dining with Diabetes: Number of participants surveyed who now use artificial sweeteners.
12	Dining with Diabetes: Number of participants surveyed who use spices and other seasonings to cut back on fat, sugar, and salt.
13	Tai Chi: Number of participants surveyed who continue doing the Tai Chi after the Tai Chi program ends.
14	Tai Chi: Number of participants surveyed who have no pain from arthritis.
15	Tai Chi: Number of participants surveyed who improved balance, body posture and joint flexibility.
16	Tai Chi: Number of participants surveyed who now practice Tai Chi every day.
17	Sanitary Operating Procedure adoption by daycare programs in Tennessee pending grant funding, centers involved (Draughon).

Outcome #1

1. Outcome Measures

Disaster Preparedness for Food Safety: Number of participants surveyed who know how much food they need on hand in case of an emergency.
Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Disaster Preparedness for Food Safety: Number of participants and their families who now have an adequate supply of safe water and food in case of an emergency.
Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Arthritis Self-Help Course: Number of participants surveyed who have less pain from their arthritis.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	500	1094

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #4

1. Outcome Measures

Arthritis Self-Help Course: Number of participants surveyed who have less stiffness from their arthritis.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	500	507

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #5

1. Outcome Measures

Arthritis Self-Help Course: Number of participants surveyed who take fewer medications for their arthritis pain.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	500	596

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #6

1. Outcome Measures

Dining with Diabetes: Number of participants surveyed who reduced weight.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	800	855

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #7

1. Outcome Measures

Dining with Diabetes: Number of participants surveyed who reduced A1c.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	800	317

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #8

1. Outcome Measures

Dining with Diabetes: Number of participants surveyed who reduced blood cholesterol.

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Dining with Diabetes: Number of participants surveyed who reduced blood pressure.

Not Reporting on this Outcome Measure

Outcome #10

1. Outcome Measures

Dining with Diabetes: Number of participants surveyed who eat at least five servings of fruits and vegetables each day.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	800	372

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #11

1. Outcome Measures

Dining with Diabetes: Number of participants surveyed who now use artificial sweeteners.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	800	855

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #12

1. Outcome Measures

Dining with Diabetes: Number of participants surveyed who use spices and other seasonings to cut back on fat, sugar, and salt.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	800	855

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #13

1. Outcome Measures

Tai Chi: Number of participants surveyed who continue doing the Tai Chi after the Tai Chi program ends.

Not Reporting on this Outcome Measure

Outcome #14

1. Outcome Measures

Tai Chi: Number of participants surveyed who have no pain from arthritis.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	800	1664

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #15

1. Outcome Measures

Tai Chi: Number of participants surveyed who improved balance, body posture and joint flexibility.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1000	1772

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #16

1. Outcome Measures

Tai Chi: Number of participants surveyed who now practice Tai Chi every day.

Not Reporting on this Outcome Measure

Outcome #17

1. Outcome Measures

Sanitary Operating Procedure adoption by daycare programs in Tennessee pending grant funding, centers involved (Draughon).

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)
- Other (Surveillance Data)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Horticultural 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
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	10%	
202	Plant Genetic Resources and Biodiversity	0%	0%	6%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	4%	
204	Plant Product Quality and Utility (Preharvest)	0%	0%	20%	
205	Plant Management Systems	60%	60%	20%	
211	Insects, Mites, and Other Arthropods Affecting Plants	10%	10%	4%	
212	Pathogens and Nematodes Affecting Plants	0%	0%	10%	
213	Weeds Affecting Plants	10%	10%	6%	
216	Integrated Pest Management Systems	10%	10%	20%	
312	External Parasites and Pests of Animals	10%	10%	0%	
	Total	100%	100%	100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	40.0	0.0
Actual	36.0	3.0	22.9	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
662034	211296	318067	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2875616	211296	2590253	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
150769	0	522141	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Variety evaluation of several different vegetable crops will be conducted to determine suitability to climate, soils and cultural practices for state producers. Yields, quality and market potential will be evaluated to assess potential production by growers seeking additional crops or alternative crops. Crops suitable for greenhouse production in farmers tobacco transplant greenhouses will be evaluated for profitability and product quality with respect to local and state markets.

Experimental research will be carried out to determine the effectiveness of various control technologies. New genetic cultivars of plants will be developed from in-house breeding programs or, in some cases, finding naturally resistant populations of plants by searching the southeast U.S. (i.e. for anthracnose resistant dogwoods).

Research will be conducted at selected Research and Education Centers across Tennessee, and at selected farmer-cooperator locations in key areas of horticultural production in Tennessee. Substantial investments are being made in construction and renovation of greenhouse facilities on campus and at certain Research and Education Centers. These will be utilized extensively in the conduct of our research.

2. Brief description of the target audience

- Farmers/producers who have traditional livestock and tobacco operations, but are looking to improve income through the Green Industry
- Master Gardeners who volunteer to provide community service through horticulture
- Business owners who need research-based information to start, maintain or expand their greenhouse, landscaping, or nursery business.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	0	0	0	0
Actual	50661	7933487	2865	0

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

Patent Applications Submitted

Year: 2009

Plan: 1

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	10	
Actual	2	53	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Horticultural workshops and conferences.

Year	Target	Actual
2009	4	0

Output #2

Output Measure

- Annual Vegetable Initiative Report summary of research results.

Year	Target	Actual
2009	1	0

Output #3

Output Measure

- Pilot production of spun-melt agricultural row covers impregnated with phase-change oils for freeze-protection of crops (Wadsworth).
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Seasonal dogwood borer flight activity data is now available to help more precisely time pesticide applications yielding better pest control and cost savings to both landscape management professionals and ornamental plant producers (Klingeman).

Year	Target	Actual
2009	{No Data Entered}	1

Output #5

Output Measure

- A genetic linkage map for *Cornus florida* (flowering dogwood) was constructed. It is among only a few for ornamental woody plants and will allow exploration of the genome, gene discovery and marker-assisted selection in the dogwood breeding program (Trigiano).

Year	Target	Actual
2009	{No Data Entered}	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Projected licenses for dogwood cultivars (M. Windham).
2	Target number of research laboratories using our reverse-genetic tool for Phytophthora gene function analysis (Lamour).
3	Annual Tennessee economic contribution of Encore azaleas based on TAES research, dollars (M. Windham).
4	UT and TSU Extension Consumer Horticulture Program Impacts
5	Interspecific hybrids in dogwood are difficult to make because of different flowering times, whereas intraspecific hybrids are easily achieved. Honey bees are efficient in moving pollen between compatible genotypes; they were used as pollinators in closed systems with two species of dogwood (Trigiano).

Outcome #1

1. Outcome Measures

Projected licenses for dogwood cultivars (M. Windham).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	58	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
212	Pathogens and Nematodes Affecting Plants

Outcome #2

1. Outcome Measures

Target number of research laboratories using our reverse-genetic tool for Phytophthora gene function analysis (Lamour).

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Annual Tennessee economic contribution of Encore azaleas based on TAES research, dollars (M. Windham).

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

UT and TSU Extension Consumer Horticulture Program Impacts

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Interest in consumer horticulture, while already strong, is increasing. To develop and maintain attractive landscapes and productive home gardens, consumers need knowledge and skills in proper fertilization, plant selection, planting techniques and pest management. Volunteers, such as Master Gardeners, are needed to provide community garden and landscape programs that improve the quality of life.

What has been done

Extension agents and specialists made over 53,000 direct contacts with Tennesseans regarding consumer horticulture programs. Highlights included over 1440 on-site visits for one-on-one consultations.

Results

Observation and post-test only questionnaires showed these results: 1100 consumers applied fewer fertilizers and pesticides due to a better understanding of landscape best management practices; 518 consumers implemented water-wise gardening practices to conserve and protect water quality; 4189 consumers learned about plant selection and proper planting to save money and time in the landscape; 1685 consumers learned how to apply landscape fertilizers and pesticides safely.

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

Interspecific hybrids in dogwood are difficult to make because of different flowering times, whereas intraspecific hybrids are easily achieved. Honey bees are efficient in moving pollen between compatible genotypes; they were used as pollinators in closed systems with two species of dogwood (Trigiano).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 13

1. Name of the Planned Program

Human Development

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	100%	100%	0%	
	Total	100%	100%	0%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	33.0	2.5	0.0	0.0
Actual	18.0	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
331017	105648	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1437808	105648	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1214000	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

This program involved professionals, parents, child care providers, older adults, and community leaders. The target audiences were child care providers, adolescents, and parents who are divorced or incarcerated. The following methods were used to help the target audience gain awareness: Displays, exhibits, community events, newspaper articles, radio programs, TV shows and newsletters. In addition, fact sheets and resource lists for parents, teachers and professionals were disseminated. Child Care Provider training involved over 10,000 annual contacts. Parenting classes targeting parenting and co-parenting outcomes reached an additional 10,000 contacts. Extension FCS Agents in over 60 of Tennessee's 95 counties offered the four-hour class Parenting Apart: Effective Co-Parenting, an information and skills-based program that utilizes lecture, class discussion, videos, and handouts to inform parents about the potential effects of divorce on their children and provides them with strategies for minimizing those effects.

2. Brief description of the target audience

The target audiences for this planned program were Tennessee child care providers, parents, and adolescents. While all parents of infants and young children are targeted for literacy programs, parents seeking a divorce were especially targeted for parenting instruction because of the added demands of co-parenting. Tennessee child care providers working full-time are required to have 18 hours and child care center directors are required to have 24 hours of instruction annually. Tennessee parents seeking a divorce are directed by the courts to a four-hour co-parenting class. In many communities in the state, UT Extension is the only provider of this instruction.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	5000	10000	0	0
Actual	7941	12168543	0	0

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

Patent Applications Submitted

Year: 2009
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of exhibits displayed to promote program awareness and participation.

Year	Target	Actual
2009	10	21

Output #2

Output Measure

- Number of research-based publications distributed as part of this program.

Year	Target	Actual
2009	200	14230

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Book by Book: Number of childcare providers and parents who report that they now provide books for infants and toddlers at eye-level and within their reach.
2	Book by Book: Number of childcare providers and parents who report providing a special place for children to read and write which is in their reach.
3	Book by Book: Number of childcare providers and parents who report visiting the library more than before this program.
4	Parenting Skills for Incarcerated Inmates: Number of inmates who acquired knowledge about the importance of effective communication required to build parent/child relationships.
5	Parenting Skills for Incarcerated Inmates: Number of inmates who demonstrated their knowledge of positive parent/child relationships by writing to their child.
6	Love At First Sight: Number of parents and childcare providers who report using suggested guidance techniques more often.
7	Parenting Skills for Incarcerated Inmates: Number of inmates who now have an ongoing relationship with their children and demonstrate the need not to violate the law.
8	Love At First Sight: Number of parents and child care providers who report yelling less at children.
9	Love At First Sight: Number of parents and child care providers who report putting down or blaming their child less.
10	Love At First Sight: Number of parents and child care providers who report talking, singing and playing more with their children than before the program.
11	Divorcing Parents: Number of parents who plan to decrease exposure of their children to parental conflict.
12	Parenting Program Impacts
13	Parenting Apart: Effective Co-Parenting in Tennessee
14	Relationship Skills for Premarital Couples
15	Relatives as Caregivers of Children

Outcome #1

1. Outcome Measures

Book by Book: Number of childcare providers and parents who report that they now provide books for infants and toddlers at eye-level and within their reach.
Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Book by Book: Number of childcare providers and parents who report providing a special place for children to read and write which is in their reach.
Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Book by Book: Number of childcare providers and parents who report visiting the library more than before this program.
Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Parenting Skills for Incarcerated Inmates: Number of inmates who acquired knowledge about the importance of effective communication required to build parent/child relationships.

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	25	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

Parenting Skills for Incarcerated Inmates: Number of inmates who demonstrated their knowledge of positive parent/child relationships by writing to their child.
Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Love At First Sight: Number of parents and childcare providers who report using suggested guidance techniques more often.
Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Parenting Skills for Incarcerated Inmates: Number of inmates who now have an ongoing relationship with their children and demonstrate the need not to violate the law.
Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Love At First Sight: Number of parents and child care providers who report yelling less at children.

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Love At First Sight: Number of parents and child care providers who report putting down or blaming their child less.

Not Reporting on this Outcome Measure

Outcome #10

1. Outcome Measures

Love At First Sight: Number of parents and child care providers who report talking, singing and playing more with their children than before the program.
Not Reporting on this Outcome Measure

Outcome #11

1. Outcome Measures

Divorcing Parents: Number of parents who plan to decrease exposure of their children to parental conflict.

Not Reporting on this Outcome Measure

Outcome #12

1. Outcome Measures

Parenting Program Impacts

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Inadequate parenting and interpersonal skills are associated with family instability which negatively affects child well-being and results in increased costs to individuals, communities, and governments.

What has been done

Agents have received training and curricula to work with parents in varying circumstances. Based on annual reports:

*Agents reported 1,141 face-to-face contacts with court-ordered parents through 150 group meetings and 252 in-office or on-site visits.

*Agents reported 224 face-to-face contacts with relative caregivers of children through 15 group meetings and 13 in-office or on-site visits.

Results

In self-report surveys of class participants, the following outcomes for parenting programs were noted:

*158 of 211 (75%) parents/caregivers report an increase in use of appropriate child guidance techniques.

*210 of 258 (81%) parents/caregivers report an increase in use of positive communication techniques with their children.

*179 of 232 (77%) parents/caregivers report feeling better about their abilities as parents.

*140 of 251 (56%) parents/caregivers report feeling less stressed as parents.

4. Associated Knowledge Areas

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

Outcome #13

1. Outcome Measures

Parenting Apart: Effective Co-Parenting in Tennessee

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Based on the latest data available, Tennessee ranks 7th in divorce rate among 45 reporting states (Division of Vital Statistics, National Center for Health Statistics, 2008). Tennessee's rate of 4.9 is higher than the U.S. rate of 3.6 divorces per 1000 population. On average, children whose parents divorce have higher rates of emotional problems, academic problems, and engage in higher risk behaviors than do children who remain in two-parent biological families.

What has been done

Agents in 53 counties reported 3,157 contacts through group meetings, 1,226 contacts through client visits or on-site-visits, and 2180 contacts through direct mail or telephone. In addition, agents have produced 24 exhibits, 58 newspaper articles, 7 radio programs, 1 TV program, 57 Websites and have distributed 678 promotional items and 1260 publications reaching a potential total of 1,339,630 people with information about parenting through divorce. Volunteers made an additional 184 contacts with this audience.

Results

- *2089 (93%) of respondents improved knowledge of how divorce impacts children by age/stage of development.
- *2086 (92%) of respondents learned effective communication techniques.
- *1950 (86%) of respondents plan to decrease exposure of their children to parental conflict.
- *2052 (91%) of respondents report understanding the importance of working together for the sakes of their children.
- *1566 (70%, N = 2252) of respondents reported a decrease in level of resentment at being required to attend the parenting class from pre- to post-class.

4. Associated Knowledge Areas

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

Outcome #14

1. Outcome Measures

Relationship Skills for Premarital Couples

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Researchers have found that, on average, children raised by both biological parents in a healthy marriage fare better on all measures than children in any other type of living arrangement. Tennessee continues to have among the highest divorce rates in the nation, and the incidence of cohabiting parents continues to increase dramatically. Divorce or single parenting and their consequences potentially cost the government money in benefits paid to low-income families, lost tax base from children who drop out of school or who cannot function successfully in school, and increased crime and property damage.

What has been done

Agents have received training and curricula (Before You Tie the Knot) for use with premarital couples, teens who are not yet in committed relationships, and professionals who work with those audiences. Based on annual reports:

*Agents reported 412 face-to-face contacts with program participants through 24 group meetings and 29 in-office or on-site visits.

*Additionally, agents have utilized 3 exhibits, 6 newspaper articles, 2 radio programs, 3 TV program, 2 Websites and have distributed 1,175 promotional items and 825 publications reaching a potential total of 53,075 contacts with information about healthy relationships.

Results

In self-report surveys of class participants, the following outcomes for relationship education programs were noted:

*240 of 246 (98%) committed to setting up a family spending plan with their future partners.

*244 of 246 (99%) committed to spending more time talking to their future partners without distractions.

*227 of 246 (92%) committed to talk to and listen to each other about their child-rearing practices/beliefs.

*244 of 246 (99%) committed to trying to understand their future partners' perspectives when having a disagreement.

*200 of 246 (81%) improved their scores from pre-to post-test after completing the classes.

4. Associated Knowledge Areas

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

802 Human Development and Family Well-Being

Outcome #15

1. Outcome Measures

Relatives as Caregivers of Children

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Studies reveal that there is an increase in the number of individuals who provide care for others in the United States. In Tennessee there are 101,510 children living in grandparent-headed households (7.3% of all children in the state). There are another 24,774 children living in households headed by other relatives (1.8% of all children in the state). Of the children living in households headed by grandparents or other relatives in Tennessee, 56,682 are living without the presence of either parent (U.S. Census 2000).

What has been done

TSU Extension conducted a Caregivers Conference. In addition, a TSU Specialist served on the leadership team for the National e-Xtension Family Caregiving Community of Practice. Extension agents and specialists conducted 15 group meetings to reach relatives caring for children.

Results

32 caregivers feel prepared to cope with the stresses of being a kinship caregiver; 30 caregivers improved knowledge of child development; 42 caregivers increased confidence in their ability to find and access community resources.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

1. Evaluation Studies Planned

- Retrospective (post program)

Evaluation Results

An independent evaluation of Parenting Apart: Effective Co-Parenting was conducted by a graduate student at the University of Tennessee utilizing data from 19 counties. Using a retrospective post-then-pre design, 139 participants reported their knowledge gain in two areas: (a) the impacts of divorce and of putting children in the middle of conflict, and (b) strategies to reduce conflict with one's former spouse. Two-month follow-up interviews were used to assess behavior change in two areas: (a) using techniques to manage post-divorce conflict with one's former spouse, and (b) implementing strategies to keep children out of the middle of conflict. The following results were reported: The participants reported knowledge gain and behavior change in each of the four respective areas. It was also found that knowledge gain in regards to the impact of divorce and putting children in the middle of conflict predicted behavior change in regards to implementing strategies to keep children out of the middle of conflict ($p < .05$).

Key Items of Evaluation

Using a retrospective post-then-pre design, 139 participants reported their knowledge gain in two areas: (a) the impacts of divorce and of putting children in the middle of conflict, and (b) strategies to reduce conflict with one's former spouse. Two-month follow-up interviews were used to assess behavior change in two areas: (a) using techniques to manage post-divorce conflict with one's former spouse, and (b) implementing strategies to keep children out of the middle of conflict. The following results were reported: The participants reported knowledge gain and behavior change in each of the four respective areas. It was also found that knowledge gain in regards to the impact of divorce and putting children in the middle of conflict predicted behavior change in regards to implementing strategies to keep children out of the middle of conflict ($p < .05$).

V(A). Planned Program (Summary)

Program # 14

1. Name of the Planned Program

Sustainable Energy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources	0%	0%	9%	
135	Aquatic and Terrestrial Wildlife	0%	0%	2%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	4%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	6%	
205	Plant Management Systems	0%	0%	3%	
206	Basic Plant Biology	0%	0%	2%	
301	Reproductive Performance of Animals	0%	0%	4%	
307	Animal Production Management Systems	0%	0%	1%	
402	Engineering Systems and Equipment	0%	0%	5%	
404	Instrumentation and Control Systems	0%	0%	3%	
501	New and Improved Food Processing Technologies	0%	0%	3%	
511	New and Improved Non-Food Products and Processes	0%	0%	35%	
512	Quality Maintenance in Storing and Marketing Non-Food Products	80%	80%	4%	
603	Market Economics	10%	10%	3%	
605	Natural Resource and Environmental Economics	10%	10%	5%	
606	International Trade and Development	0%	0%	2%	
607	Consumer Economics	0%	0%	2%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.	0%	0%	1%	
901	Program and Project Design, and Statistics	0%	0%	6%	
Total		100%	100%	100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	35.0	0.0
Actual	9.0	1.0	69.6	0.0

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

Extension		Research	
Smith-Lever 3b & 3c 165508	1890 Extension 52824	Hatch 529653	Evans-Allen 0
1862 Matching 718904	1890 Matching 52824	1862 Matching 6386244	1890 Matching 0
1862 All Other 146826	1890 All Other 0	1862 All Other 2817819	1890 All Other 0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Sustainable energy research projects include bio-diesel from canola oil, biomass analytic techniques, biomass component separation with air, lignocellulosic conversion, consumer willingness to pay for biofuels, purifying proteins from agricultural feedstocks, extracting useful chemicals from biomass, rapid analysis of biomass properties, process analytics of bio-based products, seeding and fertilization rates for biomass crops, switchgrass storage, reinforcing composites with natural fibers, integrated bioenergy and OSB production processes, better utilization of woody biomass hemicellulose, insect cellulases for biofuel production, solubilizing biomass biopolymers, and biorefinery water usage.

2. Brief description of the target audience

Producers were targeted to learn about what renewable energy systems would be technically and economically feasible to operate at the farm level.

Our research is applicable to scientists, government, and consumers across the biomass and energy spectrum.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	0	0	0	0
Actual	9792	384731	0	0

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

Patent Applications Submitted

Year: 2009

Plan: 1

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
------	-----------	----------	-------

Plan	0	11	
Actual	0	122	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer-reviewed technical resource pages in online BioWeb resource (Tiller).
Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Development of a rapid biomass compositional analysis method (Ye).
Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Yield increase of switchgrass varieties in Tennessee, percent increase (West & Larson).
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- A switchgrass accession with double the potential biomass yield of Alamo has been identified (Zale).

Year	Target	Actual
2009	{No Data Entered}	1

Output #5

Output Measure

- Insect cellulose assays conducted in the lab have identified potentially unique protein cellulases (Jurat-Fuentes).

Year	Target	Actual
2009	{No Data Entered}	1

Output #6

Output Measure

- Dropped recommended seeding rate for switchgrass by 25%, for a savings of seed cost of \$60/acre (Tyler).

Year	Target	Actual
2009	{No Data Entered}	1

Output #7

Output Measure

- A number of fungi have been isolated from poorly established stands of switchgrass seedlings, or diseased mature switchgrass (Ownley).

Year	Target	Actual
2009	{No Data Entered}	1

Output #8

Output Measure

- A goal of 60 billion gallons of ethanol per year: 1) Can be achieved without using CRP lands. 2) Will be fostered by research increasing agricultural productivity and commercialization of cellulose to ethanol. 3) Is projected to result in a cumulative increase in net farm income over the 2007-2030 of \$210 billion. 4) Is estimated to impact the nation's economy by \$350 billion and 2.4 million jobs, with much of these impacts occurring in the nation's rural economies. 5) Will provide for displacement of more than 20% of the gasoline by 2030; potentially reducing oil imports by \$52 billion. 6) Can result in cumulative displacement of 10.48 billion barrels of oil, and a potential import reduction of \$629 billion through 2030 (De La Torre Ugarte)

Year	Target	Actual
2009	{No Data Entered}	1

Output #9

Output Measure

- The project maintains and updates the NIFA biomass research database, which contains extensive information on all biomass related projects funded through NIFA mechanisms. The first update was completed and provided to NIFA; it added 193 projects, for a total of 1248 biomass projects contained in the database (Walsh).

Year	Target	Actual
2009	{No Data Entered}	1

Output #10

Output Measure

- Altering switchgrass cell walls can conceivably yield up to 35-50% more ethanol (one group has already made a plant that yields 25% more ethanol). Cell wall biosynthesis genes are being manipulated in switchgrass (Stewart).

Year	Target	Actual
2009	{No Data Entered}	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of growers producing bio-mass for commercial sale as energy crops (Wilson).
2	Acreage producing dedicated energy crops in Tennessee (Wilson).
3	Research-oriented biorefinery to test range of processes for biomass to cellulosic ethanol (Tiller).
4	Majority of first-pass biomass size reduction done with knife grids or other technology more efficient than rotary (Womac).
5	In-field size reduction and/or compacting done on majority of cellulosic biomass harvested in Tennessee (Womac).
6	Biofuels: Extension Helps Producers Gain Knowledge
7	Farmer-owned biomass cooperative in place to help capture economic advantage of bioenergy production (Tiller).

Outcome #1

1. Outcome Measures

Number of growers producing bio-mass for commercial sale as energy crops (Wilson).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	20	40

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes
605	Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

Acreage producing dedicated energy crops in Tennessee (Wilson).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	3000	2600

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes
605	Natural Resource and Environmental Economics

Outcome #3

1. Outcome Measures

Research-oriented biorefinery to test range of processes for biomass to cellulosic ethanol (Tiller).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Based on the work on switchgrass in the state conducted earlier this decade, we have seen the development of a renewable energy sector.

Results

The first demonstration plant to convert switchgrass to ethanol has now come online.

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
511	New and Improved Non-Food Products and Processes
605	Natural Resource and Environmental Economics

Outcome #4

1. Outcome Measures

Majority of first-pass biomass size reduction done with knife grids or other technology more efficient than rotary (Womac).
Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

In-field size reduction and/or compacting done on majority of cellulosic biomass harvested in Tennessee (Womac).
Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Biofuels: Extension Helps Producers Gain Knowledge

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The nation is placing increased emphasis on renewable energy. A farm-to-fuel business model was funded with support from the Tennessee General Assembly. A cellulosic ethanol demonstration facility has been constructed and ethanol is being produced. Switchgrass is a major future source of biomass for the facility.

What has been done

The University of Tennessee/ Genera Energy and DuPont Danisco Cellulosic Ethanol constructed and are operating one of the nation's first cellulosic ethanol demonstration plants and the only one dedicated to converting both agricultural residue and bioenergy crops to fuel ethanol. University of Tennessee Extension is providing leadership for educational programming with farmers on contracting, producing and harvesting switchgrass for biomass.

Results

212 producers gained the knowledge necessary to determine whether they could profitably produce a dedicated energy crop for either on-farm production of renewable energy or for sale to a bio-refinery or other energy producer; learned about different types of renewable energy options and what renewable energy systems would be technically and economically feasible to operate at the farm level; and learned about the four steps in the process for converting biomass into cellulosic ethanol: preprocessing, pretreatment, hydrolysis, and fermentation

and distillation.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Farmer-owned biomass cooperative in place to help capture economic advantage of bioenergy production (Tiller).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
512	Quality Maintenance in Storing and Marketing Non-Food Products
603	Market Economics
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

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- During (during program)
- Time series (multiple points before and after program)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 15

1. Name of the Planned Program

Climate Change

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
132	Weather and Climate	0%	0%	50%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	30%	
206	Basic Plant Biology	0%	0%	20%	
Total		0%	0%	100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	0.0	0.0	1.3	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	54245	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	90656	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The health of our agricultural crops and forests, including their resilience to drought, relies on beneficial soil organisms that form a symbiosis with roots, helping plants gather nutrients and water. Our studies help scientists, forest managers and policy makers better predict how drought and other global climate changes may affect our forests and in turn affect American industries and pastimes that depend on them.

2. Brief description of the target audience

The target audience includes policy-makers, forest managers, legislators, and the public.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2009

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan			
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- not applicable
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	Drought response of mature trees (Auge).

Outcome #1

1. Outcome Measures

Drought response of mature trees (Auge).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Our chief objective is to learn how sustained water shortage affects mycorrhizal abundance in a mature temperate forest.

What has been done

To gain an understanding of mature forest response to scenarios for future environmental change, direct experiments on large trees or forested catchments have been developed.

Results

In tulip poplar, drought treatment increased total root colonization and arbuscular colonization. Although poplar roots themselves were largely unaffected by the severe drought treatment, showing essentially no changes in root length density, mass density or specific root length, mycorrhizal symbiosis of the roots increased substantially. Root systems beneath tulip poplar and chestnut oak trees were extremely resilient to the severe drought imposed beneath tree canopies, perhaps in part in poplar trees because of increased activity of their fungal symbionts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
132	Weather and Climate

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Appropriations changes
- Public Policy changes
- Competing Public priorities

Brief Explanation

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

1. Evaluation Studies Planned

Evaluation Results

Key Items of Evaluation