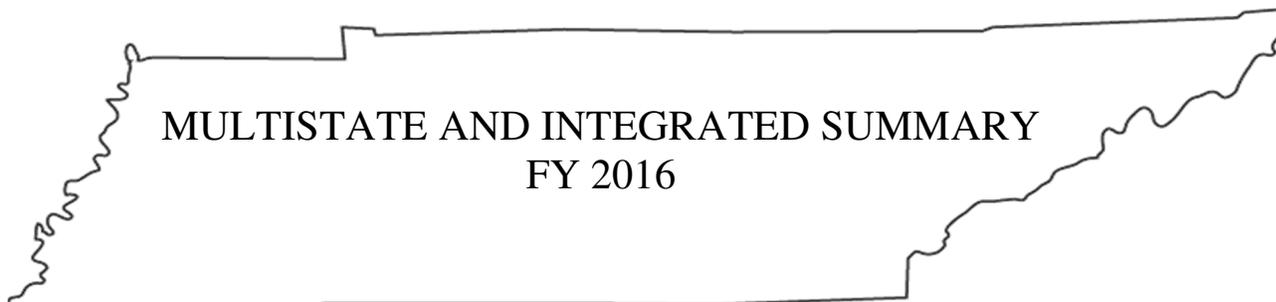


THE UNIVERSITY OF TENNESSEE EXTENSION



MULTISTATE AND INTEGRATED SUMMARY
FY 2016

AREERA SECTIONS 105 and 204

SMITH-LEVER FUNDS

Submitted to:

United States Department of Agriculture

National Institute of Food and Agriculture

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I. Introduction

In FY 2016, the University of Tennessee Extension met the multistate and integrated targets established for its Smith-Lever funds under Sections 105 and 204 of the Agricultural Research, Education and Extension Reform Act (AREERA) of 1998. The targets were recertified during FY 2008. This report is a summary of expenditures and specific program activities.

II. Multistate Extension Summary

UT Extension programs that represented both multistate and integrated efforts have been listed only in the integrated programs section of this report.

A. 4-H Positive Youth Development

4-H Health Rocks (National)

Tennessee Extension specialists conducted a webinar for 4-H Health Rocks state coordinators from 23 states. The content focused on effective ways to use evaluative data for program planning and accountability. Tennessee continues to have the largest Health Rocks program in the nation, and in the 2016 program year, more than 20,000 youth completed 10 hours of the Health Rocks curriculum.

National 4-H Congress (National)

Tennessee Extension 4-H specialists worked cooperatively with Extension personnel from across the nation to implement the 2016 National 4-H Congress in Atlanta. Tennessee 4-H specialists provided leadership and operating support for this national event.

Southern Region 4-H Horse Championships (Regional)

Tennessee Extension 4-H personnel assisted in conducting the Southern Region 4-H Horse Championships held in Perry, Georgia. Youth demonstrated their hands-on equine management skills and gained knowledge in equine science.

4-H Volunteer Leader Conference of Southern States (Regional)

Tennessee Extension 4-H specialists worked cooperatively with Extension personnel from across the Southern Region to plan and conduct the 2016 4-H Volunteer Leader Conference of Southern States in Eatonton, Georgia. The forum helped volunteer leaders to develop their skill set, cooperate with other volunteers from throughout the region, and strengthen 4-H programs in their local communities.

Southern Region 4-H Teen Leadership Conference (Regional)

Tennessee Extension 4-H personnel worked collaboratively with State Extension Specialists in all Southern Region states in hosting a regional teen leadership conference at the Clyde M. York 4-H Camp in Crossville, Tennessee. This conference is jointly planned and conducted by the University of Tennessee, University of Kentucky, University of Georgia, and University of Florida. Extension professionals from these institutions work with an advisory group of 15 teens. More than 200 members, Extension personnel, and volunteers (a new attendance record) from across the region gained practical knowledge in implementing service-learning programs and supporting project groups in their communities.

B. Agriculture and Natural Resources

Tri-State Beef Conference (North Carolina, Virginia)

Extension personnel from Tennessee, Virginia and North Carolina planned and conducted the fifth annual Tri-State Beef Conference in 2016. Regionally and nationally known speakers presented educational information on cattle health management, nutrition, respiratory disease management, and beef cattle outlook. In 2016, the event had 120 beef producers, 25 Extension personnel, and 52 agribusiness representatives. The producers were from eight states (Tennessee, Virginia, North Carolina, West Virginia, Kentucky, South Carolina, New York, and Ohio). All producers were surveyed at the end of the conference, and 100% indicated that they planned to adopt new practices. The economic impact of those new practices totaled \$110,500 in additional farm income.

Small Ruminant Conference (Alabama)

The Tennessee-Alabama Small Ruminant Conference was a three-day conference conducted by the University of Tennessee and Alabama Cooperative Extension. County extension personnel and Extension specialists from Alabama and Tennessee identified the needs of producers in the area. The planning committee then identifies and schedules speakers with the expertise to address the needs of the producers. The conference services both goat and sheep producers and in 2016 had educational topics related to marketing animals for custom exempt harvesting; genetics and replacement stock; marketing and production contracts; treatment and preventative health practices; production economics; forage and pasture management; developing a marketing cooperative; small ruminant market outlook; facilities/equipment/fencing; developing a biosecurity plan; carcass and meat quality finished on various forages; and a live animal grading demonstration. In 2016, 63 participants were in attendance, and 45 producers completed the post conference evaluation representing 40 wool sheep, 798 hair sheep, 674 meat goats, and 85 dairy goats. The 45 producers completing the economic evaluation indicated the information learned at the conference would result in changes to their operation with a total direct economic impact of \$188,550.

Apicultural Programs (National)

Agriculture depends on healthy honey bees, maintained by beekeepers to pollinate numerous crops. The UT Extension apiculture expert conducted 121 workshops in bee health in 2016; two were national workshops and eight were regional workshops. UT is one of 17 institutions collaborating to reverse managed bee decline. As lead institution, the University of Tennessee formed, certified, and maintained the eXtension Bee Health Community of Practice with Extension professionals representing more than 37 states and 5,943 subscribers. In 2016, Bee Health had more than 1.3 million video views. We estimate Tennessee beekeeping research and extension programs have aided beekeepers to reduce their losses of colonies to parasitic mites and other causes by 15%. The value of each lost colony is approximately \$700.00 for bees, hive parts, medications and honey production. We estimate that beekeepers following recommendations have saved 11,500 colonies of bees valued in excess of \$8 million annually.

Quality Milk Initiative (Regional)

The Southeast Quality Milk Initiative (SQMI), a USDA-funded, multi-state effort focused on improving milk quality continued to have direct impacts on farm. In 2016, the direct engagement of the SQMI team helped one dairy producer identify poorly functioning milking equipment, which lead to a direct improvement in milk quality and overall productivity of his farm. Lowering somatic cell count on-farm was estimated to increase milk production by 6 to 29% depending on the severity of the inflammation.

C. Family and Consumer Sciences

eXtension Involvement (National)

Tennessee Extension personnel annually address hundreds of Frequently Asked Questions through eXtension. In 2016, highlights of Tennessee Extension's Family and Consumer Sciences eXtension involvement included the following:

- 12 Tennessee Extension personnel served on the Community of Practice for *Families, Food and Fitness*.
- 11 Tennessee Extension personnel served on the *Financial Security for All* Community of Practice.
- Four Tennessee Extension personnel served on the *Food Safety* Community of Practice, including the leader, a specialist in the UT Extension Department of Family and Consumer Sciences.
- Two Tennessee Extension personnel served on the on the Community of Practice for *A,B,C's of Omega 3's*.
- Five Tennessee Extension personnel were active on the *Family Caregiving* Community of Practice.

Tennessee Extension personnel shared implementation strategies, outcome measurement, and evaluation protocols with their Community of Practice colleagues.

III. Integrated Research and Extension Summary

In cases where UT Extension integrated programs are also multistate programs, the states have been delineated in parenthesis.

A. 4-H Positive Youth Development

4-H Common Measures Advisory Team (National)

One Tennessee Extension evaluation specialist served as one of six national advisors in the National 4-H Common Measures Revision Task Force that worked to propose improvements to 4-H program evaluation. *4-H Common Measures* is an online software that features a common set of evaluation tools used by the Cooperative Extension System to assess positive youth development outcomes. In 2016, work continued to create evaluation instruments that would be user-friendly and at an appropriate reading level for the diverse audiences served nationally by 4-H programs.

B. Agriculture and Natural Resources

Crop Nutrient Stewardship

With low crop prices, increasing prices of nitrogen and phosphorus fertilizers, and the contribution of production agriculture to diminished water quality in the Mississippi River Basin, fertility practices needed to be reevaluated to benefit our producers and the environment. A multi-disciplinary, integrated research and Extension program was established to develop and disseminate information pertaining to crop fertility practices and associated economic and environmental impacts. UT Extension's Crop Nutrient Stewardship Workgroup's educational efforts to promote nutrient efficiency in Tennessee have resulted in the following impacts:

- More than 743,000 row crop acres in Tennessee are currently being soil sampled according to UT Soil Testing Procedures
- Over 650,000 row crop acres in Tennessee are currently being grid or zone soil sampled to determine the right fertilizer application rate on a site-specific basis.
- Tennessee row crop producers maximized profitability and reduced the risk of nutrient runoff or leaching in surface or groundwater resources by applying the right fertilizer rate at the right place on over 703,000 acres by using variable rate application technology.
- Based on current UT soil fertility research, Tennessee row crop producers reduced micronutrient costs by an average of 8% and primary nutrient costs by 35% on approximately 678,000 row crop acres using UT soil fertility recommendations.
- Over 235,000 acres of winter cover crops were planted in row crop production fields to reduce soil and nutrient losses to the environment in the period after harvest and prior to spring planting
- Approximately 80% of producers applied P and K fertilizers in the spring to reduce economic and environmental losses
- 19% of producers planting legume-based cover crops reduced nitrogen inputs by 60 to 80 pounds per acre by utilizing University of Tennessee soil fertility recommendations, thus

lowering fertilizer costs and the potential for soil degradation by acidification and nitrogen leaching or runoff into Tennessee's ground and surface water resources.

- Approximately 49% of row crop producers reduced the potential of nitrogen runoff or leaching by utilizing enhanced efficiency fertilizer products for nitrogen management. Based on three years and two locations of Tennessee research into the efficacy of nitrogen enhancement products purported to reduce volatilization loss of non-incorporated urea, producers now have local facts to guide them in their selection and purchase of such products.
- The 2016 303(d) list of impaired streams published by the Tennessee Department of Environment and Conservation lists streams in which water quality has measurably improved. Current de-listings with impairment previously attributed to an agricultural cause, totaling 419 streambank miles, are the result of nutrient, sediment, and bacterial load reductions from livestock and row crop farms due to cover crop placement, streambank stabilization and buffers, better pasture management, and streamside livestock exclusion.
- Over 1,200 producers applied animal manure or poultry litter to their row crop or pasture fields.
- Tennessee has 313 Tennessee farms that have active CAFO permits; 77 of those permits were issued in 2016. These producers have planned agronomic manure applications based on UT Extension crop nutrient recommendations, utilize soil tests and yearly manure analyses, and ensure that production area discharges are prevented.
- 32,568 producers, crop consultants, and other professionals attending field days, workshops, one-on-one visits and producer meetings increased their knowledge of nutrient management and skills of best management practices that promote sustainable fertilizer management.

Organic and Sustainable Crop Production Program

Organic and Sustainable Crop Production Program is an integrated research and Extension initiative composed of UT faculty from six departments and centers. The group manages a 90-acre farm dedicated to organic production, research, and education in conservation tillage techniques, variety trials, organic pest management, reducing soil-borne pathogens and managing weeds, and assessment and encouragement of native bees. In 2016, Extension and research faculty continued their work with the Tennessee Organic Production Network, a group representing growers, producer organizations, industry, government officials and agencies to encourage organic crop research and Extension programs.

Tennessee Wine Industry Analysis

The Tennessee wine and grape industry has the potential for enhancing farm incomes. However, information is lacking regarding the prospects for growth in the state. UT agricultural economists conducted an integrated research and Extension program to determine the prospects for Tennessee wine and grape industry growth. The results were published as a UT Extension bulletin that included grape production and winery budgets, demand analysis of Tennessee residents, and an industry overview. UT's work indicated that the industry has a bright future. As a result of our work, knowledge regarding the Tennessee industry has been enhanced. The UT study was used to support successful applications for three out of the four value-added producer grants awarded by the USDA in the state of Tennessee in 2016 for total funding of just under \$310,000.

Household and Structural Integrated Pest Management Program (National)

The University of Tennessee Extension's Urban Integrated Pest Management program has developed successful management strategies for pests found in and around structures. This success has brought our program national recognition. Bed bugs are now considered the most difficult pest to manage inside United States homes. In 2016, nine bed bug presentations were given to more than 365 housing managers, residents, public health professionals, entomologists, graduate students, and pest management professionals to share our research results, to help assuage concerns about bed bugs, and to inform them of their pest management role. Research on bed bug monitoring device type and number has been conducted in low-income, multi-family housing and an IPM program implemented. Cooperators from three other universities (Rutgers, Virginia Tech and Cornell) joined with UT research and Extension experts to conduct a bed bug meeting for 116 housing managers and service providers organized by UT and held in Knoxville, Tennessee. Evaluation results indicate that 98% of participants are now using recommended protocols to protect themselves from bed bugs when visiting clients and 68% plan to use bed bug monitors because of the Extension program.

The Role of Food Hubs in East Tennessee Local Food Marketing

The rapidly growing Knoxville/East Tennessee region does not have an entity managing the aggregation, distribution, and marketing of locally produced foods for small and mid-sized producers. UT collaborated with the Knoxville-Knox County Metropolitan Planning Commission to study the feasibility of a food hub for the Knoxville region. Our integrated research and Extension project evaluated the needs for a food hub to support demand (i.e., consumers) and supply (i.e., producers) of local foods as well as the services it should provide to increase the success of the region's local food system. Results from the food hub feasibility study helped policymakers decide not to invest in a full-service food hub. This decision allowed them to re-allocate resources from private and public sources of at least \$200,000 to initiatives and projects with greater potential to promote the development and sustainability of the region's local food systems. The results were also valuable to the Knox County Food Policy Council which is evaluating a local food coordinator position to potentially coordinate current demand and supply of locally grown foods in this region.

Equine Industry (Regional)

The equine industry has an impressive economic and agricultural impact to Tennessee. The equine industry makes a significant contribution to the state's economy annually and is home to over 112,000 horses, ponies, mules, donkeys and burros. In 2016, we continued our integrated, multi-disciplinary research and Extension program to develop and disseminate information regarding equine management, nutrition, economics, environmental impact and health. Research and program accomplishments are shared with Southern Region state horse specialists and researchers. Tennessee horse owners depend on UT Extension's research-based programs for horse health and nutrition. In 2016, UT Extension taught rotational grazing to increase forage production, vaccinations, dental care, and correct deworming practices. These practices helped 205 horse owners, owning more than 1,000 horses, to save a combined \$1.3 million.

Adopting Precision Agricultural Technologies

Due the rising cost of fertilizers, chemicals, seed, fuel and labor, Tennessee producers are adopting precision agriculture technologies to increase production, reduce input costs, and manage farmland more efficiently. UT Extension's integrated, multi-disciplinary research and Extension program developed and disseminated information about precision agriculture management strategies that are profitable and practical for Tennessee producers. Our work to promote the adoption of precision agriculture technologies resulted in the following impacts in 2016:

- Tennessee row crop producers lowered chemical costs and potential losses to the environment by an average of 7% by reducing off-target application errors on over 760,000 acres with the adoption of automatic section control technology on their sprayers. Based on UT crop budgets, producers adopting sprayer ASC have reduced their chemical costs by an average of \$7 per acre.
- Tennessee row crop producers maximized profitability and reduced the risk of nutrient runoff or leaching in surface or groundwater resources by applying the right fertilizer rate at the right place on approximately 703,000 acres by using variable rate application technology.

Agronomic Variety Testing Program (Kentucky)

Agronomic crop producers in Tennessee and Kentucky need unbiased variety performance data on which to base their purchasing decisions. Replicated variety tests were conducted on corn, soybeans, wheat, and some specialty crops at seven of UT's Research and Education Centers. County Standardized Variety Trials were conducted on corn, soybeans, and wheat in large strip-trials on producer's farms in 28 Tennessee counties and five Kentucky counties. Data from all of these crop trials were compiled and published together on the variety trial website and printed copies were distributed to farmers, seed industry representatives, consultants and other interested clientele. Based on surveys conducted by extension agents with grain producers in northwest Tennessee, over 90% of the producers reported that they base their variety buying decisions on data provided in UT variety test publications. In 2016, the increased income per year to grain producers was over \$100 million.

Native Grasslands Management (National)

Native grasslands were once abundant in the region and today can play a vital role in agricultural systems (forages, biofuels production) and conservation of imperiled ecosystems in Tennessee and across the eastern United States. An integrated, multi-disciplinary research and extension program has been established to develop and disseminate information about native grassland management strategies that are profitable and practical for Tennessee producers. During 2016, 10 field days were conducted and active demonstration projects were maintained on seven Research and Education Centers in Tennessee, one site in Georgia, and two sites in Alabama. UT continued its work with the National Bobwhite Conservation Initiative, a group representing experts and stakeholders from 25 states.

C. Family and Consumer Sciences

Community, Local, and Regional Food Systems (Southern Region)

In 2016, Local Foods of the South, a new Southern Extension and Research Activity (SERA-47) was organized by Extension and Experiment Station Deans in the Southern Region. This is a multi-state, integrated effort to strengthen the region's local food systems through research and Extension. UT Extension has three faculty members serving on SERA-47 workgroups. In 2016, the initiative made progress on measuring the impact of local food systems and creating an asset inventory to improve local food systems programs.

UT Obesity Research Center

In 2016, seventeen UT Extension specialists from Family and Consumer Sciences, Animal Science, Plant Sciences, and Food Science and Technology continued their service on the UT Obesity Research Center, a multi-disciplinary team formed to study and take action in obesity prevention and treatment. This effort is collaboratively funded by the UT Office of Research, UT Extension, Tennessee Agricultural Experiment Station and the College of Education, Health and Human Sciences. Integrated programs continue to explore such issues as access to affordable food and increasing physical activity.

Tennessee Shapes Up

UT Extension Family and Consumer Sciences faculty implemented an integrated research and Extension program called *Tennessee Shapes Up* in an effort to reverse the obesity trend in Tennessee. Impact data was collected using a behavior checklist survey from 42 counties. A select number of participants were surveyed to determine program impact. The behaviors measured are the healthy lifestyle practices essential in achieving and maintaining healthy weight and preventing chronic disease. Various program evaluations reached 3830 participants and demonstrated these results:

- 76% reported eating more grains.
- 75% reported decreased consumption of high-sugar foods.
- 75% reported engaging in physical activity for 30 minutes or more on 5 or more days per week.
- 72% reported improvements in blood pressure.
- 54% reported improvements in blood sugar.
- 84% reported using labels to make healthier choices.
- 48% reported losing weight. A total of 5,889 pounds were lost with average weight loss per participant of 5.3 pounds.

IV. Summary of Multistate and Integrated Expenditures with Smith-Lever Funds

U.S. Department of Agriculture
 Cooperative State Research, Education, and Extension Service
 Supplement to the Annual Report of Accomplishments and Results
 Actual Expenditures of Federal Funding for Multistate Extension and Integrated Activities

Fiscal Year: 2016

Select One: Interim Final
 Institution: University of Tennessee Extension
 State: Tennessee

	Integrated Activities (Hatch)	Multistate Extension Activities (Smith- Lever)	Integrated Activities (Smith- Lever)
<i>Established Target %</i>		7.4%	9.4%
<i>This FY Allocation (from 1088)</i>		\$8,959,920	\$8,959,920
<i>This FY Target Amount</i>		\$663,034	\$842,232
Title of Planned Program Activity			
A. 4-H Positive Youth Development		\$180,466	\$1,959,598
B. Agriculture and Natural Resources		\$992,560	\$3,306,823
C. Family and Consumer Sciences		\$116,014	\$857,324
Total		\$1,289,040	\$6,123,745
Carryover		-0-	-0-

Certification: I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays represented here accurately reflect allowable expenditures of Federal funds only in satisfying AREERA requirements.

April 1, 2017

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V. Contact Information

Inquiries regarding this report should be directed to:

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