

THE UNIVERSITY OF TENNESSEE EXTENSION



MULTISTATE AND INTEGRATED SUMMARY
FY 2017

AREERA SECTIONS 105 and 204

SMITH-LEVER FUNDS

Submitted to:

United States Department of Agriculture

National Institute of Food and Agriculture

April 1, 2018

TABLE OF CONTENTS

I. Introduction.....	3
II. Multistate Extension Summary.....	4
<i>A. 4-H Positive Youth Development.....</i>	<i>4</i>
<i>B. Agriculture and Natural Resources.....</i>	<i>5</i>
<i>C. Family and Consumer Sciences</i>	<i>6</i>
III. Integrated Research and Extension Summary.....	7
<i>A. 4-H Positive Youth Development.....</i>	<i>7</i>
<i>B. Agriculture and Natural Resources.....</i>	<i>7</i>
<i>C. Family and Consumer Sciences</i>	<i>11</i>
IV. Summary of Multistate and Integrated Expenditures with Smith-Lever Funds	13
V. Contact Information.....	14

I. Introduction

In FY 2017, 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 2017 program year, 15,523 youth in 18 counties completed the curriculum.

National 4-H Congress (National)

Tennessee Extension 4-H specialists worked cooperatively with Extension personnel from across the nation to implement the 2017 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 2017 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 the 13th annual 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 from across the region gained practical knowledge in implementing service-learning programs and supporting project groups in their communities.

B. Agriculture and Natural Resources

Tennessee AgrAbility Project (National)

Significant numbers of farmers, farm workers and their family members have disabilities that interfere with their ability to perform daily tasks and earn a living. Although many agencies and organizations provide information and assistance to disabled individuals and their families, these services may not be readily available in rural areas. The Tennessee AgrAbility Project (TAP) is the collaboration of the Cooperative Extension Services of Tennessee's two land-grant institutions, non-profit disability services organizations, government agencies and volunteers to increase disability awareness among the population, educate those with disabilities of the available services and resources, assist individuals and families in planning interventions, and assist them in securing the needed assistive technologies. Our program has reached 236 farmers and their families regarding on-farm assessments, individuals' accessibility needs, and plans for increased independence and productivity (2013-2017). In 2017, the Tennessee AgrAbility Project professionals partnered with the College of Nursing, University of Kentucky to host the "Older Farmer Farm Safety and Health" dinner theatres in three counties. Realistic farm stories encourage discussions on farm safety and how aging affects health and safety. Tennessee's AgrAbility Project also hosted the 2017 AgrAbility National Training Workshop in Knoxville for 239 attendees from 34 states and Canada. Participants gained new knowledge of education, assistance, technology, and marketing.

Nursery, Greenhouse and Landscaping Tour (Georgia, South Carolina)

UT Extension conducted a Nursery, Greenhouse and Landscaping Tour for 39 nursery growers, landscapers, and Extension agents from 18 counties. The tour was a three-day event, and featured innovative nurseries in Georgia and South Carolina. Participants from all three states benefited from the shared knowledge and experience of nursery growers, landscapers, and Extension agents. In fact, 100% of participants increased their knowledge of improved marketing practices, new and innovative plant materials, and new production technologies.

Apicultural Programs (National)

Agriculture depends on healthy honey bees, maintained by beekeepers to pollinate numerous crops. 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 2017, 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 \$850 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 \$9.7 million annually.

Educating Growers of Commercial Hydrangeas (North Carolina, Virginia)

Hydrangeas generate the second highest revenue of all deciduous flowering shrubs in the nation - over \$91 million annually. To help commercial growers in the Southeast U.S. produce this crop more efficiently and profitably, a multi-state collaboration was formed between the Tennessee, Virginia and North Carolina Cooperative Extension Services. Growers heard from national

experts, participated in hands-on demonstrations, observed hydrangea crops grown under different production treatments, such as lime and fertilizer rates and pruning techniques, as well as signs and symptoms of plant diseases. Growers reported they learned how to manage substrate inventory and how substrate physical characteristics change over a production cycle; monitor nutrients; alter flower color; recognize nutrient deficiencies; control growth with plant growth regulators; and schedule irrigation using both low and high technology solutions. Following the workshop growers estimated saving \$636,954 (\$6,009 average savings per person multiplied by 106 participants) from information gained and anticipated practice changes.

Industrial Hemp (Kentucky, North Carolina)

Section 7606 of the 2014 United States Farm Bill authorizes industrial hemp research that meets stated criteria. Passage of this bill was followed by Tennessee enacting Public Chapter 916, which permits the cultivation of industrial hemp in Tennessee according to the language of the United States Farm Bill and oversight of the Tennessee Department of Agriculture. UT Extension collaborated with Kentucky and North Carolina Extension professionals to develop, find, and share information to meet the needs of clientele interested in industrial hemp production. Our programming resulted in 79 industrial hemp licensees, of which 54 produced industrial hemp. Also, 130 industrial hemp acres were planted in 38 Tennessee counties across 75 fields. Our work also secured 38 licensed hemp processors.

C. Family and Consumer Sciences

eXtension Involvement (National)

Tennessee Extension personnel annually address hundreds of Frequently Asked Questions through eXtension. In 2017, 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 Science: Building a 4-H Career Pathway (National)

Two Tennessee Extension evaluation specialists continued a three-year integrated research and Extension program to evaluate the effectiveness of 4-H Science programs in 13 states. This work is also building a 4-H career pathway to demonstrate how to effectively help youth explore, learn, practice, and experience career opportunities. This program has reached more than 50,000 youth with research-based education in science and science careers. The research component has focused on how 4-H programs can effectively develop college and career readiness and science literacy skills. The formative evaluation results have been shared with local 4-H professionals across the 13 participating states to improve program outcomes. This research has underscored the importance of programs where youth draw connections to real-world concepts and situations and discuss STEM careers and their educational pathways.

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 need to be reevaluated to better benefit our producers and the environment. Increasing the use of sustainable resource management practices will enable the world to meet present needs while continuously improving future generation's ability to meet their own needs. This can be done not only by lessening our environmental impacts, improving human health, and improving the economic and social well-being of Tennessee's communities, but also by increasing productivity to meet current as well as future food, fuel, and fiber demands. An integrated, multi-disciplinary research, education, and outreach program has been established to develop and disseminate information pertaining to crop fertility practices and associated economic and environmental impacts. We promoted the adoption of profitable and environmentally-conscious resource management practices through presentations at field days, county, and/or on-farm demonstrations, newly-developed publications and/or mass media articles, and on-site visits. Our Crop Nutrient Stewardship educational efforts in 2017 resulted in the following impacts:

- 1565 producers assessed nutrient needs by conducting soil sampling on approximately 715,000 acres, potentially reducing fertilizer costs by \$15.70/ac and 6500 tons of excess phosphorus pentoxide from potentially moving offsite and causing environmental degradation.
- 969 producers utilized UT fertility recommendations on approximately 150,000 acres, resulting in a potential reduction in phosphorus pentoxide fertilizer costs of \$15.40/ac as well as almost 12,000 tons of phosphorus pentoxide that could move offsite and have negative environmental consequences.

Sustainable Agriculture Research and Education (Regional)

In 2017, Tennessee Extension professionals hosted the Southern Sustainable Agriculture Research and Education (SARE) Administrative Council and State Coordinators Training. This event was attended by SARE representatives from 12 Southern states and Puerto Rico, and it included tours of two local farms who were both recipients of SARE grants. Participants learned about goat production practices and ways to improve the work of Southern SARE.

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 2017, UT Extension and Research faculty started the on-farm portion of a USDA-funded effort on organic forages for grazing. Producers gained knowledge of mastitis, nutrition, and housing from their involvement in our integrated research and Extension dairy programs.

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 2017, 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 USDA Slaughter Facilities Feasibility Impact (Kentucky)

Tennessee is home to a small number of USDA inspected slaughter facilities. Beef cattle are Tennessee's top agricultural commodity; however, as predominantly a cow-calf state, most cattle are finished elsewhere. A recent survey indicated that many producers are interested in finishing, harvesting, processing, and direct marketing. We completed a Slaughterhouse Feasibility Study to stimulate interest in opening slaughterhouse facilities, by providing an economic approach, to combat the overwhelming need for processing centers in Tennessee. As part of this study, a team of interested producers, county officials, and UT Extension professionals toured a Kentucky processing facility. An analysis crafted for Van Buren County, Tennessee included results from a survey of Tennessee cattlemen as well as a discussion of issues that a new slaughter facility will likely encounter. Our analysis demonstrated a high level of probable interest. Based on other studies, our estimate is that a minimum of 25-32 head of cattle per week (1,250 – 1,600 per year for a 50 week year) is required for a plant to be viable (or equivalent values for other species assuming a multispecies cattle, hog, sheep, or goat slaughter facility). A pivotal determinant for success is the stability of the cattle supply.

Evaluating Novel Wood Preservatives

New, non-biocidal treatments to protect wood in service are attractive to many consumers who seek more environment-friendly product options. However, ensuring that these products will be effective is important to avoid unexpected failures such as those used in rebuilding efforts in New Orleans after Hurricane Katrina. UT Extension has tested a new wood preservative system that was anticipated to provide heavy-duty (i.e. "ground contact") protection. The testing – which

included a novel component to account for the special properties of the treatment being studied – indicated that the preservative system would provide protection only for above-ground, protected applications. The preservative manufacturer has redirected development efforts to applications suitable for their system. In reference to the New Orleans example, this may have avoided a potential \$500,000 liability.

Tennessee Field Crops Plant Pathology

Plant pathogens have the potential of being the most limiting factor in agriculture. To manage plant pathogens an array of tools are used including cultural practices, varietal resistance, and application of fungicides. Disease management education, demonstration and applied research programs are critical to provide information to agricultural clientele to not only reduce losses from disease, but also to maintain the multiple tools for disease management. Our work in this integrated research and Extension program included 12 county production meetings, seven field days, and three grain conferences where Extension professionals taught disease management to row crop producers. Savings to row crops producers in Tennessee via reduced fungicide costs and yield loss in field crops due to their increased understand of disease management strategies are conservatively estimated at greater than \$7 million in 2017.

Household and Structural Integrated Pest Management Program

The University of Tennessee Extension's Urban Integrated Pest Management program has developed successful management strategies for pests found in and around structures. Bed bugs are now considered the most difficult pest to manage inside United States homes. In 2017, 25 bed bug presentations were given to more than 1,782 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. We conducted the Tennessee Bud Bug Management in Multi-Family Housing Meeting for housing managers, pest management professionals and service providers. Research on building-wide bed bug inspections was conducted in low-income high rises for the elderly and disabled in east Tennessee. Also in 2017, eight building-wide bed bug inspections of high rises for the elderly and disabled revealed that housing managers were unaware of 50 to 100% of the infested units. This integrated research and Extension program continues to help locate bed bug infestations early before they spread.

Quality Deer Management (National)

Landowners who manage their property in the eastern US are interested in white-tailed deer more than all other wildlife species combined. They want information on how to manage their land for deer and how to manage the deer herds that occur on their property. UT Extension provided 27 seminars on quality deer management to 1,251 people in five states in 2017. Management practices on a minimum of 429,000 acres across 37 states and 5 Canadian provinces were impacted by this program.

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 2017, 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. In 2017, our evaluation showed that our integrated research and Extension programming saved Tennessee equine owners \$518,000 through these program results:

- 76 equine owners now feed 185 equids according to recommended nutritional requirements and management practices, such as adjusting rations based on body condition score and using forage testing to make feeding adjustments, saving \$54,000 annually.
- 69 equine owners now follow recommended health practices (including deworming, vaccination, hoof, and dental preventative care) on 202 equids, saving \$464,000 annually.

Tennessee Variety Test Program for Corn Grain, Silage, and Soybeans

Tennessee producers need information concerning corn and soybean variety test performance specific to their region so that they can select varieties that will optimize the profitability of their production systems. The variety test program provides important information on which varieties perform best in Tennessee. Replicated variety tests were conducted on corn grain (86 hybrids; 16 brands), corn silage (11 hybrids, 5 brands), and soybeans (195 varieties; 23 brands) at seven of UT's Research & Education Centers located in the different physiographic regions of Tennessee in 2017. Results from these crop trials were compiled, along with results from the County Standard Tests (CST) and soybean disease variety trials, and published in three peer-reviewed Extension publications. These were distributed electronically as both pdf and mobile-friendly, searchable tables on search.utcrops.com as well as through hard copies to farmers, Extension agents, seed industry representatives, consultants and other interested clientele. In 2017, the variety test program provided an estimated \$83.38 million in additional revenue to Tennessee producers. These numbers were calculated assuming 88% of producers use the variety test results to select top performing varieties, as indicated by a survey conducted in 2017, yield advantage for top performing varieties compared with average test yields of +11.4 bu/a for corn and +3.9 bu/a for soybeans when averaged over the past three years, and USDA reported Tennessee acreage and commodity prices in 2017. The variety test program has a significant economic impact to Tennessee producers and continues to be a program that is highly valued by producers.

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 2017, eight 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.

Improving Cotton and Soybeans in Drought Conditions (National)

In West Tennessee, approximately 95% soybean and 92% of cotton production are dryland. Producers have few options to mitigate drought stress on dryland acres; most must cope with drought stress by either adopting cultural practices which increase water use efficiency or by selecting drought tolerant cultivars. In 2017, UT Extension began studying drought tolerant screening strategies for soybean and cotton lines that would be profitable and practical for Tennessee farmers. For the very first time, using a drought simulation site, Tennessee soybean lines were planted in two locations (Jackson and Milan) under three irrigation regimes and cotton cultivars in one location three irrigation regimes. Field days and other programs were used to promote the adoption of high water saving lines on dryland acres in Tennessee. In addition, Extension professionals from 12 states learned about the high water saving potential lines for dryland environments.

C. Family and Consumer Sciences

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

In 2017, 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 2017, 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 2017, 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.

Diet-Related Chronic Disease Prevention and Management in Tennessee

Diets in the United States typically fall short of recommendations, resulting in an increased prevalence of preventable, diet-related chronic diseases such as diabetes, obesity, and heart disease. Among states, Tennessee has the 6th highest rate of adult obesity and the highest rate of overweight and obesity among youth 10-17 years of age. Diabetes prevalence among Tennessee adults (11.4%) is higher than the national average (8.7%). Adopting a healthy eating pattern that is rich in nutrient dense foods, such as fruits, vegetables, and whole grains and that minimizes intake of sodium, added sugars, and unhealthy fats, is a key lifestyle behavior for preventing and managing diet-related chronic diseases. In 2017, UT Extension Family and Consumer Sciences continued to offer nutrition education interventions and programming to Tennessee youth, adults,

and families. These nutrition education interventions and programs, equipped Tennessee consumers with knowledge and skills to choose and prepare healthy foods. Our program evaluation showed these impacts:

- 925 of 1,881 participants surveyed lost weight, reporting a total of 6,212 pounds lost.
- 1,854 of 3,543 participants surveyed now select foods and beverages that promote a healthy weight.
- 594 of 723 participants surveyed cook at home more often.
- 882 of 1,113 participants surveyed use healthy food preparation techniques.
- 6,139 of 10,289 participants surveyed now eat more vegetables.
- 609 of 813 participants surveyed prepare a greater variety of vegetables.
- 7,293 of 11,015 participants surveyed now eat more fruit.
- 5,237 of 9,002 participants surveyed now eat more whole grains.
- 2,520 of 5,235 participants surveyed drink fewer sugar-sweetened beverages.
- 931 of 1,454 participants surveyed eat fewer high-sugar foods.
- 484 of 622 participants surveyed prepare foods without adding salt.
- 395 of 556 participants surveyed prepare foods with monounsaturated and polyunsaturated oils.

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: 2017

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>		\$8,952,851	\$8,952,851
<i>This FY Target Amount</i>		\$662,510	\$841,568
Title of Planned Program Activity			
A. 4-H Positive Youth Development		\$200,187	\$1,848,374
B. Agriculture and Natural Resources		\$894,956	\$4,158,842
C. Family and Consumer Sciences		\$82,430	\$594,120
Total		<u>\$1,177,573</u>	<u>\$6,601,336</u>
Carryover		<u>-0-</u>	<u>-0-</u>

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, 2018

 Robert Burns, Dean, UT Extension

V. Contact Information

Inquiries regarding this report should be directed to:

Dr. Robert Burns, Dean and Professor

The University of Tennessee Extension

2621 Morgan Circle

121 Morgan Hall

Knoxville, TN 37996-4530

phone: 865-974-7114

facsimile: 865-974-1068

email: rburns@utk.edu