What is SARE?
Since 1988, the Sustainable Agriculture Research & Education (SARE) program has been the go-to USDA grants and outreach program for farmers, ranchers, researchers and educators who want to develop innovations that improve farm profitability, protect water and land, and revitalize communities. To date, SARE has awarded over $310 million to more than 7,431 initiatives.

SARE is grassroots with far-reaching impact
Four regional councils of expert practitioners set priorities and make grants in every state and island protectorate.

SARE communicates results
SARE shares project results by requiring grantees to conduct outreach and grower engagement; and by maintaining an online library of practical publications, granteeproduced information products and other educational materials.

SARE in Tennessee
southern.sare.org/sare-in-your-state/tennessee

$2,508,372 in total funding
60 grant projects
(since 1988)
For a complete list of grant projects state by state, go to www.sare.org/state-summaries

Project Highlight: Cover Crops Help Manage Appletree Borer

The flatheaded appletree borer (FAB) is a significant economic pest in orchards, nurseries and urban landscapes, and in Tennessee’s production nurseries, red maples are one of the most problematic trees for FAB attacks. Determined to find a solution to this problem, Tennessee State University researcher Karla Addesso and her project team used a SARE grant to evaluate the efficacy of applying a winter cover crop to field-grown nursery red maple trees to act as a barrier to FAB oviposition, an aid to preventing leaching of imidacloprid (a commonly used insecticide) from the root zone of the trees, and as a natural weed suppression technique.

After trying a few mixes, the team determined that a ryegrass/crimson clover mix was extremely effective at camouflaging the tree trunks from the pest, making it less likely to lay eggs. The cover crops reduced pest attacks by 95 percent. In addition to acting as a barrier, the cover crop mix also reduced the temperatures of the tree trunks, making the trees a less preferable egg-laying site.

Based on their highly promising results, the team proposes a systems approach to in-field nursery tree production by incorporating a winter cover crop combined with optimized pesticide use to simultaneously maximize FAB control and plant growth while minimizing crop damage, weed competition and insecticide runoff.

For more information on this project, see sare.org/projects, and search for project number OS14-084.
### SARE Grants in Tennessee

**Total awards:** 60 grants
- 23 Farmer/Rancher
- 14 Graduate Student
- 5 On Farm Research/Partnership
- 6 Professional Development Program
- 12 Research and Education

**Total funding:** $2,508,372

<table>
<thead>
<tr>
<th>Program</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer/Rancher</td>
<td>$229,826</td>
</tr>
<tr>
<td>Graduate Student</td>
<td>$151,561</td>
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<tr>
<td>On Farm Research/Partnership</td>
<td>$74,772</td>
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<tr>
<td>Professional Development Program</td>
<td>$429,818</td>
</tr>
<tr>
<td>Research and Education</td>
<td>$1,622,395</td>
</tr>
</tbody>
</table>

Find a complete list of projects on page 3.

### SARE's Impact

- 53 percent of producers report using a new production technique after reading a SARE publication.
- 79 percent of producers said they improved soil quality through their SARE project.
- 64 percent of producers said their SARE project helped them achieve higher sales.

Learn about local impacts at: southern.sare.org/sare-in-your-state/tennessee

### Contact Your SARE State Coordinator

SARE sustainable ag coordinators run state-level educational programs for Extension and other ag professionals, and many help grant applicants and recipients with planning and outreach. Visit southern.sare.org/state-pages/tennessee to learn more.

- **Roy Bullock**
  - Tennessee State University
  - (615) 963-5449
  - fbullock@tnstate.edu

- **Rob Holland**
  - University of Tennessee
  - (931) 486-2777
  - rwholland@utk.edu

For detailed information on SARE projects, go to www.SARE.org

SARE is funded by the USDA’s National Institute of Food and Agriculture (NIFA).

This report includes summaries of competitive grant programs only. Some competitive grant programs that are no longer offered may be included or excluded from the totals in this report depending on the grant program and SARE region.
Tennessee has been awarded $2,634,570 grants to support 66 projects, including but not limited to, 11 research and/or education projects, 6 professional development projects and 23 producer-led projects. Tennessee has also received additional SARE support through multi-state projects.

**RESEARCH AND EDUCATION GRANTS**

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| LS20-335  | Cover Crops and Cropping System Sustainability in a Changing Global Climate  | $299,995     | Dr.Samuel Haruna  
Middle Tennessee State University  
Dr.Song Cui  
Middle Tennessee State University  
Dr.Audrey Gamble  
Auburn University  
Dr.Seockmo Ku  
Middle Tennessee State University  
Dr.Chaney Mosley  
Middle Tennessee State University  
Dr.Edwin Ritchey  
University of Kentucky |
| LS18-287  | Cover Crops in Woody Ornamental Production: Impact on Plant Growth, Arthropod Pests, Soil-Borne Pathogens and Weeds | $284,869     | Dr.Karla Addesso  
Tennessee State University |
| LS13-254  | Improving Fitness in Meat Goat Herds through Better Genetic Management         | $230,000     | Dr.Richard Browning, Jr.  
Tennessee State University |
| LS12-253  | Breeding Organic Corn varieties to resist GMO contamination                    | $48,183      | Dr.Dennis West  
University of Tennessee |
| LS05-172  | Forage systems for the sustainable production of uniform goat carcasses        | $200,000     | Richard Joost  
University of Tennessee at Martin |
| LS03-147  | Bioactive Natural Products: A feasible method of organic disease management in float bed production systems | $19,883      | Kimberly Gwinn  
University of Tennessee |
| LS03-152  | Improving Organic Crop Production with Enhanced Biofumigation and Composting Systems | $273,440     | Carl Sams  
The University of Tennessee |
| LS95-068  | Using Farm Family Studies to Teach Sustainable Agriculture                    | $146,630     | Tim Cross  
University of Tennessee, Ag Economics |
| LS94-064  | Development of Sustainable Area-Wide Weed Management Practices for Improved Land Utilization (AS93-08) | $3,760       | Jerome F. Grant  
University of Tennessee, Entomology & Plant Pathology |
| LS93-052  | Utilization of Dairy Manure in Low-input, Conservation Tillage Animal Feed Production Systems | $90,635      | Michael D. Mullen  
University of Tennessee, Plant and Soil Science |
Influence of Integrated Pest Management (IPM) On Low-input Sustainable Agriculture (LISA) in the Southern Region

$25,000
Charles H. Hadden
University of Tennessee

PROFESSIONAL DEVELOPMENT PROGRAM GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| ES18-141  | Soil SMaRTS (Specific Management and Resources Training for Sustainability) for Soil Health in Tennessee | $77,413      | Dr.Jason deKoff  
Tennessee State University |
| ES14-121  | Sustainable ACEs (Agriculture,Curricula,Energy) for Tennessee                  | $77,757      | Dr.Jason deKoff  
Tennessee State University |
| ES03-069  | Training Educators to Protect Honey Bee Pollinators with Sustainable Pest Management | $126,648     | Dr. John Skinner  
Univ. Tennessee |
| ES02-061  | A Statewide Journey of Sustainable Success: Hands-On Training                 | $48,000      | Rob Holland  
Center for Profitable Agriculture |
| ES97-029  | Implementing Tennessee’s Strategic Plan for Sustainable Agriculture: Utilizing On-Farm Case Studies for Teaching Advanced Management and Marketing to Extension Staff | $10,000      | Dr. Clark Garland  
University of Tennessee |
| LST94-004 | Sustainable Dairy Systems Manual and Training                                 | $90,000      | Dr. Clark Garland  
University of Tennessee |

FARMER/RANCHER GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS19-315</td>
<td>A Study of the Effects of Black Woven Polypropylene on Soil Biota</td>
<td>$9,670</td>
<td>Tera Kurtz</td>
</tr>
</tbody>
</table>
| FS18-310  | Increasing Farm Fertility and Profits with Mushroom Mulches                   | $9,774       | David Wells, III  
Henosis                                    |
| FS17-294  | Adaptive Winter Squash                                                        | $1,822       | Megan Allen  
Care of the Earth Community Farm          |
| FS17-295  | Incorporating Conservation Solutions into Alternative Crop Transplant Systems | $9,999       | Sarah Bellos  
Farmer                                    |
| FS17-297  | Bacillus thuringiensis var. Israelensis as a Larvacidal on a Rotational Grazing System for Ruminants to Combat Haemonchus contortus | $10,000      | Jo Ann Harris  
Farmer                                    |
| FS12-263  | Selective breeding of honey bees for multiple traits with a priority on nosema disease resistance | $10,000      | Michael Wilson  
Rosecomb Apiaries                          |
| FS10-241  | Sustainable Cultivation of Plant-derived Indigo for Diversification and On-farm Value-added Dye Pigment Production | $9,871       | Sarah Bellos  
Farmer                                    |
| FS07-214  | Sustainable Low-Cost Heating for Season Extension Structures                   | $14,928      | Steve Hodges  
Clinch Appalachian Farm Enterprises         |
<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
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<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS07-221</td>
<td>Natural Comb Management of Honey Bees for Varroa Control</td>
<td>$15,000</td>
<td>Michael Wilson</td>
</tr>
<tr>
<td>FS06-203</td>
<td>A Demand-Driven Approach to Specialty Crop Market Development</td>
<td>$12,324</td>
<td>Dianne Levy</td>
</tr>
<tr>
<td>FS06-200</td>
<td>Establishing Natural Controls of Competitive Fungi in the Production of Shiitake Mushrooms</td>
<td>$8,832</td>
<td>James Day</td>
</tr>
<tr>
<td>FS05-188</td>
<td>Aquiculturally Derived Products as Fertilizers for High-value Organic Crop Production</td>
<td>$9,953</td>
<td>Marc Cardosa</td>
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<tr>
<td>FS05-189</td>
<td>Salsa Pepper Project</td>
<td>$9,660</td>
<td>Sara Gardner</td>
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<tr>
<td>FS04-181</td>
<td>Selection of Hygienic Honey Bee Queens Resistant to Tracheal Mites</td>
<td>$9,987</td>
<td>Edwin Holcombe</td>
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<tr>
<td>FS99-087</td>
<td>The Effect of Municipal Compost on Christmas Trees</td>
<td>$6,985</td>
<td>Curtis Buchanan</td>
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<tr>
<td>FS99-103</td>
<td>Evaluating the Cost of Production of Row Crops Using Precision Farming Technologies</td>
<td>$7,816</td>
<td>J. Tucker</td>
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<tr>
<td>FS96-045</td>
<td>Grazing Alternatives to Tall Fescue for Stocker Cattle</td>
<td>$9,982</td>
<td>Chris Pitt</td>
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<tr>
<td>FS96-042</td>
<td>Low Input Sustainable Agriculture Short Course</td>
<td>$9,650</td>
<td>Alexander McGregor</td>
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<tr>
<td>FS96-043</td>
<td>Sustainable Cultivation of Medicinal Herbs as a Cash Crop Alternative to Tobacco</td>
<td>$5,004</td>
<td>Paul D. Miller</td>
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<tr>
<td>FS94-012</td>
<td>Swine Lagoon Management System</td>
<td>$10,000</td>
<td>Kenneth Moore</td>
</tr>
</tbody>
</table>
| GS20-228   | Sustainable Management of Phytophthora Cinnamomi and Ambrosia Beetles Under Stress Conditions | $16,335      | Dr. Fulya Baysal-Gurel
                                              |               | Tennessee State University
                                              |               | Krishna Neupane
                                              |               | Tennessee State University
| GS17-168   | Evaluating Soil Microbial Communities and Cropping Systems for Biomass Feedstock Production on Degraded Lands | $14,838      | E. Kudjo Dzantor
                                              |               | Tennessee State University
                                              |               | Ekundayo Adeleke
                                              |               | Tennessee State University

GRADUATE STUDENT GRANTS
ON FARM RESEARCH/PARTNERSHIP GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| GS17-175   | Investigating the Impact of Plant Spacing on Yields of Sweet Potato Produced in Organic Systems | $16,443      | Dilip Nandwani Tennessee State University  
Sochinwechi Nwosisi Tennessee State University |
| GS16-155   | Sustainable Management of Soil-borne Diseases in Nursery Production            | $11,000      | Dr.Fulya Baysal-Gurel Tennessee State University  
Prabha Liyanapathiramanage Tennessee State University |
| GS16-157   | Integration of Silvopasture and Nut Production in the Southeast               | $7,906       | Dr.Hill Craddock University of Tennessee at Chattanooga  
Conrad Blunck Tennessee State University |
| GS14-128   | Assessment of beneficial microorganisms: Trichoderma, Actinomycetes, and Bacillus in anaerobic soil disinfestation (ASD) | $10,993      | Dr.David Butler The University of Tennessee  
Utsala Shrestha University of Tennessee, Plant Sciences |
| GS13-124   | Examining the Influence of Farmers’ Market Managers Perceived Roles on Business Opportunities for Small- and Moderate-size Farms and Access to Healthful Foods for Low-income Households | $6,479       | Dr.Deborah Slawson East Tennessee State University  
Rachel Ward East Tennessee State University |
| GS10-095   | Efficacy of entomopathogenic fungi in an integrated pest management plan for cucumber beetles in melons and pumpkins | $8,154       | Annette Wszelaki University of Tennessee  
Mary Rogers University of Tennessee |
| GS09-086   | Testing the efficacy of three new alternative treatments for Nosema disease of honey bees in Tennessee | $9,963       | Dr.John Skinner Univ. Tennessee  
Paul Rhoades University of Tennessee |
| GS08-077   | Providing habitat for native pollinators and determination of native pollinator contribution to pollination of cucurbits and blueberries at farm sites | $10,000      | Dr.John Skinner Univ. Tennessee  
Michael Wilson Rosecomb Apiaries |
| GS04-038   | Determining Cost-Effectiveness of Best Management Practices in Sustainable Watershed Management: A Decision-Making Tool for Restoring Bullrun Creek | $9,910       | Joanne Logan University of Tennessee  
Candice Jones University of Tennessee |
| GS02-016   | Collaborative Learning among Farmers as an Approach to Alternative Agricultural Education | $9,540       | John Peters University of Tennessee  
Robin Fazio Sonrisa Farm |
| GS01-111   | Suppression of Soilborne Phytopathogenic Fungi of Tomatoes via Integrated Production Systems that Utilize Biofumigation, Composted Amendments, Solarization, and Chemical Fumigants. | $10,000      | Carl Sams The University of Tennessee  
Martin Lyons University of Tennessee |
| GS00-002   | Control of Soilborne Plant Pathogens of tomatoes with incorporation of Indian Mustard (Brassica juncea) | $10,000      | Carl Sams The University of Tennessee  
Stephanie G Harvey Georgia Southwestern State University |
| OS18-112   | Biofumigants for Sustainable Soil-borne Disease Management in Nursery Production | $15,000      | Dr.Fulya Baysal-Gurel Tennessee State University |
OS17-101 Amblyseius swirksii Athias-Henriot for Control of Arthropod Pests in Woody Ornamental Propagation $14,872 Dr. Karla Addesso Tennessee State University

OS14-084 Incorporating a Cover Crop into Field Grown Nursery Production to Manage Flatheaded Appletree Borer with the Simultaneous Benefit of Improved and Sustainable Weed Management $14,997 Dr. Karla Addesso Tennessee State University

OS11-057 Organic forage production systems for organic dairies in the Southern region $14,993 Dr. David Butler The University of Tennessee

OS02-002 Specialty Flowering Bulbs as a Sustainable Alternative Crop for Tobacco Farmers in Middle Tennessee $14,910 Steve Garton

SUSTAINABLE COMMUNITY INNOVATION GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS10-075</td>
<td>Building Sustainable Families through a Celebration of Low-Impact and Organic Community-Supported Agriculture</td>
<td>$10,000</td>
<td>Ruth Correll UT Extension, Wilson County</td>
</tr>
<tr>
<td>CS10-077</td>
<td>Live Green and Prosper Community Education and Outreach Initiative</td>
<td>$10,000</td>
<td>Erica Duarte Upper Cumberland Broadcast Council - WCTE</td>
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<tr>
<td>CS07-056</td>
<td>“Gathering” of Homestead Economic and Entrepreneurs of Food Based, Organic Foods and Other Related Businesses</td>
<td>$10,000</td>
<td>Martha Pile UT Extension of Montgomery County</td>
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<tr>
<td>CS07-056A</td>
<td>“Gathering” of Homestead Economic and Entrepreneurs of Food Based, Organic Foods and Other Related Businesses</td>
<td>$10,000</td>
<td>Martha Pile UT Extension of Montgomery County</td>
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<tr>
<td>CS06-049</td>
<td>Appalachian Sustainable Agriculture and Energy Project</td>
<td>$40,000</td>
<td>John Jackson Appalachian Native Plants Inc</td>
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<tr>
<td>CS06-048</td>
<td>Schools + Potatoes Upper E. Tennessee Development System (SPUDS)</td>
<td>$39,762</td>
<td>Steve Hodges Clinch Appalachian Farm Enterprises</td>
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<tr>
<td>CS02-004</td>
<td>Homegrown, From Our Farms to Your Table: Growing a Farmers’ Cooperative in East Tennessee</td>
<td>$6,436</td>
<td>Steve Hodges Clinch Appalachian Farm Enterprises</td>
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</tbody>
</table>

Total funding from the USDA SARE program to Tennessee $2,634,570

For further information on projects, contact Candace Pollock, Southern SARE public relations coordinator, at (770) 412-4786 or cpollock@uga.edu. Sustainable Agriculture Research and Education (SARE) is funded by USDA’s National Institute of Food and Agriculture (NIFA).