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 $332 million to more than 7,749 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: Advancing the Frontier of Sustainable Agriculture in...

Delaware

Project Highlight: Training the Trainers on Cover Crop Practices
Interest in cover crops is high due to their ability to improve soil health, reduce off-farm inputs and protect both the soil and water quality. In 2014, a national conference on soil health and cover crops co-hosted by SARE drew strong engagement from Northeastern farmers, educators and researchers. As a follow up to keep the momentum going and expand the use of cover crops in the Northeast, Extension professionals with a sustainable agriculture focus came together in 2015 to organize an in-depth train-the-trainer workshop.

The Northeast SARE Regional Cover Crops Training, hosted by Delaware State University, covered the latest research on the benefits and successful management of cover crops in grain, vegetable and animal production. The planning committee included agricultural leaders from 13 states. Ninety-four participants were organized into 11 teams that integrated farmers, USDA-NRCS representatives, Extension professionals, academics and leaders from industry and nonprofits.

From this two-year project, 12 farmers adopted new cover crop species, planted new fields in cover crops, or used new establishment and termination techniques, with more reporting their intention to do so. Additionally, 71 service providers recommended cover crop practices to other farmers. Videos from the three-day conference are posted on the SARE website.

For more information on this project, see sare.org/projects, and search for project number ENE15-141.

SARE in Delaware
northeast.sare.org/sare-in-your-state/delaware

$1,158,555 in total funding
31 grant projects
(since 1988)

For a complete list of grant projects state by state, go to www.sare.org/state-summaries
SARE Grants in Delaware

Total awards: 31 grants
6 Research and Education
2 Professional Development Program
9 Farmer/Rancher
8 Graduate Student
6 On Farm Research/Partnership

Total funding: $1,158,555
$735,817 Research and Education
$140,943 Professional Development Program
$64,573 Farmer/Rancher
$115,921 Graduate Student
$101,301 On Farm Research/Partnership

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: northeast.sare.org/sare-in-your-state/delaware

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 northeast.sare.org/state-pages/delaware to learn more.

Jason Challandes
Delaware State University
(302) 388-2241
jchallandes@desu.edu

John Clendaniel
Delaware State University
(302) 857-6425
jclendaniel@desu.edu

Dan Severson
University of Delaware
(302) 831-8860
severson@udel.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.
Delaware has been awarded $1,158,555 grants to support 30 projects, including but not limited to, 5 research and/or education projects, 2 professional development projects and 9 producer-led projects. Delaware 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>
<tbody>
<tr>
<td>LNE21-418</td>
<td>Increasing the Use of a Natural Fungus (Duddingtonia flagrans) to Control Internal Parasites in Small Ruminants</td>
<td>$199,992</td>
<td>Dr. Kwame Matthews</td>
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<td></td>
<td></td>
<td></td>
<td>Delaware State University</td>
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<tr>
<td>LNE12-314</td>
<td>Improving water and nitrogen use efficiency using soil moisture monitoring to improve irrigation management</td>
<td>$210,666</td>
<td>James Adkins</td>
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<td>University of Delaware</td>
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<tr>
<td>LNE08-269</td>
<td>Efficacy of Natural Dewormers in the Control of Gastrointestinal Nematodes of Small Ruminants</td>
<td>$166,168</td>
<td>Dr. Dahlia Jackson-O’Brien</td>
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<td>Delaware State University</td>
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<tr>
<td>LNE07-261</td>
<td>Farming for native bees</td>
<td>$93,991</td>
<td>Dr. Faith Kuehn</td>
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<td></td>
<td></td>
<td></td>
<td>Plant Industries Administrator</td>
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<tr>
<td>LNE05-221</td>
<td>Mentoring small fresh produce farmers who want to increase farm revenue by selling value-added products through direct-market channels</td>
<td>$65,000</td>
<td>Anne Fitzgerald</td>
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<td></td>
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<td>Delaware Department of Agriculture</td>
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### PROFESSIONAL DEVELOPMENT PROGRAM GRANTS

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<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
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</thead>
<tbody>
<tr>
<td>ENE15-141</td>
<td>2016 Northeast SARE Regional Cover Crops Training</td>
<td>$134,443</td>
<td>John Clendaniel</td>
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<td></td>
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<td></td>
<td>Delaware State University</td>
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<tr>
<td>ENE98-043</td>
<td>Nutrient Management Education: Development and Implementation of Training Modules on Basic Principles, Current State of Knowledge and Advances in Research</td>
<td>$6,500</td>
<td>Karen L. Gartley</td>
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<td></td>
<td>University of Delaware</td>
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### FARMER/RANCHER GRANTS

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<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNE17-873</td>
<td>Improving poultry farm sustainability through pollinator buffers</td>
<td>$11,481</td>
<td>Tina Hill</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Hill Farms, Inc</td>
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<tr>
<td>FNE13-786</td>
<td>Economic analysis of oyster mushroom production in an unused poultry house</td>
<td>$8,849</td>
<td>Ramrattan sagram</td>
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<tr>
<td>FNE12-746</td>
<td>Survivability and production of heritage breed egg layers on pasture in Delmarva</td>
<td>$13,784</td>
<td>Kim Hartline</td>
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<tr>
<td></td>
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<td>Spring Morning Farm LLC.</td>
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</table>
FNE11-735  Effects of Pole Lima Production in North/South vs. East/West Row Placement  $5,375  Edward Zitvogel  Zitvogel Farms

FNE09-655  Sustainable cropping systems for processing baby lima bean production  $10,000  Wm. Donald (Don) Clifton, II Clifton Farms, Inc.

FNE07-598  Greenhouse heating system  $2,744  Katherine Brooks

FNE04-505  Using Innovative Production Systems to Meet the Needs of new Emerging Markets  $5,000  Luke Chappel


FNE96-147  Economical Analysis of Kenaf Grown with Different Nutrient Sources  $3,140  Daniel Palmer

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### GRADUATE STUDENT GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| GNE20-241 | Using Drones to Measure Cover Crop Biomass as a Predictor of Soil Nitrogen And Corn Emergence Issues | $14,832      | Dr. Jarrod Miller  
University of Delaware  
Jamie Taraila  
University of Delaware |
| GNE19-203 | Improvements to Quality-related Limitations to Market Growth of Biodiesel and Renewable Hydrocarbon Diesel Produced from Low-value Feedstocks | $15,000      | Dr. Gulnihal Ozbay  
Delaware State University  
Dr. Shehu Isah  
Delaware State University |
| GNE19-217 | Microbial Inoculants for the Improvement of Alfalfa Crop Productivity and Health | $12,453      | Dr. Harsh Bais  
University of Delaware  
Amanda Rosier  
University of Delaware |
University of Delaware  
Lauren Mosesso  
University of Delaware |
| GNE19-219 | Soil Microbiome Impacts on Floral Rewards and Implications for Pollinator Nutrition | $14,984      | Dr. Deborah Delaney  
University of Delaware  
Grace Savoy-Burke  
University of Delaware |
| GNE15-111 | Using silicon fertilizers to improve soil phosphorus availability and uptake by winter wheat in high-phosphorus soils | $14,995      | Amy Shober  
University of Delaware  
Angelia Seyfferth  
University of Delaware  
Zhixuan Qin  
University of Delaware |
| GNE14-086 | Use of a Natural Biocontrol Agent Bacillus subtilis UD1022 to Increase Crop Yiel and Reduce Contamination by Listeria monocytogenes On Cantaloupes | $14,035      | Dr. Kalmia Kniel  
University of Delaware  
Dr. Harsh Bais  
University of Delaware  
Sarah Markland  
University of Delaware |
| GNE11-023 | Developing sustainable aquaculture methods for the mummichog, Fundulus heteroclitus, with emphasis on egg production | $14,909      | Dennis McIntosh, Ph.D.  
Delaware State University  
Courtney Janiak  
Delaware State University |

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### 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>
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<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Grant Amount</th>
<th>Principal Investigator(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONE20-372</td>
<td>Prevalence of Toxoplasma gondii on Small Ruminant Farms in Delaware</td>
<td>$29,992</td>
<td>Dr. Kwame Matthews, Delaware State University</td>
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<tr>
<td>ONE19-344</td>
<td>Cost Benefits of Common Insecticide Practices Used to Prevent Soybean Pest Problems in Delaware</td>
<td>$28,221</td>
<td>Dr. David Owens, University of Delaware</td>
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<tr>
<td>ONE18-317</td>
<td>Characterization of Gastrointestinal Nematode Anthelmintic Resistance on Small Ruminant Farms in Delaware</td>
<td>$14,974</td>
<td>Dr. Kwame Matthews, Delaware State University</td>
</tr>
<tr>
<td>ONE16-280c</td>
<td>Utilizing cover crops for additional benefits in Delaware</td>
<td>$11,111</td>
<td>Mark VanGessel, University of Delaware</td>
</tr>
<tr>
<td>ONE14-215</td>
<td>Determining the risks associated with scavenging raptors to the biosecurity of broiler farms on Delmarva.</td>
<td>$11,307</td>
<td>Dr. Brigid McCrea, Delaware State University Cooperative Extension</td>
</tr>
<tr>
<td>ONE12-157</td>
<td>Development of best use practices on commercial colonies of Bombus impatiens on crops in Delaware</td>
<td>$5,696</td>
<td>Dr. Deborah Delaney, University of Delaware, Jacquelyn Marchese, University of Delaware</td>
</tr>
</tbody>
</table>

**Total funding from the USDA SARE program to Delaware**

$1,158,555

For further information on projects, contact Deb Heleba, Northeast SARE communications specialist, at 802-651-8335, ext 552 or debra.heleba@uvm.edu. Sustainable Agriculture Research and Education (SARE) is funded by USDA’s National Institute of Food and Agriculture (NIFA).