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 $389 million to more than 8,519 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...

Arizona

Project Highlight: Collaborative Training for Southwest Grassland Restoration under Environmental Uncertainty

Early settlers’ descriptions of southeast Arizona told of uninterrupted grassland stretching from one mountain range to another.

That’s changed. Today much of that land has been invaded by mesquite and other woody shrubs and the ecological services provided by the grassland – including water recharge into the underground aquifers – has been diminished.

One reason for the change has been fire – or more specifically the lack of it. Once viewed as natural to the landscape as rain, total fire suppression became standard practice in the early 1900s throughout the West. Without frequent fires to control their growth, the woody shrubs spread across desert southwest grasslands.

But as the importance of preserving the grasslands became more apparent, university researchers, conservationists, ranchers, government agencies and others began looking for ways to preserve these important landscapes, even in the face to today’s climate uncertainty.

Western SARE helped the effort by funding an important professional development project to bring all those experts and other interested people together for three day-long workshops looking at the history of the Southwest grasslands and management methods and options for controlling brush and woody species.

One thing that came out of the workshops was a Brush Management Matrix – a decision-support tool for ranchers and land managers to consult when considering brush-management projects. To extend the reach of the project, all of the presentations were recorded and posted on the web, and a series of six videos were produced.

For more information on this project, see sare.org/projects, and search for project number EW17-006.

SARE in Arizona
western.sare.org/sare-in-your-state/arizona

$3,106,771 in total funding
66 grant projects
(since 1988)

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

Total awards: 66 grants
- 12 Research and Education
- 10 Professional Development Program
- 29 Farmer/Rancher
- 13 Graduate Student
- 2 On Farm
- Research/Partnership

Total funding: $3,106,771
- $1,497,156 Research and Education
- $816,728 Professional Development Program
- $398,884 Farmer/Rancher
- $295,371 Graduate Student
- $98,632 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: western.sare.org/sare-in-your-state/arizona

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 western.sare.org/state-pages/arizona to learn more.

Randy Norton
UA Cooperative Extension
(928) 428-2432
rnorton@ag.arizona.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.
AGRICULTURE PROJECTS FUNDED IN ARIZONA
by USDA's Sustainable Agriculture Research and Education (SARE) Program

Arizona has been awarded $3,106,771 grants to support 64 projects, including but not limited to, 10 research and/or education projects, 10 professional development projects and 29 producer-led projects. Arizona 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>
| SW23-947   | Harnessing livestock and microbes to improve rangeland productivity and soil health | $304,450     | Dr. Caroline Havrilla  
Colorado State University  
Dr. Catherine Gehring  
Northern Arizona University  
Dr. Elise Gornish  
University of Arizona  
Dr. Seth Munson  
United States Geological Survey |
| SW19-904   | The utility of plant traits to identify range seeding candidates that can achieve multiple management goals | $342,481     | Elise Gornish  
University of Arizona  
Dr. Albert Barberan  
University of Arizona  
Dr. Jeffrey Fehmi  
University of Arizona  
Dr. Mitch McClaran  
University of Arizona  
Dr. Leslie Roche  
UC Davis  
George Ruyle  
University of Arizona |
| SW05-065   | Increased production of inland shrimp farms                                    | $98,024      | Feng-Jyu Tang-Nelson  
University of Arizona |
| SW01-062   | Assessing Sustainability of Shrimp Aquaculture and Integration with a Field Crop | $68,523      | Kevin Fitzsimmons  
Univ of AZ Environmental Research Lab |
| SW01-056   | Conservation Tillage Benefits in a Cotton Centered Crop Rotation System        | $175,277     | William McCloskey  
University of Arizona |
| SW01-026   | Development of a Sustainable Polyculture Seaweeds and Fish on Molokai          | $95,200      | Stephen Nelson  
University of Arizona Environmental Research Lab |
| SW00-053   | Improving Pollination in the Southwest: Testing the on farm feasibility of establishing and managing the carpenter bee for multiple crop farming systems | $32,150      | Jim Donovan  
Native Seeds SEARCH/University of Arizona |
| SW98-068   | Minimum Tillage Systems for Cotton: Reduced Energy, Time, and Particulates     | $182,850     | Robert Roth  
University of Arizona  
Dr. James Walworth  
University of Arizona |
| SW98-036   | Indian Range Livestock Production in the West and Southwest: Entering, Enduring and Emerging from Drought Conditions | $103,000     | Robert Kattnig  
University of Arizona |
### PROFESSIONAL DEVELOPMENT PROGRAM GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPDP23-007</td>
<td>Strengthening the Technology Toolbox for Sustainable Rangeland Management</td>
<td>$99,769</td>
<td>Ashley Lauren Hall, University of Arizona Cooperative Extension, Dr. Leslie Roche, UC Davis, Dr. Mark Thorne, University of Hawaii at Manoa</td>
</tr>
<tr>
<td>WPDP22-019</td>
<td>From the ground up: Educating Cooperative Extension and NRCS about agricultural technologies to enhance soil health</td>
<td>$70,723</td>
<td>Elise Gornish, University of Arizona</td>
</tr>
<tr>
<td>WPDP22-016</td>
<td>Collaborative Training for Virtual Fencing Implementation for Sustainable Rangeland Management under Environmental Uncertainty</td>
<td>$99,679</td>
<td>Dr. Aaron Lien, University of Arizona, Joslyn Beard, Ph.D., Arizona Board of Regents, University of Arizona, Aaron Lien, Ph.D., Arizona Board of Regents, University of Arizona, Andrew McGibbon, Santa Rita Ranch LLC</td>
</tr>
<tr>
<td>WPDP21-026</td>
<td>Increasing the Online Communication Toolbox for Sustainable Rangeland Management: A Train-the-Trainer Program</td>
<td>$99,993</td>
<td>George Ruyle, University of Arizona, Retta Bruegger, Colorado State University Extension, Amber Dalke, University of Arizona</td>
</tr>
<tr>
<td>WPDP21-007</td>
<td>Natural Resource Conservation Professional Development Project</td>
<td>$96,400</td>
<td>Deborah Smith, Arizona Association of Conservation Districts</td>
</tr>
<tr>
<td>EW17-006</td>
<td>Collaborative Training for Southwest Grassland Restoration under Environmental Uncertainty</td>
<td>$71,503</td>
<td>George Ruyle, University of Arizona</td>
</tr>
<tr>
<td>EW14-002</td>
<td>SOLAR ENERGY TRAINING PROGRAM FOR ARIZONA EXTENSION EDUCATORS</td>
<td>$65,559</td>
<td>Dr. Edward Franklin, University of Arizona</td>
</tr>
<tr>
<td>EW07-020</td>
<td>&quot;High Tech, High Touch&quot; Professional Development in Geospatial Applications for Invasive Species Management</td>
<td>$60,560</td>
<td>Barron Orr, University of Arizona</td>
</tr>
<tr>
<td>EW02-010</td>
<td>Striking a Balance: Rangeland Evaluation and Monitoring in the 4-Corners Region</td>
<td>$100,000</td>
<td>Joanna Austin-Manygoats, Navajo Nation Department of Agriculture, John Blueyes, Navajo Nation Department of Agriculture</td>
</tr>
</tbody>
</table>

### 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>FW20-359</td>
<td>Reduce water consumption in urban agriculture in arid climates</td>
<td>$20,000</td>
<td>Chaz Shelton, Merchant's Garden AgroTech Inc</td>
</tr>
</tbody>
</table>
Developing new, space efficient, growing techniques, with water conservation, native fish preservation, and increased crop yields for small farmers.

$19,983  
Rylan Morton-Starner  
Forestdale Farm LLC

Wild crop relatives and landrace cover crops for arid-land vineyards

$19,669  
Sarah Fox  
Sand-Reckoner Vineyard

Mitigation of Potential Adverse Effects of Transgenic Crop Production for Long-Term Improvement of Soil Health

$7,481  
Michael Osweiler  
MICHAEL OSWEILER

Sustainable Alternative Livestock Feed System for Small-Scale Ranchers

$20,000  
Chelise Largent  
Chelise Largent

Honey Bee Mating Control and Production Cost Analysis In Africanized Regions Using Instrumental Insemination

$20,000  
Jaime de Zubeldia  
Jaime de Zubeldia

Sustainable Water Management in a Passive Irrigation System

$19,660  
Aaron Anderson  
Viking Agriculture LLC

Sustainable Method of Protecting Western Redcedar from Deer Browsing

$15,000  
Dr. Andrej Romanovsky  
Tree Fever Farm: Forestland Conservation and Development

Integrating Traditional Foods with Aquaponics in the Desert Southwest

$14,972  
Aaron Cardona  
Arevalos Farm

On-Farm Pollinator Habitat

$25,000  
Dr. Gary Nabhan  
Almunia de los Zopilotes orchard

Agricultural Soil Amendment Project

$14,870  
Bill Edwards  
North Leupp Family Farms  
Stacey Jensen  
NLFF

Navajo Crop Demonstration Project

$30,000  
Ernesto Zamudio  
Principal Investigator

Eastern Navajo Cattle Herd Improvement

$29,992  
Anthony Howard  
Eastern Navajo Cattle Growers

Intensive Cultivation Through Edible Cover Cropping Integrated with Bee Keeping

$14,900  
James Golo

Hopi Rangeland Management Series

$14,513  
Dennis Becenti

Partnership for Monitoring Rangeland and Riparian Health in Red Rock Canyon Watershed, Santa Cruz County, Arizona

$19,976  
Richard Collins  
Collins C6 Ranch

Ganado Farm Board Agricultural Marketing Study

$15,000  
Teresa Showa  
Ganado Farm Board

EC Bar Ranch Riparian Grazing Management Project

$7,500  
James Crosswhite  
EC Bar Ranch
<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW03-104</td>
<td>Wool and Weavings Fair Traded from the Source</td>
<td>$15,000</td>
<td>Carol Halberstadt Black Mesa Weavers for Life and Land</td>
</tr>
<tr>
<td>FW02-215</td>
<td>Chinle Valley Navajo Truck Farm Project</td>
<td>$13,500</td>
<td>Gwendolyn Wagner</td>
</tr>
<tr>
<td>FW01-066</td>
<td>Fruitvale Community Garden</td>
<td>$2,768</td>
<td>Patricia Vigil</td>
</tr>
<tr>
<td>FW00-258</td>
<td>Gila River Farms Fresh Produce Market</td>
<td>$3,750</td>
<td>Mary Thomas</td>
</tr>
<tr>
<td>FW00-338</td>
<td>Sustainable Shrimp Farm Tours and Direct Sales Project</td>
<td>$5,800</td>
<td>Gary Wood</td>
</tr>
<tr>
<td>FW00-325</td>
<td>Navajo Corn Pollen, Young Ears of Corn for Knee-Down-Bread, and Neeshjizhi Marketing</td>
<td>$7,740</td>
<td>Teresa Showa</td>
</tr>
<tr>
<td>FW99-061</td>
<td>Carrying on Dine’ Cultural/Traditional Flour Corn Farming: Roots of Dine’ People</td>
<td>$5,000</td>
<td>Woodie and Maggie Jodie</td>
</tr>
<tr>
<td>FW98-031</td>
<td>Navajo Nation Livestock Disease Survey</td>
<td>$7,000</td>
<td>Glenda Davis</td>
</tr>
<tr>
<td>FW96-010</td>
<td>Moving Succession Forward in a Lahmann Lovegrass Monoculture</td>
<td>$3,000</td>
<td>Steve Getzwiller Spear G Ranch</td>
</tr>
<tr>
<td>FW96-012</td>
<td>Goal-Driven Intensive Management of a Riparian/Sandy Bottom Site</td>
<td>$4,310</td>
<td>Kali Holtschlag Adams Ranch</td>
</tr>
<tr>
<td>FW96-045</td>
<td>Managing Biological Processes for Maximum Diversity and Productivity</td>
<td>$2,500</td>
<td>Mike Mercer</td>
</tr>
</tbody>
</table>

**GRADUATE STUDENT GRANTS**

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>GW22-243</td>
<td>Testing the potential of seed pellets to improve the soil health in rangelands</td>
<td>$28,577</td>
<td>Dr.Albert Barberan University of Arizona Ben Yang University of Arizona</td>
</tr>
<tr>
<td>GW20-210</td>
<td>Carbon Dioxide Enrichment of Controlled Environment Plant Chambers via Specialty Mushroom Cultivation</td>
<td>$25,000</td>
<td>Dr.Barry Pryor University of Arizona Justin Chung University of Arizona Dr.Barry Pryor University of Arizona Justin Chung University of Arizona</td>
</tr>
<tr>
<td>GW19-196</td>
<td>Shrub Encroachment Early Detection System (SEEDS): a rangeland conservation tool</td>
<td>$24,994</td>
<td>Steven Archer The University of Arizona Dr.Willem van Leeuwen University of Arizona, Arizona Remote Sensing Center William Rutherford University of Arizona</td>
</tr>
<tr>
<td>GW18-024</td>
<td>Ecosystem Services on Shrub-Encroached Rangelands; Balancing Supply and Demand</td>
<td>$25,000</td>
<td>Steven Archer The University of Arizona Scott Jones University of Arizona</td>
</tr>
</tbody>
</table>
Empowering producers to effectively integrate chemical and biological controls through research and outreach on selective chemistries and impacts on natural enemies.

Biocrusts, grass establishment, and restoration of working rangelands

Enhancing the Potential for Sustainability through Participatory Environmental Assessment

Agriculture, Water, and Institutions: An Investigation of Water Management Policy and its Effects on Water Use by Agriculture in Arizona

Influences of Society, Politics and Local Knowledge on Ranch Management

Characterization of Soil Fungal Communities Associated with Native and Invasive Grass Species in Southern Arizona

Assessing Direct and Indirect Interactions between Insect and Plant Pathogens and Their Impact on Insect Herbivores

An Environmentally-Friendly Alternative for Control of the Citrus Nematode in Arizona

Contamination of non-Bt cotton fields by transgenic Bt cotton

Growing the bees to grow the farm

Production, Milling and Marketing of Arid-Adapted Heritage Grains in the Desert Borderlands to Increase Food Security

Total funding from the USDA SARE program to Arizona

$3,106,771