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 8,542 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, grantee-produced 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 in Arizona

Grants awarded
2019–2024

Total awards: 14 grants
3 Farmer/Rancher
2 Research and Education
5 Professional Development Program
1 On Farm Research/Partnership
3 Graduate Student

Total funding: $1,300,400

$59,652 Farmer/Rancher
$646,931 Research and Education
$466,564 Professional Development Program
$48,682 On Farm Research/Partnership
$78,571 Graduate Student

Find a complete list of projects on page 3.

Farmer and rancher impacts
2019–2024

SARE grantees have reported the following impacts from their projects:

1,392 farmers participated in a SARE-funded project

268 farmers reported a change in knowledge, awareness, skills or attitude

28 farmers changed a practice

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

Debankur Sanyal
The University of Arizona
(701) 781-9295
dsanyal@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.
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 |
**Improving Pollination in the Southwest: Testing the on-farm feasibility of establishing and managing the carpenter bee for multiple crop farming systems**

Project SW00-053

Support: $32,150

Project Leaders: Jim Donovan

Native Seeds SEARCH/University of Arizona

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**Minimum Tillage Systems for Cotton: Reduced Energy, Time, and Particulates**

Project SW98-068

Support: $182,850

Project Leaders: Robert Roth

University of Arizona

Dr. James Walworth

University of Arizona

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**Indian Range Livestock Production in the West and Southwest: Entering, Enduring and Emerging from Drought Conditions**

Project SW98-036

Support: $103,000

Project Leaders: Robert Kattnig

University of Arizona

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**Sustainable Culture of the Edible Red Seaweed, Gracilaria parvispora, in Traditional Hawaiian Fishponds**

Project SW97-025

Support: $95,201

Project Leaders: Edward P. Glenn

Univ. of AZ, Dept. of Soil, Water & Env. Science

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**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>
| WPDP23-007 | Strengthening the Technology Toolbox for Sustainable Rangeland Management    | $99,769      | Ashley Lauren Hall
University of Arizona Cooperative Extension
Dr. Leslie Roche
UC Davis
Dr. Mark Thorne
University of Hawaii at Manoa |
| WPDP22-019 | From the ground up: Educating Cooperative Extension and NRCS about agricultural technologies to enhance soil health | $70,723      | Elise Gornish
University of Arizona |
| WPDP22-016 | Collaborative Training for Virtual Fencing Implementation for Sustainable Rangeland Management under Environmental Uncertainty | $99,679      | 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 Mc gibbion
Santa Rita Ranch LLC |
| WPDP21-026 | Increasing the Online Communication Toolbox for Sustainable Rangeland Management: A Train-the-Trainer Program | $99,993      | Amber Dalke
University of Arizona
Retta Bruegger
Colorado State University Extension |
WPDP21-007  Natural Resource Conservation Professional Development Project $96,400  Deborrah Smith Arizona Association of Conservation Districts

EW17-006  Collaborative Training for Southwest Grassland Restoration under Environmental Uncertainty $71,503  George Ruyle University of Arizona

EW14-002  SOLAR ENERGY TRAINING PROGRAM FOR ARIZONA EXTENSION EDUCATORS $65,559  Dr.Edward Franklin University of Arizona

EW07-020  "High Tech, High Touch" Professional Development in Geospatial Applications for Invasive Species Management $60,560  Barron Orr University of Arizona

EW02-010  Striking a Balance: Rangeland Evaluation and Monitoring in the 4-Corners Region $100,000  Joanna Austin-Manygoats Navajo Nation Department of Agriculture  
John Blueyes  
Navajo Nation Department of Agriculture


**FARMER/RANCHER GRANTS**

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| FW20-359   | Reduce water consumption in urban agriculture in arid climates                | $20,000      | Chaz Shelton  
Merchant's Garden AgroTech Inc |
| FW20-367   | 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 |
| FW19-342   | Wild crop relatives and landrace cover crops for arid-land vineyards         | $19,669      | Sarah Fox  
Sand-Reckoner Vineyard |
| FNC18-1138 | Mitigation of Potential Adverse Effects of Transgenic Crop Production for Long-Term Improvement of Soil Health | $7,481       | Michael Osweiler  
MICHAEL OSWEILER |
| FW17-048   | Sustainable Alternative Livestock Feed System for Small-Scale Ranchers       | $20,000      | Chelise Largent  
Chelise Largent |
| FW17-017   | Honey Bee Mating Control and Production Cost Analysis In Africanized Regions Using Instrumental Insemination | $20,000      | Jaime de Zubeldia  
Jaime de Zubeldia |
<table>
<thead>
<tr>
<th>Project ID</th>
<th>Project Title</th>
<th>Award Amount</th>
<th>Principal Investigator</th>
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</thead>
<tbody>
<tr>
<td>FW16-032</td>
<td>Sustainable Water Management in a Passive Irrigation System</td>
<td>$19,660</td>
<td>Aaron Anderson, Viking Agriculture LLC</td>
</tr>
<tr>
<td>FW14-007</td>
<td>Sustainable Method of Protecting Western Redcedar from Deer Browsing</td>
<td>$15,000</td>
<td>Dr. Andrej Romanovsky, Tree Fever Farm: Forestland Conservation and Development</td>
</tr>
<tr>
<td>FW13-142</td>
<td>Integrating Traditional Foods with Aquaponics in the Desert Southwest</td>
<td>$14,972</td>
<td>Aaron Cardona, Arevalos Farm</td>
</tr>
<tr>
<td>FW12-068</td>
<td>On-Farm Pollinator Habitat</td>
<td>$25,000</td>
<td>Dr. Gary Nabhan, Almuniya de los Zopilotes orchard</td>
</tr>
<tr>
<td>FW11-017</td>
<td>Agricultural Soil Amendment Project</td>
<td>$14,870</td>
<td>Bill Edwards, North Leupp Family Farms Stacey Jensen, NLFF</td>
</tr>
<tr>
<td>FW11-033</td>
<td>Navajo Crop Demonstration Project</td>
<td>$30,000</td>
<td>Ernesto Zamudio, Principal Investigator</td>
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<tr>
<td>FW10-060</td>
<td>Eastern Navajo Cattle Herd Improvement</td>
<td>$29,992</td>
<td>Anthony Howard, Eastern Navajo Cattle Growers</td>
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<tr>
<td>FW09-032</td>
<td>Intensive Cultivation Through Edible Cover Cropping Integrated with Bee Keeping</td>
<td>$14,900</td>
<td>James Golo</td>
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<tr>
<td>FW07-310</td>
<td>Hopi Rangeland Management Series</td>
<td>$14,513</td>
<td>Dennis Becenti</td>
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<tr>
<td>FW05-005</td>
<td>Partnership for Monitoring Rangeland and Riparian Health in Red Rock Canyon Watershed, Santa Cruz County, Arizona</td>
<td>$19,976</td>
<td>Richard Collins, Collins C6 Ranch</td>
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<tr>
<td>FW04-113</td>
<td>Ganado Farm Board Agricultural Marketing Study</td>
<td>$15,000</td>
<td>Teresa Showa, Ganado Farm Board</td>
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<tr>
<td>FW03-002</td>
<td>EC Bar Ranch Riparian Grazing Management Project</td>
<td>$7,500</td>
<td>James Crosswhite, EC Bar Ranch</td>
</tr>
<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>
</tbody>
</table>
FW01-066  Fruitvale Community Garden  $2,768  Patricia Vigil

FW00-258  Gila River Farms Fresh Produce Market  $3,750  Mary Thomas

FW00-338  Sustainable Shrimp Farm Tours and Direct Sales Project  $5,800  Gary Wood

FW00-325  Navajo Corn Pollen, Young Ears of Corn for Knee-Down-Bread, and Neeshijzhi Marketing  $7,740  Teresa Showa

FW99-061  Carrying on Dine' Cultural/Traditional Flour Corn Farming: Roots of Dine' People  $5,000  Woodie and Maggie Jodie

FW98-031  Navajo Nation Livestock Disease Survey  $7,000  Glenda Davis

FW96-010  Moving Succession Forward in a Lahmann Lovegrass Monoculture  $3,000  Steve Getzwiller

FW96-012  Goal-Driven Intensive Management of a Riparian/Sandy Bottom Site  $4,310  Kali Holtschlag

FW96-045  Managing Biological Processes for Maximum Diversity and Productivity  $2,500  Mike Mercer

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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>
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</thead>
</table>
| GW22-243  | Testing the potential of seed pellets to improve the soil health in rangelands | $28,577      | Dr.Albert Barberan  
Ben Yang  
University of Arizona |
| GW20-210  | Carbon Dioxide Enrichment of Controlled Environment Plant Chambers via Specialty Mushroom Cultivation | $25,000      | Dr.Barry Pryor  
Justin Chung  
University of Arizona |


<table>
<thead>
<tr>
<th>Grant No.</th>
<th>Title</th>
<th>Funding Amount</th>
<th>PI(s)</th>
<th>Organization(s)</th>
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<tbody>
<tr>
<td>GW19-196</td>
<td>Shrub Encroachment Early Detection System (SEEDS): a rangeland</td>
<td>$24,994</td>
<td>Steven Archer, Dr. Willem van Leeuwen, William Rutherford</td>
<td>The University of Arizona, Arizona Remote Sensing Center, University of Arizona</td>
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<td></td>
<td>conservation tool</td>
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<tr>
<td>GW18-024</td>
<td>Ecosystem Services on Shrub-Encroached Rangelands; Balancing Supply</td>
<td>$25,000</td>
<td>Steven Archer, Scott Jones</td>
<td>The University of Arizona, University of Arizona</td>
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<td>and Demand</td>
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<tr>
<td>GW18-131</td>
<td>Empowering producers to effectively integrate chemical and biological</td>
<td>$25,000</td>
<td>Isadora Bordini, Isadora Carlos Bordini</td>
<td>University of Arizona</td>
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<td></td>
<td>controls through research and outreach on selective chemistries and</td>
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<td>impacts on natural enemies</td>
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<tr>
<td>GW15-006</td>
<td>Biocrusts, grass establishment, and restoration of working</td>
<td>$24,934</td>
<td>Steven Archer, Cheryl McIntyre</td>
<td>The University of Arizona, University of Arizona</td>
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<td>rangelands</td>
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<td>GW12-064</td>
<td>Enhancing the Potential for Sustainability through Participatory</td>
<td>$25,000</td>
<td>Barron Orr, Anahi Ocampo Melgar</td>
<td>University of Arizona, University of Arizona</td>
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<td></td>
<td>Environmental Assessment</td>
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<td>GW10-015</td>
<td>Agriculture, Water, and Institutions: An Investigation of Water</td>
<td>$8,795</td>
<td>John Anderies, Haley Paul</td>
<td>Arizona State University, University of Arizona</td>
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<td></td>
<td>Management Policy and its Effects on Water Use by Agriculture in</td>
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<td></td>
<td>Arizona</td>
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<tr>
<td>GW10-034</td>
<td>Influences of Society, Politics and Local Knowledge on Ranch</td>
<td>$25,000</td>
<td>George Ruyle, Steven Woods</td>
<td>University of Arizona, University of Arizona</td>
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<td>Management</td>
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<tr>
<td>GW10-030</td>
<td>Characterization of Soil Fungal Communities Associated with Native</td>
<td>$18,329</td>
<td>Dr. Barry Pryor, Carol Rowand</td>
<td>University of Arizona, University of Arizona Dept. of Plant Sciences</td>
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<td></td>
<td>and Invasive Grass Species in Southern Arizona</td>
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<tr>
<td>GW10-004</td>
<td>Assessing Direct and Indirect Interactions between Insect and Plant</td>
<td>$24,996</td>
<td>Dr. Patricia Stock, Patricia Navarro</td>
<td>University of Arizona, University of Arizona Dept. of Plant Sciences</td>
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<tr>
<td></td>
<td>Pathogens and Their Impact on Insect Herbivores</td>
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<tr>
<td>GW07-007</td>
<td>An Environmentally-Friendly Alternative for Control of the Citrus</td>
<td>$19,746</td>
<td>Dr. Patricia Stock, Joanna Gress</td>
<td>Entomology-University of Arizona</td>
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<td>Nematode</td>
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<td>University of Arizona, University of Arizona</td>
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<tr>
<td>Project #</td>
<td>Project Title</td>
<td>SARE Support</td>
<td>Project Leaders</td>
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</tr>
</tbody>
</table>
| GW07-004 | Contamination of non-Bt cotton fields by transgenic Bt cotton                 | $20,000      | Yves Carriere  
University of Arizona  
Shannon Heuberger  
University of Arizona |
| OW20-359 | Growing the bees to grow the farm                                             | $48,682      | Dr.Ethel Villalobos  
University of Hawaii |
| OW12-010 | Production, Milling and Marketing of Arid-Adapted Heritage Grains in the Desert Borderlands to Increase Food Security | $49,950      | Chris Schmidt  
Native Seeds/SEARCH |

**Total funding from the USDA SARE program to Arizona**  
$3,106,771

For further information on projects, contact Western SARE at (406) 994-4785 or wsare@montana.edu. Sustainable Agriculture Research and Education (SARE) is funded by USDA’s National Institute of Food and Agriculture (NIFA).