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 $353 million to more than 8,041 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 in Arizona

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

$2,673,975 in total funding

63 grant projects

(since 1988)

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

Project Highlight: Integrating Traditional Foods with Aquaponics

Cochise County, Ariz., is classified by the USDA as a food desert with high poverty rates, as well as high rates of diabetes and obesity. To help confront these problems, local farmer Aaron Cardona decided to look into aquaponics, which had not been tested in the desert regions of the Southwest or in areas with low-income populations.

With SARE funding, Cardona researched building an affordable aquaponic system in his greenhouse that could be replicated by others in the region, thus creating an economic opportunity for low-income producers and families. The system would also produce culturally relevant food as a means of bringing back traditional foods into the local population’s diet, thus improving the health of the community. The aquaponic system that he built integrated two traditional greens, verdolagas (purslane) and berros (watercress) with tilapia. Purslane did not develop in the system but watercress was a success. Arizona is typically too hot for tilapia, so he used a solar-powered system to cool the greenhouse to within their optimal temperature range.

Due to the publicity of the project and availability of watercress, Cardona estimates that nearly 40 percent of his sales at the farmers’ market were to people of Hispanic descent, a population that typically makes up a much lower percentage of farmers’ market customers.

For more information on this project, see sare.org/projects, and search for project number FW13-142.
SARE Grants in Arizona

Total awards: **63 grants**

- 11 Research and Education
- 9 Professional Development Program
- 29 Farmer/Rancher
- 12 Graduate Student
- 2 On Farm Research/Partnership

Total funding: **$2,673,975**

- **$1,192,706** Research and Education
- **$716,959** Professional Development Program
- **$398,884** Farmer/Rancher
- **$266,794** Graduate Student
- **$98,632** On Farm Research/Partnership

Find a complete list of projects on page 3.

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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](http://western.sare.org/sare-in-your-state/arizona)

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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](http://western.sare.org/state-pages/arizona) to learn more.

**Randy Norton**  
UA Cooperative Extension  
(928) 428-2432  
rnorton@ag.arizona.edu

**Joshua Sherman**  
University of Arizona  
(520) 766-3603  
jdsherman@arizona.edu

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For detailed information on SARE projects, go to [www.SARE.org](http://www.SARE.org)

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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 $2,673,975 grants to support 61 projects, including but not limited to, 9 research and/or education projects, 9 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>
<tbody>
<tr>
<td>SW19-904</td>
<td>The utility of plant traits to identify range seeding candidates that can achieve multiple management goals</td>
<td>$342,481</td>
<td>Elise Gornish University of Arizona Dr. Albert Barberan University of Arizona Dr. Jeffrey Fehmi University of Arizona Dr. Mitch McClaran University of Arizona Leslie Roche UC Davis George Ruyle University of Arizona</td>
</tr>
<tr>
<td>SW05-065</td>
<td>Increased production of inland shrimp farms</td>
<td>$98,024</td>
<td>Feng-Jyu Tang-Nelson University of Arizona</td>
</tr>
<tr>
<td>SW01-062</td>
<td>Assessing Sustainability of Shrimp Aquaculture and Integration with a Field Crop</td>
<td>$68,523</td>
<td>Kevin Fitzsimmons Univ of AZ Environmental Research Lab</td>
</tr>
<tr>
<td>SW01-056</td>
<td>Conservation Tillage Benefits in a Cotton Centered Crop Rotation System</td>
<td>$175,277</td>
<td>William McCloskey University of Arizona</td>
</tr>
<tr>
<td>SW01-026</td>
<td>Development of a Sustainable Polyculture Seaweeds and Fish on Molokai</td>
<td>$95,200</td>
<td>Stephen Nelson University of Arizona Environmental Research Lab</td>
</tr>
<tr>
<td>SW00-053</td>
<td>Improving Pollination in the Southwest: Testing the on farm feasibility of establishing and managing the carpenter bee for multiple crop farming systems</td>
<td>$32,150</td>
<td>Jim Donovan Native Seeds SEARCH/University of Arizona</td>
</tr>
<tr>
<td>SW98-068</td>
<td>Minimum Tillage Systems for Cotton: Reduced Energy, Time, and Particulates</td>
<td>$182,850</td>
<td>Robert Roth University of Arizona Dr. James Walworth University of Arizona</td>
</tr>
<tr>
<td>SW98-036</td>
<td>Indian Range Livestock Production in the West and Southwest: Entering, Enduring and Emerging from Drought Conditions</td>
<td>$103,000</td>
<td>Robert Kattnig University of Arizona</td>
</tr>
<tr>
<td>SW97-025</td>
<td>Sustainable Culture of the Edible Red Seaweed, Gracilaria parvispora, in Traditional Hawaiian Fishponds</td>
<td>$95,201</td>
<td>Edward P. Glenn Univ. of AZ, Dept. of Soil, Water &amp; Env. Science</td>
</tr>
</tbody>
</table>

### PROFESSIONAL DEVELOPMENT PROGRAM GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
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<tbody>
<tr>
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</tbody>
</table>
From the ground up: Educating Cooperative Extension and NRCS about agricultural technologies to enhance soil health

$70,723

Elise Gornish
University of Arizona

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 McGibbon
Santa Rita Ranch LLC

Increasing the Online Communication Toolbox for Sustainable Rangeland Management: A Train-the-Trainer Program

$99,993

George Ruyle
University of Arizona
Retta Bruegger
Colorado State University Extension
Amber Dalke
University of Arizona

Natural Resource Conservation Professional Development Project

$96,400

Deborrah Smith
Arizona Association of Conservation Districts

Collaborative Training for Southwest Grassland Restoration under Environmental Uncertainty

$71,503

George Ruyle
University of Arizona

SOLAR ENERGY TRAINING PROGRAM FOR ARIZONA EXTENSION EDUCATORS

$65,559

Dr. Edward Franklin
University of Arizona

“High Tech, High Touch” Professional Development in Geospatial Applications for Invasive Species Management

$60,560

Barron Orr
University of Arizona

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

$100,000

Joanna Austin-Manygoats
Navajo Nation Department of Agriculture
John Blueyes
Navajo Nation Department of Agriculture

Navajo Noxious Weed Training Program

$52,542

Wallace Tsosie
Navajo Resource Conservation & Development, Inc.

FARMER/RANCHER GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| FW20-367   | 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 |
| FW20-359   | Reduce water consumption in urban agriculture in arid climates                 | $20,000      | Chaz Shelton
Merchant’s Garden AgroTech Inc |
| 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 |
<table>
<thead>
<tr>
<th>Program</th>
<th>Title</th>
<th>Amount</th>
<th>PI</th>
<th>Organization</th>
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</thead>
<tbody>
<tr>
<td>FW17-017</td>
<td>Honey Bee Mating Control and Production Cost Analysis In Africanized Regions Using Instrumental Insemination</td>
<td>$20,000</td>
<td>Jaime de Zubeldia, Jaime de Zubeldia</td>
<td></td>
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<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>
<td></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>
<td></td>
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<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>
<td></td>
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<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>
<td></td>
</tr>
<tr>
<td>FW11-033</td>
<td>Navajo Crop Demonstration Project</td>
<td>$30,000</td>
<td>Ernesto Zamudio, Principal Investigator</td>
<td></td>
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<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>
<td></td>
</tr>
<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>FW03-104</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>
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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>
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<tr>
<td>FW02-215</td>
<td>Chinle Valley Navajo Truck Farm Project</td>
<td>$13,500</td>
<td>Gwendolyn Wagner</td>
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<tr>
<td>FW01-066</td>
<td>Fruitvale Community Garden</td>
<td>$2,768</td>
<td>Patricia Vigil</td>
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<tr>
<td>FW00-258</td>
<td>Gila River Farms Fresh Produce Market</td>
<td>$3,750</td>
<td>Mary Thomas</td>
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<tr>
<td>FW00-338</td>
<td>Sustainable Shrimp Farm Tours and Direct Sales Project</td>
<td>$5,800</td>
<td>Gary Wood</td>
<td></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>
<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>
<td></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>
<td></td>
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<tr>
<td>FW98-031</td>
<td>Navajo Nation Livestock Disease Survey</td>
<td>$7,000</td>
<td>Glenda Davis</td>
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<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>
<td></td>
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<tr>
<td>FW96-045</td>
<td>Managing Biological Processes for Maximum Diversity and Productivity</td>
<td>$2,500</td>
<td>Mike Mercer</td>
<td></td>
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<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>
<td></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>
</table>
| GW20-210   | Carbon Dioxide Enrichment of Controlled Environment Plant Chambers via Specialty Mushroom Cultivation | $25,000       | Dr. Barry Pryor University of Arizona  
Justin Chung University of Arizona  
Dr. Barry Pryor University of Arizona  
Justin Chung University of Arizona |
| GW19-196   | Shrub Encroachment Early Detection System (SEEDS): a rangeland conservation tool | $24,994       | Steven Archer The University of Arizona  
Dr. Willem van Leeuwen University of Arizona, Arizona Remote Sensing Center  
William Rutherford University of Arizona |
| GW18-024   | Ecosystem Services on Shrub-Encroached Rangelands; Balancing Supply and Demand | $25,000       | Steven Archer The University of Arizona  
Scott Jones University of Arizona |
| GW18-131   | Empowering producers to effectively integrate chemical and biological controls through research and outreach on selective chemistries and impacts on natural enemies. | $25,000       | Isadora Bordini University of Arizona  
Isadora Carlos Bordini University of Arizona |
| GW15-006   | Biocrusts, grass establishment, and restoration of working rangelands         | $24,934       | Steven Archer The University of Arizona  
Cheryl McIntyre University of Arizona |
| GW12-064   | Enhancing the Potential for Sustainability through Participatory Environmental Assessment | $25,000       | Barron Orr University of Arizona  
Anahi Ocampo Melgar University of Arizona |
| GW10-034   | Influences of Society, Politics and Local Knowledge on Ranch Management       | $25,000       | George Ruyle University of Arizona  
Steven Woods University of Arizona |
| GW10-030   | Characterization of Soil Fungal Communities Associated with Native and Invasive Grass Species in Southern Arizona | $18,329       | Dr. Barry Pryor University of Arizona  
Carol Rowand University of Arizona Dept. of Plant Sciences |

GW10-004 Assessing Direct and Indirect Interactions between Insect and Plant Pathogens and Their Impact on Insect Herbivores $24,996 Dr. Patricia Stock Entomology-University of Arizona Patricia Navarro Arizona State University

GW07-007 An Environmentally-Friendly Alternative for Control of the Citrus Nematode in Arizona $19,746 Dr. Patricia Stock Entomology-University of Arizona Joanna Gress University of Arizona

GW07-004 Contamination of non-Bt cotton fields by transgenic Bt cotton $20,000 Yves Carriere University of Arizona Shannon Heuberger University of Arizona

**ON FARM RESEARCH/PARTNERSHIP GRANTS**

<table>
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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>OW20-359</td>
<td>Growing the bees to grow the farm $48,682</td>
<td>Dr. Ethel Villalobos University of Hawaii</td>
<td></td>
</tr>
<tr>
<td>OW12-010</td>
<td>Production, Milling and Marketing of Arid-Adapted Heritage Grains in the Desert Borderlands to Increase Food Security $49,950</td>
<td>Chris Schmidt Native Seeds/SEARCH</td>
<td></td>
</tr>
</tbody>
</table>

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

$2,673,975

For further information on projects, contact Western SARE at (435) 797-2257 or wsare@usu.edu. Sustainable Agriculture Research and Education (SARE) is funded by USDA’s National Institute of Food and Agriculture (NIFA).