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, grantee-produced information products and other educational materials.

SARE: Advancing the Frontier of Sustainable Agriculture in...

Arizona

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 in Arizona

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

$2,503,763 in total funding

62 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: 62 grants
- 11 Research and Education
- 7 Professional Development Program
- 29 Farmer/Rancher
- 13 Graduate Student
- 2 On Farm Research/Partnership

Total funding: $2,503,763
- $1,192,706 Research and Education
- $546,557 Professional Development Program
- $398,884 Farmer/Rancher
- $266,804 Graduate Student
- $98,812 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

Joshua Sherman
University of Arizona
(520) 766-3603
jdsherman@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 $2,503,763 grants to support 60 projects, including but not limited to, 9 research and/or education projects, 7 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 Br. 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>SW01-026</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>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>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>
</tr>
</thead>
</table>
| WPDP21-007 | Natural Resource Conservation Professional Development Project | $96,400 | Deborrah Smith  
Arizona Association of Conservation Districts |
|------------|---------------------------------------------------------------|--------|--------------------------------------------------|
| WPDP21-026 | 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 |
| 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 |
| EW98-007   | 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 |
| FW17-017     | Honey Bee Mating Control and Production Cost Analysis In Africanized Regions Using Instrumental Insemination | $20,000      | Jaime de Zubeldia  
Jaime de Zubeldia |
| FW17-048     | Sustainable Alternative Livestock Feed System for Small-Scale Ranchers       | $20,000      | Chelise Largent  
Chelise Largent |
| FW16-032     | Sustainable Water Management in a Passive Irrigation System                  | $19,660      | Aaron Anderson  
Viking Agriculture LLC |
| FW14-007     | Sustainable Method of Protecting Western Redcedar from Deer Browsing         | $15,000      | Dr. Andrej Romanovsky  
Tree Fever Farm: Forestland Conservation and Development |
<table>
<thead>
<tr>
<th>Project Code</th>
<th>Project Title</th>
<th>Funding</th>
<th>Principal Investigator(s)</th>
</tr>
</thead>
<tbody>
<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>
</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>
</tr>
<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>
</tr>
<tr>
<td>FW07-310</td>
<td>Hopi Rangeland Management Series</td>
<td>$14,513</td>
<td>Dennis Becenti</td>
</tr>
<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>
</tr>
<tr>
<td>FW04-113</td>
<td>Ganado Farm Board Agricultural Marketing Study</td>
<td>$15,000</td>
<td>Teresa Showa, Ganado Farm Board</td>
</tr>
<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>
<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>
</tbody>
</table>
**Goal-Driven Intensive Management of a Riparian/Sandy Bottom Site**

$4,310  
Kali Holtschlag  
Adams Ranch

**Managing Biological Processes for Maximum Diversity and Productivity**

$2,500  
Mike Mercer

**Moving Succession Forward in a Lahmann Lovegrass Monoculture**

$3,000  
Steve Getzwiler  
Spear G Ranch

### GRADUATE STUDENT GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| GW21-230 | WESTERN SARE TEST Graduate Student PROPOSAL | $10 | Allison Milodragovich  
Dr. Western SARE  
Western Sare |
| GW20-210 | Carbon Dioxide Enrichment of Controlled Environment Plant Chambers via Specialty Mushroom Cultivation | $25,000 | Dr. Barry Pryor  
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 |
| GW18-131 | 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 |
| 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 |
| 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 |
| GW10-030 | 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  
University of Arizona Dept. of Plant Sciences |
Arizona State University  
Haley Paul  
Arizona State University |
<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| GW10-034  | Influences of Society, Politics and Local Knowledge on Ranch Management       | $25,000      | George Ruyle  
                        University of Arizona  
                        Steven Woods  
                        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 |
| 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 |

**ON FARM RESEARCH/PARTNERSHIP 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>
| OW20-359  | Growing the bees to grow the farm                                           | $48,862      | 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**

$2,503,763

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).