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 $333 million to more than 7,794 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: 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

$2,503,753 in total funding

61 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: 61 grants

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

Total funding: $2,503,753

- $1,192,706 Research and Education
- $546,557 Professional Development Program
- $398,884 Farmer/Rancher
- $266,794 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 $2,503,753 grants to support 59 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.

<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>
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</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
### Increasing the Online Communication Toolbox for Sustainable Rangeland Management: A Train-the-Trainer Program

**Project #:** WPDP21-026  
**SARE Support:** $99,993  
**Project Leaders:** George Ruyle (University of Arizona), Retta Bruegger (Colorado State University Extension), Amber Dalke (University of Arizona)

### Natural Resource Conservation Professional Development Project

**Project #:** WPDP21-007  
**SARE Support:** $96,400  
**Project Leaders:** Deborrah Smith (Arizona Association of Conservation Districts)

### Collaborative Training for Southwest Grassland Restoration under Environmental Uncertainty

**Project #:** EW17-006  
**SARE Support:** $71,503  
**Project Leaders:** George Ruyle (University of Arizona)

### SOLAR ENERGY TRAINING PROGRAM FOR ARIZONA EXTENSION EDUCATORS

**Project #:** EW14-002  
**SARE Support:** $65,559  
**Project Leaders:** Dr. Edward Franklin (University of Arizona)

### "High Tech, High Touch" Professional Development in Geospatial Applications for Invasive Species Management

**Project #:** EW07-020  
**SARE Support:** $60,560  
**Project Leaders:** Barron Orr (University of Arizona)

### Striking a Balance: Rangeland Evaluation and Monitoring in the 4-Corners Region

**Project #:** EW02-010  
**SARE Support:** $100,000  
**Project Leaders:** Joanna Austin-Manygoats (Navajo Nation Department of Agriculture), John Blueyes (Navajo Nation Department of Agriculture)

### Navajo Noxious Weed Training Program

**Project #:** EW98-007  
**SARE Support:** $52,542  
**Project Leaders:** Wallace Tsosie (Navajo Resource Conservation & Development, Inc.)

## FARMER/RANCHER GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
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</tr>
</thead>
<tbody>
<tr>
<td>FW20-367</td>
<td>Developing new, space efficient, growing techniques, with water conservation, native fish preservation, and increased crop yields for small farmers.</td>
<td>$19,983</td>
<td>Rylan Morton-Starner (Forestdale Farm LLC)</td>
</tr>
<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>
<tr>
<td>FW19-342</td>
<td>Wild crop relatives and landrace cover crops for arid-land vineyards</td>
<td>$19,669</td>
<td>Sarah Fox (Sand-Reckoner Vineyard)</td>
</tr>
<tr>
<td>FNC18-1138</td>
<td>Mitigation of Potential Adverse Effects of Transgenic Crop Production for Long-Term Improvement of Soil Health</td>
<td>$7,481</td>
<td>Michael Osweiler (MICHAEL OSWEILER)</td>
</tr>
<tr>
<td>FW17-048</td>
<td>Sustainable Alternative Livestock Feed System for Small-Scale Ranchers</td>
<td>$20,000</td>
<td>Chelise Largent (Chelise Largent)</td>
</tr>
<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>
</tr>
<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>
</tbody>
</table>
Integrating Traditional Foods with Aquaponics in the Desert Southwest

Aaron Cardona
Arevalos Farm

On-Farm Pollinator Habitat

Dr. Gary Nabhan

Almuniya de los Zopilotes orchard

Navajo Crop Demonstration Project

Ernesto Zamudio
Principal Investigator

Agricultural Soil Amendment Project

Bill Edwards
North Leupp Family Farms
Stacey Jensen
NLFF

Eastern Navajo Cattle Herd Improvement

Anthony Howard
Eastern Navajo Cattle Growers

Intensive Cultivation Through Edible Cover Cropping Integrated with Bee Keeping

James Golo

Hopi Rangeland Management Series

Dennis Becenti

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

Richard Collins
Collins C6 Ranch

Ganado Farm Board Agricultural Marketing Study

Teresa Showa
Ganado Farm Board

Wool and Weavings Fair Traded from the Source

Carol Halberstadt
Black Mesa Weavers for Life and Land

EC Bar Ranch Riparian Grazing Management Project

James Crosswhite
EC Bar Ranch

Chinle Valley Navajo Truck Farm Project

Gwendolyn Wagner

Fruitvale Community Garden

Patricia Vigil

Sustainable Shrimp Farm Tours and Direct Sales Project

Gary Wood

Navajo Corn Pollen, Young Ears of Corn for Knee-Down-Bread, and Neeshjizhi Marketing

Teresa Showa

Gila River Farms Fresh Produce Market

Mary Thomas

Carrying on Dine’ Cultural/Traditional Flour Corn Farming: Roots of Dine’ People

Woodie and Maggie Jodie

Navajo Nation Livestock Disease Survey

Glenda Davis
### 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  
                       |                                                                |               | Dr. Barry Pryor, University of Arizona  
                       |                                                                |               | Justin Chung, University of Arizona  
                       |                                                                |               | Dr. Barry Pryor, University of Arizona  
                       |                                                                |               | Justin Chung, University of Arizona  
                       |                                                                |               | Dr. Barry Pryor, University of Arizona  
                       |                                                                |               | Justin Chung, University of Arizona  
                       |                                                                |               | 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 Charles 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  |
| GW10-004   | 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  |
                       |                                                                |               | Haley Paul, Arizona State University  |
| 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  |
| GW10-034   | Influences of Society, Politics and Local Knowledge on Ranch Management       | $25,000      | George Ruyle, University of Arizona  
                       |                                                                |               | Steven Woods, University of Arizona  |
### ON FARM RESEARCH/PARTNERSHIP GRANTS

<table>
<thead>
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<th>Project #</th>
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<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>OW20-359</td>
<td>Growing the bees to grow the farm</td>
<td>$48,862</td>
<td>Dr. Ethel Villalobos</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</td>
<td>$49,950</td>
<td>Chris Schmidt</td>
</tr>
</tbody>
</table>

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

$2,503,753

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).