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 $307 million to more than 7,384 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

$2,307,360 in total funding
59 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: 59 grants
- 29 Farmer/Rancher
- 12 Graduate Student
- 2 On Farm Research/Partnership
- 5 Professional Development Program
- 11 Research and Education

Total funding: $2,307,360
- $398,884 Farmer/Rancher
- $266,794 Graduate Student
- $98,812 On Farm Research/Partnership
- $350,164 Professional Development Program
- $1,192,706 Research and Education

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.

Rick Gibson
University of Arizona Cooperative Extension
(520) 836-5221 Ext: 227
gibsonrd@ag.arizona.edu

Randy Norton
UA Coop. 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.
Arizona has been awarded $2,307,360 grants to support 57 projects, including but not limited to, 9 research and/or education projects, 5 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</td>
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<td></td>
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<td>Dr. Albert Barberan University of Arizona</td>
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<td>Dr. Jeffrey Fehmi University of Arizona</td>
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<td>Dr. Mitch McClaran University of Arizona</td>
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<td></td>
<td>Leslie Roche UC Davis</td>
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<td>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>SW01-026</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>SW01-056</td>
<td>Conservation Tillage Benefits in a Cotton Centered Crop Rotation System</td>
<td>$175,277</td>
<td>William McCloskey University of Arizona</td>
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<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>
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<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>
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<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</td>
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<td>Dr. James Walworth University of Arizona</td>
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<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>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
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

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

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>
| FW20-359   | 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                                         |
| FW17-017   | 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 |
| FW13-142   | Integrating Traditional Foods with Aquaponics in the Desert Southwest        | $14,972      | Aaron Cardona
Arevalos Farm                                             |
| FW12-068   | On-Farm Pollinator Habitat                                                   | $25,000      | Dr. Gary Nabhan
Almuniya de los Zopilotes orchard                        |
| FW11-017   | Agricultural Soil Amendment Project                                          | $14,870      | Bill Edwards
North Leupp Family Farms
Stacey Jensen
NLFF                                                      |

FW11-006

EW17-006

EW14-002

EW07-020

EW02-010

EW98-007
<table>
<thead>
<tr>
<th>GRANT ID</th>
<th>Project Description</th>
<th>Amount</th>
<th>Principal Investigator</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW11-033</td>
<td>Navajo Crop Demonstration Project</td>
<td>$30,000</td>
<td>Ernesto Zamudio</td>
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<tr>
<td></td>
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<td>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</td>
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<tr>
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<td>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</td>
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<td>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</td>
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<td>Ganado Farm Board</td>
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<td>FW03-002</td>
<td>EC Bar Ranch Riparian Grazing Management Project</td>
<td>$7,500</td>
<td>James Crosswhite</td>
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<td>EC Bar Ranch</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</td>
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<td>Black Mesa Weavers for Life and Land</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>FW00-338</td>
<td>Sustainable Shrimp Farm Tours and Direct Sales Project</td>
<td>$5,800</td>
<td>Gary Wood</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>FW00-325</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>
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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</td>
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<td>Adams Ranch</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>
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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</td>
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<td>Spear G Ranch</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>
| 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  
Ana 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 |
| GW10-034  | Influences of Society, Politics and Local Knowledge on Ranch Management       | $25,000      | George Ruyle  
University of Arizona  
Steven Woods  
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 |
Arizona State University  
Haley Paul  
Arizona State University |
| 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>
</tr>
</thead>
</table>
| OW20-359  | Growing the bees to grow the farm                          | $48,862      | Dr. Ethel Villalobos  
University of Hawaii |
Total funding from the USDA SARE program to Arizona
$2,307,360

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).