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 $404 million to more than 8,776 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/state-profiles/arizona/

$1,498,225 in total funding

16 grant project

(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: **16 grants**

- 3 Farmer/Rancher
- 2 Research and Education
- 7 Professional Development Program
- 1 On Farm Research/Partnership
- 3 Graduate Student

Total funding: **$1,498,225**

- $59,652 Farmer/Rancher
- $646,931 Research and Education
- $664,389 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:

- **1,586 farmers participated in a SARE-funded project**
- **268 farmers reported a change in knowledge, awareness, skills or attitude**
- **28 farmers changed a practice**

![Photo credit: Shannon Heuberger](image)

Learn about local impacts at: [western.sare.org/sare-in-your-state/arizona/](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-profiles/arizona/](western.sare.org/state-profiles/arizona/) to learn more.

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

- **Debankur Sanyal**  
  University of Arizona  
  (701) 781-9295  
  dsanyal@arizona.edu

**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 $3,304,596 grants to support 66 projects, including but not limited to, 10 research and/or education projects, 12 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                                                                                                                                   |
| SW01-026   | Development of a Sustainable Polyculture Seaweeds and Fish on Molokai        | $95,200      | Stephen Nelson University of Arizona Environmental Research Lab                                                                                                                     |
| SW01-056   | Conservation Tillage Benefits in a Cotton Centered Crop Rotation System      | $175,277     | William McCloskey 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                                                                                                                        |
### SW00-053: Improving Pollination in the Southwest: Testing the on-farm feasibility of establishing and managing the carpenter bee for multiple crop farming systems
- **SARE Support**: $32,150
- **Project Leader**: Jim Donovan
  - Native Seeds SEARCH/University of Arizona

### SW98-068: Minimum Tillage Systems for Cotton: Reduced Energy, Time, and Particulates
- **SARE Support**: $182,850
- **Project Leader**: Robert Roth
  - University of Arizona
  - Dr. James Walworth
    - University of Arizona

### SW98-036: Indian Range Livestock Production in the West and Southwest: Entering, Enduring and Emerging from Drought Conditions
- **SARE Support**: $103,000
- **Project Leader**: Robert Kattnig
  - University of Arizona

### SW97-025: Sustainable Culture of the Edible Red Seaweed, Gracilaria parvispora, in Traditional Hawaiian Fishponds
- **SARE Support**: $95,201
- **Project Leader**: Edward P. Glenn
  - Univ. of AZ, Dept. of Soil, Water & Env. Science

### 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>WPDP24-001</td>
<td>PRECISION DRONE TECHNOLOGY TRAINING FOR ARIZONA FRTEP AGENTS</td>
<td>$97,871</td>
<td>Dr. Edward Franklin</td>
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<td>University of Arizona</td>
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<tr>
<td>WPDP24-008</td>
<td>Sharing Our Way - SOW Seeds Conference and Guidebook</td>
<td>$99,954</td>
<td>Dr. Andrea Carter</td>
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<td>Native Seeds/SEARCH</td>
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<tr>
<td>WPDP23-007</td>
<td>Strengthening the Technology Toolbox for Sustainable Rangeland Management</td>
<td>$99,769</td>
<td>Ashley Lauren Hall</td>
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<td>University of Arizona Cooperative Extension</td>
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<td></td>
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<td></td>
<td>Dr. Leslie Roche</td>
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<td>UC Davis</td>
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<td></td>
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<td>Dr. Mark Thorne</td>
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<td>University of Hawaii at Manoa</td>
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<tr>
<td>WPDP22-016</td>
<td>Collaborative Training for Virtual Fencing Implementation for Sustainable</td>
<td>$99,679</td>
<td>Dr. Aaron Lien</td>
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<tr>
<td></td>
<td>Rangeland Management under Environmental Uncertainty</td>
<td></td>
<td>University of Arizona</td>
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<td></td>
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<td></td>
<td>Joslyn Beard, Ph.D.</td>
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<td>Arizona Board of Regents, University of Arizona</td>
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<td></td>
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<td>Aaron Lien, Ph.D.</td>
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<td>Arizona Board of Regents, University of Arizona</td>
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<td>Andrew McGibbon</td>
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<td>Santa Rita Ranch LLC</td>
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<tr>
<td>WPDP22-019</td>
<td>From the ground up: Educating Cooperative Extension and NRCS about agricultural</td>
<td>$70,723</td>
<td>Elise Gornish</td>
</tr>
<tr>
<td></td>
<td>technologies to enhance soil health</td>
<td></td>
<td>University of Arizona</td>
</tr>
</tbody>
</table>
Increasing the Online Communication Toolbox for Sustainable Rangeland Management: A Train-the-Trainer Program

WPDP21-026

$99,993

Amber Dalke

University of Arizona

Retta Bruegger

Colorado State University Extension

Natural Resource Conservation Professional Development Project

WPDP21-007

$96,400

Deborrah Smith

Arizona Association of Conservation Districts

Collaborative Training for Southwest Grassland Restoration under Environmental Uncertainty

EW17-006

$71,503

George Ruyle

University of Arizona

SOLAR ENERGY TRAINING PROGRAM FOR ARIZONA EXTENSION EDUCATORS

EW14-002

$65,559

Dr. Edward Franklin

University of Arizona

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

EW07-020

$60,560

Barron Orr

University of Arizona

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

EW02-010

$100,000

Joanna Austin-Manygoats

Navajo Nation Department of Agriculture

John Blueyes

Navajo Nation Department of Agriculture

Navajo Noxious Weed Training Program

EW98-007

$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>
<tbody>
<tr>
<td>FW20-359</td>
<td>Reduce water consumption in urban agriculture in arid climates</td>
<td>$20,000</td>
<td>Chaz Shelton</td>
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<td></td>
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<td></td>
<td>Merchant’s Garden AgroTech Inc</td>
</tr>
<tr>
<td>FW20-367</td>
<td>Developing new, space efficient, growing techniques, with water conservation,</td>
<td>$19,983</td>
<td>Rylan Morton-Starner</td>
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<td></td>
<td>native fish preservation, and increased crop yields for small farmers.</td>
<td></td>
<td>Forestdale Farm LLC</td>
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<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</td>
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<td></td>
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<td>Sand-Reckoner Vineyard</td>
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<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</td>
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<td></td>
<td>MICHAEL OSWEILER</td>
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<tr>
<td>Code</td>
<td>Title</td>
<td>Amount</td>
<td>Principal Investigator</td>
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<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>
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<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>
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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>
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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>
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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>
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<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>
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</tbody>
</table>
FW03-104  Wool and Weavings Fair Traded from the Source $15,000 Carol Halberstadt Black Mesa Weavers for Life and Land

FW02-215  Chinle Valley Navajo Truck Farm Project $13,500 Gwendolyn Wagner

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 Neeshjizhi 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 Spear G Ranch

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

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

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>
<tbody>
<tr>
<td>GW22-243</td>
<td>Testing the potential of seed pellets to improve the soil health in rangelands</td>
<td>$28,577</td>
<td>Dr.Albert Barberan</td>
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<td>University of Arizona</td>
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<td></td>
<td></td>
<td></td>
<td>Ben Yang</td>
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<td>University of Arizona</td>
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<tr>
<td>Project Code</td>
<td>Title</td>
<td>Amount</td>
<td>Principal Investigator(s)</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 |
| GW18-131     | Empowering producers to effectively integrate chemical and biological controls through research and outreach on selective chemistries and impacts on natural enemies. | $25,000 | Dr. Peter Ellsworth  
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 |
| GW10-034     | 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 |
Arizona State University  
Haley Paul  
Arizona State University |
Assessing Direct and Indirect Interactions between Insect and Plant Pathogens and Their Impact on Insect Herbivores

Dr. Patricia Stock
Entomology - University of Arizona
Patricia Navarro
Arizona State University

$24,996

An Environmentally-Friendly Alternative for Control of the Citrus Nematode in Arizona

Dr. Patricia Stock
Entomology - University of Arizona
Joanna Gress
University of Arizona

$19,746

Contamination of non-Bt cotton fields by transgenic Bt cotton

Yves Carriere
University of Arizona
Shannon Heuberger
University of Arizona

$20,000

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**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>
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</thead>
<tbody>
<tr>
<td>OW20-359</td>
<td>Growing the bees to grow the farm</td>
<td>$48,682</td>
<td>Dr. Ethel Villalobos</td>
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<td>University of Hawaii</td>
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<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>
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<td>Native Seeds/SEARCH</td>
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**Total funding from the USDA SARE program to Arizona**

$3,304,596

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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).