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 $389 million to more than 8,542 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 in Utah

www.sare.org/sare-in-your-state/utah

$7,934,798 in total funding

90 grant projects

(project since 1988)

For more information on this project, see sare.org/projects, and search for project number SW13-034.

Project Highlight: Better Onions, Fewer Inputs

Onions are a high-value crop, but high fertilizer rates and aggressive use of pesticides to suppress weeds, diseases and insects threaten the sustainability of onion production. In Utah, growers and researchers are working to show how changes in management practices can allow farmers to maintain profitable yields while lowering their use of inputs.

In 2013 a SARE-funded team led by Utah State University’s Diane Alston studied the effect of certain changes on onion yields, in particular fertilization rates and crop rotations. They were following the lead of a small group of onion producers in the state who were finding they could reduce their use of pesticides by lowering their use of fertilizers and still achieve good yields.

The team pursued multiple objectives and developed a body of information that is helping Utah’s producers adopt more sustainable practices. They surveyed nearly 60 farms to better understand production system predictors of pests and yield; conducted field experiments that showed reducing fertilizer rates could reduce pest densities; and created an interactive production modeling tool.

In an assessment of producers conducted near the end of the project, 67 percent said the information they learned would help them diversify their operation, and 80 percent felt it would help them reduce their use of off-farm inputs.

For more information on this project, see sare.org/projects, and search for project number SW13-034.
**SARE Grants in Utah**

**Total awards:** 90 grants
- 38 Research and Education
- 12 Professional Development Program
- 23 Farmer/Rancher
- 10 Graduate Student
- 6 On Farm Research/Partnership
- 1 Research to Grass Roots

**Total funding:** $7,934,798
- $6,297,618 Research and Education
- $851,939 Professional Development Program
- $196,386 Farmer/Rancher
- $248,106 Graduate Student
- $279,590 On Farm Research/Partnership
- $61,160 Research to Grass Roots

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/utah

**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/utah to learn more.

Marion Murray
Utah State University
(435) 797-0776
marion.murray@usu.edu

Justen Smith
Utah State University
(435) 919-1331
justen.smith@usu.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.
Utah has been awarded $7,934,798 grants to support 89 projects, including but not limited to, 37 research and/or education projects, 12 professional development projects and 23 producer-led projects. Utah 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>
| SW23-950  | Impact of including sprouted grains in the ration of beef cattle relative to animal performance, quality and nutritive value of meat, and economic via | $349,975     | Dr.Kara Thornton Utah State University  
Brady Blackett Blackett Cattle Company  
Kelly Crozier Raise‘m Right Ranch  
Dr.Matthew Garcia Utah State University  
Dr.Korry Hintze, PhD Utah State University  
Dr.Clay Isom Utah State University, Dept. of Animal, Dairy, and Veterinary Sc  
Dr.Ryan Larsen Utah State University, Dept. of Applied Economics  
Jason Morgan Morgan Ranching Company  
Dr.Stephan van Vliet Utah State University |
| SW23-948  | Can soil carbon help fund rangeland management?                               | $349,975     | Megan Nasto Working Lands Conservation/Multiplier                                |
| SW22-941  | Identifying Stacked Conservation Practices that Optimize Water Use in Agriculture: Phase II | $350,000     | Matt Yost Utah State University  
Dr.Earl Creech Utah State University  
Neil Hansen Brigham Young University  
Dr.Bryan Hopkins BYU |
| SW22-942  | Using grazing-duration to balance: livelihoods, clean water, sage-grouse habitat, and sustainable forage in semi-arid rangelands | $328,329     | Dr.Kris Hulvey Working Lands Conservation  
Taylor Payne Utah Department of Agriculture's Grazing Improvement Program |
Dry Matter Intake and Feed Efficiency of Four Dairy Breeds in a Pasture-Based Heifer Development Program

Developing sustainable strategies for nutrient and pest management on small-acreage strawberry farms

Can we manage public rangelands for producers and the environment?: Using grazing-duration to balance livelihoods, clean water, sage-grouse habitat, and sustainable forage

Identifying Stacked Conservation Practices that Optimize Water Use in Agriculture

Establishing a protocol for receiving cattle that are at-risk of having a mineral deficiency

Best Management Practices for Regionally-Distinct Populations of the Blue Orchard Bee

Grass-birdsfoot trefoil mixtures to improve the economic and environmental sustainability of pasture-based organic dairies in the western U.S.

Improving Tart Cherry Sustainability

Training cattle to graze medusahead and avoid velvet lupine: A new tool to sustain the economic viability of livestock operations in the Western US

Integrated Byproduct Streams for Enhanced Viability of Combined Dairy Farm and Milk Processing Operations
<table>
<thead>
<tr>
<th>Code</th>
<th>Project Title</th>
<th>Cost</th>
<th>Principal Investigator</th>
<th>Institution</th>
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</thead>
<tbody>
<tr>
<td>SW13-034</td>
<td>Onion Systems Management Strategies for Crop Nutrition, Weeds, Thrips, and Iris Yellow Spot Virus</td>
<td>$169,299</td>
<td>Dr. Diane Alston</td>
<td>Utah State University</td>
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<tr>
<td>SW10-088</td>
<td>Grass-Legume pastures to increase economic and environmental sustainability of livestock production</td>
<td>$209,907</td>
<td>Dr. Blair Waldron</td>
<td>USDA-ARS</td>
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<tr>
<td>SW08-076</td>
<td>Cultural Management of Onion Thrips and Iris yellow Spot Virus</td>
<td>$133,441</td>
<td>Dr. Jennifer Reeve</td>
<td>Utah State University</td>
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<tr>
<td>SW07-035</td>
<td>High Value Crop Rotations for Utah High Tunnels</td>
<td>$144,495</td>
<td>Brent Black</td>
<td>PSC Department, Utah State University</td>
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<tr>
<td>SW07-014</td>
<td>Sustainable Vegetable Production: Screening Cover Crops for Water Use Efficiency</td>
<td>$118,411</td>
<td>Dr. Daniel Drost</td>
<td>Utah State University</td>
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<tr>
<td>SW04-060</td>
<td>Perennial Forage Kochia for Improved Sustainability of Grass-Dominated Ecosystems</td>
<td>$149,503</td>
<td>Dale Zobel</td>
<td>ADVS Dept., Utah State University</td>
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<tr>
<td>SW02-013</td>
<td>Sustainable Water Management for Irrigated Asparagus</td>
<td>$23,014</td>
<td>Dr. Daniel Drost</td>
<td>Utah State University</td>
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<tr>
<td>SW01-020</td>
<td>Production of Drought-adapted Intermountain Native Plants Through Low-cost, In-containers for Emerging Western Markets</td>
<td>$71,686</td>
<td>Roger Kjelgren</td>
<td>Utah State University</td>
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<tr>
<td>SW01-023</td>
<td>Biofumigants in Commercial Onion Production to Enhance Soil Nutrient Availability, Soil Quality, and Control of Weed, Nematode, and Disease Pests</td>
<td>$134,317</td>
<td>Brad Geary</td>
<td>Brigham Young University</td>
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<tr>
<td>SW01-034</td>
<td>Assessment of Value Added Milk from Pasture-based Dairies</td>
<td>$78,000</td>
<td>Tilak Dhiman</td>
<td>Utah State University</td>
</tr>
<tr>
<td>SW01-001</td>
<td>Value Added Opportunities from the Manufacture and Feeding of Silages Produced from Liquid Cheese Whey and Other By-products to Growing and Finishing Cattle and Beef Cows</td>
<td>$59,777</td>
<td>Dale Zobel</td>
<td>ADVS Dept., Utah State University</td>
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<tr>
<td>SW00-040</td>
<td>In-house composting in high-rise, caged layer facilities</td>
<td>$60,975</td>
<td>Richard Koenig</td>
<td>Utah State University</td>
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<tr>
<td>SW00-063</td>
<td>Impact Assessment of Western Region SARE Projects</td>
<td>$38,500</td>
<td>Dr. Rhonda Miller</td>
<td>WSARE</td>
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<tr>
<td>SW99-024B</td>
<td>The Effects of Altering the Protein Efficiency of Lactating Dairy Cows on the Whole-Farm Nitrogen Efficiency of Dairy Farms</td>
<td>$19,184</td>
<td>Richard Kohn</td>
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<tr>
<td>SW99-024</td>
<td>The Effects of Altering the Protein Efficiency of Lactating Dairy Cows on the Whole-farm Nitrogen Efficiency of Dairy Farms: Subcontract 1</td>
<td>$19,184</td>
<td>Allen Young</td>
<td>Utah State University</td>
</tr>
<tr>
<td>SW99-024A</td>
<td>The Effects of Altering the Protein Efficiency of Lactating Dairy Cows on the Whole-Farm Nitrogen Efficiency of Dairy Farms.</td>
<td>$89,571</td>
<td>Allen Young</td>
<td>Utah State University</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>SW98-058</td>
<td>Reducing Chemical Inputs in Arid-Climates Through Sustainable Orchard Management</td>
<td>$261,044</td>
<td>Schuyler Seeley Utah State University</td>
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<tr>
<td>SW96-032</td>
<td>Identification of Management Practices and Cultivars for Organic Hard-Winter Wheat Production</td>
<td>$93,911</td>
<td>David Hole Utah State University</td>
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<tr>
<td>SW95-006</td>
<td>A Livestock Production System Less Reliant on the Use of Publicly Owned Lands</td>
<td>$60,000</td>
<td>Randall D. Wiedmeier Utah State University</td>
<td></td>
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<tr>
<td>SW95-015</td>
<td>Public-Land Grazing Permittees Under Pressure: Sustainability of Coping Strategies on Private Land</td>
<td>$63,000</td>
<td>D. Layne Coppock Utah State University</td>
<td></td>
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<tr>
<td>LWD93-034</td>
<td>Four Corners Navajo Nation Sustainable Agriculture Demonstration Project</td>
<td>$100,000</td>
<td>Lyle G. McNeal Utah State University.</td>
<td></td>
</tr>
<tr>
<td>LWD93-006</td>
<td>Navajo Nation Whole Farm/Ranch Sustainable Systems Demonstration Project</td>
<td>$14,000</td>
<td>Lyle G. McNeal Utah State University.</td>
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</tr>
<tr>
<td>LWD92-005</td>
<td>Conference on the Science of Sustainable Agricultural Systems</td>
<td>$15,500</td>
<td>David Bezdicek Washington State University</td>
<td></td>
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</tbody>
</table>

**RESEARCH TO GRASS ROOTS GRANTS**

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGR20-007</td>
<td>Using the Wyoming Ranch Tools site to evaluate selected Western SARE research projects to assess economic sustainability for individual producers</td>
<td>$61,160</td>
<td>Bridger Feuz Master Stockman Consulting</td>
</tr>
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**PROFESSIONAL DEVELOPMENT PROGRAM GRANTS**

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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>WPDP23-008</td>
<td>Expanding cut flower production education supports agricultural professionals and small farms</td>
<td>$99,979</td>
<td>Dr. Melanie Stock Utah State University Dr. Kynda Curtis Utah State University Claudia Nischwitz Utah State University Nick Volesky Utah State University</td>
</tr>
<tr>
<td>WPDP22-002</td>
<td>Training Agriculture Educators in Utah using the Wyoming Ranch Tools site and Western SARE research projects.</td>
<td>$83,892</td>
<td>Bridger Feuz Master Stockman Consulting Hudson Hill Master Stockman Consulting LLC.</td>
</tr>
<tr>
<td>WPDP22-014</td>
<td>Educating and training community leaders to implement water recycling approach in Utah’s landscapes and nursery industry</td>
<td>$93,568</td>
<td>Dr. Shital Poudyal Utah State University Dr. Kelly Kopp Utah State University and CWEL Candace Schaible Utah State University Extension - Iron County Katie Wagner Utah State University Extension Josh Zimmerman Utah Department of Natural Resources</td>
</tr>
</tbody>
</table>
**WPDP21-012**  
Assisting Extension professionals in assessing profitable and sustainable agricultural enterprises with producer clientele  
$99,969  
Dr. Kynda Curtis  
Utah State University  
Dr. Ryan Larsen  
Utah State University, Dept. of Applied Economics  
Dr. Anastasia Thayer  
Utah State University  
Ruby Ward  
Utah State University

**WPDP19-14**  
Enhancing Enterprise Diversification Assessment for Native American Farmers to Enhance Economic Sustainability  
$67,650  
Ruby Ward  
Utah State University  
Vicki Hebb  
Trent Teegerstrom  
University of Arizona

**EW15-023**  
Sustaining the Future of Navajo Rangelands via Mobile Learning Tools to Promote Enhanced Vegetation Management  
$62,260  
Dr. Gerald Hawkes  
New Mexico State University

**EW14-017**  
Building Business Management Capacity for American Indian Agricultural Businesses  
$75,000  
Ruby Ward  
Utah State University

**EW13-005**  
Economic Evaluation of Agricultural Diversification through Agritourism for the Intermountain West  
$74,492  
Dr. Kynda Curtis  
Utah State University

**EW09-007**  
Economic Evaluation of Alternative (low-water use) Crops for the Great Basin  
$99,724  
Carol Bishop  
University of Nevada Cooperative Extension  
Dr. Kynda Curtis  
Utah State University

**EW06-018**  
Disseminating Research-based Information to Improve Great Basin Rangelands  
$21,605  
Summer Olsen  
Utah State University  
Mark Brunson  
Utah State University

**EW06-005**  
Entrepreneurial Sustainable Agriculture: Alternatives for Processing, Packing, Labeling and Marketing in Internet/Retail Environments  
$58,755  
John C. Allen, PhD  
Western Rural Development Center

**EW04-010**  
Communication of Range Demonstration Project Results  
$15,045  
Ken Mills  
Utah Association of Conservation Districts

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### FARMER/RANCHER GRANTS

<table>
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<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| FW23-429   | Study of hydroponics in cut flower production to increase water conservation and crop quality | $25,000      | Anna Zack  
Zack Family Farms                                       |
| FW23-420   | Reduction Of Water Use On Peony Crops By Using Shade Cloth.                    | $9,067       | Britin Van Brocklin  
Cherry petals flower farm                                  |
| FW22-400   | Economic and Yield Potential of Hemp Waste Material in Specialty Mushroom Substrate | $24,282      | Natasha Quinones-Rodriguez  
Intentional Growth                                        |
| FW22-394   | The Economics of Early Weaning and Early Breeding of Range Ewe Lambs          | $22,200      | Gene Peckham  
Peckham Livestock                                          |
| FW19-343   | Can barley fodder be fed in place of grass hay to dairy goats and dairy sheep and what effect will it have on milk production and composition. | $19,407      | Anita Wilson  
Milky Hollow Creamery                                      |
<table>
<thead>
<tr>
<th>Project Code</th>
<th>Project Title</th>
<th>Amount</th>
<th>Principal Investigator</th>
<th>Organization</th>
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<tbody>
<tr>
<td>FW07-315</td>
<td>Bramble Variety Trials in Utah to Reduce Disease, Increase Production and Enhance Profitability</td>
<td>$23,250</td>
<td>Rick Heflebower</td>
<td>Utah State University</td>
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<tr>
<td>FW06-327</td>
<td>Integrating Annual Crop Residues, Perennial Pastures, and Livestock Management to Extend the Grazing Season and Minimize Losses of Soil Nitrogen</td>
<td>$10,000</td>
<td>Thomas Griggs</td>
<td>Utah State University</td>
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<tr>
<td>FW06-027</td>
<td>Commercial Artichokes in the Intermountain West</td>
<td>$5,180</td>
<td>James Haggarty</td>
<td>Sun River Farms</td>
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<tr>
<td>FW06-012</td>
<td>Interseeding Forage Kochia in Established CRP Land for Enhanced Livestock and Wildlife Utilization</td>
<td>$7,621</td>
<td>Ron Harper</td>
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<tr>
<td>FW05-022</td>
<td>Increasing the Profitability of Raspberries by Extending the Growing Season</td>
<td>$2,310</td>
<td>Clark Willis</td>
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<tr>
<td>FW04-314</td>
<td>Organic Dairy Transition in Northern Utah</td>
<td>$7,500</td>
<td>Clark Israelsen</td>
<td>Utah State University Cooperative Extension</td>
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<tr>
<td>FW04-037</td>
<td>Tomato Disease Prevention and Production Enhancement</td>
<td>$2,095</td>
<td>Aviva Maller-O’Niel</td>
<td>Rick Heflebower</td>
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<tr>
<td>FW04-014</td>
<td>Goats as a Weed Control Alternative in Small Acreage Ranchettes</td>
<td>$3,382</td>
<td>Kyle Christensen</td>
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<tr>
<td>FW03-201</td>
<td>Winter Cover Crop Experiment</td>
<td>$1,120</td>
<td>Aviva Maller-O’Niel</td>
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<tr>
<td>FW03-306</td>
<td>Season Extension Experiment</td>
<td>$1,250</td>
<td>Rick Heflebower</td>
<td>Utah State University</td>
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<tr>
<td>FW00-317</td>
<td>The Original Cache Junction Families Popped Wheat</td>
<td>$2,801</td>
<td>Wes Roundy</td>
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<tr>
<td>FW00-054</td>
<td>Southern Utah Forest Products Association Cooperative Marketing Act</td>
<td>$4,835</td>
<td>Brian Cottam</td>
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<tr>
<td>FW00-019</td>
<td>Medusahead Control and Revegetation in Southern Cache County, UT</td>
<td>$6,414</td>
<td>Guy Pulsipher</td>
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<tr>
<td>FW99-117</td>
<td>Hovenweep Burn Reseeding and Demonstration Area</td>
<td>$4,000</td>
<td>Mary Tso</td>
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<tr>
<td>FW99-080</td>
<td>Composting Poultry Waste Inside High Rise Layer Houses</td>
<td>$4,992</td>
<td>Mike Shepherd</td>
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<tr>
<td>FW97-038</td>
<td>Increased Forage Production during Alfalfa Rotation Years in Johnson Canyon, Utah. Biological Control of Scotch and Bull Thistle on Disturbed Alfalfa Pastures</td>
<td>$2,900</td>
<td>Michael E. Noel</td>
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<tr>
<td>FW97-065</td>
<td>Alternative Cropping For the Navajo Reservation</td>
<td>$4,300</td>
<td>Mark Maryboy</td>
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</tbody>
</table>
FW95-084  Pasture Aeration and Fertilizer Study  $2,480  Ken Carter

## GRADUATE STUDENT GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| GW22-230  | Evaluating the Effectiveness of Range Riding at Reducing Conflicts Between Livestock and Native Carnivores Across the American West | $30,000      | Dr. Julie Young  
Rae Nickerson  
Utah State University  
Dr. Jennifer Reeve  
Utah State University  
Preston Christensen  
Utah State University |
| GW22-244  | Evaluating the Impact of Wheat Straw Amendments on Dryland Organic Wheat Systems | $29,995      | Dr. Astrid Jacobson  
USU  
Dr. Jennifer Reeve  
Utah State University  
Preston Christensen  
Utah State University |
| GW21-221  | Enhancement of Samurai Wasp [Trissolcus japonicus (Ashmead)] for Biocontrol of Invasive Brown Marmorated Stink Bug [Halyomorpha halys (Stål)] in Utah | $30,000      | Dr. Diane Alston  
Utah State University  
Curtis Rowley  
Cherry Hill Farms  
Dr. Lori Spears  
Utah State University  
Kate Richardson  
Utah State University |
| GW20-215  | Identification of effective cover crop varieties and integrated management practices for weedy and invasive plant suppression in the Western US | $25,000      | Dr. Corey Ransom  
Utah State University  
Danielle Thiemann  
Utah State University |
| GW18-156  | Utilizing Tannin-Containing Forages and Holos Software for Sustainable Beef Production in the Intermountain West | $20,204      | Dr. Jennifer Reeve  
Utah State University  
Kathryn Slebodnik  
Utah State University |
| GW18-106  | Brown Marmorated Stink Bug in Utah's Intermountain West                      | $24,999      | Dr. Diane Alston  
Utah State University  
Mark Holthouse  
Utah State University |
| GW17-060  | Navajo Spinach (Cleome serrulata): Improving Seed Germination from Wild Populations Gathered across Native Lands of the Four Corners | $24,969      | Dr. Daniel Drost  
Utah State University  
Reagan Wytsalucy  
Utah State University |
| GW15-046  | Improved simple on-site soil quality testing for soils in the Intermountain West | $24,844      | Dr. Jennifer Reeve  
Utah State University  
Esther Thomsen  
USU |
| GW13-006  | Determination of gas emissions from manure sources in animal feeding operations | $25,000      | Scott B. Jones  
Utah State University  
Dr. Rhonda Miller  
WSARE  
Pakorn Sutitarmnontr  
Biological Engineering Department, Utah State University |
| GW12-030  | Contributions to pest suppression through predator phenology and functional diversity | $13,095      | Dr. Ricardo Ramirez  
Utah State University  
Erica Stephens  
Utah State University |

## ON FARM RESEARCH/PARTNERSHIP GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
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<th>SARE Support</th>
<th>Project Leaders</th>
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</table>
Management strategies for Tomato spotted wilt virus and curtoviruses in Utah
Claudia Nischwitz
Utah State University
Dr. Diane Alston
Utah State University
Richard Heflebower
Utah State University Extension - Washington County

Promoting crop diversification and soil health for cut flower production
Dr. Melanie Stock
Utah State University
Dr. Brent Black
Utah State University
Dr. Daniel Drost
Utah State University
Dr. Larry Rupp
Utah State University

Supporting Natural Enemies of the Cabbage Aphid with Hedgerow Plantings
Laura Horn
Wild Bee Project

Biochar Amendment to Enhance Tomato and Melon Productivity and Protect Against Phytophthora Root Rot Disease
Marion Murray
Utah State University

Rangeland Restoration on the Channel Scablands of Eastern Washington
Dr. Kip Panter
USDA-ARS-PPRL

Feedlot performance, feed efficiency, and profitability of cattle fed either a complete mixed ration or allowed to voluntarily select their diet.
Beth Burritt
Utah State University

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$7,934,798