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, granteeproduced information products and other educational materials.

www.sare.org

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

Colorado

Project Highlight: Dryland Cropping Intensification Shows Benefits
In the Great Plains region of Colorado, a scarce supply of water is the chief limiting factor in dryland cropping yields. This concern over limited water availability prompts many farmers in the area to adopt a winter wheat-fallow rotation, yet this approach worsens soil productivity over the long term.

Intensifying production and using no-till could actually improve yields and profitability by building up soil health and improving moisture retention. Using a SARE grant, Colorado State University graduate student Steven Rosenzweig set out to both quantify the benefits of reducing fallow frequency and understand the barriers to adoption. He compared different dryland rotation intensities and found that reducing fallow improved soil health, which ultimately allowed farmers to improve grain production with a similar amount of fertilizer.

He also conducted in-depth interviews with 30 farmers, and identified risk, profitability and crop insurance policy as top perceived barriers to reducing fallow frequency. He also identified strategies for helping farmers overcome the barriers, such as changing the way agronomic researchers approach their work to be more inclusive of long-term viewpoints and profitability. The identified benefits, barriers and strategies for change were widely disseminated, including a website, blog and an upcoming film.

For more information on this project, see sare.org/projects, and search for project number GW16-020.

SARE in Colorado
western.sare.org/sare-in-your-state/colorado

$4,885,358 in total funding
102 grant projects
(since 1988)

For a complete list of grant projects state by state, go to www.sare.org/state-summaries
SARE Grants in Colorado

Total awards: 102 grants
- 53 Farmer/Rancher
- 5 Graduate Student
- 5 On Farm Research/Partnership
- 21 Professional Development Program
- 18 Research and Education

Total funding: $4,885,358
- $520,995 Farmer/Rancher
- $123,992 Graduate Student
- $236,989 On Farm Research/Partnership
- $1,236,286 Professional Development Program
- $2,767,096 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/colorado

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/colorado to learn more.

Steven Newman
Colorado State University
(970) 491-7118
steven.newman@colostate.edu

Bill Noble
Colorado State University Extension
(719) 545-1845
william.nobles@colostate.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.
Colorado has been awarded $4,885,358 grants to support 102 projects, including but not limited to, 18 research and/or education projects, 21 professional development projects and 53 producer-led projects. Colorado 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>
| SW20-910   | Developing sustainable peach orchard soil microbiome management practices to control replant disease syndrome | $350,000     | Dr. Ioannis Minas  
                          Colorado State University  
                          Dr. Jorge Vivanco  
                          Colorado State University |
| SW18-500   | Examining Cover Crops for Soil Health Restoration in Dryland Cropping Systems in SW Colorado and SE Utah | $249,974     | Dr. Steven Fonte  
                          Colorado State University |
| SW15-008   | The Feasibility of Cover Crops in Dryland Cropping Systems in SW Colorado and SE Utah | $249,269     | Dr. Abdelfettah Berrada  
                          Colorado State University-Southwestern Colorado Research Center |
| SW14-023   | On-farm Cyanobacterial Bio-fertilizer Production to Reduce the Carbon Footprint of Organic Fruit and Vegetable Production | $293,599     | Dr. Jessica Davis  
                          Colorado State University |
| LNC14-356  | The Bison Advantage Outreach and Education Program                              | $103,675     | Jim Matheson  
                          National Bison Association |
| SW09-053   | Harnessing the Sun for On-farm Fertilizer Production                           | $159,023     | Dr. Jessica Davis  
                          Colorado State University |
| SW09-401   | Farm to Fork: Connecting Our Youth with Sustainable Agriculture                | $48,988      | Dennis Lamm  
                          Colorado State University  
                          Tisha Casida  
                          That’s Natural! |
| SW08-033   | Integrating Perennial Living Mulches into Irrigated Cropping Systems           | $146,684     | Joe Brummer  
                          Colorado State University |
| SW06-028   | Site-specific Manure Management for Improving Soil Quality                     | $131,332     | Dr. Raj Khosla  
                          Colorado State University |
| SW05-085   | Supply and Market Analysis for Organic Producers in the Four Corners States   | $144,511     | Dennis Lamm  
                          Colorado State University |
| SW04-087   | Native Seed Production for Crop Diversification                               | $171,121     | Dr. Ron Godin  
                          Colorado State University - Rogers Mesa Res. Ctr. |
| SW02-002   | Extending Irrigated Alfalfa Stand Life and Long-Term Profitability by Alteration of Late-Season Harvest Schedules | $61,270      | Robert Hammon  
                          Tri River Cooperative Extension |
**A Range Management Curriculum and Participatory Planning Project for the Tohono O’odham Nation**

$99,263  
Maria Fernandez-Gimenez  
Colorado State University

**Utilization of Compost Made from Agricultural and Forestry Wastes for Improving the Economic and Ecological Sustainability of Agronomic Crop Production on Low Organic Matter Soils in the San Luis Valley of Colorado**

$137,916  
Richard Zink  
Colorado State University

**Developing Sustainable Dryland Cropping Systems in SW Colorado and SE Utah Using Conservation Tillage and Crop Diversification**

$142,380  
Dr. Abdelfettah Berrada  
Colorado State University-Southwestern Colorado Research Center

**Reducing Environmental Contamination from Feedlot Manure in the South Platte River Basin through Agronomic, Economic, and Social Analysis and Education**

$206,000  
Dr. Jessica Davis  
Colorado State University

**Effectiveness of Beauveria Bassiana as a Microbial Control Agent for Coleopteran and Homopteran Pests of Irrigated Alfalfa**

$36,091  
Frank Peairs  
Colorado State University

**Compiling a Database of Sustainable Producers for the Southern Rockies Region**

$36,000  
Rita Robinson  
Sustainable Mountain Agricultural Alliance (SMALL)

### 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>
| EW18-005   | Seed Saving Farmer Training                                                   | $45,350      | Lee-Ann Hill  
Rocky Mountain Seed Alliance                                                        |
| EW14-024   | Colorado Resource Monitoring Initiative-Professionals Training               | $23,000      | Erin Karney  
Colorado Cattlemen's Association                                                   |
| EW12-009   | Integrating Birds in Range Management across the Sagebrush Steppe             | $60,000      | Laura Quattrini  
Rocky Mountain Bird Observatory (dba Bird Conservancy of the Rockies)          |
| EW09-014   | Curricula and Instructional Modules for Sustainable Small-Scale Greenhouse Production | $60,000      | Dr. Steven Newman  
Colorado State University                                                            |
| EW09-013   | In-service Training and Decision-Making Tools for Optimizing Livestock Mortality Management | $97,848      | Dr. Jessica Davis  
Colorado State University                                                            |
| EW08-016   | Professional Training for Developing a Hands-On Organic Weed Management Learning Center for Commercial Market Gardens in Local Communities | $89,492      | Beth LaShell  
Fort Lewis College                                                                  |
| EW07-008   | Enterprise, Environmental and Community Development to Promote Agricultural and Heritage Tourism | $59,973      | Martha Sullins  
Dawn Thilmany  
Andrew Seidl  
Colorado State University                                                           |
| EW06-019   | Using Videos as a Teaching Tool: Improving Profits and Rangelands Through Application of Behavioral Principles | $80,000      | Beth Burritt  
Utah State University                                                               |
**Manure Management: An essential component of 4-H livestock projects**

Dr. Jessica Davis  
Colorado State University  
EW05-015

**BEHAVE Facilitator’s Network**

Kathy Voth  
Utah State University  
EW04-016

**Education, Training and Outreach on Risk Education**

Doug Hoag  
CSU  
EW03-011

**Establishing Dialogue Between Alternative Agricultural Producers and the Land-Grant University in Colorado**

Dr. Jessica Davis  
Colorado State University  
EW02-017

**Niche Beef Production and Marketing in Colorado**

Martha Sullins  
American Farmland Trust  
Julia Freedgood  
American Farmland Trust  
Dawn Thilmany  
Colorado State University  
Tom Field  
Colorado State University  
EW02-004

**Integrating Bird Conservation into Range Management**

Tammy VerCauteren  
Rocky Mountain Bird Observatory  
EW02-009

**Exploration of the Ethical Basis for Agricultural Sustainability**

Robert Zimdahl  
Weed Research Lab, Colorado State University  
EW01-021

**Coached Land Planning and Care**

Scott Cotton  
Colorado State University Cooperative Education  
EW01-022

**Workshops on Land Use and Land Protection Policy**

Jeff Jones  
American Farmland Trust  
EW99-006

**In-Depth Training and Work Experience on a Community Supported Agriculture (C.S.A.) Farm**

Steve Carcaterra  
Colorado State University Cooperative Extension  
EW97-005

**Improving Manure Management to Protect Water Quality in the Southwestern U. S.**

Dr. Jessica Davis  
Colorado State University  
EW96-002

**Video Introduction to Sustainable Agriculture for Eight Western States**

Joe Hiller  
University of Wyoming, Cooperative Extension Service  
EW95-018

**Permaculture Systems Pamphlet**

Jerome Osentowski  
Central Rocky Mountain Permaculture Institute  
EW94-009

**FARMER/RANCHER GRANTS**

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| FW20-371  | The Application of using High-Fungal Compost to Renovate Mountain Meadow Pastures | $20,000      | Steve Oswald  
Oswald Cattle Co |
| FW19-341  | The Citizen Science Soil Health Project                                         | $24,800      | Elizabeth Black  
Your Neighborhood Christmas Tree Farm |
| FW19-354  | Evaluating Forage Production and Ranching in Response to Regenerative Rotational Grazing on Dryland Pastures in Southwest Colorado. | $25,000      | Chuck McAfee  
Charles M.McAfee & CO. LLLP |
<table>
<thead>
<tr>
<th>Project ID</th>
<th>Project Title</th>
<th>Amount</th>
<th>Principal Investigator(s)</th>
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</thead>
<tbody>
<tr>
<td>FW18-053</td>
<td>Managing Canada Thistle for Soil Health and Greater Farm Profitability through Crimped Cover Crop and Strip Tillage on Annual Brassicas and Cucurbits</td>
<td>$8,978</td>
<td>Michael Nolan Mountain Roots Produce LLC</td>
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<tr>
<td>FW15-046</td>
<td>Feasibility of Summer (floricane) Brambles in Colorado</td>
<td>$14,571</td>
<td>Amy Kafka Garden Sweet</td>
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<tr>
<td>FW15-057</td>
<td>Supplemental Heating of High Tunnels by Energy-Producing Compost Piles</td>
<td>$15,000</td>
<td>Dr.Amy Yackel Adams Sunspot Urban Farm</td>
</tr>
<tr>
<td>FW14-027</td>
<td>Colorado Queen Honey Bee Testing Project for Increased Sustainability</td>
<td>$24,922</td>
<td>Kristine Holthaus Colorado Queen Honey Bee Testing Project for Increased Sustainability</td>
</tr>
<tr>
<td>FW13-128</td>
<td>Improved Honeybee Health through Foundation Modification</td>
<td>$25,000</td>
<td>Audrey Sue McWilliams Sue McWilliams</td>
</tr>
<tr>
<td>FW12-076</td>
<td>Development of a Digitally Integrated, Low-cost Farm-to-Consumer Product Tracking System for Small Scale Farmers and Grower Networks</td>
<td>$24,965</td>
<td>Brett KenCairn Circle Fresh Farms</td>
</tr>
<tr>
<td>FW11-010</td>
<td>Alternative crops to diversify the traditional winter wheat/fallow cropping system in Northwest Colorado</td>
<td>$29,821</td>
<td>Mike Williams none Mike Williams</td>
</tr>
<tr>
<td>FW10-059</td>
<td>Expanding Small Ruminant Dairy Production</td>
<td>$14,500</td>
<td>Suzanne Quintana Quintana Farms Neville McNaughton Cheezsorce</td>
</tr>
<tr>
<td>FW10-070</td>
<td>Effects of Sustainable Soil Amendments on Nutrient Availability in High Alkaline pH Soil in Field Production of Trees in Northeastern Colorado</td>
<td>$14,379</td>
<td>Dr.Brooke Edmunds CSU Extension David Rickman Boxelder Creek Nurseries</td>
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<tr>
<td>FW09-030</td>
<td>Alternative Fertilizer for Meadow Grass Hay</td>
<td>$10,775</td>
<td>Nancy Roberts Arrowpoint Cattle Co., LLC</td>
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<tr>
<td>FW07-024</td>
<td>Different Goat Breed Crosses to Find the Best Tasting Meat</td>
<td>$12,623</td>
<td>Holly Napier Napier Family Farms</td>
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<tr>
<td>FW07-031</td>
<td>Raising Livestock and Crops Simultaneously in Unheated Greenhouses</td>
<td>$12,089</td>
<td>John Socolofsky Antelope Creek Ranch</td>
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<tr>
<td>FW07-319</td>
<td>Season Extension and Crop Area Multiplication with a Moveable Hoophouse in an Organic System</td>
<td>$11,230</td>
<td>Dr.Edward Page CSU Extension</td>
</tr>
<tr>
<td>FW06-028</td>
<td>Integrated Control of Weeds and Verticillium in Strawberry Nurseries</td>
<td>$10,000</td>
<td>Brian Coleman Ruby Mountain Nursery</td>
</tr>
<tr>
<td>FW06-314</td>
<td>Business Plan for Producers to Create Value-added Crop-based Products</td>
<td>$20,000</td>
<td>Ravi Malhotra ICAST Intl Ctr for Appropriate &amp; Sustainable Tech</td>
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<tr>
<td>FW05-009</td>
<td>Non-chemical Control of Nematodes in Potatoes</td>
<td>$9,922</td>
<td>Monty Smith Three S Ranch</td>
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<tr>
<td>FW05-309</td>
<td>Management Practices for Drip Irrigation in Baca County, Colorado</td>
<td>$9,353</td>
<td>James Vaillant Colorado State University</td>
</tr>
<tr>
<td>Project Code</td>
<td>Project Title</td>
<td>Budget</td>
<td>Principal Investigator(s)</td>
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<tr>
<td>FW04-112</td>
<td>Common Standards and Labeling</td>
<td>$13,500</td>
<td>Dan Hobbs, Tres Rios Agricultural Cooperative Inc.</td>
</tr>
<tr>
<td>FW04-318</td>
<td>Using Irrigated Forage Pastures to Enhance Livestock Production Sustainability</td>
<td>$13,555</td>
<td>Bruce Bosley, Colorado State University; Gene Schmitz, Colorado State University</td>
</tr>
<tr>
<td>FW03-016</td>
<td>Production of Medicinal Herbs as an Integral Part of On-farm Cheese Production and the Use of Medicinals for Immuno-stimulation and Enhanced Milk Production</td>
<td>$5,455</td>
<td>Denise Bohemier, El Rancho del Cielo</td>
</tr>
<tr>
<td>FW03-109</td>
<td>Edamame Bean Production and Marketing</td>
<td>$5,000</td>
<td>Phil Knob</td>
</tr>
<tr>
<td>FW03-111</td>
<td>Market Development for an Edible Bean Food Business</td>
<td>$5,000</td>
<td>Shane Atchley</td>
</tr>
<tr>
<td>FW02-025</td>
<td>Colorado Organic Honey Production</td>
<td>$6,000</td>
<td>Cesar Flores</td>
</tr>
<tr>
<td>FW02-003</td>
<td>Agricultural Systems Economics for Hay production</td>
<td>$1,030</td>
<td>Wilbur Miller</td>
</tr>
<tr>
<td>FW02-006</td>
<td>SE Colorado Range Plant Quality Database and Supplement Formulation Program</td>
<td>$13,488</td>
<td>John Doherty</td>
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<tr>
<td>FW02-007</td>
<td>Propagation of Colorado Native Plants</td>
<td>$7,500</td>
<td>Ann Grant</td>
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<tr>
<td>FW02-014</td>
<td>Study to Determine if Nepeta Cataria (Catnip) Can Be Commercially Grown in Montrose, CO</td>
<td>$5,000</td>
<td>Susan Bony</td>
</tr>
<tr>
<td>FW02-021</td>
<td>Design and Building of a Facility for the production of Goat and Sheep milk Cheeses on the farmstead in rural SW Colorado</td>
<td>$7,460</td>
<td>Denise Bohemier, El Rancho del Cielo</td>
</tr>
<tr>
<td>FW01-009</td>
<td>Tillage and Irrigation Assessment Effecting Soil Salinity along South Platte River</td>
<td>$6,400</td>
<td>Randy Honstein, Natural Resources Conservation District</td>
</tr>
<tr>
<td>FW01-010</td>
<td>Pastured Poultry as an Alternative and Enhancement to a Traditional Livestock Agricultural System</td>
<td>$6,500</td>
<td>Tony Daranyi, Colorado State University</td>
</tr>
<tr>
<td>FW00-012</td>
<td>Residue Management in Furrow Irrigated Reduced Tillage Systems</td>
<td>$4,650</td>
<td>Randy Hines</td>
</tr>
<tr>
<td>FW00-329</td>
<td>Paradox Valley Heirloom Foods and Native Seed Grow-Out</td>
<td>$9,997</td>
<td>Martha Ames Burgess</td>
</tr>
<tr>
<td>FW00-028</td>
<td>Building a Community-based Direct Marketing Model for Diverse Ranch Enterprises</td>
<td>$5,000</td>
<td>Jeremy Gingerich</td>
</tr>
<tr>
<td>FW00-032</td>
<td>Organic Soil Amendment Release Rates for Fertility in Apples</td>
<td>$6,750</td>
<td>Steve Ela</td>
</tr>
</tbody>
</table>
FW00-038 Native Plants Nursery $5,000 John Squire
FW00-074 Colorado Quality Lamb: Enhancing the Economic Viability of Local Producers Through Direct Marketing to Food Service Establishments $5,000 David Myers
FW00-240 Carbondale Community Garden Cooperative $8,311 Wendy Anderson
FW00-277 Custer County Ag-Products Internet Marketing Project $2,160 Sara Hebbert
FW00-302 Alternative Crop Marketing Based on a Pre-existing Urban-Rural Spiritual and Social Relationship $3,400 Paul Mailander
FW99-065 Sustainable Sheep Dairy Project $3,550 Steve and Carolyn Keller
FW99-011 Hydraulic Windmill Pump $2,733 Lonnie Jackson
FW98-020 Testing Alternative Crop Rotations for Traditional Small Grain/Fallow System $3,000 James Faughnan
FW98-024 Integrated Weed Management of Musk Thistle with Emphasis on Biological Control $2,938 Larry Matschke
FW98-025 Annual Forage Production for an Intensive Winter Grazing System $2,665 John Haws
FW98-065 Cultures and La Manga Cattlemen’s Association Range Analysis and Improvement Project $8,700 Dennis Moeller
FW97-003 Converting Pasture Land to Specialty Crop Production as an Alternative Farm Enterprise $2,500 Trent J. Taylor
FW97-032 Perennial Grass Establishment in Existing Alfalfa $1,825 Douglas B. Wiley
FW97-045 Pasture Fryer Chickens $2,500 Pete Mattics
FW96-005 Habitat Management as a Transitional Tool to an Insecticide: Free Pest Management Program in Apples $1,500 Bob White
FW95-047 Evaluation of Alternative Crops in Dryland Multi-Crop Rotations on Farms in the Northeastern Colorado Region $5,000 Joe Kinnie

Colorado Conservation Tillage Association

GRADUATE STUDENT GRANTS

<table>
<thead>
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<th>Project #</th>
<th>Project Title</th>
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<tr>
<td></td>
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<td></td>
<td>Colorado State University</td>
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<tr>
<td></td>
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<td></td>
<td>Anna Clare Monlezun</td>
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<tr>
<td></td>
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<td></td>
<td>Colorado State University</td>
</tr>
</tbody>
</table>
GW19-202  Climate mitigation through soil carbon sequestration: increasing soil resilience and plant productivity on rangelands through compost application  $24,766  Dr. Jennie DeMarco  Western Colorado University  Amy Honan  Western Colorado University  Alexia Cooper  Western State Colorado University (doing business as Western Colorado University)

GW16-020  Dryland cropping system intensification in the West-Central Great Plains: Impacts and barriers to adoption  $25,009  Meagan Schipanski  Colorado State University  Steven Rosenzweig  Colorado State University

GW14-028  Information flows along the beef supply chain: Information exchange as a strategy for mitigating increased costs and maximizing producer profits.  $25,000  Dr. Jennifer Bair  Sociology, CU Boulder  Sarah Lake  University of Colorado-Boulder

GW11-019  Impacts of Reduced Nitrogen Application During Late Growing Season on Potato Tuber Quality and Profitability  $24,490  Dr. Sastry Jayanty  Department of Horticulture and LA  Henry Castleberry  Colorado State University

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>
<tbody>
<tr>
<td>OW20-357</td>
<td>Microbial Ecology of Vermicompost and Vermi-teas</td>
<td>$49,100</td>
<td>Dr. Zackary Jones  Rocky Mountain Soil Stewardship  Kathy Doesken  Rocky Mountain Soil Stewardship</td>
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<tr>
<td>OW20-358</td>
<td>Compost for Carbon Sequestration on Irrigated Pasture</td>
<td>$49,746</td>
<td>Retta Bruegger  Colorado State University Extension  Dr. Megan Machmuller  Colorado State University  Seth Urbanowitz  Colorado State University Extension</td>
</tr>
<tr>
<td>OW10-325</td>
<td>Organic Winter Production Scheduling in Unheated High Tunnels.</td>
<td>$38,358</td>
<td>Frank Stonaker  Colorado State University</td>
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<tr>
<td>OW10-309</td>
<td>Reducing Nitrogen Fertilizer Inputs to Irrigated Pastures and Hayfields by Interseeding Legumes</td>
<td>$49,849</td>
<td>Joe Brummer  Colorado State University</td>
</tr>
<tr>
<td>OW10-321</td>
<td>Using Cattle to Rehabilitate Rangeland Vegetation and Improve Ecosystem Function (3 yr project)</td>
<td>$49,936</td>
<td>Kathy Voth  Livestock for Landscapes</td>
</tr>
</tbody>
</table>

Total funding from the USDA SARE program to Colorado  
$4,885,358

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).