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 $332 million to more than 7,748 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...

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

$5,545,979 in total funding

107 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: 107 grants
- 19 Research and Education
- 24 Professional Development Program
- 53 Farmer/Rancher
- 5 Graduate Student
- 6 On Farm Research/Partnership

Total funding: $5,545,979
- $3,117,090 Research and Education
- $1,471,913 Professional Development Program
- $520,995 Farmer/Rancher
- $123,992 Graduate Student
- $311,989 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/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.

Adrian Card  
Colorado State University Extension  
(303) 678-6383  
adrian.card@colostate.edu

Ioannis Minas  
Colorado State University  
(970) 491-7216  
ioannis.minas@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 $5,545,979 grants to support 107 projects, including but not limited to, 19 research and/or education projects, 24 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>
| SW21-921  | Strengthening Opportunities Along the Meat Supply Chain to Promote Sustainable Agriculture in Intermountain States | $349,994     | Becca Jablonski  
Colorado State University  
Thomas Bass  
Montana State University  
Cody Gifford  
University of Wyoming  
Jennifer Martin  
Colorado State University  
Martha Sullins  
Colorado State University Extension  
Dr. Caitlin Youngquist  
University of Wyoming |
| 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 |
| LNC14-356 | The Bison Advantage Outreach and Education Program                           | $103,675     | Jim Matheson  
National Bison Association |
| 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 |
| 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 |
Supply and Market Analysis for Organic Producers in the Four Corners States $144,511 Dennis Lamm Colorado State University

Native Seed Production for Crop Diversification $171,121 Dr. Ron Godin Colorado State University - Rogers Mesa Res. Ctr.

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>
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<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
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<tbody>
<tr>
<td>WPDP21-029</td>
<td>Training Colorado educators about Sustainable Co-existence between ranchers and wolves</td>
<td>$99,949</td>
<td>dana Hoag Colorado State University Dr. Stewart Breck Colorado State University Dr. Kevin Crooks Fish, Wildlife, and Conservation Biology, Colorado State University Dr. Alex Few Western Landowners Alliance CJ Mucklow Colorado State University Dr. John Sanderson Colorado State University Robin Young Colorado State University</td>
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<td>WPDP21-017</td>
<td>Reviving the Range School: Range Science Training for Colorado Extension Agents</td>
<td>$60,007</td>
<td>Dr. Kevin Jablonski Colorado State University Retta Bruegger Colorado State University Extension Anne Overlin Colorado State University</td>
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<tr>
<td>Project</td>
<td>Title</td>
<td>Award Amount</td>
<td>Principal Investigator(s)</td>
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| WPDP21-016| Growing Heritage Grains for Market Production                | $75,671      | Lee-Ann Hill
Rocky Mountain Seed Alliance
Lynda Garvin
Valencia County Cooperative Extension Service
Emily Lockard
Colorado State University Southwestern
Colorado Research Center |
| 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) |
| EW09-013  | In-service Training and Decision-Making Tools for Optimizing Livestock Mortality Management | $97,848      | Dr. Jessica Davis
Colorado State University |
| EW09-014  | Curricula and Instructional Modules for Sustainable Small-Scale Greenhouse Production | $60,000      | Dr. Steven Newman
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
Colorado State University
Dawn Thilmany
Colorado State University
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 |
| EW05-015  | Manure Management: An essential component of 4-H livestock projects | $59,927      | Dr. Jessica Davis
Colorado State University |
| EW04-016  | BEHAVE Facilitator's Network                                 | $99,702      | Kathy Voth
Utah State University |
| EW03-011  | Education, Training and Outreach on Risk Education           | $99,600      | Doug Hoag
CSU |
| EW02-004  | Niche Beef Production and Marketing in Colorado              | $59,470      | Martha Sullins
American Farmland Trust
Julia Freedgood
American Farmland Trust
Dawn Thilmany
Colorado State University
Tom Field
Colorado State University |
| EW02-009  | Integrating Bird Conservation into Range Management          | $81,937      | Tammy VerCauteren
Rocky Mountain Bird Observatory |
<table>
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<tr>
<th>Project #</th>
<th>Project Title</th>
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<tr>
<td>EW02-017</td>
<td>Establishing Dialogue Between Alternative Agricultural Producers and the Land-Grant University in Colorado</td>
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<td>EW01-021</td>
<td>Exploration of the Ethical Basis for Agricultural Sustainability</td>
<td>$26,772</td>
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<td>Weed Research Lab, Colorado State University</td>
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<td>EW01-022</td>
<td>Coached Land Planning and Care</td>
<td>$81,000</td>
<td>Scott Cotton</td>
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<td>EW99-006</td>
<td>Workshops on Land Use and Land Protection Policy</td>
<td>$66,195</td>
<td>Jeff Jones</td>
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<td>EW97-005</td>
<td>In-Depth Training and Work Experience on a Community Supported Agriculture (C.S.A.) Farm</td>
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<td>Colorado State University Cooperative Extension</td>
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<td>EW96-002</td>
<td>Improving Manure Management to Protect Water Quality in the Southwestern U. S.</td>
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<td>EW95-018</td>
<td>Video Introduction to Sustainable Agriculture for Eight Western States</td>
<td>$20,000</td>
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<td>University of Wyoming, Cooperative Extension Service</td>
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<td>EW94-009</td>
<td>Permaculture Systems Pamphlet</td>
<td>$5,620</td>
<td>Jerome Osentowski</td>
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<td>Central Rocky Mountain Permaculture Institute</td>
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**FARMER/RANCHER GRANTS**

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<tr>
<td>FW20-371</td>
<td>The Application of using High-Fungal Compost to Renovate Mountain Meadow Pastures</td>
<td>$20,000</td>
<td>Steve Oswald</td>
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<td>Oswald Cattle Co</td>
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<td>FW19-341</td>
<td>The Citizen Science Soil Health Project</td>
<td>$24,800</td>
<td>Elizabeth Black</td>
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<td>Your Neighborhood Christmas Tree Farm</td>
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<td>FW19-354</td>
<td>Evaluating Forage Production and Ranching in Response to Regenerative Rotational Grazing on Dryland Pastures in Southwest Colorado.</td>
<td>$25,000</td>
<td>Chuck McAfee</td>
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<td>Charles M. McAfee &amp; CO. LLLP</td>
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<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</td>
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<td>Mountain Roots Produce LLC</td>
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<td>FW15-046</td>
<td>Feasibility of Summer (floricane) Brambles in Colorado</td>
<td>$14,571</td>
<td>Amy Kafka</td>
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<td>Garden Sweet</td>
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<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</td>
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<td>Sunspot Urban Farm</td>
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<td>FW14-027</td>
<td>Colorado Queen Honey Bee Testing Project for Increased Sustainability</td>
<td>$24,922</td>
<td>Kristine Holthaus</td>
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<td>Colorado Queen Honey Bee Testing Project for Increased Sustainability</td>
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<tr>
<td>FW13-128</td>
<td>Improved Honeybee Health through Foundation Modification</td>
<td>$25,000</td>
<td>Audrey Sue McWilliams</td>
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<td></td>
<td>Sue McWilliams</td>
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</table>
FW12-076  Development of a Digitally Integrated, Low-cost Farm-to-Consumer Product Tracking System for Small Scale Farmers and Grower Networks  $24,965  Brett KenCairn  
Circle Fresh Farms

FW11-010  Alternative crops to diversify the traditional winter wheat/fallow cropping system in Northwest Colorado  $29,821  Mike Williams  
none

FW10-059  Expanding Small Ruminant Dairy Production  $14,500  Suzanne Quintana  
Quintana Farms
Neville McNaughton  
Cheezsorce

FW10-070  Effects of Sustainable Soil Amendments on Nutrient Availability in High Alkaline pH Soil in Field Production of Trees in Northeastern Colorado  $14,379  Dr. Brooke Edmunds  
CSU Extension
David Rickman  
Boxelder Creek Nurseries

FW09-030  Alternative Fertilizer for Meadow Grass Hay  $10,775  Nancy Roberts  
Arrowpoint Cattle Co., LLC

FW07-024  Different Goat Breed Crosses to Find the Best Tasting Meat  $12,623  Holly Napier  
Napier Family Farms

FW07-031  Raising Livestock and Crops Simultaneously in Unheated Greenhouses  $12,089  John Socolofsky  
Antelope Creek Ranch

FW07-319  Season Extension and Crop Area Multiplication with a Moveable Hoophouse in an Organic System  $11,230  Dr. Edward Page  
CSU Extension

FW06-028  Integrated Control of Weeds and Verticillium in Strawberry Nurseries  $10,000  Brian Coleman  
Ruby Mountain Nursery

FW06-314  Business Plan for Producers to Create Value-added Crop-based Products  $20,000  Ravi Malhotra  
ICAST Intl Ctr for Appropriate & Sustainable Tech

FW05-009  Non-chemical Control of Nematodes in Potatoes  $9,922  Monty Smith  
Three S Ranch

FW05-309  Management Practices for Drip Irrigation in Baca County, Colorado  $9,353  James Valliant  
Colorado State University

FW04-112  Common Standards and Labeling  $13,500  Dan Hobbs  
Tres Rios Agricultural Cooperative Inc.

FW04-318  Using Irrigated Forage Pastures to Enhance Livestock Production Sustainability  $13,555  Bruce Bosley  
Colorado State University
Gene Schmitz  
Colorado State University

FW03-016  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  $5,455  Denise Bohemier  
El Rancho del Cielo

FW03-109  Edamame Bean Production and Marketing  $5,000  Phil Knob
<table>
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<tr>
<th>Project Code</th>
<th>Project Title</th>
<th>Funding</th>
<th>Principal Investigator</th>
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<tr>
<td>FW03-111</td>
<td>Market Development for an Edible Bean Food Business</td>
<td>$5,000</td>
<td>Shane Atchley</td>
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<td>FW02-003</td>
<td>Agricultural Systems Economics for Hay production</td>
<td>$1,030</td>
<td>Wilbur Miller</td>
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<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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<td>FW02-007</td>
<td>Propagation of Colorado Native Plants</td>
<td>$7,500</td>
<td>Ann Grant</td>
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<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>
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<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>
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<td>FW02-025</td>
<td>Colorado Organic Honey Production</td>
<td>$6,000</td>
<td>Cesar Flores</td>
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<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>
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<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>
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<td>FW00-012</td>
<td>Residue Management in Furrow Irrigated Reduced Tillage Systems</td>
<td>$4,650</td>
<td>Randy Hines</td>
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<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>
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<td>FW00-032</td>
<td>Organic Soil Amendment Release Rates for Fertility in Apples</td>
<td>$6,750</td>
<td>Steve Ela</td>
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<td>FW00-038</td>
<td>Native Plants Nursery</td>
<td>$5,000</td>
<td>John Squire</td>
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<td>FW00-074</td>
<td>Colorado Quality Lamb: Enhancing the Economic Viability of Local Producers Through Direct Marketing to Food Service Establishments</td>
<td>$5,000</td>
<td>David Myers</td>
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<td>FW00-240</td>
<td>Carbondale Community Garden Cooperative</td>
<td>$8,311</td>
<td>Wendy Anderson</td>
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<td>FW00-277</td>
<td>Custer County Ag-Products Internet Marketing Project</td>
<td>$2,160</td>
<td>Sara Hebbert</td>
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<td>FW00-302</td>
<td>Alternative Crop Marketing Based on a Pre-existing Urban-Rural Spiritual and Social Relationship</td>
<td>$3,400</td>
<td>Paul Mailander</td>
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<td>FW00-329</td>
<td>Paradox Valley Heirloom Foods and Native Seed Grow-Out</td>
<td>$9,997</td>
<td>Martha Ames Burgess</td>
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FW99-011  Hydraulic Windmill Pump  $2,733  Lonnie Jackson
FW99-065  Sustainable Sheep Dairy Project  $3,550  Steve and Carolyn Keller
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

<table>
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<tr>
<th>Project #</th>
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<th>Project Leaders</th>
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<tr>
<td>GW20-214</td>
<td>Cattle as Partners in Conservation: Ecological, Economic, and Social Outcomes of Public-Private Partnerships on Colorado Landscapes</td>
<td>$24,727</td>
<td>Dr. Stacy Lynn</td>
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<td>Anna Clare Monlezun</td>
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<td>GW19-202</td>
<td>Climate mitigation through soil carbon sequestration: increasing soil resilience and plant productivity on rangelands through compost application</td>
<td>$24,766</td>
<td>Dr. Jennie DeMarco</td>
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<td>Alexia Cooper</td>
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<td>Western State Colorado University (doing business as Western Colorado University)</td>
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<td>GW16-020</td>
<td>Dryland cropping system intensification in the West-Central Great Plains: Impacts and barriers to adoption</td>
<td>$25,009</td>
<td>Meagan Schipanski</td>
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<td>Colorado State University</td>
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<td>Steven Rosenzweig</td>
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<td>GW14-028</td>
<td>Information flows along the beef supply chain: Information exchange as a strategy for mitigating increased costs and maximizing producer profits.</td>
<td>$25,000</td>
<td>Dr. Jennifer Bair</td>
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<td>Sociology, CU Boulder</td>
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<td>Sarah Lake</td>
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<td>University of Colorado-Boulder</td>
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**Impacts of Reduced Nitrogen Application During Late Growing Season on Potato Tuber Quality and Profitability**

**ON FARM RESEARCH/PARTNERSHIP GRANTS**

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
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</thead>
</table>
| OW21-368   | Enabling improved environmental outcomes/farm economics for sugarbeet farmers using improved nutrient stewardship | $75,000      | Dr. Rebecca Larson  
The Western Sugar Cooperative |
| OW20-357   | Microbial Ecology of Vermicompost and Vermi-teas                               | $49,100      | Dr. Zackary Jones  
Rocky Mountain Soil Stewardship  
Kathy Doesken  
Rocky Mountain Soil Stewardship |
| OW20-358   | Compost for Carbon Sequestration on Irrigated Pasture                           | $49,746      | Retta Bruegger  
Colorado State University Extension  
Dr. Megan Machmuller  
Colorado State University  
Seth Urbanowitz  
Colorado State University Extension |
| OW10-309   | Reducing Nitrogen Fertilizer Inputs to Irrigated Pastures and Hayfields by Interseeding Legumes | $49,849      | Joe Brummer  
Colorado State University |
| OW10-321   | Using Cattle to Rehabilitate Rangeland Vegetation and Improve Ecosystem Function (3 yr project) | $49,936      | Kathy Voth  
Livestock for Landscapes |
| OW10-325   | Organic Winter Production Scheduling in Unheated High Tunnels                   | $38,358      | Frank Stonaker  
Colorado State University |

Total funding from the USDA SARE program to Colorado  
$5,545,979

For further information on projects, contact Western SARE at (435) 797-2257 or wsare@usu.edu.  
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