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 $353 million to more than 8,041 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...

Montana

Project Highlight: Improving the Benefits of Applied Nitrogen

Broadcast applications of urea are a common management practice for large-acreage, no-till, dryland winter wheat producers in Montana. But when urea is applied to the soil surface, a significant amount of nitrogen can be lost when it converts to ammonia gas and enters the atmosphere in a process known as volatilization. Farmers face economic losses due to reduced yield or crop quality from inadequate nitrogen fertility, and ammonia emissions contribute to environmental pollution and nitrogen enrichment of natural ecosystems.

With SARE funding to address the problem, Montana State soil scientist Richard Engel conducted on-farm trials over four seasons to identify soil and environmental conditions under which urea applications were most susceptible to ammonia loss, and to identify management practices to reduce those losses. Based on the findings, Engel’s team recommends against surface-applying fertilizer to frozen or wet ground, particularly during the over-winter period. Applying it during the spring following thaw resulted in lower ammonia volatilization loss. By following the team’s recommendations to fertilize in the spring and incorporate the fertilizer into the soil when possible, a majority of Montana’s wheat growers are reducing air pollution and saving about $5 million a year through reduced fertilizer loss and increased yields.

For more information on this project, see sare.org/projects, and search for project number SW10-050.

SARE in Montana

western.sare.org/sare-in-your-state/montana

$9,634,362 in total funding

134 grant projects

(since 1988)

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

Total awards: **134 grants**

- 46 Research and Education
- 22 Professional Development Program
- 36 Farmer/Rancher
- 10 On Farm Research/Partnership
- 16 Graduate Student
- 4 Research to Grass Roots

Total funding: **$9,634,362**

- $6,776,722 Research and Education
- $1,325,229 Professional Development Program
- $435,075 Farmer/Rancher
- $405,603 On Farm Research/Partnership
- $373,767 Graduate Student
- $317,966 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/montana](http://western.sare.org/sare-in-your-state/montana)

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/montana](http://western.sare.org/state-pages/montana) to learn more.

Patrick Mangan
Montana State University Extension Service
(406) 258-4205
patrick.mangan@montana.edu

For detailed information on SARE projects, go to [www.SARE.org](http://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.
Montana has been awarded $9,634,362 grants to support 133 projects, including but not limited to, 45 research and/or education projects, 22 professional development projects and 36 producer-led projects. Montana has also received additional SARE support through multi-state projects.

### RESEARCH AND EDUCATION GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW22-934</td>
<td>Landowner Collaborative Strategies for Nonlethal Predator Control</td>
<td>$349,951</td>
<td>Dr. Jared Beaver&lt;br&gt;Montana State University&lt;br&gt;Dr. Stewart Breck&lt;br&gt;Colorado State University&lt;br&gt;Dr. Alex Few&lt;br&gt;Western Landowners Alliance&lt;br&gt;Kyran Kunkel&lt;br&gt;Western Landowners Alliance&lt;br&gt;Kyran Kunkel&lt;br&gt;Western Landowners Alliance&lt;br&gt;Kyran Kunkel&lt;br&gt;Western Landowners Alliance&lt;br&gt;Dr. Julie Young&lt;br&gt;Utah State University</td>
</tr>
<tr>
<td>SW21-929</td>
<td>Indigenous Food-Science-Ways: Integrating Indigenous knowledge with food science research and education to support value-added Native foods</td>
<td>$349,898</td>
<td>Wan-Yuan Kuo&lt;br&gt;Montana State University&lt;br&gt;Rachel Andrews-Gould&lt;br&gt;Salish and Kootenai College&lt;br&gt;Eric Belasco&lt;br&gt;Dr. Jane Boles&lt;br&gt;Montana State University&lt;br&gt;Dr. Paul Gannon&lt;br&gt;Montana State University&lt;br&gt;Dr. Paul Lachapelle&lt;br&gt;Montana State University&lt;br&gt;Dr. Brent Peyton&lt;br&gt;Montana State University&lt;br&gt;Brenda Richey&lt;br&gt;Montana State University</td>
</tr>
<tr>
<td>SW21-930</td>
<td>Intercropping chickpea with flax: An alternative sustainable way to manage Ascochyta blight of Chickpea</td>
<td>$347,557</td>
<td>Dr. Chengci Chen&lt;br&gt;Montana State University&lt;br&gt;Dr. Frankie crutcher&lt;br&gt;Montana State University-EARC&lt;br&gt;Dr. William Franck&lt;br&gt;Montana State University-EARC&lt;br&gt;Dr. Qasim Khan&lt;br&gt;Montana State University-SARC&lt;br&gt;Dr. Kevin McPhee&lt;br&gt;Montana State University-EARC&lt;br&gt;Dr. Kent McVay&lt;br&gt;Montana State University-SARC</td>
</tr>
<tr>
<td>Project ID</td>
<td>Project Title</td>
<td>Funding Amount</td>
<td>Investigators</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SW20-915</td>
<td>Developing an integrated management decision framework for cheatgrass control in the northeastern region of the sagebrush steppe</td>
<td>$349,315</td>
<td>Lisa Rew&lt;br&gt; Montana State University&lt;br&gt; Andrew and Hilary Andersen&lt;br&gt; J Bar L Ranch&lt;br&gt; Jim Berkey&lt;br&gt; The Nature Conservancy&lt;br&gt; Amber Burch&lt;br&gt; Beaverhead County Weed District&lt;br&gt; Daphne and Kevin Chester and Crowe&lt;br&gt; Double C Ranch Holdings&lt;br&gt; Kyle Cutting&lt;br&gt; US Fish, Wildlife Service&lt;br&gt; Eric and Stephanie Hansen&lt;br&gt; Hansen Livestock Company&lt;br&gt; Jeff Johnson&lt;br&gt; Johnson Ranch&lt;br&gt; Dr. Jane Mangold&lt;br&gt; Montana State University&lt;br&gt; Kara Maplethorpe&lt;br&gt; Beaverhead County Weed District&lt;br&gt; Allen and Yvonne Martinell&lt;br&gt; Lee Martinell Ranch&lt;br&gt; Dr. Bok Sowell&lt;br&gt; MSU- Animal &amp; Range Sciences&lt;br&gt; Dr. Catherine Zabinski&lt;br&gt; Montana State University</td>
</tr>
<tr>
<td>SW19-907</td>
<td>Snowbanks to Grassbanks</td>
<td>$349,710</td>
<td>Dr. Bok Sowell&lt;br&gt; MSU- Animal &amp; Range Sciences&lt;br&gt; Dr. Andrea Litt&lt;br&gt; Department of Ecology, Montana State University&lt;br&gt; Megan Van Emon&lt;br&gt; Montana State University</td>
</tr>
<tr>
<td>SW17-016</td>
<td>Soil acidity management of long-term no-till fields in Montana to prevent crop failure</td>
<td>$264,016</td>
<td>Dr. Richard Engel&lt;br&gt; Montana State University</td>
</tr>
<tr>
<td>SW17-080</td>
<td>The Impacts of Integrating Livestock into Cropping Systems on Soil Health and Crop Production</td>
<td>$249,502</td>
<td>Devon Ragen&lt;br&gt; Montana State University</td>
</tr>
<tr>
<td>SW16-051</td>
<td>Research and Demonstration of Minimum Tillage and Optimum Water Management in Sugarbeet Production in Eastern Montana</td>
<td>$247,410</td>
<td>Dr. Chengci Chen&lt;br&gt; Montana State University</td>
</tr>
<tr>
<td>SW15-028</td>
<td>Examining, Optimizing, and Building Capacity for Montana’s Local Beef to School Supply Chain</td>
<td>$220,021</td>
<td>Dr. Carmen Byker Shanks&lt;br&gt; Montana State University</td>
</tr>
<tr>
<td>SW14-014</td>
<td>Sustainable Cropping Systems for Dual-Purpose Biennial Canola</td>
<td>$256,397</td>
<td>Dr. Darrin Boss&lt;br&gt; Montana State University&lt;br&gt; Dr. Steve Fransen, PhD&lt;br&gt; Washington State University</td>
</tr>
<tr>
<td>SW13-043</td>
<td>Evaluating Native Perennial Flower Strips for Enhancing Native Bees and Pollination Services on Farmlands</td>
<td>$170,951</td>
<td>Laura Burkle&lt;br&gt; Montana State University</td>
</tr>
<tr>
<td>SW13-056</td>
<td>Landscape Collaborative Grazing and Greater Sage Grouse Survival</td>
<td>$339,552</td>
<td>Dr. Bok Sowell&lt;br&gt; MSU- Animal &amp; Range Sciences</td>
</tr>
<tr>
<td>SW12-108</td>
<td>Low Glycemic Potatoes, a value-added crop for Montana</td>
<td>$154,000</td>
<td>Dr. David Sands&lt;br&gt; Montana State Univ</td>
</tr>
<tr>
<td>SW11-086</td>
<td>Degree Day Modeling and Economic Considerations of Insects and Weeds in Sheep Grazed Alfalfa, Grain, and Range Production Systems</td>
<td>$206,700</td>
<td>Dr. Hayes Goosey&lt;br&gt; Montana State University</td>
</tr>
<tr>
<td>Project ID</td>
<td>Title</td>
<td>Funding</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------------------------------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>SW11-099</td>
<td>Using cover crop mixtures to improve soil health in low rainfall areas of the northern plains</td>
<td>$354,405</td>
<td></td>
</tr>
<tr>
<td>SW10-050</td>
<td>Enhancing Cropping System Sustainability by Minimizing Ammonia-N Losses from Biological and Chemical Inputs</td>
<td>$190,009</td>
<td></td>
</tr>
<tr>
<td>SW09-068</td>
<td>Integrating Biological Control with Targeted Sheep Grazing to Suppress Spotted Knapweed</td>
<td>$49,865</td>
<td></td>
</tr>
<tr>
<td>SW09-601</td>
<td>Infrastructure Support for Small Livestock Processing Facilities</td>
<td>$46,796</td>
<td></td>
</tr>
<tr>
<td>SW07-013</td>
<td>Evaluation of Alfalfa Weevil (Coleoptera Curculionidae) Densities, Weed Abundance, and Regrowth Characteristics of Alfalfa Grazed by Sheep.</td>
<td>$96,817</td>
<td></td>
</tr>
<tr>
<td>SW07-025</td>
<td>Grower-based selection of varieties and systems for wheat stem sawfly control</td>
<td>$125,000</td>
<td></td>
</tr>
<tr>
<td>SW07-028</td>
<td>Is Sulfur Cinquefoil a Candidate for Control with Sheep and Goats?</td>
<td>$54,250</td>
<td></td>
</tr>
<tr>
<td>SW07-063</td>
<td>Developing a free on-line excel based enterprise budget decision support program to evaluate the incorporation of sheep into farm systems as an alternative to pesticide and mechanical methods of weed and insect control</td>
<td>$10,000</td>
<td></td>
</tr>
<tr>
<td>SW06-006</td>
<td>Survey and Economic Analysis of Montana Farms Utilizing Integrated Livestock-Cereal Grain (Ley Farming) Systems</td>
<td>$91,500</td>
<td></td>
</tr>
<tr>
<td>SW06-075</td>
<td>Does Timing of Defoliation Affect Spotted Knapweed Seed Viability and Germination?</td>
<td>$62,600</td>
<td></td>
</tr>
<tr>
<td>SW05-038</td>
<td>Developing Distance Learning Based on Perceptions and Knowledge of Producers and Agricultural Professionals</td>
<td>$98,819</td>
<td></td>
</tr>
<tr>
<td>SW04-007</td>
<td>Methane Recovery from Small Dairy Operations</td>
<td>$123,834</td>
<td></td>
</tr>
<tr>
<td>SW03-056</td>
<td>Ecologically Based Integrated Weed Management to Restore Plant Diversity</td>
<td>$121,750</td>
<td></td>
</tr>
<tr>
<td>SW03-063</td>
<td>Factors Affecting Alfalfa Stand Longevity in Montana</td>
<td>$139,397</td>
<td></td>
</tr>
<tr>
<td>SW02-005</td>
<td>Increasing Crop Water Use Efficiency in Advanced No-Till Systems</td>
<td>$22,980</td>
<td></td>
</tr>
</tbody>
</table>
Using Crop Diversity in No-till and Organic Systems to Reduce Inputs and Increase Profits and Sustainability in the Northern Plains

Bruce Maxwell
MSU

An Alternative to Traditional Wheat Stubble Management Using Sheep to Control Pests and Improve Soil Nutrient Cycling

Patrick Hatfield
Department of Animal and Range Sciences
Sue Blodgett
Montana State University, Dept. Entomology
Dr. Hayes Goosey
Montana State University
Duane Griffith
Montana State University, Ag Econ and Ext Dept

Selecting Cattle to Prevent Grazing Distribution Problems

Derek Bailey
Montana State University

Comparison of Pest Management Interactions in Spring Wheat-Cover Crop and Spring Wheat-Fallow Cropping Systems

Andrew Lenssen
Montana State University

Sustaining Agriculture and Community: Moving the Farm Improvement Club Program Beyond the Farm Gate

Jonda Crosby
Alternative Energy Resources Organization

Sustainable Farming Quarterly

Nancy Matheson
Alternative Energy Resources Organization (AERO)

The Sustainable Farming Quarterly (SFQ) A Regional Newsletter

Al Kurki
Alternative Energy Resources Organization (AERO)

Farm Improvement Club Network for Sustainable Agriculture

Nancy Matheson
Alternative Energy Resources Organization (AERO)

Specifying and Analyzing Whole-Ranch Systems for Sustainable Range Livestock Production in Environmentally Sensitive Areas

Jack Riesselman
Montana State University

Practical Education in Sustainable Production Systems

Wade Crouch
Montana State University

Regional Farm and Research Center Matching System-FARMS

J. Jacobsen
Montana State University


Nancy Matheson
Alternative Energy Resources Organization (AERO)

Low-Input Legume/Cereal Rotations for the Northern Great Plains/Intermountain Region

James Sims
Montana State University

Bio-Priming for the Control of Pythium Reemergence Damping-Off in Vegetable Crops

Nancy Callan
Montana State University

Livestock Health and Nutrition Alternatives: A Western States Conference

Al Kurki
Alternative Energy Resources Organization (AERO)
### 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>
</table>
| WRGR22-001 | Montana Food Economy Initiative                                                 | $96,984      | Erin Austin  
Alternative Energy Resources Organization (AERO)  
Erin Austin  
AERO  
Michal DeChellis  
AERO and Cultivating Minds, LLC  
Kim Lloyd  
St. Peter's Health  
Michele Schahczenski  
Yellowstone Valley Food Hub  
Randi Wing  
AERO and FBCEDC |
| WRGR21-001 | Montana's Soil Health Network: Deepening the Roots in Four Regions            | $51,223      | Maggie Gordon  
Northern Plains Resource Council  
Caroline Canarios  
Northern Plains Resource Council  
Charlie French  
NRCS  
Stephen Charter  
Charter Beef |
| WRGR21-006 | Participatory Training in Small-scale Anaerobic Digestion of Agricultural Residues | $95,000      | Dr. Roland Ebel  
Montana State University  
Selena Ahmed  
Montana State University  
Mac Burgess  
Montana State University  
Dr. Jed Eberly  
Montana State University  
Timothy Seipel  
Department of Land Resources and Environmental Sciences, Montana State University |
| RGR20-009  | Montana Food Economy Initiative                                                | $74,759      | Lindsay Ganong  
AERO |

### 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>
| WPDP22-021 | Montana Agritourism Fellows Program: Developing Leaders to Advance Sustainable AgriTourism | $99,965      | Dr. Shannon Arnold  
Montana State University  
Dr. Dustin Perry  
Montana State University  
Dr. Beth Shirley  
Montana State University |
| PDP20-020  | Building Internal and Community Capacity for the Blackfeet Nation Through Agriculture | $73,795      | Will Seeley  
Blackfeet Tribe: Agriculture Resource Management Plan |
<table>
<thead>
<tr>
<th>Grant Number</th>
<th>Project Title</th>
<th>Budget</th>
<th>Principal Investigators</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPDP19-15</td>
<td>Sustainable Beef Cattle Production: Ranch to Ribeye</td>
<td>$57,310</td>
<td>Megan Van Emon, Montana State University, Colleen Buck, Montana State University,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Callie Cooley, Montana State University, Molly Hammond, Montana State University,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Elin Kittelmann, Montana State University, Kari Lewis, Montana State University</td>
</tr>
<tr>
<td>EW18-027</td>
<td>Building Internal Capacity for the Blackfeet Tribe Agricultural Resource</td>
<td>$52,155</td>
<td>Loren Bird Rattler, Blackfeet Tribe</td>
</tr>
<tr>
<td></td>
<td>Management Plan (ARMP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EW18-011</td>
<td>Pheromones as Tools for Monitoring the Insect Pests in the Northern Plains -</td>
<td>$73,510</td>
<td>Dr. Michael Ivie, Montana State University-Bozeman</td>
</tr>
<tr>
<td></td>
<td>Instructive Tools for Agricultural Professionals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EW17-011</td>
<td>Integrated Parasite Management: Train the Trainer</td>
<td>$74,189</td>
<td>David Scott, National Center for Appropriate Technology</td>
</tr>
<tr>
<td>EW16-029</td>
<td>Best Management Practices (BMPs) for Mitigating Herbicide Resistance in the</td>
<td>$68,871</td>
<td>Dr. Prashant Jha, Montana State University, Southern Agricultural Research Center,</td>
</tr>
<tr>
<td></td>
<td>Northern Great Plains-Educational Tools for Agricultural Professionals</td>
<td></td>
<td>Huntley, MT</td>
</tr>
<tr>
<td>EW16-036</td>
<td>Catalyzing Increased Agricultural Sales through a Common Understanding of</td>
<td>$22,332</td>
<td>Jennifer Hill-Hart, AERO</td>
</tr>
<tr>
<td></td>
<td>Montana’s New Food Modernization Law</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EW15-009</td>
<td>Conservation and Augmentative Biological Control in the Northern Plains –</td>
<td>$68,182</td>
<td>Dr. Michael Ivie, Montana State University-Bozeman</td>
</tr>
<tr>
<td></td>
<td>Providing Tools for Agriculture Professionals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EW13-014</td>
<td>Enhancing the Exploring Energy Efficiency &amp; Alternatives (E3A) Curriculum</td>
<td>$42,277</td>
<td>Milton Geiger, University of Wyoming Extension</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dr. Glen Whipple, University of Wyoming Extension</td>
</tr>
<tr>
<td>EW12-004</td>
<td>Tour of sustainable Small Grain Production in Eastern Washington</td>
<td>$7,350</td>
<td>Dan Picard, MSU Extension-Pondera County, Jesse Fulbright, Montana State University</td>
</tr>
<tr>
<td>EW12-006</td>
<td>Montana State University Extension Range Management Institute</td>
<td>$60,000</td>
<td>Dr. Tracy Mosley, Montana State University Extension</td>
</tr>
<tr>
<td>EW11-012</td>
<td>Wildlife Damage Control for Traditional and Organic Farmers</td>
<td>$96,053</td>
<td>Dr. Jim Knight, Extension Wildlife Specialist</td>
</tr>
<tr>
<td>EW01-007</td>
<td>Training Tour 2002-03-04</td>
<td>$30,024</td>
<td>Jonda Crosby, Alternative Energy Resources Organization</td>
</tr>
<tr>
<td>EW01-016</td>
<td>Growing Our Own: Communities That Sustain Entrepreneurs</td>
<td>$52,483</td>
<td>Richard Williams, Montana State University Extension Service</td>
</tr>
<tr>
<td>EW99-008</td>
<td>Developing a Sustainable and Organic Master Gardener Horticulture Production</td>
<td>$22,483</td>
<td>Helen Atthowe, Missoula County Extension Service</td>
</tr>
<tr>
<td>EW99-015</td>
<td>Harvesting the Wealth: of AERO’s Farm and Ranch Improvement Clubs</td>
<td>$60,000</td>
<td>Jonda Crosby, Alternative Energy Resources Organization</td>
</tr>
<tr>
<td>Project #</td>
<td>Project Title</td>
<td>SARE Support</td>
<td>Project Leaders</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------------------------------------------------------</td>
<td>--------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>EW97-007</td>
<td>Sustainable Agriculture Youth Education: Professional Dev. for Youth Program Leaders and Educators</td>
<td>$100,000</td>
<td>Jonda Crosby Alternative Energy Resources Organization</td>
</tr>
<tr>
<td>EW95-002</td>
<td>Sustainable Noxious Weed Management on Northwestern Rangelands</td>
<td>$43,800</td>
<td>Roger Sheley Montana State University</td>
</tr>
<tr>
<td>EW95-003</td>
<td>Agency Personnel Training in Riparian Monitoring and Management of Wildlife and Livestock in the Intermountain West</td>
<td>$98,000</td>
<td>Dr. Jim Knight Extension Wildlife Specialist</td>
</tr>
<tr>
<td>EW95-012</td>
<td>Sustainable Agriculture Training Project A Model of Collaborative Learning</td>
<td>$31,450</td>
<td>Nancy Matheson Alternative Energy Resources Organization (AERO)</td>
</tr>
<tr>
<td>EW94-006</td>
<td>Sustainable Agriculture Training Project: A Model of Collaborative Learning</td>
<td>$91,000</td>
<td>Nancy Matheson Alternative Energy Resources Organization (AERO)</td>
</tr>
</tbody>
</table>

**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>FW22-390</td>
<td>Could sainfoin be the first dual-purpose perennial pulse crop for the western US?</td>
<td>$24,864</td>
<td>Shawn Wentzel Alaska Ranch</td>
</tr>
<tr>
<td>FW22-398</td>
<td>Establishing a Cool Season Legume Grass Finishing Pasture</td>
<td>$8,992</td>
<td>Ronald Wade Browns Meadow Farm</td>
</tr>
<tr>
<td>FW21-372</td>
<td>Collaborative monitoring for ranch resilience and social-ecological sustainability in central Montana</td>
<td>$29,000</td>
<td>Bill Milton Milton Ranch</td>
</tr>
<tr>
<td>FW19-340</td>
<td>Improving Winter Greens Production and Storage for Cold Climate Farmers</td>
<td>$19,990</td>
<td>Katelyn Madden MGVC</td>
</tr>
<tr>
<td>FW15-039</td>
<td>Making the Most of Fine Fleece: Environmental, Economic, and Social Costs and Benefits of Alternative Strategies for Marketing Sheep Wool</td>
<td>$10,646</td>
<td>Linda Poole Prairie Shepherd</td>
</tr>
<tr>
<td>FW11-024</td>
<td>Organic Control of Perennial Weeds with Vinegar and Biologicals</td>
<td>$20,790</td>
<td>Jess Alger Organic control of Perennial Weeds</td>
</tr>
<tr>
<td>FW10-042</td>
<td>Marketing J Bar L Ranch Grassfed Beef to Members of Conservation Organizations</td>
<td>$13,000</td>
<td>Bryan Ulring J Bar L Ranches, LLC</td>
</tr>
<tr>
<td>FW09-305</td>
<td>Composting Recommendations and Marketing Evaluation for Livestock Operations in Cold Semi-Arid Environments</td>
<td>$49,315</td>
<td>Thomas Bass Montana State University</td>
</tr>
<tr>
<td>FW08-016</td>
<td>Can Producers in Five Montana Counties Successfully Use No-Till Methods for Renovation of Irrigated and Dryland Pastures?</td>
<td>$29,999</td>
<td>Ron Carlstrom MSU Extension- Gallatin County George Reich</td>
</tr>
<tr>
<td>FW08-023</td>
<td>Pasture-Raised Heritage Turkeys in a Dryland Farming System</td>
<td>$6,413</td>
<td>Jacob Cowgill</td>
</tr>
<tr>
<td>FW08-034</td>
<td>High-Nutrition Drought-Tolerant Corn</td>
<td>$30,000</td>
<td>Dave Christensen</td>
</tr>
</tbody>
</table>
**FW08-317** Sustainable Food and Bioenergy Systems: Student Internships Development Plan  
$29,983  
Dr. William Dyer  
Montana State University

**FW06-025** Agroecosystem Approach to Managing Imported Cabbage Worm (Peris rapae)  
$6,356  
Helen Atthowe  
Biodesign Farm

**FW05-012** Forage Winter Wheat Production for Grazing or Hay Production in Eight Montana Counties  
$19,795  
George Reich

**FW05-301** Protecting High Quality Rangelands in Garfield County from Invasive Weed Spread  
$20,000  
Eric Miller  
Montana State University

**FW05-305** Demonstration of Leafy Spurge Management Using Sheep Grazing in a Leafy Spurge Barrier Zone  
$9,960  
Sharla Sackman  
Montana State University Extension Service

**FW04-018** Forage Winter Wheat Production for Hay or Grain in Gallatin County, Montana  
$5,370  
George Reich

**FW02-036** Sheep and Cattle Grazing Complementarity Project  
$5,055  
Randall Tunby

**FW01-032** Biological Weed Control: Education and Implementation  
$7,500  
Noah Poritz

**FW01-085** Biological and Mechanical Control of Perennial Weeds in North-Central Montana  
$6,387  
Robert Quinn  
Montana State University

**FW00-017** Establishing a Sustainable Program for Recycling and Propagation of Quality Flower Bulbs in a Wholesale Flower Production Operation  
$2,197  
Laura Smith

**FW00-260** Test Marketing Campaign to Conduct In-Store Lamb Cooking and Recipe Demonstration for Montana Natural Lamb Cooperative in the Billings, Montana Market Area  
$9,300  
Gayle Ott

**FW00-282** Better Board of Trade.Com  
$8,054  
David Oien

**FW00-288** TEAM-Team Effort in Agricultural Marketing for the McAlpine Ranch  
$9,705  
Clay McAlpine

**FW00-314** Montana Arnica Web Page  
$870  
Rod Daniel

**FW99-069** No-Till Wheat into Medic vs. Conventional Wheat  
$4,578  
Jess Alger  
Organic control of Perennial Weeds

**FW99-102** Range Monitoring in the Badlands Grazing District  
$10,000  
Jack McCuin

**FW98-035** Annual Forages for Dryland Rotations  
$1,540  
Vern Pluhar

**FW98-093** Cull Potato Composting  
$7,500  
Steve McCullough
FW96-007 Green Manure/Covercrop Combination Experiment $1,923 Rod Daniel

FW96-008 Legume Grazing in Rotation with Small Grains $4,000 Jess Alger Organic control of Perennial Weeds

FW96-073 Evaluation of Grass Species for Improved Pasture Management $4,800 Robert Lee

FW96-083 Vegetative Changes through Alternative Water Sources $2,500 Dale Veseth

FW95-026 Carter-Fallon Forage Committee Range/Livestock Project $4,943 Randy Tunby Carter-Fallon Forage Committee

FW95-078 Managing a Living Mulch System in an Intensive Organic Vegetable Cropping Operation to Enhance Weed, Nutrient, and Pest Management $5,000 Helen Atthowe Biodesign Farm

FW95-093 Influencing Elk and Livestock Riparian Use $4,750 Allen 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>
| GW21-218  | Integrating thistle rust into weed management of Canada thistle | $30,000 | Timothy Seipel  
  Department of Land Resources and Environmental Sciences, Montana State University  
  Dr. Jed Eberly  
  Montana State University  
  Fabian Menalled  
  Dept. of Land Resources and Environmental Sciences  
  Daniel Chichinsky  
  Montana State University |
| GW20-204  | Restoring Disturbed Rangelands With Site-Specific Seeding | $25,000 | Lisa Rew  
  Montana State University  
  Colter Mumford  
  Montana State University |
| GW20-205  | Measuring intra-field variability in pea protein to understand influencing factors in Montana cropping systems | $25,000 | Dr. Clain Jones  
  Montana State University  
  Dr. Perry Miller  
  Montana State University  
  Samuel Koeshall  
  Montana State University |
| GW19-190  | Nitrogen Fertilizer Management Based on Site-Specific Maximized Profit and Minimized Pollution | $24,992 | Dr. Stephanie Ewing  
  Montana State University  
  Bruce Maxwell  
  MSU  
  Paul Hegedus  
  Montana State University |
Fostering resilient plant-soil interactions on working ranches in semi-arid steppe ecosystems of north-central and eastern Montana.

**GW19-197**

Precision Agriculture Applied to Organic Systems

**GW19-198**

Effects of Habitat Heterogeneity on Crop Yield and Biodiversity

**GW19-199**

Montana Hardy Fruit Nutraceutical Quality

**GW18-050**

Predicting overwinter nitrate-N changes at the subfield scale in leaching-susceptible, agricultural soils

**GW18-179**

Advancing Cover Crop Knowledge: Assessing the Role of Plant Diversity on Soil Change

**GW18-151**

Sustainability of dormant season grazing: Does protein supplementation impact beef cattle performance, soil organic matter, vegetation, and residual cover for wildlife?

**GW17-040**

Cover Crop Grazing: Optimal Seasonality for Soil and Livestock Benefit

**GW16-053**

Multiple Forms of Uncertainty as a Barrier to the Adoption of Sustainable Farming Practices

**GW12-004**

Investigating the Legume Green Fallow Alternative on North-Central Montana No-Till Operations

**GW10-032**

GW06-026  Effects of Weed Communities in Conventional and Organic Agricultural Systems. $7,536  Bruce Maxwell  MSU  Fabian Menalled  Dept. of Land Resources and Environmental Sciences  Fred Pollnac  Montana 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>OW22-372</td>
<td>The Buzz on the Range: Promoting healthy soils and pollinators on Montana rangeland</td>
<td>$55,990</td>
<td>Michael DeChellis  We Are For The Land Foundation, Inc.  Michael DeChellis  OpenTeam And We Are For the Land Board Member  Michal DeChellis  Cultivating Minds LLC and We Are For the Land Foundation</td>
</tr>
<tr>
<td>OW17-009</td>
<td>Soil Moisture Network and Tools - MT and WY collaborative</td>
<td>$49,995</td>
<td>Lee Schmelzer  Montana State University</td>
</tr>
<tr>
<td>OW17-026</td>
<td>Montana Food Economy Initiative</td>
<td>$50,000</td>
<td>Lindsay Ganong  AERO</td>
</tr>
<tr>
<td>OW17-021</td>
<td>Evaluating Nitrates and Forage Quality in Fall Regrowth of Annual Cereal Forages</td>
<td>$19,972</td>
<td>Dr. Tracy Mosley  Montana State University Extension</td>
</tr>
<tr>
<td>OW15-026</td>
<td>Are Feedlot-based Performance Cattle Limiting Ecological Services for Rangeland Ecosystems in Northern Mixed-grass prairies?</td>
<td>$49,961</td>
<td>Dr. Emily Meccage  Montana State University</td>
</tr>
<tr>
<td>OW13-017</td>
<td>Reference strips and precision sensors for increased nitrogen use efficiency in wheat production</td>
<td>$49,907</td>
<td>Dr. Olga Walsh  Montana State University</td>
</tr>
<tr>
<td>OW13-144</td>
<td>Effects of Late-Season Water Lease on Forage Crops</td>
<td>$24,950</td>
<td>Jodi Pauley  Montana State University</td>
</tr>
<tr>
<td>OW12-044</td>
<td>Best Management Practices for Livestock Protection Dogs</td>
<td>$49,998</td>
<td>Dr. Jeff Mosley  Montana State University</td>
</tr>
<tr>
<td>OW11-326</td>
<td>Developing Community Based Oilseed Industry in Montana</td>
<td>$49,830</td>
<td>Taylor Lyon  Bio-Energy Center                                                                  Dr. Nestor Soriano, Jr.  Lead Research Scientist</td>
</tr>
<tr>
<td>FW04-313</td>
<td>Preserving Farms and Ranches</td>
<td>$5,000</td>
<td>Robert &quot;Rob&quot; Johnson  Montana State University</td>
</tr>
</tbody>
</table>

Total funding from the USDA SARE program to Montana $9,634,362
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).