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 $359 million to more than 8,107 initiatives.

SARE is grassroots with far-reaching impact

Four regional councils of expert practitioners set priorities and make grants in every state and island protectorate.

SARE communicates results

SARE shares project results by requiring grantees to conduct outreach and grower engagement, and by maintaining an online library of practical publications, grantee-produced information products and other educational materials.

SARE in Montana

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

$9,745,902 in total funding

138 grant projects

(since 1988)

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

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 Grants in Montana

Total awards: 138 grants
- 46 Research and Education
- 22 Professional Development Program
- 37 Farmer/Rancher
- 10 On Farm
- 19 Graduate Student
- 4 Research to Grass Roots

Total funding: $9,745,902
- $6,776,722 Research and Education
- $1,325,229 Professional Development Program
- $457,198 Farmer/Rancher
- $405,603 On Farm
- $463,184 Research/Partnership
- $317,966 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

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 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

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 $9,745,902 grants to support 137 projects, including but not limited to, 45 research and/or education projects, 22 professional development projects and 37 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;Dr. Julie Young&lt;br&gt;Utah State University</td>
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<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>
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<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>
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</table>
SW20-915  Developing an integrated management decision framework for cheatgrass control in the northeastern region of the sagebrush steppe  $349,315  Lisa Rew  Montana State University  Andrew and Hilary Andersen  J Bar L Ranch  Jim Berkey  The Nature Conservancy  Amber Burch  Beaverhead County Weed District  Daphne and Kevin Chester and Crowe Double C Ranch Holdings  Kyle Cutting  US Fish, Wildlife Service  Eric and Stephanie Hansen  Hansen Livestock Company  Jeff Johnson  Johnson Ranch  Dr. Jane Mangold  Montana State University  Kara Maplethorpe  Beaverhead County Weed District  Allen and Yvonne Martinell  Lee Martinell Ranch  Dr. Bok Sowell  MSU- Animal & Range Sciences  Dr. Catherine Zabinski  Montana State University

SW19-907  Snowbanks to Grassbanks  $349,710  Dr. Bok Sowell  MSU- Animal & Range Sciences  Dr. Andrea Litt  Department of Ecology, Montana State University  Megan Van Emon  Montana State University

SW17-016  Soil acidity management of long-term no-till fields in Montana to prevent crop failure  $264,016  Dr. Richard Engel  Montana State University

SW17-080  The Impacts of Integrating Livestock into Cropping Systems on Soil Health and Crop Production  $249,502  Devon Ragen  Montana State University

SW16-051  Research and Demonstration of Minimum Tillage and Optimum Water Management in Sugarbeet Production in Eastern Montana  $247,410  Dr. Chengci Chen  Montana State University

SW15-028  Examining, Optimizing, and Building Capacity for Montana’s Local Beef to School Supply Chain  $220,021  Dr. Carmen Byker Shanks  Montana State University

SW14-014  Sustainable Cropping Systems for Dual-Purpose Biennial Canola  $256,397  Dr. Darrin Boss  Montana State University  Dr. Steve Fransen, PhD  Washington State University

SW13-043  Evaluating Native Perennial Flower Strips for Enhancing Native Bees and Pollination Services on Farmlands  $170,951  Laura Burkle  Montana State University

SW13-056  Landscape Collaborative Grazing and Greater Sage Grouse Survival  $339,552  Dr. Bok Sowell  MSU- Animal & Range Sciences

SW12-108  Low Glycemic Potatoes, a value-added crop for Montana  $154,000  Dr. David Sands  Montana State University

SW11-086  Degree Day Modeling and Economic Considerations of Insects and Weeds in Sheep Grazed Alfalfa, Grain, and Range Production Systems  $206,700  Dr. Hayes Goosey  Montana State University
<table>
<thead>
<tr>
<th>Project Code</th>
<th>Project Title</th>
<th>Funding</th>
<th>Principal Investigator(s)</th>
<th>Institution</th>
</tr>
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<tbody>
<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>Dr. Perry Miller</td>
<td>Montana State University</td>
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<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>Dr. Richard Engel</td>
<td>Montana State University</td>
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<tr>
<td>SW09-068</td>
<td>Integrating Biological Control with Targeted Sheep Grazing to Suppress Spotted Knapweed</td>
<td>$49,865</td>
<td>Rachel Frost, Dr. Jeff Mosley</td>
<td>Montana State University</td>
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<tr>
<td>SW09-601</td>
<td>Infrastructure Support for Small Livestock Processing Facilities</td>
<td>$46,796</td>
<td>Dr. Jane Boles</td>
<td>Montana State University</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>Dr. Hayes Goosey</td>
<td>Montana State University</td>
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<tr>
<td>SW07-025</td>
<td>Grower-based selection of varieties and systems for wheat stem sawfly control</td>
<td>$125,000</td>
<td>Dr. Luther Talbert</td>
<td>Montana State University</td>
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<tr>
<td>SW07-028</td>
<td>Is Sulfur Cinquefoil a Candidate for Control with Sheep and Goats?</td>
<td>$54,250</td>
<td>Dr. Jeff Mosley, Rachel Frost</td>
<td>Montana State University</td>
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<tr>
<td>SW07-603</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>Dr. Hayes Goosey</td>
<td>Montana State University</td>
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<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>Dr. Chengci Chen</td>
<td>Montana State University</td>
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<tr>
<td>SW06-075</td>
<td>Does Timing of Defoliation Affect Spotted Knapweed Seed Viability and Germination?</td>
<td>$62,600</td>
<td>Tracy Brewer, Dr. Tracy Mosley</td>
<td>Park County Extension - Montana State University</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>Fabian Menalled</td>
<td>Dept. of Land Resources and Environmental Sciences</td>
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<tr>
<td>SW04-007</td>
<td>Methane Recovery from Small Dairy Operations</td>
<td>$123,834</td>
<td>Ron Carlstrom</td>
<td>MSU Extension- Gallatin County</td>
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<tr>
<td>SW03-056</td>
<td>Ecologically Based Integrated Weed Management to Restore Plant Diversity</td>
<td>$121,750</td>
<td>James Jacobs</td>
<td>Montana State University</td>
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<tr>
<td>SW03-063</td>
<td>Factors Affecting Alfalfa Stand Longevity in Montana</td>
<td>$139,397</td>
<td>Dennis Cash</td>
<td>Montana State University</td>
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<tr>
<td>SW02-005</td>
<td>Increasing Crop Water Use Efficiency in Advanced No-Till Systems</td>
<td>$22,980</td>
<td>Dr. Perry Miller</td>
<td>Montana State University</td>
</tr>
<tr>
<td>Project Code</td>
<td>Title</td>
<td>Funding</td>
<td>Principal Investigator(s)</td>
<td></td>
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</tr>
</tbody>
</table>
| SW01-048     | Using Crop Diversity in No-till and Organic Systems to Reduce Inputs and Increase Profits and Sustainability in the Northern Plains | $157,888 | Bruce Maxwell  
MSU                                                                   |
| SW00-015     | An Alternative to Traditional Wheat Stubble Management Using Sheep to Control Pests and Improve Soil Nutrient Cycling | $166,147 | Patrick Hatfield  
Department of Animal and Range Sciences  
Sue Blodgett  
Montana State University, Dept. Entomology  
Dr. Hayes Goosby  
Montana State University  
Duane Griffith  
Montana State University, Ag Econ and Ext Dept |
| SW98-064     | Selecting Cattle to Prevent Grazing Distribution Problems                                  | $115,598 | Derek Bailey  
Montana State University                                                   |
| SW97-056     | Comparison of Pest Management Interactions in Spring Wheat-Cover Crop and Spring Wheat-Fallow Cropping Systems | $150,964 | Andrew Lenssen  
Montana State University                                                   |
| SW96-019     | Sustaining Agriculture and Community: Moving the Farm Improvement Club Program Beyond the Farm Gate | $124,425 | Jonda Crosby  
Alternative Energy Resources Organization                                         |
| LW92-004     | Sustainable Farming Quarterly                                                               | $17,500 | Nancy Matheson  
Alternative Energy Resources Organization (AERO)                                    |
| LWD92-004    | The Sustainable Farming Quarterly (SFQ) A Regional Newsletter                               | $17,500 | Al Kurki  
Alternative Energy Resources Organization (AERO)                                    |
| LW91-023     | Farm Improvement Club Network for Sustainable Agriculture                                   | $69,000 | Nancy Matheson  
Alternative Energy Resources Organization (AERO)                                    |
| LW91-024     | Specifying and Analyzing Whole-Ranch Systems for Sustainable Range Livestock Production in Environmentally Sensitive Areas | $290,000 | Jack Riesselman  
Montana State University                                                   |
| LW91-025     | Practical Education in Sustainable Production Systems                                       | $14,250 | Wade Crouch  
Montana State University                                                   |
| LW91-003     | Regional Farm and Research Center Matching System-FARMS                                     | $3,000 | J. Jacobsen  
Montana State University                                                   |
Alternative Energy Resources Organization (AERO)                                    |
| LW89-014     | Low-Input Legume/Cereal Rotations for the Northern Great Plains/Intermountain Region         | $162,000 | James Sims  
Montana State University                                                   |
| LW89-016     | Bio-Priming for the Control of Pythium Reemergence Damping-Off in Vegetable Crops            | $14,984 | Nancy Callan  
Montana State University                                                   |
| LW89-019     | Livestock Health and Nutrition Alternatives: A Western States Conference                    | $5,000  | Al Kurki  
Alternative Energy Resources Organization (AERO)                                    |
<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>
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<tr>
<th>Project #</th>
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<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 |
Sustainable Beef Cattle Production: Ranch to Ribeye

Building Internal Capacity for the Blackfeet Tribe Agricultural Resource Management Plan (ARMP)

Pheromones as Tools for Monitoring the Insect Pests in the Northern Plains - Instructive Tools for Agricultural Professionals

Integrated Parasite Management: Train the Trainer

Best Management Practices (BMPs) for Mitigating Herbicide Resistance in the Northern Great Plains - Educational Tools for Agricultural Professionals

Catalyzing Increased Agricultural Sales through a Common Understanding of Montana’s New Food Modernization Law

Conservation and Augmentative Biological Control in the Northern Plains - Providing Tools for Agriculture Professionals

Enhancing the Exploring Energy Efficiency & Alternatives (E3A) Curriculum

Tour of sustainable Small Grain Production in Eastern Washington

Montana State University Extension Range Management Institute

Wildlife Damage Control for Traditional and Organic Farmers

Training Tour 2002-03-04

Growing Our Own: Communities That Sustain Entrepreneurs

Developing a Sustainable and Organic Master Gardener Horticulture Production Manual

Harvesting the Wealth: of AERO’s Farm and Ranch Improvement Clubs
### Sustainable Agriculture Youth Education: Professional Dev. for Youth Program Leaders and Educators

**Project #:** EW97-007  
**Title:** Sustainable Agriculture Youth Education: Professional Dev. for Youth Program Leaders and Educators  
**Award:** $100,000  
**Project Leaders:** Jonda Crosby  
**Institution:** Alternative Energy Resources Organization

### Sustainable Noxious Weed Management on Northwestern Rangelands

**Project #:** EW95-002  
**Title:** Sustainable Noxious Weed Management on Northwestern Rangelands  
**Award:** $43,800  
**Project Leaders:** Roger Sheley  
**Institution:** Montana State University

### Agency Personnel Training in Riparian Monitoring and Management of Wildlife and Livestock in the Intermountain West

**Project #:** EW95-003  
**Title:** Agency Personnel Training in Riparian Monitoring and Management of Wildlife and Livestock in the Intermountain West  
**Award:** $98,000  
**Project Leaders:** Dr. Jim Knight  
**Institution:** Extension Wildlife Specialist

### Sustainable Agriculture Training Project A Model of Collaborative Learning

**Project #:** EW95-012  
**Title:** Sustainable Agriculture Training Project A Model of Collaborative Learning  
**Award:** $31,450  
**Project Leaders:** Nancy Matheson  
**Institution:** Alternative Energy Resources Organization (AERO)

### Sustainable Agriculture Training Project: A Model of Collaborative Learning

**Project #:** EW94-006  
**Title:** Sustainable Agriculture Training Project: A Model of Collaborative Learning  
**Award:** $91,000  
**Project Leaders:** Nancy Matheson  
**Institution:** Alternative Energy Resources Organization (AERO)

## FARMER/RANCHER GRANTS

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<tr>
<th>Project #</th>
<th>Project Title</th>
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<th>Project Leaders</th>
</tr>
</thead>
</table>
| FW22-390   | Could sainfoin be the first dual-purpose perennial pulse crop for the western US? | $24,864      | Shawn Wentzel  
             |                                                                |              | Alaska Ranch   |
| FW22-398   | Establishing a Cool Season Legume Grass Finishing Pasture                      | $8,992       | Ronald Wade     
             |                                                                |              | Browns Meadow Farm |
| FW22-396   | Livestock as a Tool for Pasture Management: Shifting Species Composition        | $22,123      | Doug Lair       
             |                                                                |              | DBA Lair Ranch  |
| FW21-372   | Collaborative monitoring for ranch resilience and social-ecological sustainability in central Montana | $29,000      | Bill Milton     
             |                                                                |              | Milton Ranch    |
| FW19-340   | Improving Winter Greens Production and Storage for Cold Climate Farmers        | $19,990      | Katelyn Madden  
             |                                                                |              | MGVC            |
| FW15-039   | Making the Most of Fine Fleece: Environmental, Economic, and Social Costs and Benefits of Alternative Strategies for Marketing Sheep Wool | $10,646      | Linda Poole     
             |                                                                |              | Prairie Shepherd |
| FW11-024   | Organic Control of Perennial Weeds with Vinegar and Biologicals                 | $20,790      | Jess Alger      
             |                                                                |              | Organic control of Perennial Weeds |
| FW10-042   | Marketing J Bar L Ranch Grassfed Beef to Members of Conservation Organizations | $13,000      | Bryan Ulring    
             |                                                                |              | J Bar L Ranches, LLC |
| FW09-305   | Composting Recommendations and Marketing Evaluation for Livestock Operations in Cold Semi-Arid Environments | $49,315      | Thomas Bass     
             |                                                                |              | Montana State University |
| FW08-016   | Can Producers in Five Montana Counties Successfully Use No-Till Methods for Renovation of Irrigated and Dryland Pastures? | $29,999      | Ron Carlstrom   
             |                                                                |              | MSU Extension- Gallatin County  
<pre><code>         |                                                                |              | George Reich    |
</code></pre>
<p>| FW08-023   | Pasture-Raised Heritage Turkeys in a Dryland Farming System                     | $6,413       | Jacob Cowgill   |</p>
<table>
<thead>
<tr>
<th>Project Code</th>
<th>Title</th>
<th>Budget</th>
<th>Principal Investigator</th>
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</thead>
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<tr>
<td>FW08-034</td>
<td>High-Nutrition Drought-Tolerant Corn</td>
<td>$30,000</td>
<td>Dave Christensen</td>
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<tr>
<td>FW08-317</td>
<td>Sustainable Food and Bioenergy Systems: Student Internships Development Plan</td>
<td>$29,983</td>
<td>Dr. William Dyer Montana State University</td>
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<td>FW06-025</td>
<td>Agroecosystem Approach to Managing Imported Cabbage Worm (Peris rapae)</td>
<td>$6,356</td>
<td>Helen Atthowe Biodesign Farm</td>
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<tr>
<td>FW05-012</td>
<td>Forage Winter Wheat Production for Grazing or Hay Production in Eight Montana Counties</td>
<td>$19,795</td>
<td>George Reich</td>
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<td>FW05-301</td>
<td>Protecting High Quality Rangelands in Garfield County from Invasive Weed Spread</td>
<td>$20,000</td>
<td>Eric Miller Montana State University</td>
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<td>FW05-305</td>
<td>Demonstration of Leafy Spurge Management Using Sheep Grazing in a Leafy Spurge Barrier Zone</td>
<td>$9,960</td>
<td>Sharla Sackman Montana State University Extension Service</td>
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<tr>
<td>FW04-018</td>
<td>Forage Winter Wheat Production for Jay or Grain in Gallatin County, Montana</td>
<td>$5,370</td>
<td>George Reich</td>
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<td>FW02-036</td>
<td>Sheep and Cattle Grazing Complementarity Project</td>
<td>$5,055</td>
<td>Randall Tunby</td>
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<td>FW01-032</td>
<td>Biological Weed Control: Education and Implementation</td>
<td>$7,500</td>
<td>Noah Poritz</td>
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<tr>
<td>FW01-085</td>
<td>Biological and Mechanical Control of Perennial Weeds in North-Central Montana</td>
<td>$6,387</td>
<td>Robert Quinn Montana State University</td>
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<td>FW00-017</td>
<td>Establishing a Sustainable Program for Recycling and Propagation of Quality Flower Bulbs in a Wholesale Flower Production Operation</td>
<td>$2,197</td>
<td>Laura Smith</td>
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<td>FW00-260</td>
<td>Test Marketing Campaign to Conduct In-Store Lamb Cooking and Recipe Demonstration for Montana Natural Lamb Cooperative in the Billings, Montana Market Area</td>
<td>$9,300</td>
<td>Gayle Ott</td>
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<td>FW00-282</td>
<td>Better Board of Trade.Com</td>
<td>$8,054</td>
<td>David Oien</td>
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<td>FW00-288</td>
<td>TEAM-Team Effort in Agricultural Marketing for the McAlpine Ranch</td>
<td>$9,705</td>
<td>Clay McAlpine</td>
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<tr>
<td>FW00-314</td>
<td>Montana Arnica Web Page</td>
<td>$870</td>
<td>Rod Daniel</td>
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<tr>
<td>FW99-102</td>
<td>Range Monitoring in the Badlands Grazing District</td>
<td>$10,000</td>
<td>Jack McCuin</td>
</tr>
<tr>
<td>FW98-035</td>
<td>Annual Forages for Dryland Rotations</td>
<td>$1,540</td>
<td>Vern Pluhar</td>
</tr>
</tbody>
</table>
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>
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<tbody>
<tr>
<td>GW22-235</td>
<td>Carrots as a Model for Defining Critical Period of Weed Management, Biofertilization, and Market Opportunities for Great Plains Vegetables Producers</td>
<td>$29,997</td>
<td>Fabian Menalled  Dept. of Land Resources and Environmental Sciences  Mac Burgess Montana State University  Dr. Roland Ebel Montana State University  Emma Kubinski Montana State University</td>
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<tr>
<td>GW22-237</td>
<td>Integrated Weed Management of non-native annual grass, Ventenata dubia, in Montana rangelands</td>
<td>$29,722</td>
<td>Lisa Rew Montana State University  Dr. Jane Mangold Montana State University  Dr. Lisa Rew Montana State University  Lilly Sencenbaugh Montana State University</td>
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<td>GW22-240</td>
<td>Managing Crop Residues for Soil Health</td>
<td>$29,698</td>
<td>Dr. Catherine Zabinski Montana State University  Zane Ashford Montana State University</td>
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<td>GW21-218</td>
<td>Integrating thistle rust into weed management of Canada thistle</td>
<td>$30,000</td>
<td>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</td>
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<tr>
<td>Project Code</td>
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<td>Principal Investigator(s)</td>
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<tr>
<td>GW20-204</td>
<td>Restoring Disturbed Rangelands With Site-Specific Seeding</td>
<td>$25,000</td>
<td>Lisa Rew Montana State University Colter Mumford Montana State University</td>
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<td>GW20-205</td>
<td>Measuring intra-field variability in pea protein to understand influencing factors in Montana cropping systems</td>
<td>$25,000</td>
<td>Dr.Clain Jones Montana State University Dr.Perry Miller Montana State University Samuel Koeshall Montana State University</td>
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<tr>
<td>GW19-190</td>
<td>Nitrogen Fertilizer Management Based on Site-Specific Maximized Profit and Minimized Pollution</td>
<td>$24,992</td>
<td>Dr.Stephanie Ewing Montana State University Bruce Maxwell MSU Paul Hegedus Montana State University</td>
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<tr>
<td>GW19-197</td>
<td>Fostering resilient plant-soil interactions on working ranches in semi-arid steppe ecosystems of north-central and eastern Montana.</td>
<td>$24,988</td>
<td>Dr.Craig Carr Montana State University Dr.Stephanie Ewing Montana State University Dr.Christine Gobrogge Montana State University Environmental Analytical Laboratory Seth Newton Bear Gulch Ranch Jay &quot;Butch&quot; Ortner Ortner Ranch Danny Pratt Natural Resources Conservation Services Tiffany Salveson Natural Resources Conservation Service Timothy Seipel Department of Land Resources and Environmental Sciences, Montana State University Joseph Capella Montana State University</td>
</tr>
<tr>
<td>GW19-198</td>
<td>Precision Agriculture Applied to Organic Systems</td>
<td>$22,500</td>
<td>Bruce Maxwell MSU Royden Loewen Montana State University</td>
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<tr>
<td>GW19-199</td>
<td>Effects of Habitat Heterogeneity on Crop Yield and Biodiversity</td>
<td>$24,972</td>
<td>Bruce Maxwell MSU Hannah Duff 1992</td>
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<tr>
<td>GW18-050</td>
<td>Montana Hardy Fruit Nutraceutical Quality</td>
<td>$17,765</td>
<td>Mac Burgess Montana State University Durc Setzer Montana State University</td>
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<td>GW18-179</td>
<td>Predicting overwinter nitrate-N changes at the subfield scale in leaching-susceptible, agricultural soils</td>
<td>$25,000</td>
<td>Dr.Clain Jones Montana State University Dr.Patrick Carr Montana State University Simon Fordyce Montana State University Central Agricultural Research Center</td>
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<td>GW18-151</td>
<td>Advancing Cover Crop Knowledge: Assessing the Role of Plant Diversity on Soil Change</td>
<td>$25,000</td>
<td>Dr.Perry Miller Montana State University Kristen Dagati Montana State University</td>
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<td>GW17-040</td>
<td>Sustainability of dormant season grazing: Does protein supplementation impact beef cattle performance, soil organic matter, vegetation, and residual cover for wildlife?</td>
<td>$24,970</td>
<td>Dr Janice Bowman Montana State University Dr.Lance McNew Montana State University Samuel Wyffels Montana State University</td>
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<tr>
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| OW22-372 | The Buzz on the Range: Promoting healthy soils and pollinators on Montana rangeland | $55,990      | Michael DeChellis  
We Are For The Land Foundation, Inc.  
OpenTeam And We Are For the Land Board Member  
Cultivating Minds LLC and We Are For the Land Foundation |
| OW17-009 | Soil Moisture Network and Tools - MT and WY collaborative                    | $49,995      | Lee Schmelzer  
Montana State University                           |
| OW17-026 | Montana Food Economy Initiative                                              | $50,000      | Lindsay Ganong  
AERO                                                |
| OW17-021 | Evaluating Nitrates and Forage Quality in Fall Regrowth of Annual Cereal Forages | $19,972      | Dr. Tracy Mosley  
Montana State University Extension                 |
| OW15-026 | Are Feedlot-based Performance Cattle Limiting Ecological Services for Rangeland Ecosystems in Northern Mixed-grass prairies? | $49,961      | Dr. Emily Meccage  
Montana State University                            |
| OW13-017 | Reference strips and precision sensors for increased nitrogen use efficiency in wheat production | $49,907      | Dr. Olga Walsh  
Montana State University                           |
| OW13-144 | Effects of Late-Season Water Lease on Forage Crops                          | $24,950      | Jodi Pauley  
Montana State University                           |
| OW12-044 | Best Management Practices for Livestock Protection Dogs                      | $49,998      | Dr. Jeff Mosley  
Montana State University                           |
| OW11-326 | Developing Community Based Oilseed Industry in Montana                       | $49,830      | Taylor Lyon  
Bio-Energy Center  
Dr. Nestor Soriano, Jr.  
Lead Research Scientist                            |
Total funding from the USDA SARE program to Montana
$9,745,902

For further information on projects, contact Western SARE at (406) 994-4789 or wsare@montana.edu.
Sustainable Agriculture Research and Education (SARE) is funded by USDA’s National Institute of Food and Agriculture (NIFA).