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 $361 million to more than 8,187 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: 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

$9,745,902 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
SARE Grants in Montana

Total awards: 138 grants
- 46 Research and Education
- 22 Professional Development Program
- 37 Farmer/Rancher
- 10 On Farm Research/Partnership
- 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 Research/Partnership
- $463,184 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>
</table>
| SW22-934  | Landowner Collaborative Strategies for Nonlethal Predator Control              | $349,951     | Dr. Jared Beaver  
Montana State University  
Dr. Stewart Breck  
Colorado State University  
Dr. Alex Few  
Western Landowners Alliance  
Kyran Kunkel  
Western Landowners Alliance  
Dr. Julie Young  
Utah State University    |
| SW21-929  | Indigenous Food-Science-Ways: Integrating Indigenous knowledge with food science research and education to support value-added Native foods | $349,898     | Wan-Yuan Kuo  
Montana State University  
Eric Belasco  
Dr. Jane Boles  
Montana State University  
Dr. Paul Gannon  
Montana State University  
Dr. Paul Lachapelle  
Montana State University  
Dr. Brent Peyton  
Montana State University  
Brenda Richey  
Montana State University    |
| SW21-930  | Intercropping chickpea with flax: An alternative sustainable way to manage Ascochyta blight of Chickpea | $347,557     | Dr. Chengci Chen  
Montana State University  
Dr. Frankie Crutcher  
Montana State University-EARC  
Dr. William Franck  
Montana State University-EARC  
Dr. Qasim Khan  
Montana State University-SARC  
Dr. Kevin McPhee  
Montana State University-EARC  
Dr. Kent McVay  
Montana State University-SARC |
Developing an integrated management decision framework for cheatgrass control in the northeastern region of the sagebrush steppe

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

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

Soil acidity management of long-term no-till fields in Montana to prevent crop failure

$264,016

Dr. Richard Engel
Montana State University

The Impacts of Integrating Livestock into Cropping Systems on Soil Health and Crop Production

$249,502

Devon Ragen
Montana State University

Research and Demonstration of Minimum Tillage and Optimum Water Management in Sugarbeet Production in Eastern Montana

$247,410

Dr. Chengci Chen
Montana State University

Examining, Optimizing, and Building Capacity for Montana’s Local Beef to School Supply Chain

$220,021

Dr. Carmen Byker Shanks
Montana State University

Sustainable Cropping Systems for Dual-Purpose Biennial Canola

$256,397

Dr. Darrin Boss
Montana State University
Dr. Steve Fransen, PhD
Washington State University

Evaluating Native Perennial Flower Strips for Enhancing Native Bees and Pollination Services on Farmlands

$170,951

Laura Burkle
Montana State University

Landscape Collaborative Grazing and Greater Sage Grouse Survival

$339,552

Dr. Bok Sowell
MSU-Animal & Range Sciences

Low Glycemic Potatoes, a value-added crop for Montana

$154,000

Dr. David Sands
Montana State University

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 Number</th>
<th>Title</th>
<th>Amount</th>
<th>Principal Investigator</th>
<th>Institution</th>
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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</td>
<td>Montana State University</td>
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<tr>
<td></td>
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<td></td>
<td>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>
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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</td>
<td>Montana State University</td>
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<td>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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<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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<td>SW06-075</td>
<td>Does Timing of Defoliation Affect Spotted Knapweed Seed Viability and Germination?</td>
<td>$62,600</td>
<td>Tracy Brewer</td>
<td>Park County Extension - Montana State University</td>
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<td>Dr. Tracy Mosley</td>
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<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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<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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<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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<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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<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>
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<td>SW01-048</td>
<td>Using Crop Diversity in No-till and Organic Systems to Reduce Inputs</td>
<td>$157,888</td>
<td>Bruce Maxwell MSU</td>
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<td></td>
<td>and Increase Profits and Sustainability in the Northern Plains</td>
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<td>SW00-015</td>
<td>An Alternative to Traditional Wheat Stubble Management Using Sheep</td>
<td>$166,147</td>
<td>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</td>
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<td></td>
<td>to Control Pests and Improve Soil Nutrient Cycling</td>
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<td>SW98-064</td>
<td>Selecting Cattle to Prevent Grazing Distribution Problems</td>
<td>$115,598</td>
<td>Derek Bailey Montana State University</td>
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<td>SW97-056</td>
<td>Comparison of Pest Management Interactions in Spring Wheat-Cover</td>
<td>$150,964</td>
<td>Andrew Lenssen Montana State University</td>
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<td>Crop and Spring Wheat-Fallow Cropping Systems</td>
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<td>SW96-019</td>
<td>Sustaining Agriculture and Community: Moving the Farm Improvement</td>
<td>$124,425</td>
<td>Jonda Crosby Alternative Energy Resources Organization</td>
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<td>Club Program Beyond the Farm Gate</td>
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<td>LW92-004</td>
<td>Sustainable Farming Quarterly</td>
<td>$17,500</td>
<td>Nancy Matheson Alternative Energy Resources Organization (AERO)</td>
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<td>LWD92-004</td>
<td>The Sustainable Farming Quarterly (SFQ) A Regional Newsletter</td>
<td>$17,500</td>
<td>Al Kurki Alternative Energy Resources Organization (AERO)</td>
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<td>LW91-023</td>
<td>Farm Improvement Club Network for Sustainable Agriculture</td>
<td>$69,000</td>
<td>Nancy Matheson Alternative Energy Resources Organization (AERO)</td>
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<td>LW91-024</td>
<td>Specifying and Analyzing Whole-Ranch Systems for Sustainable Range</td>
<td>$290,000</td>
<td>Jack Riesselman Montana State University</td>
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<td>Livestock Production in Environmentally Sensitive Areas</td>
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<td>LW91-025</td>
<td>Practical Education in Sustainable Production Systems</td>
<td>$14,250</td>
<td>Wade Crouch Montana State University</td>
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<td>LWD91-003</td>
<td>Regional Farm and Research Center Matching System-FARMS</td>
<td>$3,000</td>
<td>J. Jacobsen Montana State University</td>
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<td>Small Grains-Fallow Area of the Inland Northwest and High Plains</td>
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<td>LW89-014</td>
<td>Low-Input Legume/Cereal Rotations for the Northern Great Plains</td>
<td>$162,000</td>
<td>James Sims Montana State University</td>
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<td>Intermountain Region</td>
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<td>LW89-016</td>
<td>Bio-Priming for the Control of Pythium Reemergence Damping-Off</td>
<td>$14,984</td>
<td>Nancy Callan Montana State University</td>
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<td>in Vegetable Crops</td>
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<td>LW89-019</td>
<td>Livestock Health and Nutrition Alternatives: A Western States</td>
<td>$5,000</td>
<td>Al Kurki Alternative Energy Resources Organization (AERO)</td>
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<td></td>
<td>Conference</td>
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</table>
LW88-006  Soil-building Cropping Systems
Conference-Legumes and Other
Green Manures in Cropping Systems
of The Northern Plains, Rockies and
Intermountain Region

$7,700  Robert Gillespie
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
Michel DeChellis
AERO and Cultivating Minds, LLC
Kim Lloyd
St. Peter's Health
Michele Schachtsen
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>
<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
Gerald Lunak
Joe Gervais
K Webb Galbreath
<table>
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<tr>
<th>Project Code</th>
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<th>Amount</th>
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<tr>
<td>WPDP19-15</td>
<td>Sustainable Beef Cattle Production: Ranch to Ribeye</td>
<td>$57,310</td>
<td>Megan Van Emon&lt;br&gt;Montana State University&lt;br&gt;Colleen Buck&lt;br&gt;Montana State University&lt;br&gt;Callie Cooley&lt;br&gt;Montana State University&lt;br&gt;Molly Hammond&lt;br&gt;Montana State University&lt;br&gt;Elin Kittelmann&lt;br&gt;Montana State University&lt;br&gt;Kari Lewis&lt;br&gt;Montana State University</td>
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<tr>
<td>EW18-027</td>
<td>Building Internal Capacity for the Blackfeet Tribe Agricultural Resource Management Plan (ARMP)</td>
<td>$52,155</td>
<td>Loren Bird Rattler&lt;br&gt;Blackfeet Tribe</td>
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<tr>
<td>EW18-011</td>
<td>Pheromones as Tools for Monitoring the Insect Pests in the Northern Plains - Instructive Tools for Agricultural Professionals</td>
<td>$73,510</td>
<td>Dr. Michael Ivie&lt;br&gt;Montana State University-Bozeman</td>
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<tr>
<td>EW17-011</td>
<td>Integrated Parasite Management: Train the Trainer</td>
<td>$74,189</td>
<td>David Scott&lt;br&gt;National Center for Appropriate Technology</td>
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<tr>
<td>EW16-029</td>
<td>Best Management Practices (BMPs) for Mitigating Herbicide Resistance in the Northern Great Plains - Educational Tools for Agricultural Professionals</td>
<td>$68,871</td>
<td>Dr. Prashant Jha&lt;br&gt;Montana State University, Southern Agricultural Research Center, Huntley, MT</td>
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<tr>
<td>EW16-036</td>
<td>Catalyzing Increased Agricultural Sales through a Common Understanding of Montana’s New Food Modernization Law</td>
<td>$22,332</td>
<td>Jennifer Hill-Hart&lt;br&gt;AERO</td>
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<tr>
<td>EW15-009</td>
<td>Conservation and Augmentative Biological Control in the Northern Plains - Providing Tools for Agriculture Professionals</td>
<td>$68,182</td>
<td>Dr. Michael Ivie&lt;br&gt;Montana State University-Bozeman</td>
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<td>EW13-014</td>
<td>Enhancing the Exploring Energy Efficiency &amp; Alternatives (E3A) Curriculum</td>
<td>$42,277</td>
<td>Milton Geiger&lt;br&gt;University of Wyoming Extension&lt;br&gt;Dr. Glen Whipple&lt;br&gt;University of Wyoming Extension</td>
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<tr>
<td>EW12-004</td>
<td>Tour of sustainable Small Grain Production in Eastern Washington</td>
<td>$7,350</td>
<td>Dan Picard&lt;br&gt;MSU Extension-Pondera County&lt;br&gt;Jesse Fulbright&lt;br&gt;Montana State University</td>
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<tr>
<td>EW12-006</td>
<td>Montana State University Extension Range Management Institute</td>
<td>$60,000</td>
<td>Dr. Tracy Mosley&lt;br&gt;Montana State University Extension</td>
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<tr>
<td>EW11-012</td>
<td>Wildlife Damage Control for Traditional and Organic Farmers</td>
<td>$96,053</td>
<td>Dr. Jim Knight&lt;br&gt;Extension Wildlife Specialist</td>
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<tr>
<td>EW01-007</td>
<td>Training Tour 2002-03-04</td>
<td>$30,024</td>
<td>Jonda Crosby&lt;br&gt;Alternative Energy Resources Organization</td>
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<tr>
<td>EW01-016</td>
<td>Growing Our Own: Communities That Sustain Entrepreneurs</td>
<td>$52,483</td>
<td>Richard Williams&lt;br&gt;Montana State University Extension Service</td>
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<tr>
<td>EW99-008</td>
<td>Developing a Sustainable and Organic Master Gardener Horticulture Production Manual</td>
<td>$22,483</td>
<td>Helen Atthowe&lt;br&gt;Missoula County Extension Service</td>
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<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&lt;br&gt;Alternative Energy Resources Organization</td>
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</tbody>
</table>
### EW97-007
**Sustainable Agriculture Youth Education: Professional Dev. for Youth Program Leaders and Educators**
- **SARE Support:** $100,000
- **Project Leaders:** Jonda Crosby (Alternative Energy Resources Organization)

### EW95-002
**Sustainable Noxious Weed Management on Northwestern Rangelands**
- **SARE Support:** $43,800
- **Project Leaders:** Roger Sheley (Montana State University)

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

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

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

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**FARMER/RANCHER GRANTS**

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<th>Project #</th>
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<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>
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<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>
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<td>FW22-396</td>
<td>Livestock as a Tool for Pasture Management: Shifting Species Composition</td>
<td>$22,123</td>
<td>Doug Lair (DBA Lair Ranch)</td>
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<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>
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<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>
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<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>
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<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>
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<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>
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<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>
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<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>
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<td>FW08-023</td>
<td>Pasture-Raised Heritage Turkeys in a Dryland Farming System</td>
<td>$6,413</td>
<td>Jacob Cowgill</td>
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FW08-034  High-Nutrition Drought-Tolerant Corn  $30,000  Dave Christensen
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
FW99-102  Range Monitoring in the Badlands Grazing District  $10,000  Jack McCuin
FW98-035  Annual Forages for Dryland Rotations  $1,540  Vern Pluhar
Cull Potato Composting $7,500 Steve McCullough

Green Manure/Covercrop Combination Experiment $1,923 Rod Daniel

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

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

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

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

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

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>
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</thead>
</table>
| GW22-235 | Carrots as a Model for Defining Critical Period of Weed Management, Biofertilization, and Market Opportunities for Great Plains Vegetables Producers | $29,997 | 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 |
| GW22-237 | Integrated Weed Management of non-native annual grass, Ventenata dubia, in Montana rangelands | $29,722 | Lisa Rew  
Montana State University  
Dr.Jane Mangold  
Montana State University  
Dr.Lisa Rew  
Montana State University  
Lilly Sencenbaugh  
Montana State University |
| GW22-240 | Managing Crop Residues for Soil Health | $29,698 | Dr.Catherine Zabinski  
Montana State University  
Zane Ashford  
Montana State University |
| 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

GW19-197  Fostering resilient plant-soil interactions on working ranches in semi-arid steppe ecosystems of north-central and eastern Montana.  $24,988
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 "Butch" 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

GW19-198  Precision Agriculture Applied to Organic Systems  $22,500
Bruce Maxwell  MSU
Royden Loewen  Montana State University

GW19-199  Effects of Habitat Heterogeneity on Crop Yield and Biodiversity  $24,972
Bruce Maxwell  MSU
Hannah Duff  1992

GW18-050  Montana Hardy Fruit Nutraceutical Quality  $17,765
Mac Burgess  Montana State University
Durc Setzer  Montana State University

GW18-179  Predicting overwinter nitrate-N changes at the subfield scale in leaching-susceptible, agricultural soils  $25,000
Dr.Clain Jones  Montana State University
Dr.Patrick Carr  Montana State University
Simon Fordyce  Montana State University Central Agricultural Research Center

GW18-151  Advancing Cover Crop Knowledge: Assessing the Role of Plant Diversity on Soil Change  $25,000
Dr.Perry Miller  Montana State University
Kristen Dagati  Montana State University

GW17-040  Sustainability of dormant season grazing: Does protein supplementation impact beef cattle performance, soil organic matter, vegetation, and residual cover for wildlife?  $24,970
Dr.Janice Bowman  Montana State University
Dr.Lance McNew  Montana State University
Samuel Wyffels  Montana State University
GW16-053  Cover Crop Grazing: Optimal Seasonality for Soil and Livestock Benefit  $25,000  Dr. Perry Miller  Montana State University  Robert Walker  MSU LRES

GW12-004  Multiple Forms of Uncertainty as a Barrier to the Adoption of Sustainable Farming Practices  $24,830  Patrick Lawrence  Montana State University

GW10-032  Investigating the Legume Green Fallow Alternative on North-Central Montana No-Till Operations  $24,250  Dr. Perry Miller  Montana State University  Justin O’Dea  Washington State University


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>
</table>
| 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.  
Michael DeChellis  
OpenTeam And We Are for the Land Board Member  
Michal DeChellis  
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).