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 $389 million to more than 8,542 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.

<table>
<thead>
<tr>
<th>SARE in Montana</th>
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<tbody>
<tr>
<td>western.sare.org/sare-in-your-state/montana</td>
</tr>
</tbody>
</table>

$9,853,640 in total funding

139 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: 139 grants
- 46 Research and Education
- 23 Professional Development Program
- 36 Farmer/Rancher
- 10 On Farm Research/Partnership
- 20 Graduate Student
- 4 Research to Grass Roots

Total funding: $9,853,640
- $6,776,722 Research and Education
- $1,425,090 Professional Development Program
- $435,075 Farmer/Rancher
- $405,603 On Farm Research/Partnership
- $493,184 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
MSU Extension FRTEP- Flathead Reservation
(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.
AGRICULTURE PROJECTS FUNDED IN MONTANA
by USDA's Sustainable Agriculture Research and Education (SARE) Program

Montana has been awarded $9,853,640 grants to support 138 projects, including but not limited to, 45 research and/or education projects, 23 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>
</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  
Montana State University  
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  
Mattie Griswold  
Montana State University  
Rebecca Richter  
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 |
<table>
<thead>
<tr>
<th>Project Code</th>
<th>Title</th>
<th>Budget</th>
<th>Principal Investigator(s)</th>
</tr>
</thead>
</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 |
SW11-099  Using cover crop mixtures to improve soil health in low rainfall areas of the northern plains  
$354,405  Dr.Perry Miller  
Montana State University

SW10-050  Enhancing Cropping System Sustainability by Minimizing Ammonia-N Losses from Biological and Chemical Inputs  
$190,009  Dr.Richard Engel  
Montana State University

SW09-068  Integrating Biological Control with Targeted Sheep Grazing to Suppress Spotted Knapweed  
$49,865  Rachel Frost  
Montana State University  
Dr.Jeff Mosley  
Montana State University

SW09-601  Infrastructure Support for Small Livestock Processing Facilities  
$46,796  Dr.Jane Boles  
Montana State University

$96,817  Dr.Hayes Goosey  
Montana State University

SW07-025  Grower-based selection of varieties and systems for wheat stem sawfly control  
$125,000  Dr.Luther Talbert  
Montana State University

SW07-028  Is Sulfur Cinquefoil a Candidate for Control with Sheep and Goats?  
$54,250  Dr.Jeff Mosley  
Montana State University  
Rachel Frost  
Montana State University

SW07-603  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 preesticide and mechanical methods of weed and insect control  
$10,000  Dr.Hayes Goosey  
Montana State University

SW06-006  Survey and Economic Analysis of Montana Farms Utilizing Integrated Livestock-Cereal Grain (Ley Farming) Systems  
$91,500  Dr.Chengci Chen  
Montana State University

SW06-075  Does Timing of Defoliation Affect Spotted Knapweed Seed Viability and Germination?  
$62,600  Tracy Brewer  
Park County Extension - Montana State University  
Dr.Tracy Mosley  
Montana State University Extension

SW05-038  Developing Distance Learning Based on Perceptions and Knowledge of Producers and Agricultural Professionals  
$98,819  Fabian Menalled  
Dept. of Land Resources and Environmental Sciences

SW04-007  Methane Recovery from Small Dairy Operations  
$123,834  Ron Carlstrom  
MSU Extension- Gallatin County

SW03-056  Ecologically Based Integrated Weed Management to Restore Plant Diversity  
$121,750  James Jacobs  
Montana State University

SW03-063  Factors Affecting Alfalfa Stand Longevity in Montana  
$139,397  Dennis Cash  
Montana State University

SW02-005  Increasing Crop Water Use Efficiency in Advanced No-Till Systems  
$22,980  Dr.Perry Miller  
Montana State University
<table>
<thead>
<tr>
<th>Code</th>
<th>Project Title</th>
<th>Budget</th>
<th>Principal Investigator(s)</th>
</tr>
</thead>
</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 | Dr. 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  |
| 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)  |
### RESEARCH TO GRASS ROOTS GRANTS

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

### PROFESSIONAL DEVELOPMENT PROGRAM GRANTS

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<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
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<tbody>
<tr>
<td>WPDP23-015</td>
<td>Skills and Tools for Complex Adaptive Thinking to Equip Leaders in Change Initiatives</td>
<td>$99,861</td>
<td>Nicole Masters&lt;br&gt;Integrity Soils&lt;br&gt;Nicole Masters&lt;br&gt;Integrity Soils</td>
</tr>
<tr>
<td>WPDP22-021</td>
<td>Montana Agritourism Fellows Program: Developing Leaders to Advance Sustainable AgriTourism</td>
<td>$99,965</td>
<td>Dr. Shannon Arnold&lt;br&gt;Montana State University&lt;br&gt;Dr. Dustin Perry&lt;br&gt;Montana State University&lt;br&gt;Dr. Beth Shirley&lt;br&gt;Montana State University</td>
</tr>
</tbody>
</table>
WPDP19-15 Sustainable Beef Cattle Production: Ranch to Ribeye $57,310 Megan Van Emon Montana State University, Colleen Buck Montana State University, Callie Cooley Montana State University, Molly Hammond Montana State University, Elin Kittelmann Montana State University, Kari Lewis Montana State University

EW18-027 Building Internal Capacity for the Blackfeet Tribe Agricultural Resource Management Plan (ARMP) $52,155 Loren Bird Rattler Blackfeet Tribe

EW18-011 Pheromones as Tools for Monitoring the Insect Pests in the Northern Plains - Instructive Tools for Agricultural Professionals $73,510 Dr. Michael Ivie Montana State University-Bozeman

EW17-011 Integrated Parasite Management: Train the Trainer $74,189 David Scott National Center for Appropriate Technology

EW16-029 Best Management Practices (BMPs) for Mitigating Herbicide Resistance in the Northern Great Plains–Educational Tools for Agricultural Professionals $68,871 Dr. Prashant Jha Montana State University, Southern Agricultural Research Center, Huntley, MT

EW16-036 Catalyzing Increased Agricultural Sales through a Common Understanding of Montana’s New Food Modernization Law $22,332 Jennifer Hill-Hart AERO

EW15-009 Conservation and Augmentative Biological Control in the Northern Plains – Providing Tools for Agriculture Professionals $68,182 Dr. Michael Ivie Montana State University-Bozeman

EW13-014 Enhancing the Exploring Energy Efficiency & Alternatives (E3A) Curriculum $42,277 Milton Geiger University of Wyoming Extension, Dr. Glen Whipple University of Wyoming Extension

EW12-004 Tour of sustainable Small Grain Production in Eastern Washington $7,350 Dan Picard MSU Extension-Pondera County, Jesse Fulbright Montana State University

EW12-006 Montana State University Extension Range Management Institute $60,000 Dr. Tracy Mosley Montana State University Extension

EW11-012 Wildlife Damage Control for Traditional and Organic Farmers $96,053 Dr. Jim Knight Extension Wildlife Specialist

EW01-007 Training Tour 2002-03-04 $30,024 Jonda Crosby Alternative Energy Resources Organization

EW01-016 Growing Our Own: Communities That Sustain Entrepreneurs $52,483 Richard Williams Montana State University Extension Service

EW99-008 Developing a Sustainable and Organic Master Gardener Horticulture Production Manual $22,483 Helen Atthowe Missoula County Extension Service

EW99-015 Harvesting the Wealth: of AERO’s Farm and Ranch Improvement Clubs $60,000 Jonda Crosby Alternative Energy Resources Organization
EW97-007  Sustainable Agriculture Youth Education: Professional Dev. for Youth Program Leaders and Educators $100,000  Jonda Crosby  Alternative Energy Resources Organization

EW95-002  Sustainable Noxious Weed Management on Northwestern Rangelands $43,800  Roger Sheley  Montana State University

EW95-003  Agency Personnel Training in Riparian Monitoring and Management of Wildlife and Livestock in the Intermountain West $98,000  Dr. Jim Knight  Extension Wildlife Specialist

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

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

FARMER/RANCHER GRANTS

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<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
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</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>
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<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>
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<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>
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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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<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>
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<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>
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<tr>
<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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<td>FW08-034</td>
<td>High-Nutrition Drought-Tolerant Corn</td>
<td>$30,000</td>
<td>Dave Christensen</td>
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<td>FW08-317</td>
<td>Sustainable Food and Bioenergy Systems: Student Internships Development Plan</td>
<td>$29,983</td>
<td>Dr. William Dyer</td>
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<tr>
<td>FW06-025</td>
<td>Agroecosystem Approach to Managing Imported Cabbage Worm (Peris rapae)</td>
<td>$6,356</td>
<td>Helen Atthowe</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</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</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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<tr>
<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</td>
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<tr>
<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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<td>FW00-314</td>
<td>Montana Arnica Web Page</td>
<td>$870</td>
<td>Rod Daniel</td>
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<td>FW99-102</td>
<td>Range Monitoring in the Badlands Grazing District</td>
<td>$10,000</td>
<td>Jack McCuin</td>
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<tr>
<td>FW98-035</td>
<td>Annual Forages for Dryland Rotations</td>
<td>$1,540</td>
<td>Vern Pluhar</td>
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<tr>
<td>FW98-093</td>
<td>Cull Potato Composting</td>
<td>$7,500</td>
<td>Steve McCullough</td>
</tr>
<tr>
<td>Project #</td>
<td>Project Title</td>
<td>SARE Support</td>
<td>Project Leaders</td>
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<tr>
<td>FW96-007</td>
<td>Green Manure/Covercrop Combination Experiment</td>
<td>$1,923</td>
<td>Rod Daniel</td>
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<td>FW96-008</td>
<td>Legume Grazing in Rotation with Small Grains</td>
<td>$4,000</td>
<td>Jess Alger, Organic control of Perennial Weeds</td>
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<td>FW96-073</td>
<td>Evaluation of Grass Species for Improved Pasture Management</td>
<td>$4,800</td>
<td>Robert Lee</td>
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<td>FW96-083</td>
<td>Vegetative Changes through Alternative Water Sources</td>
<td>$2,500</td>
<td>Dale Veseth</td>
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<td>FW95-026</td>
<td>Carter-Fallon Forage Committee Range/Livestock Project</td>
<td>$4,943</td>
<td>Randy Tunby, Carter-Fallon Forage Committee</td>
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<td>FW95-078</td>
<td>Managing a Living Mulch System in an Intensive Organic Vegetable Cropping Operation to Enhance Weed, Nutrient, and Pest Management</td>
<td>$5,000</td>
<td>Helen Atthowe, Biodesign Farm</td>
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<td>FW95-093</td>
<td>Influencing Elk and Livestock Riparian Use</td>
<td>$4,750</td>
<td>Allen Carter</td>
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</table>

**GRADUATE STUDENT GRANTS**

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>GW23-255</td>
<td>Understanding Soil Water Capture and Use in Very Tall Stubble</td>
<td>$30,000</td>
<td>Dr. Perry Miller, Montana State University, Ryan Barnes, Montana State University</td>
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<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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<tr>
<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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<tr>
<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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</table>
| 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

GW09-012  joint management of wheat stem sawfly, fusarium crown rot, and weeds: assessing the ecological basis of a total systems approach to pest management strategies  $21,964  Fabian Menalled
Dept. of Land Resources and Environmental Sciences
Ilai Keren
Montana 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>
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<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
$9,853,640

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).