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 $404 million to more than 8,776 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/state-profiles/montana/

$3,340,585 in total funding

33 grant project

(since 1988)

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

Grants awarded
2019–2024

Total awards: **33 grants**

- 5 Farmer/Rancher
- 8 Research and Education
- 5 Professional Development Program
- 2 On Farm Research/Partnership
- 13 Graduate Student

Total funding: **$3,340,585**

- $107,846 Farmer/Rancher
- $2,316,926 Research and Education
- $429,885 Professional Development Program
- $129,087 On Farm Research/Partnership
- $356,841 Graduate Student

Find a complete list of projects on page 3.

Farmer and rancher impacts
2019–2024

SARE grantees have reported the following impacts from their projects:

- **12,412 farmers participated in a SARE-funded project**
- **936 farmers reported a change in knowledge, awareness, skills or attitude**
- **160 farmers changed a practice**

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-profiles/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.
Montana has been awarded $10,363,192 grants to support 142 projects, including but not limited to, 48 research and/or education projects, 24 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>
| SW24-001  | Enhancing the Sustainability of Small Farms in Montana through Postharvest Management of Berry Crops, with Emphasis on Haskaps | $75,000      | Dr. Roland Ebel  
  Montana State University  
  Omar Franco Mora  
  Autonomous University of the State of Mexico  
  Claire Luby  
  Montana State University  
  Fabian Menalled  
  Dept. of Land Resources and Environmental Sciences  
  Dr. Zachariah Miller  
  Montana State University-Western Ag. Research Center |
| SW24-005  | Livestock Antibiotic Sustainability                                             | $145,584     | Katie Rein, DVM  
  Crazy Mountain Veterinary Service, PLLC |
| SW24-011  | Prioritizing effective and sustainable management approaches for cheatgrass and ventenata in Montana rangelands | $349,911     | Lisa Rew  
  Montana State University  
  Dan Atwater  
  Montana State University  
  Dr. Katherine Lee  
  University of Idaho  
  Dr. Jane Mangold  
  Montana State University  
  Dr. Catherine Zabinski  
  Montana State University |
| SW22-934  | Landowner Collaborative Strategies for Nonlethal Predator Control               | $349,951     | Dr. Jared Beaver  
  Montana State University  
  Dr. Stewart Breck  
  Colorado State University  
  Kyran Kunkel  
  Western Landowners Alliance  
  Dr. Julie Young  
  Utah State University  
  Hallie Mahowald  
  Western Landowners Alliance |
Indigenous Food-Science-Ways: Integrating Indigenous knowledge with food science research and education to support value-added Native foods

Intercropping chickpea with flax: An alternative sustainable way to manage Ascochyta blight of Chickpea
<table>
<thead>
<tr>
<th>Project Code</th>
<th>Project Title</th>
<th>Budget</th>
<th>Principal Investigators</th>
</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 Univ

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

SW07-013  Evaluation of Alfalfa Weevil (Coleoptera Curculionidae) Densities, Weed Abundance, and Regrowth Characteristics of Alfalfa Grazed by Sheep. $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
<table>
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<tr>
<th>Project ID</th>
<th>Title</th>
<th>Funding</th>
<th>Principal Investigator(s)</th>
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| 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 pesticide 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 |
| 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 |
<table>
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<tr>
<th>Project Code</th>
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<td>SW98-064</td>
<td>Selecting Cattle to Prevent Grazing Distribution Problems</td>
<td>$115,598</td>
<td>Derek Bailey</td>
<td>Montana State University</td>
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<td>SW97-056</td>
<td>Comparison of Pest Management Interactions in Spring Wheat-Cover Crop and</td>
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<td>Andrew Lenssen</td>
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<td>Spring Wheat-Fallow Cropping Systems</td>
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<td>SW96-019</td>
<td>Sustaining Agriculture and Community: Moving the Farm Improvement Club Program</td>
<td>$124,425</td>
<td>Jonda Crosby</td>
<td>Alternative Energy Resources Organization</td>
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<td>Beyond the Farm Gate</td>
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<td>LW92-004</td>
<td>Sustainable Farming Quarterly</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</td>
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<td>LW91-023</td>
<td>Farm Improvement Club Network for Sustainable Agriculture</td>
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<td>Nancy Matheson</td>
<td>Alternative Energy Resources Organization</td>
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<td>LW91-024</td>
<td>Specifying and Analyzing Whole-Ranch Systems for Sustainable Range Livestock</td>
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<td>Jack Riesselman</td>
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<td>Production in Environmentally Sensitive Areas</td>
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<td>LW91-025</td>
<td>Practical Education in Sustainable Production Systems</td>
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<td>Wade Crouch</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</td>
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<td>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/Intermountain</td>
<td>$162,000</td>
<td>James Sims</td>
<td>Montana State University</td>
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<td>LW89-016</td>
<td>Bio-Priming for the Control of Pythium Reemergence Damping-Off in Vegetable</td>
<td>$14,984</td>
<td>Nancy Callan</td>
<td>Montana State University</td>
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<td>Crops</td>
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<tr>
<td>LW89-019</td>
<td>Livestock Health and Nutrition Alternatives: A Western States Conference</td>
<td>$5,000</td>
<td>Al Kurki, Alternative Energy Resources Organization (AERO)</td>
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**PROFESSIONAL DEVELOPMENT PROGRAM GRANTS**

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<th>Project #</th>
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<tr>
<td>WPDP24-019</td>
<td>406 Grazing Academy</td>
<td>$98,954</td>
<td>Stacey Barta, Montana Department of Natural Resources Conservation, Rachel Frost, Montana State University, Dr.Jeff Mosley, Montana State University</td>
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<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, Integrity Soils, Nicole Masters, Integrity Soils</td>
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<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, Montana State University, Dr.Dustin Perry, Montana State University, Dr.Beth Shirley, Montana State University</td>
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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, 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</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, Blackfeet Tribe</td>
</tr>
</tbody>
</table>
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>
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<th>Project Leaders</th>
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<tr>
<td>FW24-015</td>
<td>Gold Creek Return Flow Pilot Study: Evaluating Potential Benefits of Early Season Center Pivot Irrigation on Local Hydrology and Production</td>
<td>$25,000</td>
<td>Bruce Thomas Thomas Herefords</td>
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<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>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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<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</td>
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<td>Linda Poole</td>
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<td>Costs and Benefits of Alternative Strategies for Marketing Sheep</td>
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<td>Organic Control of Perennial Weeds with Vinegar and Biologicals</td>
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<td>Jess Alger</td>
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<td>FW10-042</td>
<td>Marketing J Bar L Ranch Grassfed Beef to Members of Conservation</td>
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<td>Bryan Ulring</td>
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<td>FW09-305</td>
<td>Composting Recommendations and Marketing Evaluation for Livestock</td>
<td>$49,315</td>
<td>Thomas Bass</td>
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<td>Operations in Cold Semi-Arid Environments</td>
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<td>FW08-016</td>
<td>Can Producers in Five Montana Counties Successfully Use No-Till</td>
<td>$29,999</td>
<td>Ron Carlstrom</td>
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<td>Methods for Renovation of Irrigated and Dryland Pastures?</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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<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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<td>FW06-025</td>
<td>Agroecosystem Approach to Managing Imported Cabbage Worm (Peris</td>
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<td>Helen Atthowe</td>
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<td>FW05-012</td>
<td>Forage Winter Wheat Production for Grazing or Hay Production in</td>
<td>$19,795</td>
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<td>FW05-301</td>
<td>Protecting High Quality Rangelands in Garfield County from</td>
<td>$20,000</td>
<td>Eric Miller</td>
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<td>Invasive Weed Spread</td>
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<td>Demonstration of Leafy Spurge Management Using Sheep Grazing in a</td>
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<td>Sharla Sackman</td>
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<td>Description</td>
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<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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<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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<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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<td>FW98-035</td>
<td>Annual Forages for Dryland Rotations</td>
<td>$1,540</td>
<td>Vern Pluhar</td>
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<td>FW98-093</td>
<td>Cull Potato Composting</td>
<td>$7,500</td>
<td>Steve McCullough</td>
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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>
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<tr>
<th>Project #</th>
<th>Project Title</th>
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<th>Project Leaders</th>
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<tr>
<td>GW24-011</td>
<td>Evaluating the potential for micronutrient soil amendments to improve rangeland sustainability. $29,972</td>
<td>Lisa Rew</td>
<td>Montana State University Dr.Jane Mangold Montana State University Erin Teichroew Montana State University</td>
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<tr>
<td>GW24-014</td>
<td>Comparing soil organic carbon, infiltration, and bulk density in various grass communities and management practices on Confederated Salish and Kootena $30,000</td>
<td>Virgil Dupuis</td>
<td>Salish Kootenai College Maureen McCarthy Desert Research Institute Sarah Holloway Salish Kootenai College</td>
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<td>GW23-255</td>
<td>Understanding Soil Water Capture and Use in Very Tall Stubble $30,000</td>
<td>Dr.Perry Miller</td>
<td>Montana State University Ryan Barnes Montana State University</td>
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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  
Dr.Samuel Wyffels  
Montana State University |
<table>
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| 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 |
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 |

<table>
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<tr>
<th>Project #</th>
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<th>Project Leaders</th>
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| OW24-002   | Co-developing criteria for white bark pine friendly ranching                   | $73,097      | Dr. Jonathan Spiess  
USDA ARS |
| 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 |
<table>
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<tr>
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<tr>
<td>OW15-026</td>
<td>Are Feedlot-based Performance Cattle Limiting Ecological Services for Rangeland Ecosystems in Northern Mixed-grass prairies?</td>
<td>$49,961</td>
<td>Dr. Emily Meccage</td>
<td>Montana State University</td>
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<tr>
<td>OW13-017</td>
<td>Reference strips and precision sensors for increased nitrogen use efficiency in wheat production</td>
<td>$49,907</td>
<td>Dr. Olga Walsh</td>
<td>Montana State University</td>
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<td>OW13-144</td>
<td>Effects of Late-Season Water Lease on Forage Crops</td>
<td>$24,950</td>
<td>Jodi Pauley</td>
<td>Montana State University</td>
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<td>OW12-044</td>
<td>Best Management Practices for Livestock Protection Dogs</td>
<td>$49,998</td>
<td>Dr. Jeff Mosley</td>
<td>Montana State University</td>
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<td>OW11-326</td>
<td>Developing Community Based Oilseed Industry in Montana</td>
<td>$49,830</td>
<td>Taylor Lyon</td>
<td>Bio-Energy Center</td>
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<td>Dr. Nestor Soriano, Jr.</td>
<td>Lead Research Scientist</td>
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<td>FW04-313</td>
<td>Preserving Farms and Ranches</td>
<td>$5,000</td>
<td>Robert &quot;Rob&quot; Johnson</td>
<td>Montana State University</td>
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**Total funding from the USDA SARE program to Montana**

$10,363,192

For further information on projects, contact Western SARE at (406) 994-4785 or wsare@montana.edu.

Sustainable Agriculture Research and Education (SARE) is funded by USDA’s National Institute of Food and Agriculture (NIFA).