

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 \$309 million to more than 7,407 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.



www.sare.org

SARE: Advancing the Frontier of Sustainable Agriculture in...

North Dakota

Project Highlight: *Long-Term Stability Through Integrated Production*

In recent years, extreme volatility in crop and beef cattle prices, influenced by highly variable weather patterns including drought, has made the business side of commodity farming and ranching difficult to manage. In North Dakota, researchers are suggesting that a sea of calm in this volatility might reside in the soil.

With a five-year SARE grant, North Dakota State University researchers sought to determine if an integrated crop and beef cattle production system, which uses grazing and crop rotation to build soil health, could provide more long-term stability than a conventional system.

Their primary objective was to compare yields and returns of continuous wheat production and wheat grown in a five-year rotation that included cover crops, forage crops and cattle grazing. At first the yield of continuous wheat was higher, but that gradually changed as the soil in the rotational system grew more productive. By the fifth year, the yield of wheat in rotation was 40 percent higher. "How that occurred is clearly a demonstration of the soil's power to grow nutrients," said Douglas Landblom, the project coordinator.

Over five years the net return per acre was \$10 higher for wheat in rotation, and the production cost was lower. The profit margin per steer was \$307 higher when cattle grazed this system and spent 76 fewer days in the feedlot than a control group.

For more information on this project, see sare.org/projects, and search for project number [LNC11-335](#).

SARE in North Dakota

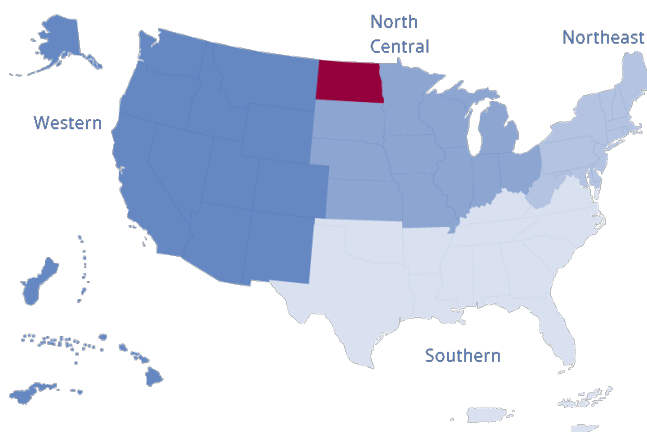
northcentral.sare.org/state-programs/north-dakota

\$5,521,366
in total funding

126 grant projects

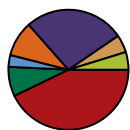
(since 1988)

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



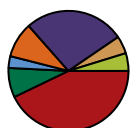
SARE Grants in North Dakota

Total awards: 126 grants



54 Farmer/Rancher
 10 Graduate Student
 4 On Farm
 Research/Partnership
 12 Professional
 Development Program
 34 Research and Education
 6 Youth
 6 Youth Educator

Total funding: \$5,521,366



\$570,882
 Farmer/Rancher
 \$111,041
 Graduate Student
 \$108,810
 On Farm
 Research/Partnership
 \$800,847
 Professional Development
 Program
 \$3,913,536
 Research and Education
 \$2,390
 Youth
 \$13,861
 Youth Educator

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:

northcentral.sare.org/state-programs/north-dakota

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 northcentral.sare.org/state-pages/north-dakota to learn more.

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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 NORTH DAKOTA

by USDA's
Sustainable Agriculture Research and Education (SARE) Program

North Dakota has been awarded \$5,521,366 grants to support 124 projects, including but not limited to, 32 research and/or education projects, 12 professional development projects and 54 producer-led projects. North Dakota has also received additional SARE support through multi-state projects.

RESEARCH AND EDUCATION GRANTS

Project #	Project Title	SARE Support	Project Leaders
LNC19-420	Examining the role of shelterbelts (tree plantings) on early-season honey production and hive growth of honeybees in the North Central Region (NCR).	\$199,922	Benjamin Geaumont North Dakota State University
LNC19-424	Perennial flax: a new crop for sustainable agriculture in the Northern Plains	\$199,998	Dr. Burton Johnson North Dakota State University
LNC19-426	Grazing Management Practices to Enhance Soil Health in the Northern Great Plains	\$198,168	Miranda Meehan North Dakota State University
LNC18-412	Whole System Approach to Integrated Crop/Livestock Production to Enhance Soil Health and Profitability of Cropping and Livestock Systems in the Northern Great Plains	\$199,995	Michael Ostlie, Michael Ostlie North Dakota State University
LNC16-381	Effect of Long-Term Integrated Crop and Livestock Systems on Forage Finishing, Soil Fertility, Nitrogen Mineralization, Carbon Sequestration, and Profitability	\$199,998	Douglas Landblom North Dakota State University-Dickinson Research Extension Center
LNC15-373	It All Adds Up: Data Collection to Increase Profitability of Small-scale Vegetable Growers on the Northern Great Plains	\$196,145	Holly Mawby Dakota College at Bottineau ECH
LNC12-340	Evaluating the Sustainability of Beef Cattle Breeding Systems	\$199,995	Dr. Carl Dahlen North Dakota State University
LNC12-347	Increasing Varietal Suitability and Availability of Cowpea and Forage Radish Cover Crop Seed for Northern Climates	\$199,776	Frank Kutka NPSAS Karri Stroh Northern Plains Sustainable Agriculture Society
LNC11-332	Effect of Optimal Water Management for Sustainable and Profitable Crop Production and Improvement of Water Quality in Red River Valley	\$199,706	Dr. Xinhua Jia North Dakota State University
LNC11-335	Increasing Sustainability of Livestock Production of the Northern Great Plains	\$199,736	Douglas Landblom North Dakota State University-Dickinson Research Extension Center
LNC09-308	Ranchers Mentoring Network - Ranchers Sharing Ideas with Ranchers	\$175,000	Mary Stevens Dakota Prairies RC&D

LNC09-310	Cover Crop Selection and Use in Organic No-Till Farming	\$155,730	Dr.Patrick Carr Montana State University
LNC09-312	Southwest North Dakota Soil Health Demonstration	\$175,000	Toby Stroh Dakota West RC &D Ty Eisenbraun Central Stark and Western Soil Conservation
LNC06-265	Organic Education: Increasing Opportunities for Farmers and Processors	\$114,811	Brit Jacobson FARRMS
LNC04-250	Promoting sustainable range-livestock enterprises through partnerships which develop producer mentoring networks for best management practices	\$93,006	Paul Nyren North Dakota State University Central Grasslands
LNC02-201	Bringing Small-Grain Variety Development and Selection onto Organic Farms	\$72,953	Dr.Patrick Carr Montana State University
LNC02-211	Aiding in the Coexistence of Sustainable and Biotech Agriculture by Minimizing Contamination	\$99,978	Bradley Brummond North Dakota State University
LNC01-196	Agroecology Analysis of Farming Systems: A Summer Course	\$18,303	Dr.Mary Wiedenhoeft Iowa State Univ
LNC01-182	Enhancing Grain Production of Great Plains Cropping Systems with a Legume-Pasture Phase	\$42,676	Dr.Patrick Carr Montana State University
LNC00-162	Soil Quality Changes In Different Residue Management Systems Compared To Grassland After 22 Years	\$20,000	Edward Deibert North Dakota State University
LNC99-153	Using Alternative Forages on Traditional Small Grain Crop Land in Rotational Grazing Systems for the Northern Great Plains	\$36,670	Woodrow Poland North Dakota State University, Dickinson Research Extension Ctr
LNC98-126	Marketing Sustainable and/or Organic Products in Small Metro Areas	\$41,355	David Watt Dept of Agricultural Economics, North Dakota State University
LNC97-113	Maximizing Forage and Minimizing Grain Intake in Bison Fed for Meat	\$78,360	Vern Anderson Carrington Research/Extension Center, North Dakota State University
LNC92-010.3	Substituting Legumes for Fallow in U.S. Great Plains Wheat Production	\$113,000	John Gardner North Dakota State University
LNC91-032	Trap Cropping to Minimize Insecticide Application and Farm Input Costs in Sunflower Production	\$35,455	Gary Brewer North Dakota State University
LNC90-010.2	Substituting Legumes for Fallow in U.S. Great Plains Wheat Production	\$185,000	John Gardner North Dakota State University
LNC90-030	Ruminant Production Systems Inter-Related with Non-Traditional Crop Management	\$108,800	Vern Anderson Carrington Research/Extension Center, North Dakota State University
LNC89-013.1	Evaluation of Integrated Low-Input Crop-Livestock Production Systems	\$82,700	John Gardner North Dakota State University

LNC89-023	LISA IMPACTS: Social, Economic, and Demographic Impacts of Low-Input/Sustainable Agriculture Practices on Farms and Rural Communities in the Northwest Area	\$65,300	David Watt Dept of Agricultural Economics, North Dakota State University
LNC89-010.1	Substituting Legumes for Fallow in U.S. Great Plains Wheat Production	\$82,000	John Gardner North Dakota State University
LNC88-010	Substituting Legumes for Fallow in U.S. Great Plains Wheat Productions	\$74,000	John Gardner North Dakota State University
LNC88-013	Evaluation of Integrated Low-Input Crop-Livestock Production Systems	\$50,000	John Gardner North Dakota State University

PROFESSIONAL DEVELOPMENT PROGRAM GRANTS

Project #	Project Title	SARE Support	Project Leaders
ENC20-196	Training for Effective Delivery of Science-Based Soil Health Information - It's about More than Just Content, It's About Messaging Skills	\$89,817	Abbey Wick NDSU
ENC18-165	Cover Crops and Forage Grazing Training Program in North Dakota	\$74,855	Dr.Marisol Berti North Dakota State University
ENC15-142	Enhancing Soil Health with Cover Crops in North Dakota: Training Program	\$71,012	Dr.Marisol Berti North Dakota State University
ENC12-131	Expanding Opportunities for Sustainable Small Farm Specialty Crop Producers: Training Educators in Feasibility Analysis, Marketing, and Community Building	\$74,980	Dr.Glenn Muske North Dakota State University
ENC08-105	Soil Health/Soil Biology Training for the Northern Plains	\$73,923	Tom Hanson ND Association of Soil Conservation Districts
ENC01-055	Bison Education in the Northern Plains	\$50,740	Thomas Hanson North Dakota State University
ENC99-042	Reservation Education of Leafy Spurge Control with Multi-Species Grazing of Sheep and Cattle	\$76,476	Thomas Hanson North Dakota State University
ENC98-030	Marketplace '99	\$12,600	Thomas Hanson North Dakota State University
ENC98-031	Revitalizing Community Development in the Dakotas	\$64,700	Thomas Hanson North Dakota State University
ENC97-002.2	Sustainable Agriculture Distance Learning	\$57,700	Thomas Hanson North Dakota State University
ENC96-002.1	Sustainable Agriculture Training Project for North Dakota and South Dakota	\$32,044	Darnell Lundstrom North Dakota State University Extension Service
ENC94-002	North Dakota/South Dakota Professional Development Project	\$122,000	Darnell Lundstrom North Dakota State University Extension Service

FARMER/RANCHER GRANTS

Project #	Project Title	SARE Support	Project Leaders
FNC20-1234	Development of an integrated ventilation, thermal mass, and lighting system for the first Deep Winter Greenhouse (DWG) in North Dakota	\$8,980	Derek Lowstuter Folly Hill Farm
FNC20-1236	Honey bee breeding program designed for the commercial beekeeping industry to provide sustainable breeding stock using artificial insemination.	\$9,000	Megan Mahoney MaHoney Bees and Queens LLC
FNC20-1248	Organic No-till in Perennial Cover	\$8,826	James Ryan, Mr owner
FNC20-1218	Multi-Species Bale Grazing to Build Soil Health	\$18,000	Erin Gaugler Gaugler Farm and Ranch
FNC19-1164	Improving plant diversity in non-diverse grasslands on a small family farm in southwest North Dakota	\$8,879	Benjamin Geaumont Geaumont Farms
FNC18-1123	Bale Grazing to Build Soil Health	\$15,000	Erin Gaugler Gaugler Farm and Ranch
FNC17-1085	Controlling Imported Cabbage Worm and Cabbage Looper Damage in Brassicaceae Crops in an Organic Production System	\$7,500	Ross Lockhart Heart and Soil Farm
FNC17-1098	Improving Soil Health by Rotationally Grazing Cattle on Full Season Cover Crop Cocktails on a No-till Farm in the Red River Valley of North Dakota	\$15,000	Clint Severance From The Ground Up Farm
FNC15-1011	Quinoa Production in Central North Dakota	\$13,516	Glendon Philbrick Hiddendale Farm
FNC14-961	Growing Peaches, Pears, Cherries and Strawberries in an Unheated High Tunnel	\$7,499	Alyce Ann Lunde Lakeside Garden
FNC13-908	Utilizing cover crops to increase productivity, health & vigor on tame grass pasture	\$6,905	Donnie Feiring Feiring's Cattle Co.
FNC13-913	Kesselring-Kindred ND Native Wild Grape Vineyard: Establishing Wild Grapes in a Vineyard Setting	\$7,500	Jason Kesselring Kesselring Vineyards
FNC13-924	New Buckwheat Varieties for Greater Sustainability	\$18,881	Anne Ongstad Whitman Ranch
FNC13-929	New Method to Eliminate Ovine Progressive Pneumonia in Sheep Flocks in North Dakota	\$18,250	Rick Schmidt NDSU Extension Service
FNC10-796	Developing a mob grazing system to improve the sustainability and profitability of a cattle operation in North Dakota.	\$5,991	Krista Reiser Reiser Ranch Jeremia Reiser Reiser Ranch
FNC10-828	Optimizing sorghum-sudan/forage soybean cover crop populations and screening sorghum varieties for organic cover crop performance, forage, and seed production in the Northern Great Plains region	\$17,912	Richard Gross David Podoll raymond berry

FNC10-832	Bringing Hayland and CRP into Production Using Cover Crops and No-Till using Forage Soybeans and Other Legumes, What Works Best?	\$6,000	Jeremy Wilson Wilson Farm
FNC10-837	Multi-Species Cover Crops Control Weeds and Improve Fertility in Organic No-Till Fields	\$18,000	Linda Grotberg Prairie Farm Pilot Project
FNC09-750	Reducing the Impact of Soybean Aphid on Organic Soybeans through Multiple Management Tactics.	\$18,000	Mark Askegaard
FNC09-754	Screening Open-Pollinated Vegetable Varieties Bred and Released In North Dakota for Suitability to Organic Production Systems and Local Markets	\$17,988	Theresa Podoll Prairie Road Organic Farm Steve Zwinger North Dakota State University Carrington Research Extension Center Marvin Baker North Star Farms
FNC08-702	Building Organic Soil Health with Green Manure and Cover Crops	\$1,807	Pat Frank
FNC08-709	Building the Local Food Link in Valley City	\$17,829	Sharon Clancy
FNC08-717	Small and Mid-sized Farm Sustainability Through Crop Diversity and Photosynthesis	\$18,000	Kelly Severson
FNC08-738	Organic No-Till- The Ultimate Cropping System For Soil Health and Farm Sustainability	\$18,000	Linda Grotberg Prairie Farm Pilot Project
FNC07-667	Is It Possible? Can We Have Organic Sustainable Agriculture with Minimal Tillage while Soil Building and Producing High Quality Forage for Grass-Fed Beef	\$5,920	Anne Ongstad Whitman Ranch
FNC06-625	Prairie Farm Pilot Project - Transitioning from Conventional to Organic Farming	\$18,000	Richard Grotberg
FNC06-596	Oyate Tawoju (People's Garden)	\$18,000	Delano Dogskin
FNC06-607	Kids Get the Skinny on Whole Grains	\$18,000	Adrian Biewer
FNC05-587	Central North Dakota Pastured Poultry Institute	\$17,910	Linda Grotberg Prairie Farm Pilot Project
FNC05-591	Farmer-Led Development and Commercial Release of Improved Hard Red Spring Wheat Variety	\$17,995	Blaine Schmaltz
FNC05-592	Alternative Nutrient Recycling System	\$6,000	Kevin Throener
FNC04-507	Colgate Identity Preserved Growers Association	\$18,000	William Satrom

FNC04-519	Developing & Maintaining Sustainable Agroforestry & Natural Resource Systems on the Middle Sheyenne Watershed in East-Central North Dakota	\$17,120	Elmer Bakke
FNC03-461	Beaver Creek Pumpkin Patch/Corn Maze	\$1,089	Andrew Vetter Beaver Creek Pumpkins
FNC03-442	Evaluation of an Annual Cover Crops for No-till Management	\$5,868	Clark Lemley
FNC03-452	Portable Poultry Eviscerating Unit	\$15,590	Dennis Schill
FNC02-400	Bigg Dogg Cuisine Expansion	\$5,814	Linda Ova
FNC01-334	Growing Commercial Cabbage in Heavy Loam Soils in Northern North Dakota	\$14,495	Mike Johnston
FNC01-345	Sales Plan Development for Expansion of a Family On-Farm Flour Milling Company	\$5,000	Dennis Kubischta Summers Harvest Flour Mill
FNC01-360	Conducting Research on the Eradication of Canadian Thistle in Small Grains Using Sustainable Farming Methods	\$3,236	Harold Johnson
FNC00-323	Patrie's Raspberries on the Prairie Website Development and Internet Sales	\$4,738	Patti Patrie
FNC99-257	Adding Value to Medium to Low Grade Wool	\$10,160	Janet Jacobson
FNC99-259	Summers Harvest Flour Mill	\$5,000	Dennis Kubischta Summers Harvest Flour Mill
FNC99-273	Saving our Ranch with Grass	\$4,923	Brian Maddock
FNC98-229	Don't Take Grass for Granted	\$1,997	Jack Orts
FNC97-164	Promotion of Crop Diversification and Research of Speciality Crop Markets for Western North Dakota	\$9,680	Curt Trulson West Dakota Feed & Seed Steering Committee
FNC97-176	Grazing Yearlings on Annual Forage Pastures	\$4,986	Paul Klamm
FNC96-143	Networking and Education of Sustainable Bison Producers in the Northern Plains	\$9,966	David Lutt
FNC95-090	Interseeding Field Peas and Yellow Mustard for Enhanced Moisture Retention and Harvesting Ease in a No-till System	\$4,980	Vern Mayer

FNC95-120	Incorporating Holistic Resource Management	\$4,423	Larry Woodbury
FNC95-128	Identifying Management Practices that Enhance the Probability of Producing Quality Durum Wheat	\$5,000	Lawson Jones
FNC94-073	Bio-Control of Leafy Spurge	\$4,930	Dennis Dietz
FNC94-087	Hairy Vetch in Minimum-Till Organic Rotation	\$4,399	James Ryan
FNC92-016	Strip Tilling Sunflowers into Small Grain Residue	\$4,400	Lawson Jones

GRADUATE STUDENT GRANTS

Project #	Project Title	SARE Support	Project Leaders
GNC20-305	Economic Impacts of Bats in Dakota Agroecosystems: Do Insect-Eating Bats Reduce Pesticide Needs and Contribute to Plant Pollination?	\$14,850	North Dakota State University Mandy Guinn, M.Sc. United Tribes Technical College Hanna Karevold North Dakota State University
GNC19-288	Development of Breeding Lines and Molecular Tools for Selection of Grapevines with Altered Canopy Dynamics via Dissected Foliar Morphology	\$14,951	Harlene Hatterman-Valenti North Dakota State University Dr.Xuehui Li North Dakota State University Andrej Svyantek NDSU
GNC16-219	Assessing Multi-Species Cover Crop Responses to Variable Soil Moisture and Soil Types	\$11,928	Dr.Greta Gramig North Dakota State University Kenneth Beamer North Dakota State University
GNC15-202	Effects of Pre-breeding Administration of Injectable Trace Mineral Supplements on Subsequent Reproductive Performance in Beef Herds	\$10,000	Dr.Carl Dahlen North Dakota State University Mellissa Crosswhite Oklahoma State University
GNC10-123	Weed Suppression with Winter Annual Cover Crops in Potato	\$9,950	Grant Mehring NDSU Dept of Plant Sciences
GNC10-135	Integration of Biological Control and Native Cover Crops for Canada Thistle Control	\$10,000	Dr.Greta Gramig North Dakota State University Erin Burns North Dakota State University
GNC09-106	Determining efficacy of Waste Lime in Managing Fusarium Root Rot of Field Peas	\$9,964	Dr.Rubella Goswami North Dakota State University Dr.Mohamed Khan North Dakota State University Dr.Kishore Chittem NDSU
GNC09-113	Maintenance of Natural Sustainable Riparian Communities Located Within the Middle Sheyenne Watershed	\$9,528	Edward DeKeyser North Dakota State University Miranda Meehan North Dakota State University
GNC08-092	Reducing cost to livestock producers: Very large scale aerial (VLSA) imagery compared to traditional range field monitoring methods	\$9,870	Christopher Schauer North Dakota State University Amanda Gearhart North Dakota State University

GNC06-062	Effect of maternal diet on ovarian development in potential replacement ewe lambs	\$10,000	Joel Caton North Dakota State University Anna Grazul-Bilska North Dakota State University Kimberly Vonnahme North Dakota State University Wendy Arndt North Dakota State University
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ON FARM RESEARCH/PARTNERSHIP GRANTS

Project #	Project Title	SARE Support	Project Leaders
ONC17-036	Adoption of Cover Crops to Build Soil Health in the Northern Plains (Continuation)	\$29,488	Abbey Wick NDSU
ONC17-037	Evaluating Early Maturing, Cold - Tolerant White Sorghum Cultivars (Part 2)	\$22,303	Steve Zwinger North Dakota State University Carrington Research Extension Center
ONC15-007	Evaluating Early-Maturing, Cold-Tolerant White Sorghum Cultivars	\$29,998	Frank Kutka NPSAS
ONC15-012	Adaption of Cover Crops to Build Soil Health in the Northern Plains	\$27,021	Abbey Wick NDSU

YOUTH EDUCATOR GRANTS

Project #	Project Title	SARE Support	Project Leaders
YENC19-141	Sustainable AG Day: Sustainable Agriculture Promotion and Education Day for Middle School Students in Mid-Central North Dakota	\$4,000	Dr.Indrani Sasmal Dakota College at Bottineau Dr.Jerry Migler Dakota College at Bottineau
YENC13-061	Squash in Sustainable Food Production	\$2,000	Sue Isbell NDSU Sioux County Extension
YENC12-042	ND Western 4-H Camp SARE Garden	\$1,998	Michell Effertz Irene Graves
YENC12-057	Utilizing Cover Crops for Sheep	\$1,982	Rick Schmidt NDSU Extension Service
YENC10-029	Growing Sustainable Agriculture in Southwest North Dakota	\$1,881	Andrea Bowman Bowman County Extension
YENC08-005	Sustainable Soils	\$2,000	Marcus Lewton South Heart School/North Dakota Association of Ag

YOUTH GRANTS

Project #	Project Title	SARE Support	Project Leaders
YNC10-059	The effect feeding flax to hens on the nutritional value of eggs	\$400	Ketti Ringwall
YNC09-033	A Garlic CSA Project	\$392	Neil Podoll
YNC09-042	"Chicken Riddle" Poultry Project	\$400	Abby Braaten

YNC09-047	Lamb Growth Study	\$398	Cody Knudson
YNC09-049	Soil Health Project	\$400	Kalen Hartel
YNC08-019	Soil Health Project	\$400	Kalen Hartel

**Total funding from the USDA SARE program to
North Dakota
\$5,521,366**



For further information on projects, contact North Central SARE at (612) 626-3113 or ncrsare@umn.edu.

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