2023–2024 SARE


SOUTH


NORTHEAST


WEST


NORTH CENTRAL

SUSTAINABLE AGRICULTURE RESEARCH & EDUCATION

REPORT FROM THE FIELD

“SARE grants have helped our viability as a business and demonstrated that small businesses can make a positive impact on the environment when we develop relationships with each other for the benefit of all.”

Jeanine Seabrook
Glass Rooster Cannery
(See story on page 18.)

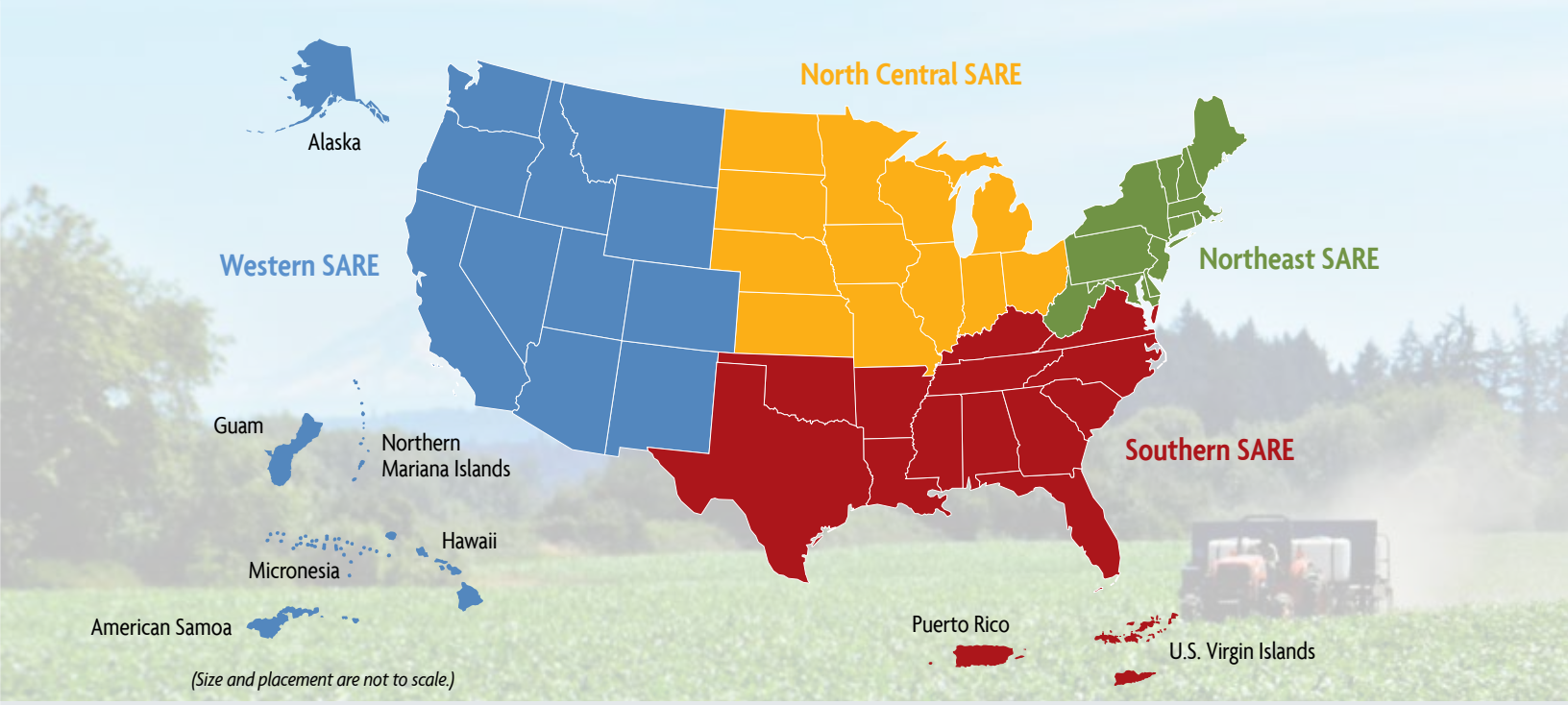
Letter from the Director

I have always appreciated the value of long-term research as well as the long-term impact of both applied and basic research. The core aspects of the SARE program were developed to have positive, enduring impacts on the environment, farm and ranch profitability, and the quality of life of our communities. I see these impacts in the stories contained in this issue of *Report from the Field* and in the myriad other projects that have been completed or are ongoing.

In our Southern region, multiple Farmer/Rancher grants over numerous years have resulted in better and higher yielding squash varieties; in the Northeast, a Research and Education grant allowed researchers to demonstrate that the grazing season could be extended by incorporating brassica species into grazing systems; in the North Central region, a Farmer/Rancher grant improved local food access in urban areas of Indiana, demonstrated the value of nutritious foods and provided virtual cooking demonstrations about their preparation; and in the West, a Research to Grassroots grant helped to improve food sovereignty among several Native American tribes by developing and demonstrating mushroom cultivation, thus ensuring that mushrooms will remain an important part of the tribes’ food culture for years to come.

These examples, the others in this issue of *Report from the Field*, and so many hundreds of others that you can peruse at projects.sare.org, clearly demonstrate the long-term impact of the SARE program on individuals and communities across the country. What a great program!

Vance Owens, SARE Director
2023








SARE is...

INVESTMENT IN SUSTAINABLE FARMING AND RANCHING

Since 1988, more than $31 million in research funds have gone directly to America's most innovative farmers and ranchers. In total, SARE has invested over $389 million in more than 8,500 projects.

GRANTS FOR INNOVATIVE RESEARCH AND EDUCATION

SARE offers grants to farmers, ranchers, educators, researchers, graduate students and others for on-farm research, education, and professional and community development.

LOCAL LEADERSHIP, NATIONAL IMPACT

Four regional administrative councils—including farmers, educators, scientists, government, NGOs and other stakeholders—set priorities and make grant award decisions.

FARMER LEADERSHIP

As grantees and administrative council members, hundreds of farmers and ranchers from all corners of the nation share their on-farm research results and advise SARE.

EDUCATION AND TRAINING

SARE shares research results by funding trainings, requiring project outreach and producing a library of practical, how-to books, bulletins and other information products.

Learn more at www.sare.org.

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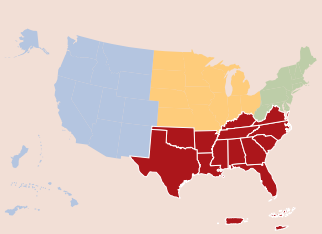
SARE Sustainable Agriculture Research & Education

USDA United States Department of Agriculture

National Institute of Food and Agriculture

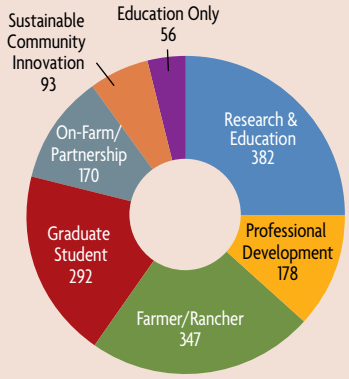
SOUTHERN SARE



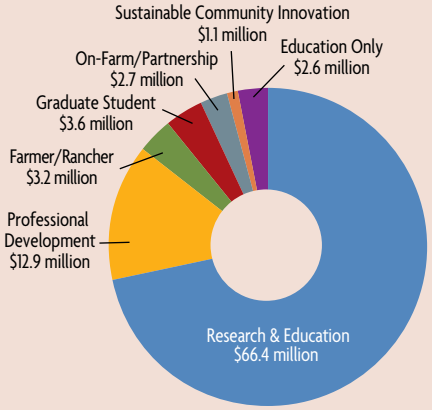
All photos by Candace Pollock, Southern SARE, except top right, by Preston Keres, USDA

Total Grant Awards, 1988–2023[1]

1,518 GRANTS



$92.4 MILLION



Recent Highlights from the Southern Region

- From grantmaking to program recruitment to resource development, Southern SARE is striving to make sure all audiences are equitably engaged. To better recognize bias and develop more effective diversity, equity and inclusion (DEI) strategies, we are conducting a year-long training with the assistance of Sage D Consulting in Atlanta. The training includes identifying DEI needs within the program, developing DEI protocols for improved grantsmanship, and developing fluid recruitment processes for staff, state coordinators and Administrative Council members.
- As food systems evolve across the Southern region, shaping both rural and urban landscapes, it's becoming more important to support the farmers and the community groups behind these changes. In response, we have created three new positions on our Administrative Council to ensure a more equitable reflection of Southern agriculture: a farmer representative with emphasis on urban production; a representative with a focus on equity, justice and food sovereignty; and a farmer representing military veterans. The positions will be filled in 2024.
- Southern SARE recognizes that some of the most innovative work to advance equity and justice is being done within the area of youth education among historically underserved communities. As a result, we have developed a new policy for our Education grants to support a limited number of youth education projects each year that are highly innovative and can provide replicable models for other communities within the Southern region.

Grant Proposals and Awards, 2022–2023

Grant Type	Preproposals Received[2]	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education	145	64	58	26	$9,063,283
Professional Development Program	67	32	30	16	$1,160,949
Farmer/Rancher	N/A	N/A	112	22	$314,083
On-Farm Research/Partnership	N/A	N/A	74	21	$492,856
Graduate Student	N/A	N/A	199	43	$666,877
Education Only	N/A	N/A	58	25	$1,103,882

[1]These totals exclude additional direct funding given each year to Cooperative Extension in every state to support state-level programming on sustainable agriculture.
[2]The use of a preproposal process varies by region. It serves to screen project ideas for the larger and more complex grant programs, and to reduce applicants' proposal preparation burden as well as the proposal review burden for SARE's volunteer reviewers.

Breeding Better, More Resilient Squash Varieties in the Southeast

> "We've heard from growers in many parts of the Southeast how South Anna has been helpful to their operations. Since then I've been working on crosses between South Anna and other material to improve keeping quality and yields while maintaining the same level of flavor and disease resistance. We're close to a new release."

Edmund Frost, co-owner of Common Wealth Seed Growers and Twin Oaks Seed Farm

THE CHALLENGE

Downy mildew frustrates farmers and home gardeners alike. But while it may be maddening for gardeners, a farmer can lose their entire season's cucurbit crop to the disease and suffer significant financial harm. If more disease-resistant varieties can be developed, farmers in Virginia and across the Southeast may feel more confident investing in cucurbit production. Plus, using selective breeding to create resistant crops reduces and potentially eliminates the need for chemical sprays and fungicides, which can save farmers money.

THE ACTIONS TAKEN

Virginia farmer Edmund Frost, co-owner of Common Wealth Seed Growers and Twin Oaks Seed Farm, received funding from three Farmer/Rancher grants to develop better varieties of winter squash through careful research, selection and breeding. The ideal squash would be disease and pest resistant, produce consistent shape and size fruit, and taste delicious. Importantly, the improved varieties needed to be well suited to the hot and humid conditions of the Southeast.

Frost's first two projects involved replicated variety trials, and selection from a cross between Seminole Pumpkin and Waltham Butternut squash. The work resulted in South Anna (named after a river near Louisa, Va., where the research was conducted), a butternut squash that stands out for its downy mildew resistance, eating quality and ability to produce well in the local climate. Frost then used the third grant to evaluate and develop new seedstocks by crossing South Anna with other tropical and temperate varieties with a focus on keeping quality, higher yields and other traits. His ultimate goal is to develop one to three varieties that taste great, yield optimally, resist downy mildew and offer uniformity, different flavor profiles and shapes, and improved storage quality.

THE IMPACTS

Frost's projects have built upon each other, and now South Anna has become a popular squash variety for growers in the region. Specific impacts include:

- **A new, better squash**: South Anna, which has been available for sale since 2017 but is improved each year, has shown to have excellent downy mildew resistance, eating quality and productivity.
- **More options on the market**: Frost's breeding work and research have increased the availability of resilient winter squash varieties for both organic and conventional farmers in the Southeast.
- **Additional research**: Frost recently secured a fourth Farmer/Rancher grant to further improve South Anna and other butternut squash varieties for improved keeping quality, yields, Southeast adaptation and resistance to downy mildew, even if the pathogen changes in the future.

Learn more: See the related SARE projects FS20-325, FS16-291 and FS13-273.

Along with growing trials, members of Common Wealth Seed Growers used taste testing to help identify the best squash varieties for production and marketing in the Southeast. *Photos by Edmund Frost, Common Wealth Seed Growers*

Supporting Farm Businesses with Financial Planning and Education

> "The technical details of finance, legality, business structures and goal strategies were just what I needed to start up this business with a structure and format that is set up for success."
>
> *A workshop participant*

THE CHALLENGE

Farmers know better than anyone that theirs is not an easy life. In fact, according to the USDA Economic Research Service, 85 percent of new farm businesses fail within their first five years of production.

Yet while there are plenty of training opportunities available related to sustainable agriculture practices, there are fewer options when it comes to financial planning, creating a business plan and keeping records. If education on these important aspects of running a business was easier to access and more readily available, new and seasoned farmers alike would be better able to manage their businesses for long-term success and profitability.

THE ACTIONS TAKEN

Margo Hale of the National Center for Appropriate Technology (NCAT) used an Education grant to develop "Take Your Farm to the Next Level," a six-part curriculum that covered how to develop business and financial plans, streamline recordkeeping systems, and improve labor management and marketing. The training series was then provided to an in-person group of farmers over the course of six months. Throughout the course, NCAT experts and other agricultural professionals addressed access to capital, legal issues, business structures, branding and marketing, entering new markets and other specifics of whole-farm business planning. Farmers were given space to share their own experiences and to talk with other participants, and they were provided resource books and publications that complemented the presentations. Once the in-person series ended, the project team converted the workshop to an online format.

Developing business management skills is vital to surviving through the early years of running a farm business. *Photo by Lance Cheung, USDA*

THE IMPACTS

Feedback from the course was very positive; participants felt more confident running their businesses, and they rated the training as a 4.7 out of 5. Specific impacts include:

- **One-on-one help**: NCAT staff provided technical assistance to the trainees throughout the in-person course and after its completion.
- **Future use**: NCAT plans to use the online course as a resource for additional beginning farmer training events, and new grant proposals have been developed to improve and expand on the subject matter.
- **Learning opportunities for all**: "Take Your Farm to the Next Level" is available for anyone to take online through the ATTRA website.

Learn more: See the related SARE project EDS18-03.

Finding the Right Cover Crop Mix in West Texas

> "The cover crop practices tested in this project ... demonstrate the potential to provide high-quality forages to supplement livestock production during critical periods."
>
> *Reagan Noland, Texas A&M AgriLife Extension*

Top: Texas A&M Agronomist Reagan Noland (holding the plant), along with farmers attending a field tour, looks at nitrogen-fixing nodules on the roots of a vetch plant. Right: Nitrogen-fixing nodules on the roots of leguminous cover crops. *Photos by Steve Estes, Texas A&M*

THE CHALLENGE

Semi-arid regions in western Texas are subject to wind and drought, which can dry out soils, reduce water-holding capacity and lead to erosion. Dryland, no-till wheat rotated with cotton and followed by grain sorghum and non-alfalfa hay crops is common in Texas' Concho Valley, along with livestock production and ranching. As adoption of conservation management practices has grown in this area, many farmers are intrigued by cover crops but need regionally appropriate information on how to grow them. If a dual-use legume cover crop could be incorporated into seasonal crop rotations, producers in the area would benefit from improved soil health and supplemental forage for cattle, goats and sheep.

THE ACTIONS TAKEN

Reagan Noland, an agronomist with Texas A&M AgriLife Extension, wanted to find the right cover crops to meet the challenges of farming throughout western Texas. He has used two On-Farm Research grants to evaluate various cover crop species for warm and cold seasons. Noland worked with four farms in the Southern Rolling Plains and Permian Basin regions to conduct cowpea and sunn hemp trials for the warm season and hairy vetch, Austrian winter peas and sweet clover for cool seasons. Each crop was planted with common grass crops cereal rye and pearl millet to evaluate changes in biomass production, soil benefits and forage potential. While research showed that the warm-season combination of legume covers and grass did not yield substantial biomass and wasn't well suited to the region, cool-season legumes showed more promise. Legumes, particularly Austrian winter peas, planted with a lower seeding rate of cereal rye, increased total biomass and reduced weeds.

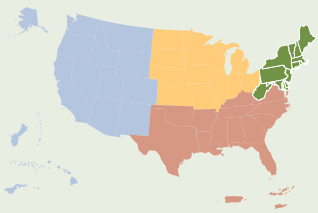
THE IMPACTS

Noland is encouraged by the results. While the research didn't determine a one-size-fits-all solution for the region's farmers, Noland believes there is a strong opportunity for cover crop establishment there, particularly if livestock are integrated to convert the forage to an added value stream. Specific impacts include:

- **Reducing inputs**: Increasing overall biomass through legume cover cropping improves nitrogen sequestration and may offset the need for synthetic fertilizers.
- **Future research**: Trial data showed the importance of seeding rates for the right cool-season legume and grass mix, but more research is needed to determine proper rates for success in such a challenging environment.
- **Farmer interest**: When much of the cotton crop in western Texas failed in 2022 due to intense drought, several farmers reached out to the program for advice, demonstrating a clear interest in the area for low-risk cover crop options.

Learn more: See the related SARE projects OS19-131 and OS20-138.

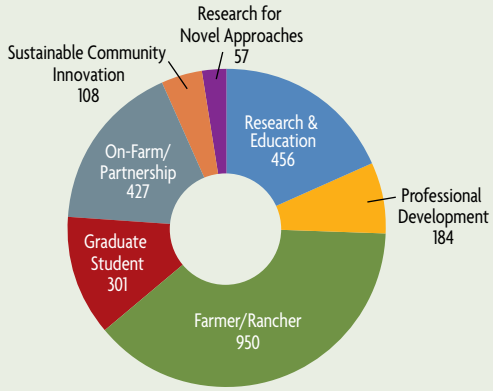
NORTHEAST SARE



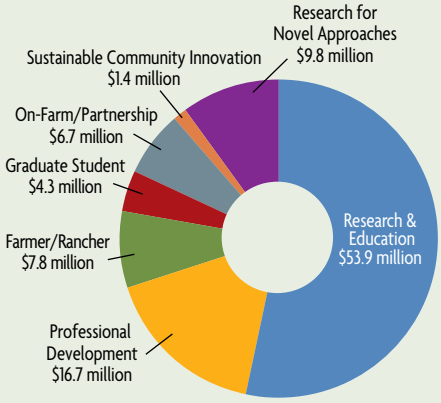
All photos by Preston Keres, USDA, except the far left, by Vander Gac, Northeast SARE

Total Grant Awards, 1988–2023[1]

2,483 GRANTS



$100.6 MILLION



Recent Highlights from the Northeast Region

- We continue to grow our library of instructional materials and videos for grant applicants, with a focus on improving accessibility and encouraging diverse applicants. This effort supports the implementation of our recently adopted regional plan for diversity, equity, inclusion and justice. Several of these products were developed to align with the release of our 2024 Farmer grant call for proposals. They include short videos to help people 1) identify potential projects that might be a good fit for a Farmer grant; 2) understand how to develop a budget for their application; and 3) use our online grant management system to submit a proposal. The videos are available at northeast.sare.org/grants/get-a-grant/farmer-grant-program. We've used this experience to map out potential future videos to help applicants identify which program is right for them, what to expect if funded and other aspects of working with SARE grants.
- At their summer 2023 meeting, the Northeast SARE Administrative Council approved the addition of two seats, one representing BIPOC farming communities and one representing organizations that work with and understand the experience of migrant farm employees.
- We are hosting a series of Q&A sessions for the 2024 Farmer grant call for proposals. These sessions, in tandem with the instructional videos mentioned above, are being tested as an alternative to a traditional webinar. Our hope is that by creating space for more direct engagement, we will promote more proposals that are fundable and of high quality.

Grant Proposals and Awards, 2022–2023

Grant Type	Preproposals Received[2]	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education	118	63	55	26	$5,354,762
Professional Development Program	36	27	20	15	$2,041,418
Farmer/Rancher	N/A	N/A	144	68	$1,509,606
On-Farm Research/Partnership[3]	N/A	N/A	36	24	$652,414
Graduate Student[3]	N/A	N/A	66	31	$459,397
Research for Novel Approaches	128	62	54	22	$4,003,039

[1] These totals exclude additional direct funding given each year to Cooperative Extension in every state to support state-level programming on sustainable agriculture.
[2] The use of a preproposal process varies by region. It serves to screen project ideas for the larger and more complex grant programs, and to reduce applicants' proposal preparation burden as well as the proposal review burden for SARE's volunteer reviewers.
[3] These grant programs were paused in 2023 as part of a grantmaking redesign to increase accessibility to Northeast SARE grant funding. They are scheduled to resume in 2024.

Training Farmers to Confront Racism and Inequity in Our Food Systems

> "The impact of the work funded through this grant continues to proliferate throughout our coalition and our movement ecosystem."
>
> *Caitlin Arnold, National Young Farmers Coalition*

THE CHALLENGE

Young farmers across the Northeast know that racial inequity is deeply rooted in American agriculture, which makes it more difficult for farmers of color to secure land, capital and other resources critical to running a successful farm business. Ninety-five percent of our nation's primary producers are white, according to the 2017 Census of Agriculture, and that number is only increasing as more Black, Latino, Asian American and Native American primary producers leave the industry. If we are to have a just food system, it's critical that we reckon with systemic racism and inequities, and that we acknowledge and support the unique experiences and needs of non-white producers.

THE ACTIONS TAKEN

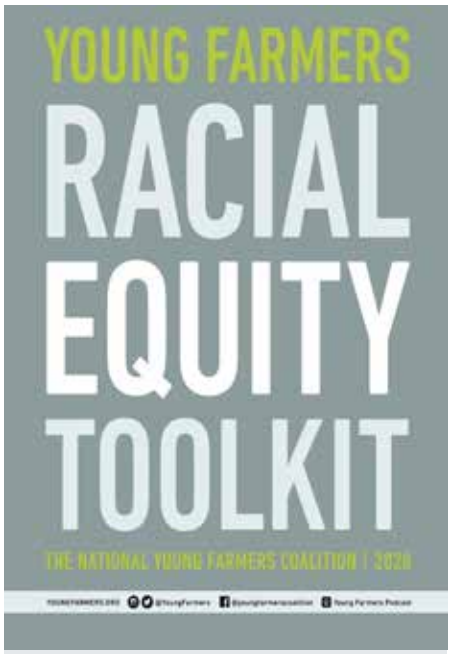
Project leader Caitlin Arnold and the National Young Farmers Coalition (NYFC) secured a SARE Partnership grant and focused their efforts on developing and distributing a Racial Equity Toolkit that tackles the issue of how racism operates in our food system. It also provides guidance and tools for starting conversations about race, racism, equity and justice. The coalition partnered with Soul Fire Farm of Petersburg, N.Y., which facilitated three anti-racism "Uprooting Racism" trainings for 25 of the coalition's chapter groups. These trainings focused on identifying and combating racism in their communities and economies. Participants completed the *Racial Equity Toolkit* and were connected to local organizations engaged in anti-racism work.

THE IMPACTS

This important work has led to the creation of a functional resource for those looking to dismantle racism within their local agricultural communities. Specific impacts include:

- **Deepening conversations**: The Racial Equity Toolkit has been downloaded nearly 10,000 times and has received positive feedback from farmers and agricultural service providers.
- **Increased awareness**: Training participants reported taking action on racial equity issues in their communities, including educating others, improving practices on their farms and engaging in initiatives related to racial and food justice.
- **Resilient communities**: Collaboration among participants and likeminded organizations involved in racial equity work encourages more just and diverse farm communities across the country.

Learn more: See the related SARE project ONE19-328.



The goal of the 38-page *Young Farmers Racial Equity Toolkit* is to help farmers organize around transformative learning and action.

Members of the Atlanta chapter of the National Young Farmers Coalition meet at Urban Sprouts Farm for a skill-share event. *Photo by Richie Graham*

Incorporating Brassicas into Forage Systems Leads to Longer Grazing Seasons and Lower Methane Emissions

> "This project will contribute to the future sustainability of grazing dairy farms via providing alternative forage options to extend the grazing season."
>
> *Kathy Soder, USDA Agricultural Research Service*

THE CHALLENGE

The growing demand for grass-fed meat and milk products has led to increased costs for farmers, particularly when it comes to feed. These increases have driven pasture-based dairy and livestock farmers to seek ways to lower costs and extend the grazing season for their animals, which isn't always easy in the variable weather of the Northeast. Concerns about methane production from livestock diets are also on the rise, making it necessary to evaluate season-extending forages for their potential impacts on greenhouse gas emissions.

A team led by USDA Agricultural Research Service Animal Scientist Kathy Soder hypothesized that incorporating brassicas into grazing systems across the Northeast would produce equal or superior animal performance while generating less methane per cow than systems with annual ryegrass. If so, brassicas such as canola, turnips and forage rape may close gaps in seasonal forage availability, reduce feed costs and potentially reduce methane emissions from grazing livestock.

THE ACTIONS TAKEN

After securing a SARE Research and Education grant, the multi-state project team surveyed grazing farmers across the Northeast to determine their preexisting knowledge about, and research needs for, using brassicas in grazing systems. Results showed that farmers are very interested in exploring alternative forages but are hesitant to try them due to animal health concerns and a lack of knowledge on how to properly establish the forages. The team also ran an in-vitro study evaluating the effects of turnip, canola and forage rape on ruminal fermentation and methane outputs. And a two-year grazing experiment at the University of New Hampshire demonstrated that partially replacing baleage with grazing canola in late fall yielded similar milk production and composition in Jersey cows, and reduced feed use by 40%, a significant cost savings. Finally, the team hosted field days, webinars and online training events, and produced fact sheets and journal articles in order to spread their results to as many farmers as possible.

Grazing livestock on brassicas such as turnips can significantly reduce methane emissions. *Photo by Keith Murray*

THE IMPACTS

This project revealed several convincing benefits when brassicas are added to grazing systems. Specific impacts include:

- **Methane reduction**: The in-vitro study showed that the brassicas reduced methane output by nearly 50% when compared to standard annual ryegrass, without affecting nutrient digestibility.
- **Increased productivity**: A forage plot experiment showed that the three brassicas produced nearly double the amount of fall forage compared to annual ryegrass and generated two to three times the protein and energy. These yields can lead to more grazing days and greater animal productivity when other forages are dormant.
- **Fast adoption**: Farmers benefited from the outreach efforts. Several quickly began using brassicas on their farms, and more than 40 farmers were considering incorporating brassicas into their grazing systems.

Learn more: See the related SARE project LNE16-352.

Crops that have the potential to diversify potato production include (from left) sunflowers, yellow field peas, condiment mustard (top) and red lentils (bottom). *Photos by Jake Dyer, Maine Potato Board*

Sustaining Maine's Potato Farms Using Alternative Crop Rotations

> "This project highlighted several viable crop options that have the potential to diversify potato cropping systems in Maine. Some of the crops trialed in this project failed to gain traction due to limited market access while some, specifically mustard, field peas and sunflowers, were successful and remain in production in Maine today."
>
> *Jake Dyer, Maine Potato Board*

THE CHALLENGE

Potato growers in Maine face challenges when developing sustainable crop rotations due to short growing seasons and labor scarcity. And while the ecological benefits of crop rotation are well known, potato producers often struggle to find reliable markets for the small-grain crops, such as oats and barley, that are rotated with potatoes. Though previous research suggests that a variety of highly marketable pulse and oilseed crops can perform well in Maine's challenging climate, not enough information exists on regional best management practices. These crops can not only be an income driver for the producer, but rotating potatoes with pulses and oilseed crops may also decrease the need for inputs, break pest cycles, reduce erosion and compaction, and add value by filling market demands.

THE ACTIONS TAKEN

Supported by a SARE Research and Education grant, Jake Dyer, an agronomist with the Maine Potato Board, evaluated the potential of rotating potatoes with more lucrative crops such as oilseeds and pulses. Research was conducted across several host farms during the 2018 and 2019 growing seasons. In the first year of the study they evaluated crops like field peas, sunflowers, canola and mustard in different growing conditions to determine their performance, strengths and weaknesses. The most-promising crops from the initial trials were studied on a larger scale in 2019, with sunflowers, canola, field peas and condiment mustard performing and selling well.

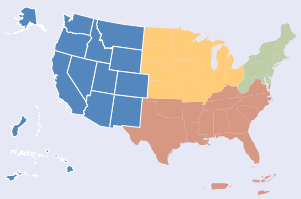
THE IMPACTS

The team's research shows great promise for the adoption of these crops within Maine's potato production systems. Specific impacts include:

- **Improved yields**: Field peas and canola demonstrated increased yields while requiring minimal fertility and few chemical inputs.
- **Cost savings**: Second-year research on field peas showed that fertilizer, seed treatments and foliar fungicides did not significantly increase yields, saving farmers around $60 an acre.
- **Best practices**: Two years of field research provided valuable insights into alternative crop production, paving the way for future crop diversification, more sustainable farming practices and new revenue streams.

Learn more: See the related SARE project LNE17-358.

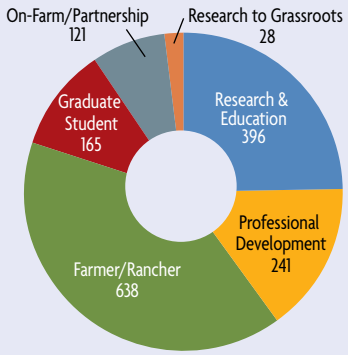
WESTERN SARE



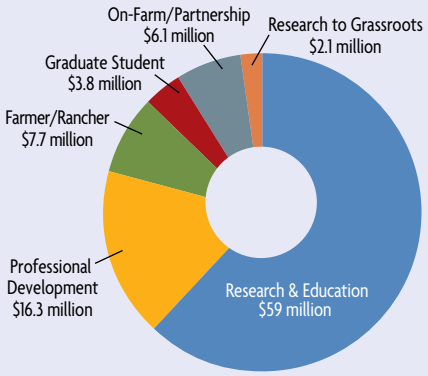
Photos by Vo von Sehlen, Vo-tography Images

Total Grant Awards, 1988–2023[1]

1,589 GRANTS



$95 MILLION



Recent Highlights from the Western Region

- In 2022, Western SARE developed our pilot program, "Sustainable Agriculture Action Plans." These plans bring stakeholders together in a collaborative process to document the research, regulatory, infrastructural, and educational needs and priorities required to increase sustainable agriculture practices in specific industries or commodities, or in a specific area of the West. The Paso Robles CAB Collective in California and Mosca-Hooper Conservation District in Colorado were awarded funds in this first round.
- We worked with adult education specialists at University of Georgia Extension to develop a "Teaching and Learning Best Practices Toolkit for Developing Impactful Educational Programs." Using the right teaching and learning strategies can help create an experience that addresses audiences' needs and will make program participants eager to implement change. This project included a full-day training for Western state coordinators at their annual meeting.
- Our podcast "Fresh Growth: Approaches to a More Sustainable Future from Western Ag" is in its third season. Fifteen episodes have been recorded, with more than 5,600 downloads. All guests are farmers and ranchers who are finding innovative, sustainable practices that enrich our natural resources. These successful operations experiment with new ideas and are making it pay off.

Grant Proposals and Awards, 2022–2023

Grant Type	Preproposals Received[2]	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education	118	59	58	26	$8,328,066
Professional Development Program	N/A	N/A	39	27	$2,460,823
Farmer/Rancher	N/A	N/A	73	47	$1,114,891
On-Farm Research/Partnership	N/A	N/A	37	18	$1,299,204
Graduate Student	N/A	N/A	50	24	$708,830
Research to Grassroots	N/A	N/A	16	12	$1,113,271

[1]These totals exclude additional direct funding given each year to Cooperative Extension in every state to support state-level programming on sustainable agriculture.
[2]The use of a preproposal process varies by region. It serves to screen project ideas for the larger and more complex grant programs, and to reduce applicants' proposal preparation burden as well as the proposal review burden for SARE's volunteer reviewers.

Reducing Goat Herd Predation in New Mexico

> "The addition of goats either as a tool or as an enterprise to existing ranches is ... expected to be a great option in the right circumstances."
>
> *Emily Cornell, Sol Ranch*

THE CHALLENGE

There are many highs and lows of the ranching lifestyle, but losing animals to predation is a particularly difficult challenge to cope with. Predators like mountain lions and coyotes can cause enormous economic losses if they go unchecked. Sydney Franz learned this the hard way when she moved her goat ranch, K&C Boer Goats, from central Texas to Mora County, N.M., to establish multi-species grazing for land restoration and to earn additional revenue. With protection options limited due to finances, the ranch lost 24 percent of its goat kids between 2016 and 2017. And while she and her partner were able to reduce losses to 14 percent in 2018 through modifications to previous protection methods, they needed better solutions in order to keep the business and animals alive.

THE ACTIONS TAKEN

K&C collaborated with fellow ranchers on a Farmer/Rancher grant project to improve herding techniques and reduce predation. To trial their options in the first year, many of K&C's goats were herded during the fall and winter, the period of worst predation, on Sol Ranch LLC, a neighboring cattle ranch operated by Emily Cornell with 5,000 acres of mixed open and rough terrain. Coincidentally, fall and winter are also the times when brush and other unwanted weed species increase, so having goats forage the landscape served both the goats and the ranch. The goats returned to K&C's Turner Ranch headquarters in the second year. They were released with six livestock guard dogs and again suffered significant losses before Franz took over and began continual herding. Over the course of the project's three years, the group significantly reduced predation through a combination of human herders, livestock guard dogs, herding dogs, night penning and in-shed kidding. Herders were particularly effective as they were better able to train the herd and prevent it from splintering into smaller groups and becoming vulnerable.

THE IMPACTS

By adjusting their methods and using human herders, K&C reduced its animal losses to a consistent 6 to 8 percent each year. The trial also showed potential for whole-farm benefits like improved weed control and soil health. Specific impacts include:

- **Revenue opportunity**: Incorporating meat goats to improve ranch landscapes provides an additional income opportunity for ranchers.
- **Improved rangeland health**: Multi-species foraging offers soil health benefits as each herd feeds on different plant species; for example, goats will forage woody plants and cactus left behind by cattle.
- **Education and outreach**: Despite difficulties with outreach due to the pandemic during the project period, plans are in place to share project outcomes at open-gate tours, meetings and workshops, and through like-minded organizations.

Learn more: See the related SARE project FW19-357.

Sydney Franz with one of the guard dogs that, along with other improved herding practices, have helped her reduce goat losses to predators.
Photo courtesy Sol Ranch, New Mexico

Improving Tribal Food Sovereignty Through Mushroom Cultivation and Research

> "Mushrooms can grow on what we throw out. Perhaps it's time to change how we think about food and waste."
>
> *Jade Swor, Potter Valley Tribe*

THE CHALLENGE

Food sovereignty is crucial to sustaining the cultures, economies, community health and identities of Native American peoples across the nation. It allows tribes to self-determine what food to produce and how to produce it, with a focus on culturally appropriate foods grown to meet community needs. Food programs have sprouted up on tribal lands to educate and empower tribe members to take control of their diets and food supplies. While many of these programs focus on traditional foods and native plants, mushroom production is uncommon. The Potter Valley Tribe, descendants of the Northern Pomo people, cultivates a small variety of mushroom species on their land in Fort Bragg, Calif. They've implemented a closed-loop production system that allows them to increase the kinds of mushrooms they grow using waste substrates produced by local businesses, like spent coffee grounds, hardwood sawdust, spent brewer's grain and cannabis stalks. After constructing a cultivation lab, they stopped outsourcing mushroom spawn by producing their own on site. The tribe's ultimate goal is to sell mushrooms and subsequent products at farmers markets and co-ops.

Top: Jade Swor (far left) of the Potter Valley Tribe teaches tribal members and employees how to inoculate a log with mushrooms. Among the varieties they grow are grey oysters (left) and lion's mane (right). *Photos courtesy of Jade Swor, Potter Valley Tribe*

THE ACTIONS TAKEN

Supported by a Research to Grassroots grant, the project team established a community mushroom cultivation lab and expanded current production by growing different mushrooms known for their medicinal and culinary uses. They carefully documented the cultivation process from collection, to inoculation, to harvest. Mushrooms and mushroom medicine products were then given to tribal members. Educational materials were created to teach tribal youth and other regional tribes how to generate income by growing their own mushrooms using sustainable practices and recycled waste materials.

THE IMPACTS

The benefits of this project reached far beyond the Potter Valley Tribe thanks to a focus on regional networking, partnerships and outreach. Specific impacts include:

- **Inter-tribal knowledge sharing**: The team collaborated with eight regional tribes for mushroom workshops, cooking demonstrations and mushroom gathering with youth. Three tribes will begin their own mushroom programs.
- **Strong participation**: More than 40 new participants got involved with the project, including elders and youth.
- **Firm commitment**: Building the mushroom cultivation lab, producing how-to guides and manuals, finding best practices, leading foraging expeditions and mapping the tribal land's mycoflora ensure that mushrooms will remain an important part of the tribe's food culture for years to come.

Learn more: See the related SARE project RGR20-010.

Left: Cattle waste left in grazing areas adds nutrients to the soil, promotes the growth of grasses and ground cover, and fosters dung beetles.
Right: Cattle grazing on the Jordan Ranch in Livingston, Mont., distribute their manure, urine and nutrients throughout the pasture. *Photos courtesy of USDA Natural Resources Conservation Service, Montana*

Understanding Opportunities for Nutrient Recycling and Food Safety in the West

> "This conference achieved the goal of connecting sectors of agriculture to safely share nutrients in livestock and poultry manures."
>
> *Joe Harrison, Washington State University*

THE CHALLENGE

The Clean Water Act requires states to submit water quality assessment reports every two years that include details on whether rivers, lakes, estuaries and coastal waters are meeting water quality standards. Pacific and Mountain Northwest states, including Washington, Idaho, Montana, Utah and Oregon, have reported varying rates of nutrient-related impairment in their waterways, some of which were very high. While not all impairment can be attributed to agriculture, crop and animal production plays a significant role in the over-enrichment of our water sources. Agricultural professionals often lack adequate understanding of nutrient cycling and recycling, rate and transport of nutrients across agricultural landscapes, and food safety related to irrigation management. To increase knowledge of how these important topics pertain to farm businesses and to regional water quality, Joe Harrison of Washington State University teamed up with professionals across five states to host a conference aimed at those who advise producers, including regional, state and local agencies and technical service providers.

THE ACTIONS TAKEN

With support from a Professional Development Program grant, the organizers identified 10 projects to be presented at the conference that addressed topics like technology for nutrient capture and recycling, carbon sequestration and storage, safe use of compost and manure in vegetable crops, nutrient cycling in grazing systems, irrigation management, and more. Topics were chosen to promote the adoption of practices that encourage resource stewardship, particularly water. In-person training is a preferred learning method for farmers, ranchers and other ag professionals, so the event was to be hosted in Boise, Idaho, but the Covid-19 pandemic necessitated a virtual meeting instead. The October 2020 Pacific Northwest and Mountain West Nutrient Management, Food Safety and Soil Health Conference attracted nearly 400 registrants, and those who responded to a post-event survey indicated an increase in the level of their skills and knowledge related to the topic areas.

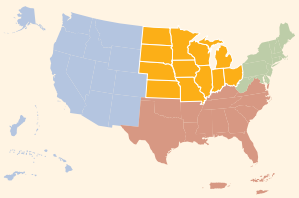
THE IMPACTS

Though the event had to be held online, the virtual platform allowed for registrants to attend from locations across the globe. Specific impacts include:

- **Worldwide interest**: Participants registered from six Western states, as well as from British Columbia and 43 other locations across the nation and the world.
- **Online resources**: The virtual conference environment allowed for easy online access to session recordings and event resources for attendees and for those who were unable to participate at the time.
- **Future events**: Participants indicated strong interest in annual or biennial professional development conferences on similar topics in the future.

Learn more: See the related SARE project WPDP19-10.

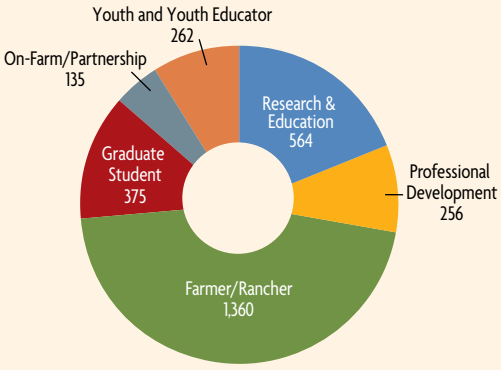
NORTH CENTRAL SARE



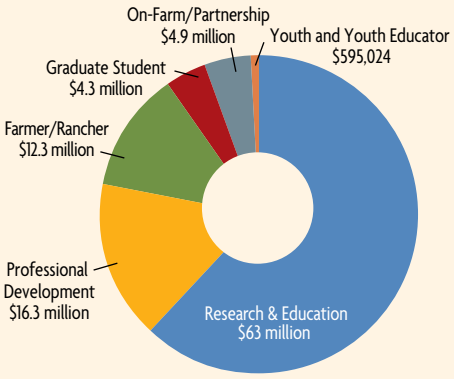
Photos by Marie Flanagan, North Central SARE

Total Grant Awards, 1988–2023[1]

2,952 GRANTS



$101.4 MILLION



Recent Highlights from the North Central Region

- Since 2012, North Central SARE, the Conservation Technology Innovation Center (CTIC), and other partner organizations have surveyed farmers nationally about their experiences with cover crops. In 2022, our 7th cover crop survey addressed new topics like cover crop grazing, carbon sequestration and newer management strategies, alongside yield and economic data.
- We have expanded our Farmers Forums, enabling grant recipients to share sustainable agriculture practices at conferences. In 2022, Farmers Forums were held in all 12 states, supporting more than 50 grantees' participation and the exchange of valuable project insights.
- In our ongoing efforts to be inclusive and to build connections with a wide range of producers, we collaborated with the 1994 land grant institutions in the region to pilot a 1994 Tribal College Coordinator program. The 1994 Tribal College Coordinator will support train-the-trainer programs and share information about our grant programs and other sustainable agriculture resources with the five tribal colleges in Michigan and Wisconsin. We also funded a Spanish version of the video series "What Is Sustainable Agriculture?".
- We launched the "Farming Matters" YouTube video series to highlight the diverse perspectives and experiences of farmers, ranchers, educators and researchers involved in sustainable agriculture research.

Grant Proposals and Awards, 2022–2023

Grant Type	Preproposals Received[2]	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education	246	73	67	34	$7,782,556
Professional Development Program	N/A	N/A	48	24	$2,208,300
Farmer/Rancher	N/A	N/A	251	84	$1,477,624
On-Farm Research/Partnership	N/A	N/A	75	39	$1,672,199
Graduate Student	N/A	N/A	105	43	$635,049

[1]These totals exclude additional direct funding given each year to Cooperative Extension in every state to support state-level programming on sustainable agriculture.
[2]The use of a preproposal process varies by region. It serves to screen project ideas for the larger and more complex grant programs, and to reduce applicants' proposal preparation burden as well as the proposal review burden for SARE's volunteer reviewers.

Bringing Nutritious Options to Food Deserts

> "This SARE youth grant project was the foundation to establishing the national presence that Legacy Taste of the Garden has today."
>
> *John Jamerson, Legacy Taste of the Garden*

THE CHALLENGE

Urban areas with limited access to fresh and affordable food, commonly known as food deserts, are typically located in historically marginalized communities. Residents in these areas often have poorer health outcomes and may lack knowledge about food nutrition and preparation. Legacy Taste of the Garden is a Black-owned, multi-generational farm occupying four acres across three Indiana locations. With a goal to address the region's food access and information needs, Legacy secured a Farmer/Rancher grant to promote and offer fresh and local food, educate their community about traditional farming and gardening methods, and close the gap between local producers and consumers.

THE ACTIONS TAKEN

Legacy Taste of the Garden Operations Director John Jamerson partnered with two other area farms to educate youth and adults alike about urban farming practices and business opportunities. Participants learned about Legacy's farming methods like using hoop houses and bucket systems, as well as about direct marketing models like community-supported agriculture (CSA). Additionally, Jamerson collaborated with chefs to create educational programming and materials centered on nutrition and food preparation, including a "28-day challenge" that guided participants through a month-long, plant-based diet. An app was developed to direct community members to local food options. The multi-faceted project connected consumers to local producers and provided an example of how one can operate and sustain an urban farm business.

THE IMPACTS

Legacy Taste of the Garden was highly successful at its efforts to improve local food access and to generate enthusiasm for sustainable agriculture and nutritious whole foods. Specific impacts include:

- **Increased availability of fresh food**: Community members gained access to fresh produce thanks to Legacy's decision to grow food across three separate food-desert locations.
- **Local outreach**: Legacy Taste of the Garden not only provided education on sustainable agriculture practices, but they also conducted workshops, 4-H programs and virtual cooking demonstrations about preparing healthy food.
- **Community engagement**: The project led to partnerships with local organizations, libraries, churches and farmers. Social media efforts and a website connected food producers with consumers through information on events, markets and crop availability.

Learn more: See the related SARE project FNC19-1169.

Denise Greer Jamerson is a fifth-generation farmer who co-manages Legacy Taste of the Garden along with her husband, John Jamerson, and their son. *Photo by ©Journal Communications/Jeff Adkins*

Vegetables are prepared for canning at Glass Rooster Cannery. *Photo by Marie Flanagan, North Central SARE*

Scaling up Value-Added Local Food in Ohio

> "SARE grants have helped our viability as a business and demonstrated that small businesses can make a positive impact on the environment when we develop relationships with each other for the benefit of all. We hope to inspire others to develop similar local hubs, duplicating our efforts around the state and beyond."
>
> *Jeanine Seabrook, Glass Rooster Cannery*

THE CHALLENGE

Producers and processors involved in sustainable agriculture are concerned with food waste and how to keep edible produce from heading to the compost heap. Value-added foods like jams, pickles, sauces and preserves offer not only an additional, year-round income stream for farmers, but they're also a reliable option for making the most of each season's bounty. Jeanine Seabrook and her team at Glass Rooster Cannery, a sustainable farm that teaches home canning in central Ohio, wanted to reduce waste, connect with their farm community through partnerships and provide processing services that generate profit for both the cannery and its farmer partners.

THE ACTIONS TAKEN

Seabrook was awarded two Farmer/Rancher grants between 2016 and 2023. The first grant allowed the licensed cannery to expand its capacity through the purchase of a 40-gallon steam jacket kettle and canning supplies. This investment reduced production costs, increased batch sizes and gave local farmers the opportunity to sell shelf-safe products made with their excess produce. By the end of the first season, Glass Rooster had used 12,000 pounds of produce and canned 8,000 jars of product. Eight partnering farmers received 25% of the finished product to sell at market. Building on the success of the first project, Seabrook used the second grant to further expand the cannery to include a climate-controlled holding area and additional commercial equipment. More area farmers got involved thanks to the increased capacity for produce processing, and storage and spoilage were no longer issues. By the end of the 2021 season, Glass Rooster had processed more than 30,000 pounds of farmer-provided produce.

THE IMPACTS

These projects have been a resounding success for Glass Rooster Cannery, its community and the local farmers involved. Specific impacts include:

- **Added profit**: Each jar generates between $1 and $3 for the cannery and its partners, providing steady income during the off season.
- **Enormous demand**: The projects were so successful that Glass Rooster had to turn away potential partners, creating a future opportunity for additional expansion.
- **Waste diversion**: As a result of SARE funding, Glass Rooster has been able to divert thousands of pounds of excess produce from landfills and compost piles and turn it into pickles, sauces and other goods enjoyed by the surrounding community.

Learn more: See the related SARE projects FNC21-1304 and FNC16-1056.

Shedding Light on Ranchers' Views of Grassland Conservation Payments

> "Safeguarding Nebraska's natural resources for an uncertain future should be at the top of the agenda for policymakers in the state. Our research shows the ranching community is ready for the challenge, but it will take some out-of-the box thinking and teamwork to get us there."
>
> *Kyle Martens, University of Nebraska*

THE CHALLENGE

Though grasslands account for 46% of Nebraska's 49.5 million acres, they're one of the least protected and most altered vegetation types. Converting grasslands for other uses can lead to soil erosion, reduced or contaminated water resources, and a loss of biodiversity. At the community level, conversion shrinks grasslands and removes job opportunities, reducing income for ranchers and affecting livelihoods in rural areas. Grassland conservation programs do exist to help preserve these landscapes for future generations, including direct payments to producers for land conservation, but these programs don't account for the many non-agricultural benefits and services grasslands provide, such as wildlife habitat, water purification, carbon sequestration and nutrient cycling. Despite these ecological services, temperate grasslands are being converted at five times the rate than they can currently be protected.

THE ACTIONS TAKEN

Kyle Martens, now a doctoral candidate at University of Nebraska, wanted to better understand ranchers' preferences for emerging grassland conservation programs in the state, known as payment for ecological services (PES) programs. After receiving a Graduate Student grant in 2020, Martens set out to learn what aspects of PES programs would most benefit Nebraska's ranchers and lead to more adoption of conservation practices. He partnered with several organizations to survey those most affected by grassland loss, with the goal of receiving direct feedback from ranchers and ag professionals on their preferences for management actions, payment amounts and contract lengths of voluntary conservation programs. The results were intriguing. Survey participants prioritized practices that improve biological diversity, and while they showed a keen interest in incentivized management actions, they were less concerned with the amount of payment or length of contract.

THE IMPACTS

Survey results showed clear interest by Nebraska's ranchers to participate in flexible conservation programs that reflect the challenges of ranching in a grassland ecosystem and that honor the ecological services provided by their management actions. Specific impacts include:

- **Encouraging biodiversity**: Martens found it notable that using grazing to conserve biodiversity was preferred over 15 other management practices suggested in the survey.
- **Protecting livelihoods**: Ranchers want incentivized conservation programs to work in tandem with their lifestyle in order to enhance profitability and long-term business sustainability.
- **Stakeholder engagement**: Ranchers demonstrated a significant interest in engaging in the PES process so that incentives more closely align with their concerns and priorities.

Learn more: See the related SARE project GNC20-307.

University of Nebraska doctoral candidate Kyle Martens found many ranchers are willing to use grazing practices that promote biodiversity. *Photo by Kyle Martens*

SARE Shares

SARE's work does not stop when it awards a grant; SARE follows through with a robust regional and national outreach effort to share useful findings with farmers and ranchers, researchers, and ag educators. Here are some of the ways SARE shares.

EDUCATIONAL RESOURCES
www.SARE.org/Resources
Hundreds of educational resources on dozens of topics.

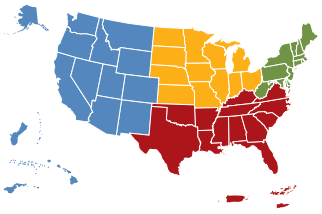
DATABASE OF PROJECT REPORTS
www.SARE.org/Project-Reports
Results from more than 8,500 SARE-funded research and education projects.

STATE PROGRAMS
www.SARE.org/State-Programs
SARE coordinators in every state and island protectorate offer learning opportunities.

Photo by Cashawn Myers, HABESHA, Inc.

HOW TO ORDER SARE PUBLICATIONS
Books and bulletins are free to view online at www.sare.org/resources.
To buy books or order free print bulletins, visit www.sare.org/WebStore or call (301) 779–1007.

SARE OFFICES
Contact your regional office or visit its website for requests for proposals, application deadlines and other grant information. Contact SARE Outreach or visit www.sare.org for questions about SARE publications.



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