2025-2026

SARE


NORTHEAST


WEST


NORTH CENTRAL


SOUTH

SUSTAINABLE AGRICULTURE RESEARCH & EDUCATION

REPORT FROM THE FIELD

“SARE is a funding source for producers. It’s designed for producers, and I think that’s really important.”

Emily Cornell, Sol Ranch
(See story on page 9.)

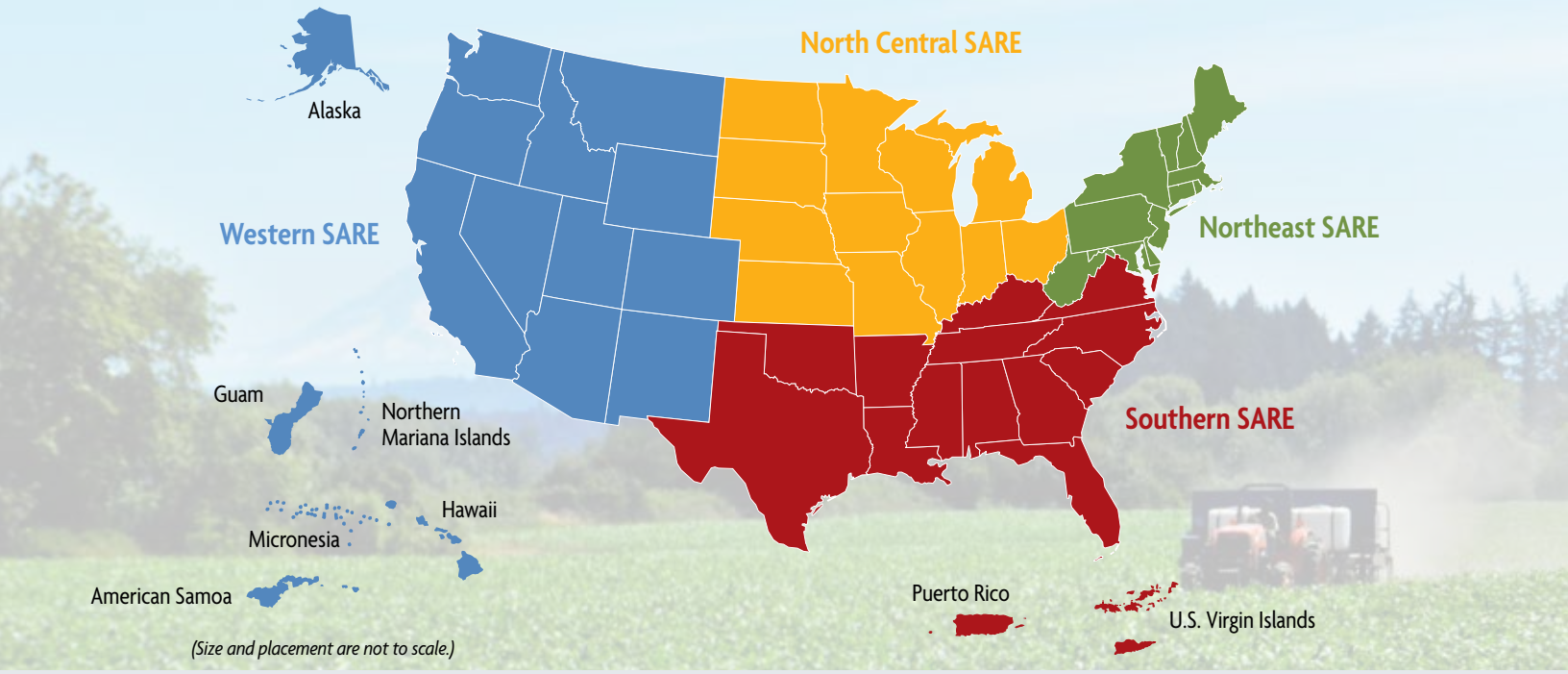
In Recognition of Farmers and Ranchers

SARE has been around for nearly 40 years, and the impacts that our grant and outreach programs have had on the sustainability of U.S. agriculture are because of one simple thing: **Farmers and ranchers are at the center of everything we do**.

This concept takes shape in many ways. At the most basic level, SARE provides grants directly to producers, which removes the financial risk of testing new ideas for making their operations more profitable, productive and sustainable. Our many other grant programs that support the work of agricultural service providers, such as Extension professionals, also require producer engagement throughout their project activities. This way, the innovative practices developed through SARE grants are applicable to actual producer needs and real-world conditions.

Farmers and ranchers also serve in important leadership and decision-making positions at SARE’s regional and national levels. They help guide regional priorities, are involved in grant application review processes, and oversee SARE’s investments in all grants and project activities. This means that producers have a say when it comes to directing SARE’s grant funding towards solving the most pressing challenges in agriculture. As rancher Emily Cornell points out in the quote on this page, SARE truly is designed for producers.

We’ve devoted all 12 of the stories you’ll find in this edition of *Report from the Field* to grant projects that were led by producers. While all of our grant programs are important and impactful, we did this in order to celebrate the countless farmers and ranchers who have been involved with SARE since 1988, either as grantees and project collaborators, or in volunteer leadership positions. We invite you to read on!








SARE is...

INVESTMENT IN SUSTAINABLE FARMING AND RANCHING

Since 1988, more than $35.9 million in research funds have gone directly to America's most innovative farmers and ranchers. In total, SARE has invested over $478 million in more than 9,800 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.

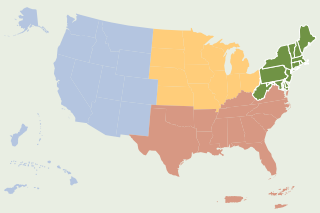
EDUCATION AND TRAINING

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.

Credits: Stories written by Andy Zieminski, SARE. Design by Kirsten Ankers, Citrine Sky Design. **Photo credits:** cover: main photo by Jermaine Hinds, SARE; inset photos by (from left): Vander Gac, Northeast SARE; Vo von Sehlen, Vo-tography Images; Marie Flanagan, North Central SARE; Amy Robertson, USDA; page two: main photo by LD Productions; side photos by (from top): Marie Flanagan; Amy Robertson; Shannon Mulvania-Beck, University of Missouri; page three (from left): Carah Ronan; Marie Flanagan; Cynthia Fiser; LD Productions; David Wells; LD Productions.

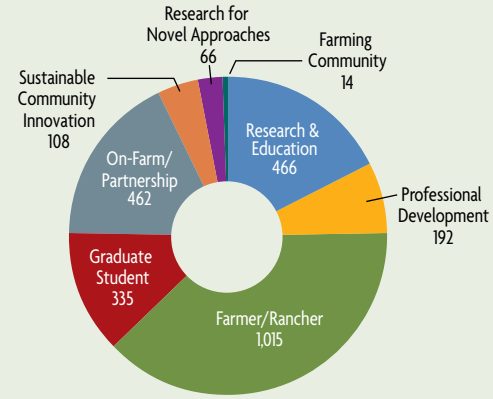
NORTHEAST SARE



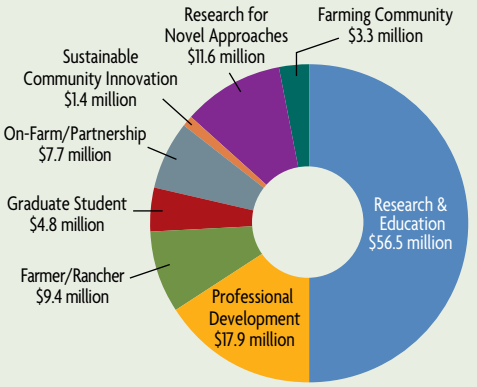
Photos by Vander Gac, Northeast SARE

Total Grant Awards, 1988–2025[1]

2,644 GRANTS



$112.6 MILLION



Recent Highlights from the Northeast Region

- We launched the Farming Community grant program in 2025, which seeks to increase the agricultural workforce and protect farmer health by supporting agricultural research and education in areas of social science. The Farming Community grant program has a streamlined application process, designed for ease of access. We anticipate that this will encourage more farmers working with communities to apply as they build and share innovative agricultural knowledge.
- We're streamlining grant applications across all programs to accommodate the needs of farmers, students, and agricultural service providers. We hope this will assist in contributing to the ever-increasing pool of sustainable agriculture insights and resources being produced in the Northeast. This streamlining includes shorter calls for proposals with revised questions and consolidated appendices.
- We've launched a technical assistance program to help first-time grant applicants navigate the grant-writing process—from identifying and designing a successful project to completing a budget and submitting an application. This program was launched as a support mechanism for the Farming Community grant program, and we're in the process of expanding it to support first-time applicants to our other grant programs. The technical assistance program makes it easier for applicants who aren't affiliated with land grant universities to access institutional knowledge.

Grant Proposals and Awards, 2024–2025

Grant Type	Preproposals Received[2]	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education[3]	82	34	27	10	$2,625,917
Professional Development Program[3]	37	29	20	8	$1,211,053
Research for Novel Approaches[3]	111	36	31	9	$1,755,817
Farmer/Rancher	N/A	N/A	186	66	$1,667,105
On-Farm Research/Partnership[4]	N/A	N/A	46	35	$959,453
Graduate Student[4]	N/A	N/A	96	34	$504,322
Farming Community[5]	N/A	N/A	168	14	$3,311,490

[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 programs were paused in 2024 due to a grantmaking redesign in the region. They resumed in 2025.
[4]Funding data for 2025 was not available at the time this report was published.
[5]This grant program was started in 2025.

Reducing Pest Damage and Increasing Profitability for Delaware Bay Oyster Farmers

> "The project was eye opening and exceeded our expectation of how it will inform our future farm operations."
>
> *Lisa Calvo, Sweet Amalia Oyster Farm*

THE CHALLENGE

One of the biggest headaches for oyster farmers along the East Coast is the species of pests commonly known as mud worms. One species settles on the outside of oyster shells, which causes mud to accumulate that reduces oyster growth and can cause mortality. To avoid this, farmers have to hose off their oysters regularly, which is very labor intensive, and therefore an expensive practice. Another mud worm species bores into the oyster's shell, causing blemishes that can make them unmarketable. There are a handful of practices that reduce this problem, but none are practical enough for oyster farmers to easily adopt them.

THE ACTIONS TAKEN

Mud worms are widespread in the Delaware Bay, where Lisa Calvo owns and operates Sweet Amalia Oyster Farm, on the New Jersey side. Calvo, who is also a marine biologist, received a SARE Farmer grant to study a new approach to avoiding mud worm damage. In the Delaware Bay, many farmers grow oysters using the "rack and bag" system. This involves growing them in bags that rest on metal racks in the intertidal zone, so they alternate between being underwater and in the air. Most racks are 15" off the ground, and Calvo experimented with 20" and 30" elevations. At a higher elevation, oysters would be exposed to less mud worm damage, but they would also have less time to feed. This would increase the amount of time, and therefore labor, it takes them to reach marketable size. Both of these tradeoffs–less pest damage versus a longer production period–can have a major impact on profitability, which Calvo wanted to evaluate.

Lisa Calvo explored ways to reduce pest damage in oyster farming and make it more profitable. *Photo by Gab Bonghi*

THE IMPACTS

Working with technical advisors at Rutgers Cooperative Extension, Calvo found that each rack height can be financially viable. This is useful because it gives oyster farmers more options based on their situation. The higher racks had more labor costs due to the longer growth time, but the higher yields they produced made them profitable. Specific impacts include:

- Calvo found that increasing rack height by 5", to the 20" level, increased production time by two weeks but reduced mud worm damage enough that it was more profitable than the standard height.
- She has begun the process of converting all of her racks to 20" as a result, excluding ones that are needed for winter production.

Learn more: See the related SARE project FNE23-038.

Charles Lafferty diversified his family's Pennsylvania farm by raising pigs in the forested sections of their land. *Photo by Tanya Lafferty*

Turning Woodlots into Revenue Streams With Silvopasture

> "The project successfully demonstrated that pigs can be raised profitably in wooded areas."
>
> *Charles Lafferty, Skyline Pastures*

THE CHALLENGE

Many farms in the Northeast include wooded or brushy land that isn't suitable for food production. As a result, this land has a cost attached to it in the form of property taxes and potentially in maintenance, while it isn't generating revenue for the farmer. As financial pressure increases on farmers in the region due to higher land and input costs, finding agricultural uses for woodlots can add important revenue streams to farm operations. One emerging avenue for this is silvopasture, or raising livestock among trees. Charles Lafferty, of Skyline Pastures in Mohrsville, Penn., wanted to try raising pigs in his wooded lands, but he found there were critical knowledge gaps in terms of which forage species and tree cultivars would be best for pigs to thrive in.

THE ACTIONS TAKEN

Along with farming the land sustainably, one of Lafferty's long-term goals is to transition to farming full-time, without the need to supplement his income. So, he used a SARE Farmer grant to experiment with rotational grazing of pigs in the wooded lands of his 12-acre farm. He wanted to see what impact this would have on the health of his animals and the forest, as well as profitability. To start, he set up temporary electric fencing in a woodlot to establish paddocks and added necessary infrastructure for the animals, like troughs and shelter. He also established a range of fodder and nut tree species for them. Along with keeping track of costs and revenue, he collected soil data and worked with a forester to conduct plant and tree inventories. Concerned about animal welfare, Lafferty also made sure his pigs had adequate access to food, water and shelter, and were comfortable with being moved from one paddock to another.

THE IMPACTS

Lafferty found that this rotational silvopasture system was profitable, despite its startup costs and the labor associated with managing it. Specific impacts include:

- After factoring in all expenses, the average net profit was $300 per pig. Lafferty also found he was able to rotate between paddocks efficiently, freeing up time for other tasks such as forage management.
- Lafferty saw a 90% survival rate of the fodder and nut tree species he planted, while also observing an improvement in control of invasive species.
- He shared the results of this project directly with more than 50 farmers, through two field days and multiple farm walks.

Learn more: See the related SARE project FNE23-053.

Equipping Farmers with Profitable Winter Production Options

> "I reached new markets and generated a new revenue source during winter months, a time when our farm income is low."
>
> *Jennifer Wilhelm, Fat Peach Farm*

THE CHALLENGE

The Northeast has short growing seasons and long winters, which traditionally puts a limit on how many crops–and thus how much income–farmers can produce from their land. This long income gap presents one of the biggest challenges to the financial viability of small-scale farms in the region. As a result, there's a lot of interest in season extension and winter production strategies. These can take many forms, such as growing in high tunnels or producing crops during the growing season that can be stored and sold in the winter, like squash or cabbage. But even these common approaches require resources that many small-scale producers may not have, including the money or space to build a high tunnel, or enough land to grow crops that aren't sold immediately.

THE ACTIONS TAKEN

Supported by a SARE Farmer grant, Jennifer Wilhelm of Fat Peach Farm in Madbury, N.H., successfully demonstrated another approach to winter production that takes advantage of something most growers already have–cold storage rooms. These small buildings are meant to refrigerate crops during the hot summer months, and mostly sit unused during the winter. But with small modifications to add growing lights, shelving, fans and heating, Wilhelm wanted to explore if they could be used effectively to grow microgreens during the winter months. Microgreens are a fast-growing, high-value crop that don't need a lot of space and are popular with consumers.

During the project, Wilhelm modified her cold storage room and evaluated the yield and profitability of four microgreen varieties: kale, broccoli, mild salad mix and pea shoots. She assessed profitability by doing a budget analysis that included costs for startup, supplies, labor and electricity, as well as income from sales.

THE IMPACTS

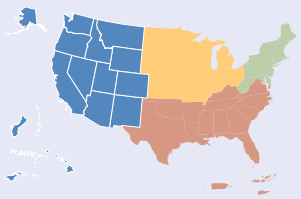
Wilhelm found that the project was a success–she was able to grow microgreens, found willing buyers, and determined they were profitable. Specific impacts include:

- Startup costs could be recovered in year one, and she could generate a net income of $1,577 per week from 12 trays of microgreens, and $1,090 per 28-week season from 6 trays of pea shoots.
- Wilhelm learned important lessons about managing soil moisture and heat levels to optimize yields while avoiding mold. She was planning to expand production after the project ended, and to continue improving her system.

Learn more: See the related SARE project FNE20-966.

Jennifer Wilhelm (left) and Micum Davis (right) operate Fat Peach Farm in Madbury, N.H. *Photo by Northeast SARE staff.* They used a SARE grant to grow microgreens in their cold storage facility (bottom photos). *Photos by Jennifer Wilhelm*

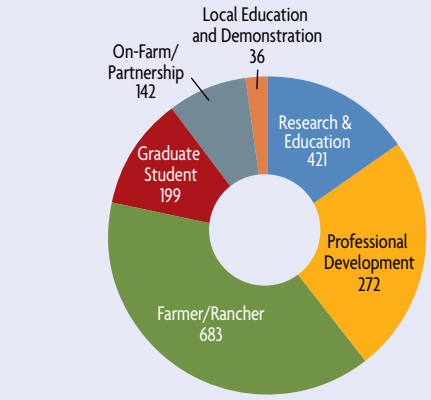
WESTERN SARE



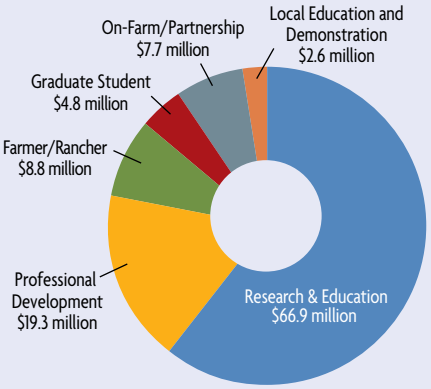
Second photo from left by LD Productions; all others by Vo von Sehlen, Vo-tography Images

Total Grant Awards, 1988–2025[1]

1,753 GRANTS



$110 MILLION



Recent Highlights from the Western Region

- Grantees in our region reported the following impacts from projects funded in 2022–2023: 683 producers actively participated in research; 7,825 producers were reached; 2,928 producers reported gaining knowledge, attitude, skills or awareness; 635 producers changed a practice; and 835 on-farm demonstrations, workshops and field days were held.
- We hosted two annual *Cultivating Agricultural Partnerships for Sustainability (CAPS) Summits*, one in Salt Lake City and one in Phoenix. This interactive and informational summit centered on bringing together individuals, groups, and entities actively working in the field of sustainable agriculture. Summit objectives were to foster opportunities for participants to share program information, develop relationships, and network among nonprofits, state Extension and Western SARE. At each one, over 130 participants developed a better understanding of how to work together to address the most critical issues facing sustainable agriculture. Mike Peterson of This Week in Agribusiness was a keynote speaker and moderator at both events.
- Our podcast *Fresh Growth: Approaches to a More Sustainable Future from Western Ag* is starting its sixth season, and has more than 7,700 downloads. All guests are farmers and ranchers who are finding innovative, sustainable practices that enrich our natural resources and pay off economically. We also created a series of videos highlighting successful Farmer/Rancher grantees, which have been viewed more than 17,000 times.

Grant Proposals and Awards, 2024–2025

Grant Type	Preproposals Received[2]	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education	140	112	104	25	$7,935,599
Professional Development Program	N/A	N/A	69	31	$3,055,863
Farmer/Rancher	N/A	N/A	101	45	$1,106,492
On-Farm Research/Partnership	N/A	N/A	66	21	$1,579,225
Graduate Student	N/A	N/A	78	34	$1,012,890
Local Education and Demonstration	N/A	N/A	34	8	$493,238

[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.

Ranchers Turn to Compost to Improve Soils and Boost Forage Production

> "We would not have been able to pull this off without the Western SARE grant."
>
> *Zachary Withers, Polk's Folly Farm*

THE CHALLENGE

Historical mismanagement of rangelands in the semi-arid Southwest has put a huge financial squeeze on today's ranchers. Degraded soils combined with increasingly erratic precipitation patterns–which usually comes in the form of prolonged and intense drought–have made it difficult for ranchers to maintain consistent forage levels for their herds, which is the basis of their livelihoods. As a result, many ranchers in the region are adopting new practices aimed at improving the health of their soils and the quality of the forage resources available to them. Healthier soils can capture and store more rainfall and snowmelt, and they resist erosion better during extreme rains. They can also support a greater diversity of forage species and higher, more consistent levels of forage production.

THE ACTIONS TAKEN

Zachary Withers, who co-owns Polk's Folly Farm with his brother in Cedar Crest, N.M., used a SARE Farmer/Rancher grant to see what effect compost would have on their soils and forage resources. Working closely with fellow rancher Emily Cornell of Sol Ranch and a team of technical advisors, he designed a research project to compare the effect of different compost application rates on test plots over the course of two years. The compost they used was a readily available resource–Withers makes it on his own farm, primarily from food scraps and wood mulch, with additional feedstocks including horse, pig and chicken manure. During the project, the group collected and analyzed a wide range of data on key indicators on soil health and forage quality.

THE IMPACTS

"I think the most consistent and positive results we got were in water infiltration," Withers says. "The ability of the soil to absorb water dramatically increased." Cornell agrees, and adds that she saw a noticeable improvement in the density and diversity of plants in the test plots from compost applications. Other specific impacts include:

- The group generally found a linear relationship between compost applications and improved indicators; in other words, the more compost added, the more the soil improved. This knowledge can help producers make decisions about application rates based on their own constraints and goals.
- During the project, Cornell and Withers each hosted a field day at their respective ranches, involving a total of 32 local ranchers and service providers.

Learn more: See the related SARE project FW20-363.

Livestock producer Zachary Withers (right) worked with Emily Cornell (left) and other ranchers to study the positive effects of adding compost to rangeland. *Photos by LD Productions*

Bringing High-Yielding, Low-Cost Mango Orchard Systems to Hawaii

> "By improving our orchard systems through high density orchards, we are going to be able to grow our industry."
>
> *Umi Martin, Umi's Farm*

THE CHALLENGE

Over time, Hawaii's once-vibrant agricultural industry has given way to an economy dominated by tourism, but many Hawaiians are now interested in bringing agriculture back to the forefront as a way to improve their state's resilience. Umi Martin is one of these people, by scaling up mango production. When starting out, the problem for Martin was that the conventional production method in other tropical regions doesn't translate well to Hawaii. This is because trees in conventional systems are planted at 25 feet by 25 feet and they grow very large, making them difficult to maintain and harvest. So, to be successful, a producer would need a lot of land and labor, plus capital and expensive equipment. And these are things that most of Hawaii's farmers don't have easy access to.

THE ACTIONS TAKEN

To overcome these challenges, Martin used two SARE Farmer/Rancher grants–one in 2017 and another in 2021–to demonstrate that mangoes can be grown in innovative systems that are high yielding but don't require intensive labor or a large landbase. He focused on two orchard systems that have been developed in recent decades in such places as India and Australia: the Tatura trellis system and the ultra high density plantation (UHDP) system. In both systems, the key concepts are that instead of planting 50 large trees per acre, you plant 300 or more, and keep them pruned to a height of about 6 feet. This dramatically reduces labor because a person can prune and harvest trees quickly, from the ground. With his first grant, Martin established orchards using each system, his main goal being to track the labor and startup costs. With his second project, after the trees matured, he focused on evaluating yield and profitability, while also identifying management and postharvest issues to work out.

Umi Martin is attempting to bring high-yielding, small-scale mango production to the Hawaiian islands. *Photos by LD Productions*

THE IMPACTS

Martin learned a great deal from these projects to inform how he plans to improve his systems, as he also continues to demonstrate their effectiveness to other farmers. Specific impacts include:

- Martin's main advice is to slightly lower the planting density and widen the rows, to both improve airflow and sunlight, and to allow for small tractors to pass through.
- He discovered that when bringing mango branches so low to the ground, feral pigs become a major pest, requiring the need for electric fencing.
- One year, Martin achieved an 8,000 pound yield of the Keitt mango variety on 0.3 acre. This translates to 12 tons per acre, or a 140–500% improvement over conventional yields.

Learn more: See the related SARE projects FW17-034 and FW21-375.

Nichlos Pate mows a hayfield that he established in an apple orchard in an effort to improve soil health and water management on his farm. *Photos by LD Productions*

Gaining New Insights into Alley Cropping to Share with Farmers in Western Washington

> "SARE allowed me to take on that risk of an experiment, to do alley cropping."
>
> *Nichlos Pate, Raising Cane Ranch*

THE CHALLENGE

Alley cropping is the practice of growing annual crops between rows of fruit trees or other perennials. Interest in alley cropping is growing because it has great potential to improve both soil health and water management, while also maintaining or improving farm productivity. But good information isn't always available on which systems work best in a specific region, or what benefits one can expect to see, in terms of the impact on soil health, water management, biological diversity, quantity and quality of yields, and profitability. This was the problem faced by Nichlos Pate, owner of Raising Cane Ranch in Snohomish, Wa., when he started thinking about integrating two of his main crops–annual hay fields and apple orchards–into an integrated system.

THE ACTIONS TAKEN

Pate used a SARE Farmer/Rancher grant to study the ecological and economic impact of a hay/cider apple agroforestry system on his farm, with the intention also of sharing his experience with other farmers in his area. Collaborating with a team of local farm advisors, Pate tracked the costs associated with establishing the hay/orchard system as well as the ongoing costs to maintain it. He also tracked the system's impact on annual hay yields and soil health measurements. He was able to compare yield and soil health data in the new field to data from both a hay/apple field he had established in 2017 and a control hay field. Another objective was to share the data they gathered with the local farming community through field events, publications and outreach online.

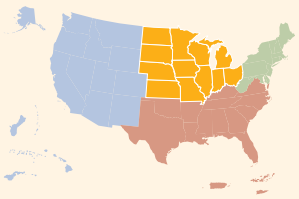
THE IMPACTS

The two-year project wasn't long enough to gain a complete economic picture, because the cider trees he established needed several more years to reach their full production potential. But, according to Pate, all of the yield, soil and economic data he collected has provided an important baseline that will influence future management goals. Specific impacts regarding how he shared his experience with other farmers include:

- Pate held two farm tours during the project, involving a total of 53 farmers and service providers. He also created a factsheet summarizing the project's costs and outcomes.
- A total of 22 producers reported gaining knowledge, attitude, skills and/or awareness as a result of the project, according to Pate.
- A total of four producers intended to change a practice as result of this project, Pate reported.

Learn more: See the related SARE project FW21-374.

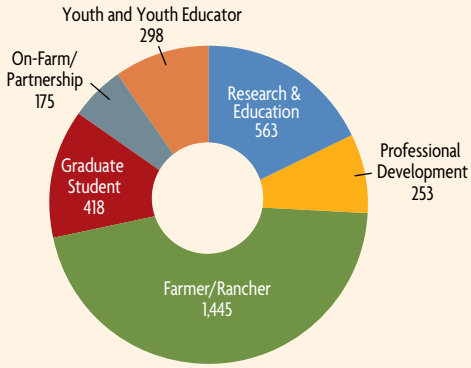
NORTH CENTRAL SARE



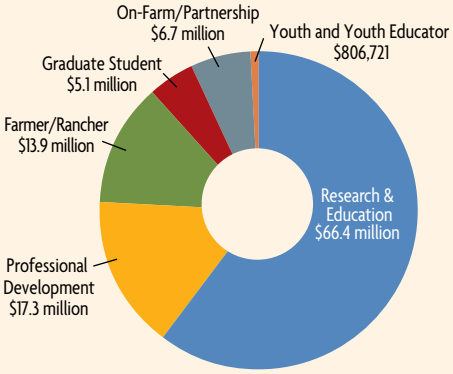
Photos by Marie Flanagan, North Central SARE

Total Grant Awards, 1988–2025[1]

3,152 GRANTS



$110.1 MILLION



Recent Highlights from the North Central Region

- We've launched an online *Grant How-To Video Series* to help more people feel ready to apply for a SARE grant. These short videos answer common questions and break down the application process in step-by-step detail.
- Since 2012, North Central SARE, the Conservation Technology Innovation Center, and partners have surveyed farmers nationwide about their experiences with cover crops. The 2025 survey highlighted how firsthand experience drives adoption; farm advisors who use cover crops are five times more likely to recommend them.
- Innovation creates opportunity, but it also comes with risk. With SARE support, farmers don't face that risk alone—through 3,538 collaborations from 2014 to 2024, our grants have brought farmers, researchers, and educators together to share knowledge, test ideas, and navigate uncertainty with greater confidence.
- Farm owners are increasingly asking how they can attract employees and build long-term working relationships. In response, our "Paths to Sustainability with Farm Labor" training in 2025 brought together more than 60 agricultural educators from across the region, providing tools and insights to strengthen farm labor practices. As part of this effort, the event organizers released a new guide, *Farming into the Future by Centering Farmworkers*, which is now available online.

Grant Proposals and Awards, 2024–2025

Grant Type	Preproposals Received[2]	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education	340	84	80	33	$8,034,491
Professional Development Program[3]	N/A	N/A	25	12	$1,334,650
Farmer/Rancher	N/A	N/A	300	84	$1,549,127
On-Farm Research/Partnership	N/A	N/A	99	40	$1,786,242
Graduate Student	N/A	N/A	201	44	$846,505

[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]Funding data for 2025 was not available at the time this report was published.

Utilizing Cover Crops in Wide Row Corn

> "There are a number of growers and landowners who have taken a great interest in my work. It is intriguing to them because it is so different from their traditional practices."
>
> *Bob Recker, Cedar Valley Innovation*

THE CHALLENGE

These days, most farmers are familiar with cover crops and their potential value as a management tool. In the right context, cover crops can reduce erosion, suppress weeds, provide nitrogen, improve water retention or generate revenue as livestock forage. Bob Recker, a farmer and consultant in Iowa, has always had an interest in experimenting with practices that represent a departure from the status quo. His primary focus is on exploring how to leverage sunlight to maximize crop yields, and this recently led him to a radical idea: While some farmers already plant cover crops between rows of corn, he wanted to widen the corn rows significantly to open up more sunlight and allow the cover crops to grow more vigorously. The first thought of most farmers might be that wider rows sounds like little more than lost yields, but Recker wanted to see the real-world effect this practice could have on profitability, productivity and soil health.

THE ACTIONS TAKEN

Recker received two SARE Farmer/Rancher grants to experiment with fields of corn planted in 60- and 90-inch rows, compared with standard fields with 30-inch rows. He collaborated with three farmers near Waterloo, Iowa. On each participating farm, they looked at a variety of inter-row plantings, including a simple cover crop species that a beginner might start with and a more diverse cover crop mix for more experienced farmers. Each farmer included an additional treatment that was based on their own interests. For example, one farmer might use vigorous cover crop growth to focus on building up soil health or to assist the transition to organic, while another might graze the cover crop after harvest to offset yield loss and boost profitability. Another way to improve profitability could be to include a vegetable crop as well as a cover. In the treatment plots, Recker increased the number of plants per row so that the number of plants per acre was consistent across all plots. On all of the farms, he tracked plant growth through the season, weed suppression, biomass, runoff and yield.

Bob Recker (left) collaborated with three other farmers on his SARE-funded projects, including Mike Cook (right). *Photo courtesy of Practical Farmers of Iowa*

THE IMPACTS

Some treatments resulted in surprisingly impressive–but still slightly lower–corn yields, plus other benefits. But, Recker admits that a farmer should only explore this practice if they have a clear goal for doing it, until more is learned about it. Specific impacts include:

- On one farm, the plot with 60-inch rows had 56% less water runoff during rain events.
- In just one season, Recker recorded organic matter increases of 0.2% and 0.3%, which exceeded his expectations.
- In one year, a participating farmer's corn crop failed due to a dry season, but he still earned a profit from his treatment field because he had planted turnips there, which he sold at a local farmers' market.

Learn more: See the related SARE projects FNC21-1297 and FNC22-1348.

Anna Racer (left) and Peter Skold (right) added a new revenue stream to their farm through winter marketing of chicory crops. *Photos by Andrea Brubaker*

Diversifying Vegetable Production and Sales with Chicory Crops

> "We learned that these crops can be successfully grown in this part of the country and have the potential to be valuable additions to any vegetable farm's mix of winter crops."
>
> *Peter Skold, Waxwing Farm*

THE CHALLENGE

Anna Racer and Peter Skold are full-time farmers at their 40-acre Waxwing Farm in Webster, Minn. In 2020, they had 3–5 seasonal employees but their long-term goal was to grow the business enough to support one full-time employee instead. One way they could bring in more revenue was to expand winter sales. Many small-scale vegetable farmers use high tunnels for season extension and winter sales, but Racer and Skold decided to explore a different strategy. They looked into growing less common chicory crops–Belgian endives and radicchio–that are of interest to high-end restaurants and other specialty markets. Chicory crops are grown in the field and must go through a period of "forcing" after they're harvested in the fall, where they continue to grow in a dark environment so that their color turns white and their flavor enhances. These crops wouldn't take up space in a high tunnel because they're grown in a field and are forced in a separate location, meaning they could provide a unique winter marketing opportunity in addition to high tunnel production.

THE ACTIONS TAKEN

Racer and Skold used a SARE Farmer/Rancher grant to evaluate the feasibility of growing both Belgian endives and radicchio in Minnesota's climate, and to compare different techniques for harvesting and forcing them in a cold-storage facility. Other goals included assessing the sales potential and profitability of these specialty crops, and sharing their findings with other farmers in the area. To reduce labor costs, Racer and Skold used mechanical planting and harvesting techniques instead of manual ones. After harvest, endives can be forced in a medium of either peat moss or sand. The traditional method of forcing radicchio is to put them in a temperature-controlled hydroponic system, which Racer and Skold set up using water tanks, a simple recirculation pump and an aquarium heater. They worked with their existing restaurant partners to explore the general appeal, sales volume and pricing of these crops.

THE IMPACTS

Ultimately, Racer and Skold learned enough about the production and sales of chicory crops that they plan to develop their market for radicchio and include it in their winter crop planning in the future. Specific impacts include:

- Racer and Skold learned that direct-seeding instead of transplanting, along with proper harvest techniques, resulted in better root systems and more success during the forcing period.
- They found that endives can also be grown successfully in the Midwest but at a lower sales price. Because endives are more familiar than radicchio, they have a larger established market and thus can be grown on a larger scale. But Racer and Skold chose not to pursue endives due to scale constraints on their farm.

Learn more: See the related SARE project FNC20-1251.

Using Soil Amendments to Improve Crop Health and Reduce Pest Damage

> "Advantages to this project include the ability to experiment on a small scale with results that can be applied on a much larger scale."
>
> *Glendon Philbrick, Hiddendale Farm*

THE CHALLENGE

Grasshoppers are highly mobile insects that feed on a wide range of plants, making them a significant pest in gardens, vegetable farms, row crop fields and rangelands. They are especially troublesome when their populations are high. Grasshoppers thrive in dry conditions, and as a result they caused widespread damage in the Great Plains during the drought years of 2020–2021. Glendon Philbrick, who operates the 200-acre Hiddendale Farm in Turtle Lake, N.D., saw their devastating effect firsthand. Those years, grasshoppers swarmed and destroyed many of his crops, everything from hay crops, corn and soybeans, to a variety of vegetables. Even in 2022, when conditions were wetter and less favorable to the grasshopper's life cycle, they were still present in his fields. As an organic farmer he couldn't rely on synthetic pesticides, so Philbrick wanted to see if he could deter grasshoppers by raising the Brix level (or sugar content) of his crops. Some farmers have observed that pests such as grasshoppers will avoid feeding on crops when the Brix reaches a certain level, because they find the taste undesirable.

THE ACTIONS TAKEN

In 2023, Philbrick received a SARE Farmer/Rancher grant to experiment with this concept on his farm. The primary way to increase the Brix level of a crop is to focus on improving soil health. So, Philbrick tested the effect of different mineral amendments on 20 crops that had suffered grasshopper damage in recent years, including alfalfa, sweet corn, tomatoes, carrots and lettuce. Through his own experience and by talking with researchers, he determined that grasshoppers wouldn't feed on his crops when they had a Brix level of 12% or higher. In an attempt to increase Brix, he tested five different soil amendments, using only organic-approved products. These treatments included calcium, amino acids, and humic and fulvic acids. Two other treatments were meant to address iron deficiencies or a low potassium-to-nitrogen level, both based on soil test results. During the project, he took weekly Brix measurements using a refractometer.

THE IMPACTS

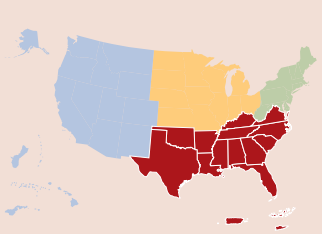
Philbrick gained useful insights on the influence that different soil amendments can have on the Brix level and quality of many of the crops he studied. Specific impacts include:

- In 2023, grasshoppers were present on his farm but they didn't cause significant damage.
- Philbrick found that the most notable increases in Brix due to his treatments happened in carrots, sweet corn and tomatoes.
- He shared his findings at a field day with 38 farmers, and 18 reported gaining new knowledge as a result of their participation.

Learn more: See the related SARE project FNC23-1389.

Glendon Philbrick takes a Brix measurement as part of a project to see if changes in the sugar content of his crops could reduce pest damage. *Photo by Katie Erickson*

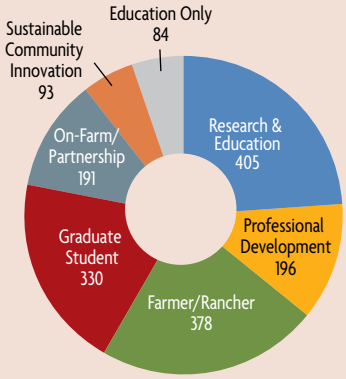
SOUTHERN SARE



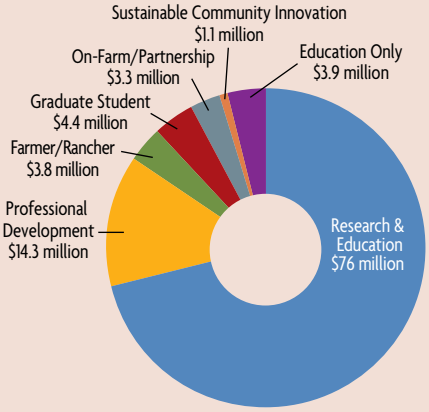
Photos by Candace Pollock-Moore, Southern SARE

Total Grant Awards, 1988–2025[1]

1,677 GRANTS



$106.7 MILLION



Recent Highlights from the Southern Region

- Connecting farmers and ag professionals in Puerto Rico and the U.S. Virgin Islands to SARE grants and resources has always been a difficult task. Historically, the territories have received little funding from the SARE program compared to other states in the Southern region, with only 3.5% of total regional funding since 1988. Over the past several years, Southern SARE has expanded its outreach efforts and they are paying off. Collectively, grant funding across the territories has increased nearly 70% since 2022.
- On the Virgin Islands, results from a grant project on vetiver grass (EDS24-069) increased farm erosion control, and exploring lemongrass varieties (FS19-316) led to the development of a nascent lemongrass cooperative.
- Puerto Rico shares many of the agricultural problems that face the Virgin Islands, including ensuring long-term farmer sustainability. One particular Research and Education grant project (LS20-339) studied the viability of farm agritourism on the island. As a result of the work, 13 farmers in the mountainous region of Utuado were able to add various agritourism ventures to their farms.
- The National SARE Food Loss and Waste grant program awarded 14 projects with resources to redirect and upcycle edible food that would have been discarded without intervention. Since October of 2024, the projects have diverted over 8.5 million pounds of food from the waste stream. The primary destination of this food has been donation to low-income individuals and families. Over half of the food was fresh or prepared fruit and vegetables. Get to know these projects at www.sare.org/resources/food-loss-and-waste. SARE will be hosting 10 in-person workshops in 2026, designed to engage state, local and tribal governments to spark reduction activities in their state.

Grant Proposals and Awards, 2024–2025

Grant Type	Preproposals Received[2]	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education	207	81	75	23	$9,037,331
Professional Development Program	90	52	48	18	$1,406,678
Farmer/Rancher	N/A	N/A	140	31	$570,440
On-Farm Research/Partnership	N/A	N/A	98	21	$623,351
Graduate Student	N/A	N/A	409	38	$790,011
Education Only	N/A	N/A	99	28	$1,301,781

[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.

Using an Alternative Feed to Bring Stability in the Face of Drought and Rising Costs

> "This study highlights moringa as a feasible, cost-effective alternative to alfalfa for lamb feed."
>
> *Diana Padilla, Yahweh's All Natural Farm and Garden*

THE CHALLENGE

Diana Padilla is a small-scale producer of vegetables and lamb in Harlingen, Texas, located in the Rio Grande Valley. Like many farmers in this dry, southern area, she feels the ongoing financial pressure of persistent drought combined with inflation. As drought impacts forage production, many livestock farmers with limited access to land need to buy more supplemental feed, which has been rising in cost in recent years. At the same time, lamb prices have been fluctuating and reliable access to meat processing has been difficult to find. All of these issues combined have made it difficult for Padilla to track her costs of production and price her lamb accordingly. As a result, she is seeking out ways to bring more financial stability to her operation, for example by growing more of her own feed and, eventually, becoming certified organic.

THE ACTIONS TAKEN

Padilla used a SARE Farmer/Rancher grant to explore whether moringa could serve as a viable feed supplement compared to the alfalfa pellets she typically purchases. Moringa is a fast-growing, drought-resistant tree native to India, and research outside the United States has shown that it can replace conventional feeds in a cost-effective way. In her project, Padilla compared bringing lambs to market on a diet of pasture and alfalfa pellets with pasture and farm-grown moringa. She pelletized the moringa before feeding it to her lambs, and evaluated a range of alfalfa/moringa replacement rates, up to 100% moringa. She also tracked her costs of production, including the labor associated with pelletizing her own feed, to develop a clear idea of whether moringa could work as a financial alternative to purchased alfalfa pellets.

THE IMPACTS

Padilla's initial experiments with adding moringa to her herd's diet showed promising results, and she plans to continue refining her approach to using the feed so that it can contribute to the long-term sustainability of her farm. Specific impacts include:

- Moringa pellets showed a slight cost advantage over purchased alfalfa pellets and resulted in comparable weight gain for lambs.
- Padilla identified the labor involved in processing moringa as the highest cost to using it as a feed source. Going forward, she plans to see how she can improve efficiency in this area and make moringa even more cost effective.

Learn more: See the related SARE project FS23-348.

Texas farmer Diana Padilla has started growing moringa as an alternative feed source for her lamb flock. *Photo by Diana Padilla*

Creating Economic Value Out of Waste Materials in Mushroom Production

> "The project demonstrates clear economic advantages for farmers by turning what was once waste—spent mushroom substrate—into valuable products."
>
> *David Wells, Henosis Mushrooms*

THE CHALLENGE

Fueled by consumer interest, the market for locally produced specialty mushrooms is growing throughout the country. High-value specialty mushrooms can be grown in a range of woody substrates, with compressed sawdust logs being the method that allows for indoor production on the largest scale. Yields from logs drop dramatically after the first flush, so mushroom farmers must make or buy new ones on a regular basis. Although they represent a recurring cost, spent logs do have potential value as a compost material, at least for farmers who also grow vegetables and are in the practice of making their own compost. But according to Tennessee mushroom grower David Wells, these logs aren't being used to their fullest potential.

THE ACTIONS TAKEN

Wells, who operates a mushroom business called Henosis outside of Nashville, used a SARE Farmer/Rancher grant to show that spent sawdust logs can be used to grow lesser known specialty mushrooms. The mushroom he focused on is called the almond portobello, which can sell for $25-$50 per pound. While more common specialty mushrooms prefer a woody substrate, almond portobellos do well in a more composted environment. So, Wells explored whether it would be economically viable to compost his spent sawdust logs, inoculate blocks of compost with almond portobellos and produce a marketable yield. To do so, he tracked the costs associated with materials and labor plus yields to identify a reasonable price point. After this secondary mushroom harvest, he then had the remaining compost evaluated by Cornell University for its value as a commercial product or an on-farm soil amendment, and he applied it to his own vegetable beds to observe its effect on his other crops.

Mushroom farmer David Wells began composting and reusing old growing substrate to increase his farm's profitability. *Photo by David Wells*

THE IMPACTS

While he recommends further research to improve efficiency and study the market, Wells demonstrated that instead of looking at spent sawdust logs as waste, mushroom farmers can view them as a potential source of additional revenue streams. Specific impacts include:

- Based on his recordkeeping and economic analysis, producing two 50-block batches of almond portobellos each week could generate an annual profit of almost $17,000 when priced at $24 per pound.
- The final compost Wells added to his own vegetable beds resulted in healthy crops, and based on a lab analysis its quality is comparable to the compost used in the button mushroom industry. This confirmed its value as a second potential income stream, after using it to grow almond portobellos.

Learn more: See the related SARE project FS21-331.

Nolan Parker (pictured) studied the ability of two types of drones to collect fertility data in his fields: fixed-wing aircraft (top right) and quadcopters (bottom right, not the actual drone used in the study). *Main photo and top right courtesy Nolan Parker; bottom right photo by Mary Hightower, University of Arkansas*

Using Drone Technology to Help Farmers Reduce Nitrogen Use

> "Overall, this study resulted in increased sustainability through a reduction of nitrogen inputs."
>
> *Nolan Parker, Parker Farms Partnership*

THE CHALLENGE

As with most of the country, Mississippi's large-scale row crop farmers struggle to find a balance between environmental stewardship and profitability when it comes to applying fertilizers on their fields. Many farmers over-apply nitrogen beyond the needs of their crop because the prospect of low yields can lead to severe economic losses. Not only are these farmers spending more money on fertilizer than they need to, the excess nitrogen leaches into waterways and ultimately impairs water quality. There are tools available to help farmers tailor their application rates more closely to the actual needs of their crop, and one evolving technology that can be very helpful is the use of variable rate nitrogen mapping with drones. Essentially, drones can be used to collect highly detailed data that indicates a crop's nitrogen needs throughout a field. Farmers can then apply fertilizer at variable rates based on this data–targeting the rate exactly to the crop's needs on a row-by-row level.

THE ACTIONS TAKEN

Nolan Parker, a third generation farmer who researched agricultural uses of drones in graduate school at Mississippi State University, used a SARE Farmer/Rancher grant to advance the field further. His two objectives were to test new algorithms related to nitrogen use efficiency in corn and cotton, and to compare the data-collecting ability of two types of drones on his family's farm: quadcopters and fixed-wing aircraft. At the time quadcopters were the preferred technology in agriculture, but their batteries limited them to covering only about 30 acres at a time, whereas fixed-wing drones were less commonly used but could fly about five times longer. One of Parker's main goals was to see if the faster speed of the fixed-wing drone resulted in less accurate data collection.

THE IMPACTS

While Parker's project encompassed only two years on a single farm, the results were insightful and demonstrated this technology can be used to help farmers reduce their nitrogen use. Specific impacts include:

- Parker's demonstration data from both years showed there is potential to reduce nitrogen below a full fixed rate without affecting yields, in both corn and cotton.
- Field data collected by the fixed-wing aircraft was not significantly different than what the slower quadcopter collected, suggesting both types of technology can be useful in a variable rate nitrogen program.

Learn more: See the related SARE project FS20-321.

SARE Shares

SARE's work doesn't stop when it awards a grant; we follow 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 9,800 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 Kirsten Strough, USDA

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To buy books or order free print bulletins, visit www.sare.org/webstore or call (301) 779–1007.

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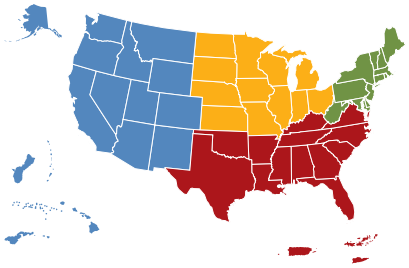
Contact your regional office or visit its website for requests for proposals, application deadlines and other grant information. Contact SARE Outreach or visit www.sare.org for questions about SARE publications.



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