

# 2015-2016 SARE



SUSTAINABLE AGRICULTURE RESEARCH & EDUCATION



# SARE is...



## GRANTS FOR INNOVATIVE RESEARCH AND EDUCATION

**SARE offers grants to** farmers, ranchers and ag professionals for on-farm research, education, and professional and community development. SARE-supported projects address soil health, pest management, energy, livestock production, stewardship, marketing, systems research and more.

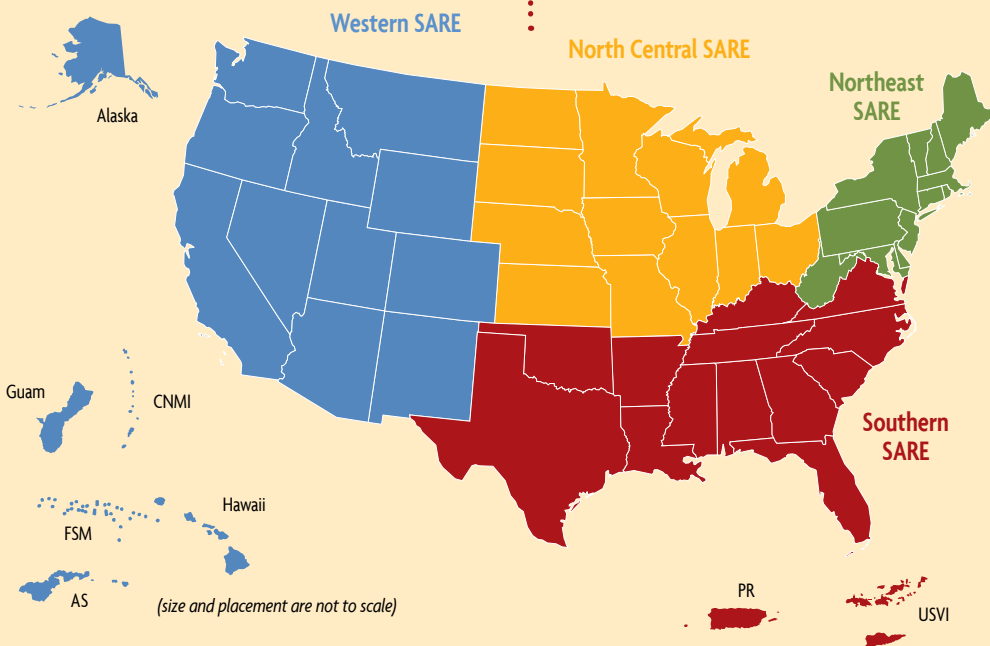


## LOCAL LEADERSHIP, NATIONAL IMPACT

**Four regional councils**—including farmers, educators, scientists, government, NGOs and other stakeholders—set priorities and make grants.

## ENGAGEMENT 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 (see back cover).



## FARMER LEADERSHIP

Hundreds of producers from all corners of the nation **share their on-farm research results and advise SARE.**

**Cover photo:** Alabama Extension Entomologist Ayanava Majumdar helps vegetable farmers protect their crops using the multi-tier strategies of integrated pest management (page 19). Photo by Candace Pollock, Southern SARE. **Photo credits** (clockwise from top left): Darin Eastburn; Abby Massey, SARE; Lance Cheung, USDA; Marie Flanagan, NCR-SARE; Candace Pollock, Southern SARE.



Robert Hedberg, SARE Director.  
Photo by Marie Flanagan, North Central Region SARE

[LETTER FROM THE DIRECTOR]

## SARE: A Program of Partnerships

It is a pleasure to share this report, which offers a small sample of the excellent work supported by the SARE program in each of our four regions. This work spans the country, from all 50 states to the far reaches of the Pacific and Caribbean territories, and it includes topics that advance the core components of sustainable agriculture: productivity, profitability, environmental stewardship and quality of life.

As you read these stories, I encourage you to take note of the people, the processes and the partnerships that have contributed to their success. Each project begins with a person who has an idea. Whether it is a farmer, a rancher, a graduate student, a scientist or an educator, they develop that idea into a proposal for potential funding from their regional SARE program.

Each proposal undergoes competitive review. Proposals are evaluated for their originality, quality of the project design, potential contribution to sustainable agriculture and relevancy to regional needs. A new feature of this report summarizes the number of proposals received and funded in each of our grant programs. You will see that we receive many more proposals than we can fund, so each year we must tell many worthy applicants that SARE cannot fund their idea.

This review process is strengthened because it draws on multiple partners. These include the land grant universities that work with USDA National Institute of Food and Agriculture (NIFA) to host the regional SARE programs and administer the review process. It draws on technical reviewers with professional experience to evaluate the originality and design of projects. It also involves regional Administrative Councils, which include farmers, ranchers, scientists, educators, nonprofit organizations, and federal and state agencies from throughout the region. These councils make the final decision about which proposals will contribute most to building sustainable agricultural systems in their region.

SARE partnerships also go far beyond the proposal review process. Many SARE projects engage multiple partners to get the job done. For example, in this report you will read how the USDA Natural Resources Conservation Service (NRCS) has improved technical outreach to organic farmers in a project that involved collaboration with multiple nonprofit organizations (see p. 11).

Another example is the long-standing partnership between SARE and the National Association of County Agricultural Agents (NACAA). This partnership helps provide the best sustainable agriculture training possible for agricultural agents across the country. These agents are on the front lines to provide farmers and ranchers with applied agricultural training and information. See page 20 of this report to learn more.

I would like to close with a note about SARE's initiative to provide graduate students a unique training and career-development opportunity. As of 2015, SARE has awarded over 500 Graduate Student grants to help develop our next generation of agricultural scientists. Take for example Felipe Barrios Masias, whose story is in this report (see p. 10). Barrios Masias, now an assistant professor of sustainable horticulture at the University of Nevada Reno, credits the SARE Graduate Student grant he received with helping his career, and now he encourages other students to pursue this opportunity. The enthusiasm that graduate student grantees like Barrios Masias have for their projects, for sustainable agriculture and for the SARE program promises us a bright future.

Robert Hedberg  
SARE Director

Read on to learn about SARE's work across America > > >

### 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](http://www.sare.org) for questions about SARE information materials.

**North Central SARE**  
(hosted by the University of Minnesota)  
[www.northcentralsare.org](http://www.northcentralsare.org)  
(612) 626-3113  
[nrcsare@umn.edu](mailto:nrcsare@umn.edu)

**Northeast SARE**  
(hosted by the University of Vermont)  
[www.nesare.org](http://www.nesare.org)  
(802) 656-0471  
[nesare@uvm.edu](mailto:nesare@uvm.edu)

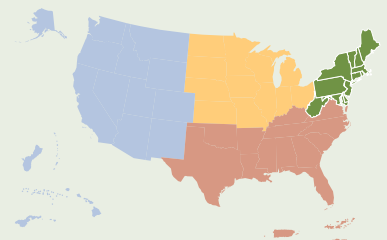
**Southern SARE**  
(hosted by the University of Georgia and Fort Valley State University)  
[www.southernsare.org](http://www.southernsare.org)  
(770) 412-4787  
[ssare@uga.edu](mailto:ssare@uga.edu)

**Western SARE**  
(hosted by Utah State University)  
[www.westernsare.org](http://www.westernsare.org)  
(435) 797-2257  
[wsare@usu.edu](mailto:wsare@usu.edu)

**SARE Outreach**  
(hosted by the University of Maryland)  
[www.sare.org](http://www.sare.org)  
(301) 405-7955  
[info@sare.org](mailto:info@sare.org)



# NORTHEAST SARE



Urban agriculture is not a new concept, but it is getting more attention these days. The social component to urban farming has a lot of value, even if the volumes of food involved may not be large. These include increased access to healthy, affordable food, expanding green spaces and community participation that builds social capital. Further, urban agriculture raises awareness about the larger food system, which spans cities and countryside.

In recent years Northeast SARE has funded some very successful urban ag projects. For example, The Farm Alliance of Baltimore City, which in its first two years harvested 38,902 pounds of products, coordinated 10,983 volunteer hours, generated \$165,756 in sales and hosted 5,334 students and youth on member farms.

In New York City, The Brooklyn Grange used 2.5 acres of rooftops to grow market vegetables that were sold fresh to the community. The project also composted over 150,000 pounds of organic waste on a nearby lot in a navy yard.

Sustainable Urban Development in West Philadelphia created a guide to help residents increase their access to fresh, healthy and affordable food by reclaiming vacant lots in the city and building for-profit urban farms.

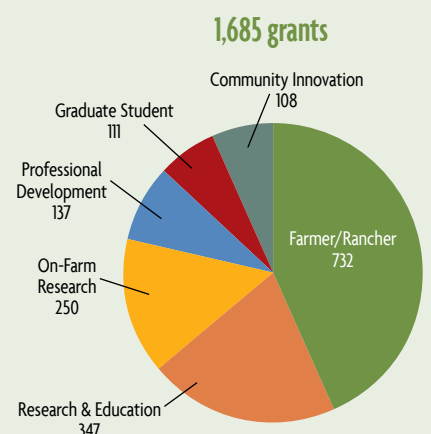
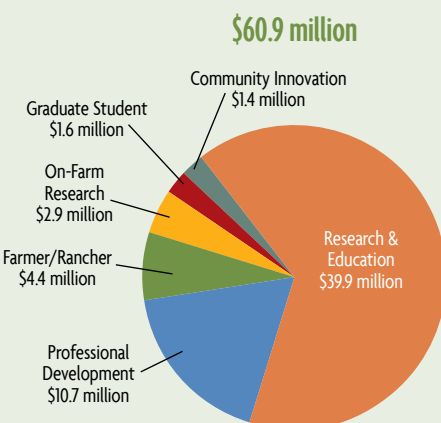
As part of their state plan of work, SARE coordinators in Rhode Island and Connecticut are engaged in a project that provides training to 25 urban farmers on crop production techniques, soil health, nutrient management, crop rotation, cover crops and pest control.

## Grant Proposals and Awards, 2014 and 2015

Grant Type	Preproposals Received <sup>1</sup>	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education	153	53	45	19	\$2.6 million
Professional Development	32	21	20	12	\$1.2 million
Farmer/Rancher	N/A	N/A	109	44	\$532,410
On-Farm/Partnership	N/A	N/A	119	56	\$782,633
Graduate Student	N/A	N/A	106	43	\$612,477

<sup>1</sup> The use of a preproposal process varies by region. It serves to screen project ideas for the larger and more complex grant programs, to reduce applicants' proposal preparation burden and the proposal review burden for SARE's volunteer reviewers.

## Total Grant Awards in the Northeast, 1988-2015



New York SARE Coordinator Violet Stone is helping farmers scale up from direct markets to wholesale markets. Through a three-year initiative begun in 2014, she is equipping ag service providers with the knowledge, tools and resources they need to help small and mid-size farmers identify markets, engage in communications with potential buyers, and assess the benefits and challenges of pursuing wholesale opportunities. Photo by Craig Cramer, Cornell University

# Sustainable Cropping Systems for Northeastern Dairies

When Heather Karsten, a new PhD student, stepped off the plane in New Zealand with a Fulbright Award to study grazing systems, she knew she wanted to use her new-found knowledge to improve livestock cropping systems in the United States. Two decades later, Karsten is putting to good use what she gleaned about perennial forages all those years ago.



Penn State researchers have found that dairy farmers can save up to 70 pounds of nitrogen per acre by injecting manure instead of broadcasting it. Photo by Robert Meinen

Karsten is the project director of a large-scale, multidisciplinary research effort that is helping to create more sustainable cropping systems for Northeastern dairy farmers. Funded by a SARE grant, the project has already begun to show how farmers can reduce off-farm inputs such as fertilizer while maintaining productivity.

“I’ve always wanted to promote perennial systems in the Northeast and the United States, and that has evolved into not just integrating perennials into cropping systems, but also mimicking perennial cover or continuous cover by integrating double crops and cover crops into annual crop rotations,” says Karsten, associate professor of crop production/ecology at Penn State University.

As such, the project, which involves a multidisciplinary group of researchers, Extension agents, students and farmer advisors, compares two six-year no-till

rotations that include perennials such as alfalfa inter-cropped with orchard-grass, wheat or rye under-seeded with red clover, winter canola, corn and soybeans. A standard corn/soybean rotation is used as a control treatment. While one no-till rotation compares broadcast and injected manure treatments, and the other compares standard weed control with reduced herbicide treatments, both use multiple strategies to promote sustainability and minimize off-farm inputs to produce forage, feed and fuel for a simulated 65-cow, 240-acre dairy farm.

Initiated in 2010, the project has just begun producing a wealth of information. For example, researchers have found that by injecting instead of broadcasting manure, they can save up to 70 pounds of nitrogen per acre. They were also able to

reduce herbicides in corn with banding and high-residue cultivation. Researchers were able to tweak the rotations so that by the end of year five, both systems were producing sufficient forage and feed for the farm, and turning a profit.

It is this ability to respond to environmental and other pressures that makes systems projects unique, as the researchers also found when dealing with an unexpected pest problem.

Originally, they hoped to plant late-summer, no-till alfalfa to reap its benefits as both a winter cover and a spring forage, but found the summer-planted stands sub-par. The culprit? Two years of insect data pointed to slugs, feasting on an all-you-can-eat autumn buffet of alfalfa. The solution? Using oats as a winter cover and moving the alfalfa planting to early spring.

The insect data also led to some unexpected findings, another unique feature of systems experiments. While monitoring pests, researchers found, not unexpectedly, higher predation by beneficial insects in the diverse systems.

They also found that while insecticide-treated seeds had no impact on slug populations, surprisingly, the insecticides were harming the beetle populations that fed on the slugs—a valuable reminder of the negative impact pesticides can have on the larger ecosystem, and especially on beneficial ecosystem services.

“It makes a good argument that seed insecticides can be counter-productive to ecological pest management, and that a better strategy would be to avoid pre-emptive insecticide applications and create habitat with diverse rotations to protect biological control organisms,” Karsten says.

For more information, go to [www.sare.org/project-reports](http://www.sare.org/project-reports) and search for LNE09-291 or LNE13-329.

## FREE RESOURCES!

**SARE bulletin:** *Diversifying Cropping Systems*. To order free copies or download: [www.sare.org/diversify](http://www.sare.org/diversify).

**SARE fact sheet:** *Alternative Continuous-Cover Dairy Forage System for Profitability, Flexibility and Soil Health*. Download for free at: [www.sare.org/accf](http://www.sare.org/accf).

**SARE topic room:** *Cover Crops*. Find dozens of free educational materials in this one-stop shop: [www.sare.org/cover-crops](http://www.sare.org/cover-crops).

# Finding Answers for an Emergent Oyster Farming Industry

Decades ago, wild oyster harvests from New Jersey's Delaware Bay ranged from 1 million to 3 million bushels annually (at approximately 265 oysters per bushel), before diseases decimated wild oyster populations. Harvests have begun to rebound in recent years, thanks to an emerging oyster farming industry that produces about 1.5 million oysters a year. The farmed industry is poised for growth, but oyster farmers still lack basic, location-specific information that would help increase efficiency and production.



Seed oysters bred for disease resistance at Rutgers University's Haskin Shellfish Research Laboratory are commercially available to farmers. Improving disease management is one way farmers and aquaculture professionals are working to rebuild New Jersey's oyster industry. Photo by Lisa Calvo, Rutgers University

"These are not insurmountable research areas. Growers just need the time and resources to do simple research and innovative studies that will help them adapt to the harsh conditions of the bay," says Rutgers University Aquaculture Program Coordinator Lisa Calvo.

Those research needs are being met in part by SARE: Since 2012, Calvo and local oyster farmers have received three SARE research grants to improve different aspects of the industry, from production to pest management to health and safety.

Recipient of a 2012 SARE farmer grant, Barney Hollinger is part of a family of

oystermen that has been pulling wild-caught oysters from the salty waters for over 100 years. Since wild stocks are at such low levels, Hollinger recently started oyster farming to supplement his income. "We have a wild-caught sustainable oyster fishery, but with a quota system it's hard to have enough oysters for your market," he says. "We can use aquaculture to make up the difference."

One issue Hollinger and other Delaware Bay farmers face is determining what equipment to use to increase production capacity, while also keeping oysters healthy. Collaborating with Calvo,

Hollinger used his SARE grant to test two different types of cages in the deeper, subtidal waters of the bay, where he has leases. He found that farming oysters in subtidal waters is a viable option, and improved oyster cultivation methods that are specifically suited for his operation and location.

Calvo also worked with 2013 SARE grantee and oyster farmer Betsy Haskin on biofouling, one of the most important issues facing the industry. Oysters provide ideal habitat for many types of organisms that live in the bay environment, among them a tiny mud-worm that builds its home on top of the oyster's shell. This pest and associated mud can kill oysters, reduce their growth and make them hard to shuck, so farmers spend 30 percent of their labor costs managing biofouling. Haskin tested three "dip treatments" by immersing the oysters in different solutions. Unfortunately, none of the dips measurably prevented biofouling damage, but Haskin and Calvo are using this study as a basis for ongoing research on more effective control methods.

Recognizing that consumer health is integral to the industry's sustainability, Calvo conducted her own 2014 SARE research project to determine the persistence of *Vibrio*—bacteria commonly found in marine waters—in farmed oysters grown in the

Delaware Bay. This preliminary study found that local farmers who use best management practices can raise oysters with low levels of *Vibrio* and avoid human health risk.

"I had a great start from SARE to attack a critical question," says Calvo. "It gives growers the information they need to help understand their local environment and provide the safest product possible."

For more information, go to [www.sare.org/project-reports](http://www.sare.org/project-reports) and search for FNE12-747, FNE13-780 or ONE14-201.

### FREE RESOURCES!

#### Grantee product:

*Minimizing Risks of Vibrio Bacteria in Farm-Raised Oysters Grown in Intertidal Environments of the Delaware Bay.*

Download this fact sheet summarizing Lisa Calvo's SARE-funded research at [www.sare.org/vibrio-oysters](http://www.sare.org/vibrio-oysters).

# To Improve the Soil, First Know the Soil

The importance of soil health cannot be overstated. It supports vigorous plant growth by promoting the efficient use of nutrients and water, protecting against erosion and compaction, and aiding in disease and pest management. Soil health drives farm productivity and resilience against weather extremes.

But the soil is an incredibly complex environment, and for farmers to know how to improve their ground, they first need to learn about its condition.

That is why a multidisciplinary team from Cornell University created a new kind of soil assessment—with early funding from multiple SARE grants as well as other sources—and why interest in it is steadily growing, not just in the Northeast but across the country.

“The Cornell Assessment of Soil Health is really a framework that’s based on



Bianca Moebius-Clune, director of the soil health division at USDA’s Natural Resources Conservation Service, demonstrates how to take a good soil sample during the 2015 Cornell Soil Health Workshop. Photo by Aaron Ristow, Cornell University

measuring a number of indicators of soil health—physical, chemical and biological—and then using that information to help farmers make management decisions,” says Harold van Es, a Cornell soil and water management professor.

Traditional soil tests, which are also important management tools, are typically limited to measuring nutrient levels and pH. They do not reveal anything about the physical structure or microbial life present in the soil, yet such characteristics strongly influence crop yields as well as the efficiency of inputs such as water and fertilizers. In contrast, Cornell’s soil health assessment reports typically include management recommendations to address specifically identified constraints and promote soil-building practices such as cover cropping, reduced tillage, the use of compost or manure, and diversified rotations that include perennial crops.

“As far as the soil health assessment, it’s really an eye opener. Quite an eye opener,” says Donn Branton, one of many New York farmers who collaborated with the researchers who developed it. A long-time no-tiller, Branton says he has a new appreciation for the role of soil biology in crop production, and is now using more mixed-species cover crops in his rotations.

The need for the assessment was born out of a survey of Northeastern farmers, many of whom used traditional soil tests but “felt there was something more going



Photo by Ron Nichols, USDA-NRCS

on with their soils,” says Bianca Moebius-Clune, director of the soil health division at USDA’s Natural Resources Conservation Service. “There were erosion issues, they had weed issues, they had decreasing yields even though they needed to irrigate more, put on more fertilizer, more pesti-

cides. And they really didn’t have good diagnostic tools for all of these issues.”

Beginning in 2003, three SARE grants supported the assessment’s creation and early outreach efforts. The Cornell team identified the most meaningful soil health indicators to include, and worked with farmers like Branton to refine them through on-farm testing.

“That initial funding was critical,” van Es says. “What is also very nice about the SARE funding program is that it requires a fairly intense collaboration with farmers or consultants or Extension agents. And that really was very critical to making this project successful, because if you want this new technology to be adopted by farmers, you need to involve them in the development process right from the start.”

The Cornell lab handles about 2,000 soil samples each year, and the assessment is in “a rapid growth phase,” van Es says. The team is now collecting soil samples from across the country so that the assessment can be adapted for use at the national level.

For more information, go to [www.sare.org/project-reports](http://www.sare.org/project-reports) and search for LNE03-175, LNE06-235 or ENE09-110.

**FREE RESOURCES!**

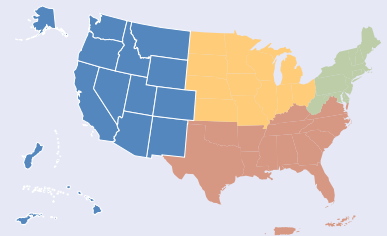
**Grantee product:** The Cornell Soil Health Assessment. Learn more at [www.sare.org/soil-health-test](http://www.sare.org/soil-health-test).

**SARE book:** *Building Soils for Better Crops*. Download for free or purchase hard copies: [www.sare.org/bsbc](http://www.sare.org/bsbc).

**SARE video:** Donn Branton explains how the assessment impacted his farm at [www.sare.org/soil-health-video](http://www.sare.org/soil-health-video).



# WESTERN SARE



The innovative projects highlighted in this report illustrate the effect of Western SARE funds in this vast and diverse region. The investment of almost \$53 million over 27 years has enabled 994 project leaders to conduct high-quality research that draws on true engagement and collaboration with producers. This research has impacted such agricultural issues as efficient water use, sustainable livestock grazing, soil health and cover cropping, improved marketing and branding, and more.

Importantly, research results do not stay shelved—Western SARE is committed to getting project results into the hands of those who most need them. Researchers, ag professionals, farmers, ranchers and policymakers all have access to publications, research reports, videos and other tools detailing the work that has been conducted and how new practices can be tested in their area.

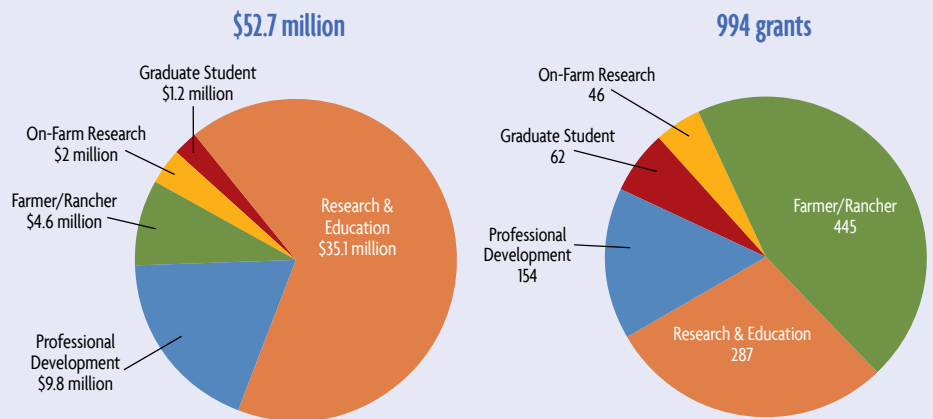
From 2014 to 2016, the number of proposals submitted in two key grants programs—Research and Education, and Graduate Student—more than doubled, indicative of the growing need for an investment in sustainable agriculture research in the Western Region (2016 data not shown). With a dedication of more funds, Western SARE would be better able to invest in more of the next “big ideas,” as it did with researcher Rick Engel (p. 9) and graduate student Felipe Barrios Masias (p. 10).

## Grant Proposals and Awards, 2014 and 2015

Grant Type	Preproposals Received <sup>1</sup>	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education	97	33	31	14	\$3.4 million
Professional Development	N/A	N/A	55	14	\$842,500
Farmer/Rancher	N/A	N/A	50	19	\$286,707
On-Farm/Partnership	N/A	N/A	58	14	\$662,861
Graduate Student	N/A	N/A	61	13	\$409,307

<sup>1</sup> The use of a preproposal process varies by region. It serves to screen project ideas for the larger and more complex grant programs, to reduce applicants' proposal preparation burden and the proposal review burden for SARE's volunteer reviewers.

## Total Grant Awards in the West, 1988-2015



Alaska is a very large state, so Alaska SARE Coordinator Steve Seefeldt uses partnerships, collaborations and events to share information on sustainable agriculture. He organizes the Alaska Sustainable Agriculture Conference, now in its 10<sup>th</sup> year—in a survey of 2014 attendees, 88 percent reported adopting new practices as a result of what they learned, from no-till to crop rotations to marketing strategies. *Photo by Jeff Fay, University of Alaska Fairbanks Cooperative Extension Service*



# Keeping Fertilizer in the Ground and Out of the Air

Sometimes farmers' dollars literally evaporate into thin air. Take fertilizer for example: If not applied properly, up to 40 percent of urea fertilizer can escape into the atmosphere as ammonia gas, through a process called volatilization. In "a landmark study," Montana State University (MSU) researchers recently found that some fairly simple changes in fertilizer application methods can significantly reduce nitrogen volatilization. Now, no-till wheat farmers in the state are better able to minimize this economic loss and source of air pollution.



Montana State University scientist Rick Engel and his team used the integrated horizontal flux method to measure ammonia gas loss on a farm in Havre, Mont. They developed practical recommendations for how farmers can minimize atmospheric nutrient losses when fertilizing crops. *Courtesy Rick Engel, Montana State University*

A key recommendation developed by the researchers, whose on-farm study was funded by SARE, is that farmers should apply fertilizer in the spring rather than the winter or fall, and should take weather conditions into account. They found that nitrogen losses in the spring averaged 1.9 percent, while winter and fall losses were as high as 16.3 and 11.4 percent, respectively. Less volatilization occurs when fertilizer is applied on dry ground or in advance of rain than when applied on wet, snowy or icy ground. "A lot is dictated by the conditions that follow the application of the fertilizer material, as well as the moisture conditions at the time of the application," says MSU Soil Scientist Rick Engel.

"This was a landmark study because...we knew we were losing nitrogen, we just didn't know how we were losing it," says Curtis Hershberger, a Montana wheat farmer who participated in the study. "Nitrogen is a very big input cost for us, so by mitigating the losses of nitrogen and improving our crops, it helps our bottom line. It makes our business so much more sustainable, so we're not wasting money and having lower yields as a result of what we do."

The study focused on urea applications because it is the nitrogen fertilizer used by the majority of Montana farmers. Another critical finding was that applying urea with a urease inhibitor—which binds to the fertilizer and helps mitigate its loss—reduced volatilization by 64 percent.

Encouraged by the positive results that came from the MSU team's three years of field trials, approximately 50 percent of Montana wheat growers have made changes to their nitrogen management practices. The team estimates the collective economic impact for farmers who have adopted some or all of these nitrogen management recommendations is \$5 million annually. "Any nitrogen loss from the soil system will potentially impact either yield or quality of crops," Engel says.

Hershberger changed his practices by applying fertilizer below the soil surface when planting, injecting it directly into the soil so it does not have the chance to volatilize. "We feel that the change in management practices has been very rewarding to us economically," he says. "We did have a great expense in changing our seeding equipment to band fertilizer below the surface, but we think we've been paid back just in the last few years."

Along with conventional fertilizers, the team evaluated legume cover crops as a nitrogen source—particularly, whether volatilization was a concern when terminating a cover crop of field peas, either by mowing or herbicide application. They found that only a nominal amount of nitrogen loss was detected—equivalent to 0.3 and 0.5 percent of the nitrogen in the plant biomass—meaning that farmers who use field peas for nitrogen do not need to worry about volatilization losses.

**FREE RESOURCES!**  
**Grantee product:** Resources from Montana State University on minimizing nitrogen loss after fertilization: [www.sare.org/montana-N-loss](http://www.sare.org/montana-N-loss).  
**SARE video:** Rick Engel and Curtis Hershberger describe their SARE project in their own words: [www.sare.org/wheat-nitrogen](http://www.sare.org/wheat-nitrogen).

For more information, go to [www.sare.org/project-reports](http://www.sare.org/project-reports) and search for SW10-050.

# Improving the Water-Use Efficiency of Tomatoes

**A**griculture consumes about 80 percent of California’s water, and as competition for it increases, improving water-use efficiency will become ever more critical to farmers’ long-term productivity.

Finding ways to reduce water use in the production of processing tomatoes, a major crop in the state, has been the focus of Felipe Barrios Masias. As a University of California (UC) Davis graduate student in 2010, he used a SARE grant to study the water needs of processing tomatoes under furrow irrigation. His findings were striking—farmers could use 25 percent less water while maintaining yields—and have led him and his colleagues to newer lines of inquiry that could result in a better understanding of how to maintain high tomato yields with less water.

“It is apparent to me that processing tomatoes have a great potential to perform well under lower water availability. This is one of the main outcomes of the SARE project,” says Barrios Masias.

During the SARE project, Barrios Masias studied the response of various tomato cultivars to alternate furrow irrigation, or irrigating every other furrow instead of all furrows, which is one of the more conventional approaches to watering. By partially watering fields, farmers who rely on furrow irrigation could use 25 percent less water without hurting yield or fruit quality.

Some California farmers, who grow about one third of the world’s processing

tomatoes, were interested in the results. But because Barrios Masias completed his project in 2011, a year before the drought began, water was more plentiful and adoption of alternate furrow irrigation was initially low. That has changed. “For farmers using furrow irrigation in 2015, my guess is that many will probably be using alternate furrow irrigation at some point in the season, since water availability is such an issue during the drought,” says UC Davis Professor Louise Jackson, his research adviser.

The project was conducted with partnerships that were critical to its success: Trials were done on four farms in collaboration with a research and development team from the Campbell’s Research and Development Unit in Davis, Calif. Having such an industry partner helped the project because “they know tomatoes and they were interested in reducing their water use,” Jackson says.

Barrios Masias says his SARE project helped lay the groundwork for follow-up research funded by a USDA Specialty Crop Block Grant, on traits associated with the



**FREE RESOURCES!**  
**SARE bulletin:** *Smart Water Use on Your Farm or Ranch*. To order free copies or download: [www.sare.org/water](http://www.sare.org/water).  
**Western SARE bulletin:** *Boosting Agricultural Production through Water Use Efficiency*. Download at [www.westernsare.org/water-use-efficiency-bulletin](http://www.westernsare.org/water-use-efficiency-bulletin).

Felipe Barrios Masias, now a sustainable horticulture professor at the University of Nevada Reno, says a SARE graduate student grant to study water use in tomatoes benefited his career. Courtesy Felipe Barrios Masias

tomato’s ability to capture and use water efficiently, particularly in the roots. “We know that a lot is happening at the roots and we need to do a better job in understanding their physiological role in drought resistance,” Barrios Masias says.

This can have implications for drought resistance and the improved management of many irrigation systems, including furrow and drip, which is becoming increasingly common in tomatoes and other crops.

Just as important, the project was a critical stepping stone for Barrios Masias, now an assistant professor of sustainable horticulture at the University of Nevada Reno. “This SARE graduate student project was really good for my career, and I would urge my students to pursue a grant like it,” he says.

For more information, go to [www.sare.org/project-reports](http://www.sare.org/project-reports) and search GW10-010.

**FUNDING THE NEXT GENERATION OF AG SCIENTISTS**  
“It’s hard to write a grant. It takes practice,” says University of Vermont graduate student Robert Mugabi. “I want to have an academic career, so I want to get exposed to grant writing.” That is why Mugabi applied for, and received, a 2014 Graduate Student grant from SARE to study the causes of mastitis in dairy herds. SARE has awarded more than 500 grants to graduate students across the country. Working with faculty advisors, these students conduct important research on sustainable agriculture topics and gain invaluable experience in both their field of specialization and the research process itself. Search graduate student projects at [www.sare.org/project-reports](http://www.sare.org/project-reports).

# USDA Improves Technical Outreach to Organic Farmers

In 2009, the USDA Natural Resources Conservation Service (NRCS) was tasked with providing financial and technical assistance to help organic farmers implement conservation practices.

Over the years, however, participation from organic farmers remained low due to lack of coordination among agencies, limited outreach and a dearth of technical materials that could address both conservation planning and organic certification standards.

That is changing now, thanks to a team from Oregon Tilth, the National Center for Appropriate Technology (NCAT) and the Northwest Center for Alternatives to Pesticides that has partnered with NRCS to better prepare field personnel to work with organic farmers. The project, which includes trainings and development of new training manuals, has been funded by two SARE grants.

“NRCS has a lot of technical guides and conservation practice specifications, but these [new implementation guides] are the first that align with organic regulations,” says Rex Dufour, director of NCAT’s Western Regional Office and a project collaborator.

Designed to provide guidance on conservation practices that will make growers

eligible for NRCS Environmental Quality Incentives Program Organic Initiative (EQIP-OI) funding, the implementation guides also contain specific practice information that organic growers must follow to meet USDA certification standards. Focusing on conservation areas that protect soil and water, such as buffers, alternative pest management, cover crops and nutrient management, each guide also provides relevant portions of the National Organic Program (NOP) regulations, which are generally more stringent than those required by conservation plans.

The guides are also designed to fill in technical gaps for NRCS personnel and other planners who may

not be accustomed to writing conservation plans for organic systems. For example, as Dufour explains, many NRCS personnel are not accustomed to working with growers who do not use chemical fertilizer, and estimating nutrient availability from multiple alternative sources such as manure and cover crops is difficult. To address this complexity, the *Implementation Guide for Nutrient Management Plans* provides tables of crop nutrient requirements, detailed steps on calculating nutrient credits from soil, cover crops and manure, and an extensive table of estimated nutrients from organic-approved sources.

The Western state implementation guides were so well received by NRCS that state offices in Pennsylvania, Kentucky and New England also requested regionally adapted versions.

Pre- and post-training surveys also bear out the success of the training sessions held in Oregon, Idaho, California and Nevada. In one post-training evaluation, attendees reported that knowledge and skills increased in every category after each session.

Equally significant, “[The trainings] reduced anxiety and helped planners feel more prepared to work with organic farmers,” says NRCS Oregon State Agronomist Denise Troxell, who collaborated on the guides and helped plan the trainings.

Building on the success of this collaboration, NRCS, working with the NOP and Oregon Tilth, recently unveiled its new Conservation Activity Plan, a program that will allow conservation planners to help growers transitioning to organic develop an Organic System Plan as part of their conservation plan. “Any chance we get to match up conservation and organic planning, it’s a good thing,” Troxell says.

For more information, go to [www.sare.org/project-reports](http://www.sare.org/project-reports) and search for EW12-031 or EW15-020.

### FREE RESOURCES!

**Grantee product:** Download the technical guides developed through this project at [www.sare.org/NRCS-organic](http://www.sare.org/NRCS-organic).

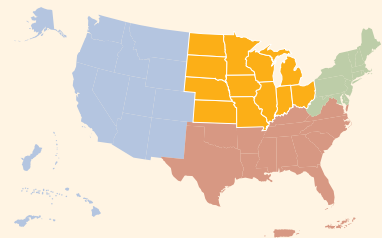
**SARE book:** *The Organic Transition Planner*. Download for free or purchase hard copies: [www.sare.org/organic-transition-planner](http://www.sare.org/organic-transition-planner).



At a Soil Quality Network meeting in Oregon, a participant cuts a cover crop to determine its biomass, which allows for a rough estimate of the nitrogen contribution it will make to the following crop. This is a common technique employed by technical service providers to support farmers who use organic practices such as cover crops to build soil quality and provide nitrogen. Photo by Rex Dufour, National Center for Appropriate Technology



Nebraska SARE Coordinator Gary Lesoing is working with Extension colleagues and other educators to provide research and education opportunities on cover crops, as farmers grow increasingly interested in their use to improve soil health. His efforts have been instrumental in leveraging more federal grant dollars for soil conservation activities. *Photo by Mandy Hall Photography*



# NORTH CENTRAL SARE

In the North Central region we are seeing unprecedented demand for information about how we can sustain our region's cultural history, agricultural prowess and innovative systems. At NCR-SARE, we are compelled to meet this demand with a diversity of resources for a variety of audiences.

NCR-SARE funds exciting, pioneering projects through several grant programs. Thanks to the hard work of our Administrative Council and grant review teams, we fund projects that truly engage farmers, respond to their needs and seek to identify solutions from the ground up. NCR-SARE's Research and Education grant program supports highly innovative ideas, but with 341 preproposals received in two years, and funds for 20 projects, we simply cannot fund all the good proposals we receive from research institutions and the farmer-based nonprofits that have been the vanguard of sustainable agriculture for the past 30 years. Our new Partnership grant program allows agricultural professionals to work with farmers to do on-farm research, and we anticipate that this program will serve as a foundation for future funding for our grantees.

We know it is not enough to simply fund projects. We need to make the information generated from the nearly 2,000 projects we have funded in our region accessible. So, we extend our reach with state coordinators who continue to serve as critical resources for local information, new web-based resources, Farmers Forums at winter conferences, and on-site project visits. Visit us on YouTube, Twitter and Facebook to see the exciting work happening in the North Central region.

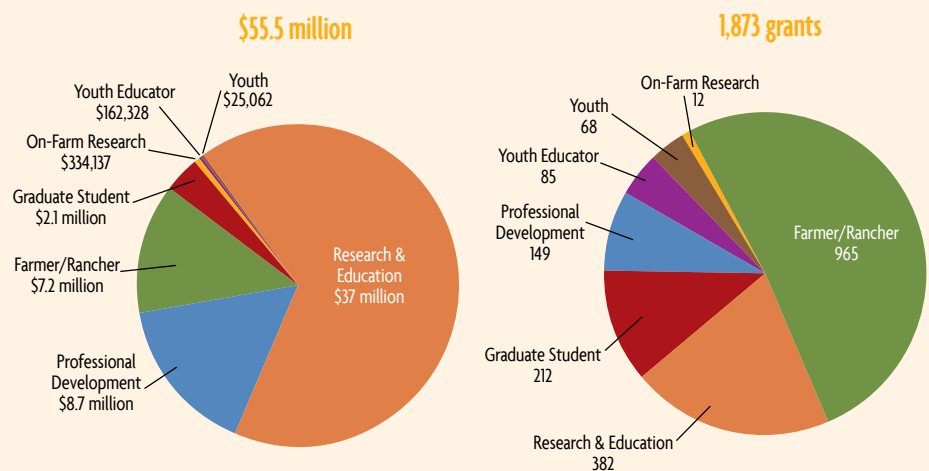
## Grant Proposals and Awards, 2014 and 2015

Grant Type	Preproposals Received <sup>1</sup>	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education	341	55	50	20	\$3.4 million
Professional Development <sup>2</sup>	N/A	N/A	17	9	\$657,501
Farmer/Rancher	N/A	N/A	244	82	\$907,733
On-Farm/Partnership	N/A	N/A	52	12	\$334,137
Graduate Student	N/A	N/A	86	35	\$339,108

<sup>1</sup> The use of a preproposal process varies by region. It serves to screen project ideas for the larger and more complex grant programs, to reduce applicants' proposal preparation burden and the proposal review burden for SARE's volunteer reviewers.

<sup>2</sup> This grant program was not offered in the region in 2014.

## Total Grant Awards in the North Central Region, 1988-2015



# Developing a Localized Approach to Cover Crops and Livestock

**G**rown on an estimated 10 million acres across the country, cover crops are becoming an indispensable part of crop rotations. To maintain this momentum, the development of reliable information at the local level—how to craft a diversified rotation that pays—needs to keep pace with growth in farmers’ interest.



This cover crop of oats, spring field peas and sorghum was cut for hay in October, yielding 1.59 tons per acre. Kansas farmer Josh Roe compared the economics of growing a cover crop for grazing and hay. Photo by Josh Roe

That is what motivated Josh Roe to use a SARE grant to explore the economics of grazing and haying cover crops in a corn-soybean-wheat rotation on his family’s farm in North Central Kansas, where no-till is common but cover crops are rare. After one year of trials, Roe has seen many benefits that he likes, from profitability to system flexibility to improved resilience.

“Obviously we’ve been hearing more and more about cover crops. We are familiar with the benefits, especially after wheat, of further utilizing the soil resource and building up organic material,” says Roe, a sixth generation farmer who has 1,500 acres in no-till crop production and backgrounds 3,000 cattle per year. “We were interested in trying them out as part of our rotation.”

Backgrounding is a stage (method) of beef production where excess calves are raised on high quality feeds including grain, forage and pasture.

Working with a Kansas State University agronomist, Roe established a cover crop mix following wheat and compared the economics of three treatments: haying, grazing and terminating the cover crop without incorporating livestock. The cover crop mix included oats, spring field peas, radishes, turnips and sorghum, except that the hay treatment excluded radishes and turnips.

With high hay prices and particularly favorable weather for cover crop growth in 2014, Roe, an economist by training,

used sensitivity analysis to evaluate profitability at various price and yield levels. He harvested 1.59 tons per acre and, based on his costs, estimated a break-even point of \$73 per ton, or nearly 20 percent below that season’s price.

“We had very good luck with these trials, good rain, decent hay and cattle prices,” Roe says. “We realize these results may not be replicable year after year, so we’re going to keep looking at how these systems perform under different conditions.”

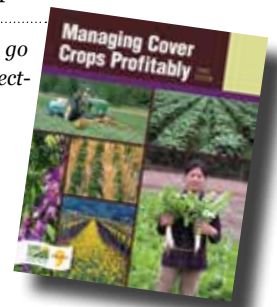
There was an immediate soil-health benefit from his trials, too, when a May rainfall of 9 inches in less than two hours caused heavy flooding in the area. “We still had some flooding, but without the cover crop residue I can’t imagine how bad the erosion would have been—if it had been just bare soil or the previous year’s wheat stubble,” he says.

Going forward, Roe plans to continue using cover crops for both grazing and haying, because the management flexibility it allows is

a plus. “Looking at a combined system like this is interesting,” he says. “Maybe there’s a time you can’t graze because it’s wet and you’re worried about compaction, then you can feed stockpiled forage from another hayed field.”

Roe says there has been a lot of interest in his trials among farmers, Extension agents and county conservation district staff in the area. Along with hosting on-farm field days, he has been asked to speak at numerous events about his experiences with cover crops.

For more information, go to [www.sare.org/project-reports](http://www.sare.org/project-reports) and search for FNC14-971.



[www.sare.org/mccp](http://www.sare.org/mccp)

**FREE RESOURCES!**

**SARE topic room: Cover Crops.** Find dozens of free educational materials and research projects on cover crops in this one-stop shop: [www.sare.org/cover-crops](http://www.sare.org/cover-crops).

**SARE bulletin: Cover Cropping for Pollinators and Beneficial Insects.** To order free copies or download: [www.sare.org/cover-crops-pollinators](http://www.sare.org/cover-crops-pollinators).

**National Conference on Cover Crops and Soil Health:** Recordings of in-depth breakout sessions are online at [www.sare.org/covercropconference](http://www.sare.org/covercropconference).

# A Head Start for Beginning Farmers

Nebraska is growing farmers: There were over 8,000 beginning farmers in the state in 2012, according to the USDA Census of Agriculture. However, beginning farmers face immense challenges and their failure rate is high, so support programs like the Community Crops farmer incubator program can prove critical to their success—whether that means they stay on as farmers or exit without having over-invested.

equipment and giving it a shot. Community Crops takes that gamble out of it.”

Shaw has developed strong marketing skills through being enrolled in the program and already has rapport with restaurants and stores that he will sell to when he is on his own.

The program reaches out to many minorities, immigrants and refugees in Lincoln. Kirst says that Community Crops often engages with people who were farmers in their home country and want to see if they can build a viable career farming in Nebraska. Working with such diverse groups can be a challenge, she says, but it has helped mold the program into what it is today. Community Crops provides translated materials and interpreters, and staff work with USDA and Extension to help them improve their outreach so that it is applicable to a diverse, limited-resource farming demographic.

SARE funding has helped Community Crops continue to improve and modify the program to make it more useful for farmers. For example, staff have come to recognize the importance of one-on-one training, so during their 2011

SARE grant they committed

to visiting participating farms to

provide training tailored to their diverse, unique needs. Understanding beginning farmers’ needs and providing them with tools and knowledge has created a program that produces successful results, whether participants decide to stay in farming or not.

For more information, go to [www.sare.org/project-reports](http://www.sare.org/project-reports) and search for LNC07-286 or LNC11-333.



New farmers Nicole and Paul Saville harvest carrots on their half-acre plot at the Prairie Pines Training Farm in Lincoln, Neb., where they primarily grow medicinal herbs for their community-supported herbalism business. Photo by Ingrid Kirst

Community Crops received SARE grants in 2007 and 2011 to create a training program for small-scale, immigrant and limited-resource farmers in Lincoln, Neb. The funding helped increase the program’s outreach to a larger number of participants, who attended field days and workshops on business skills and marketing. During the three-year period covered by Community Crops’ more recent grant, 10 participants became farmers, while five did not.

The program also provides participants land and equipment to help them “figure out if this is something they want to do long term before they go and invest a lot of money,” says Community Crops Director Ingrid Kirst.

“Farming isn’t for everyone,” Kirst says. “We realized that if someone decides not

to be involved in farming after two years, it really is a success. That’s a perfectly fine answer.”

New farmer Nicole Saville runs a community-supported herbalism business with her husband out of their half-acre plot at Community Crops. “We honestly would not be in our second year of business if it weren’t for the program,” she says. “We would never have found land on our own, we wouldn’t have access to the resources that we do now, and we wouldn’t have the training.”

When third-year farmer Brian Shaw leaves Community Crops, he plans to expand his business to a diverse, five-acre operation. “Anyone can farm. The tricky part is the business end of it,” says Shaw. “The alternative is leasing land, buying

### FREE RESOURCES!

**SARE books:** *Building a Sustainable Business* and *Organic Transition*.

Download for free or purchase hard copies: [www.sare.org/books](http://www.sare.org/books).

**SARE topic room:** *Farm to Table: Building Local and Regional Food Systems*. Extensive production, marketing and business information suitable for beginning farmers, at [www.sare.org/local-food](http://www.sare.org/local-food).



[www.sare.org/books](http://www.sare.org/books)

# Establishing a Queen Bee Industry in Illinois

With honeybees disappearing at alarming rates, it is now considered normal for beekeepers to lose up to 30 percent of their hives each year. Some beekeepers can even lose from 50 to 70 percent in a winter, according to Illinois beekeeper Stu Jacobson. Part of the problem is that most honeybees are reared in California and the South, where they are bred for their ability to produce honey but generally not to withstand diseases and the harsh winters customary in many of the places where they are shipped.

“If the colonies are not healthy, especially if they die, they aren’t going to be able to do that important job of pollinating crops and native plants,” says Jacobson, who raises almost 20 honeybee colonies on his Rochester, Ill., farm. Since 2003, Jacobson has received four SARE grants focused on increasing the understanding and adoption of disease- and mite-resistant queens and bees in Illinois and neighboring states.

To combat high honeybee losses in Illinois, Jacobson and two fellow beekeepers took the problem into their own hands. In 2008, Jacobson used one of his SARE grants to start the Illinois Queen Initiative (IQI), which promotes the production of queens that are adapted to local conditions, and resistant to disease and the varroa mite, an especially destructive pest.

These locally adapted bees are able to overwinter, and emerge healthy and productive in the spring. Because of the serious impact that harsh winters and varroa mites have on honeybees, demand for strong, resilient queens is very high. “If I had 100 queens today I could sell them all. It’s just there is a demand, especially with all of the problems that beekeeping has,” says Illinois beekeeper Craig Schultz.

Pollinators are critical to the food supply—one in every three bites of food we eat



Photo by Lance Cheung, USDA

relies on insect pollination—so beekeepers in Illinois and beyond are looking for solutions to the problems afflicting honeybees. Organizations like the IQI are hoping to help. “The conversation about the need for locally adapted, mite- and disease-resistant bees has increased greatly.

Now that’s across the country and to a great extent in the North Central region,” says Jacobson. “I think [the IQI has] contributed to it; I can’t document that, but we are part of the conversation.”

The IQI conducts workshops on how to raise queen honeybees, and hosts meetings where beekeepers can share their successes and problems with one another. A core of more than 10 dedicated IQI

Beekeepers at an Illinois Queen Initiative (IQI) workshop in Vandalia, Ill., learn how to set up a cell builder colony that will produce productive queens. The IQI has educated hundreds of beekeepers at similar workshops and classes in Illinois. Photo by Lonnie Langley

members have educated hundreds of people like Schultz on how to raise locally adapted, disease- and mite-resistant queen bees. Eight years ago there was just one beekeeper selling queen bees in Illinois. Today there are about 120 people in the IQI. Upwards of 20 raise queens for themselves and to sell, and at least eight advertise their queens on the organization’s website ([www.illinoisqueeninitiative.com](http://www.illinoisqueeninitiative.com)).

Though his SARE grants are complete, Jacobson still devotes much of his time to teaching workshops on sustainable beekeeping practices.

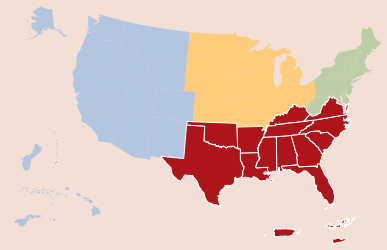
For more information, go to [www.sare.org/project-reports](http://www.sare.org/project-reports) and search for ENCo3-072, FNCo6-641, FNCo8-705 or FNCo10-822.

**FREE RESOURCES!**

**SARE video:** Stu Jacobson describes his SARE project in his own words: [www.sare.org/illinois-queen-bees](http://www.sare.org/illinois-queen-bees).

**SARE bulletin:** *Cover Cropping for Pollinators and Beneficial Insects*. To order free copies or download: [www.sare.org/cover-crops-pollinators](http://www.sare.org/cover-crops-pollinators).

**SARE resources:** Find dozens of educational resources on pollinators at [www.sare.org/learning-center/pollination](http://www.sare.org/learning-center/pollination).



# SOUTHERN SARE

**S**ARE may be small compared to other USDA grant programs, but it consistently has an impact out of proportion to its budget. One factor in SARE's success is the high level of continued engagement researchers have with the program; researchers and Extension specialists routinely revisit SARE as a source of grant funding for sustainable agriculture projects.

In the Southern region, this relationship is best illustrated through the Graduate Student grant program. The grant was started in 2000 to give Master's and PhD students the opportunity to conduct sustainable agriculture research projects. It has been a vehicle to apply for other SARE grants as students further their research careers.

In a brief snapshot of the history of the Graduate Student grant program, seven students who received a Southern SARE Graduate Student grant went on to become a primary investigator or participant in future Southern SARE grant projects, as researchers or Extension specialists. As professionals, these seven former graduate student grantees received a combined \$2.7 million in funding from Southern SARE, a continued investment in the next generation of leaders in sustainable agriculture research.

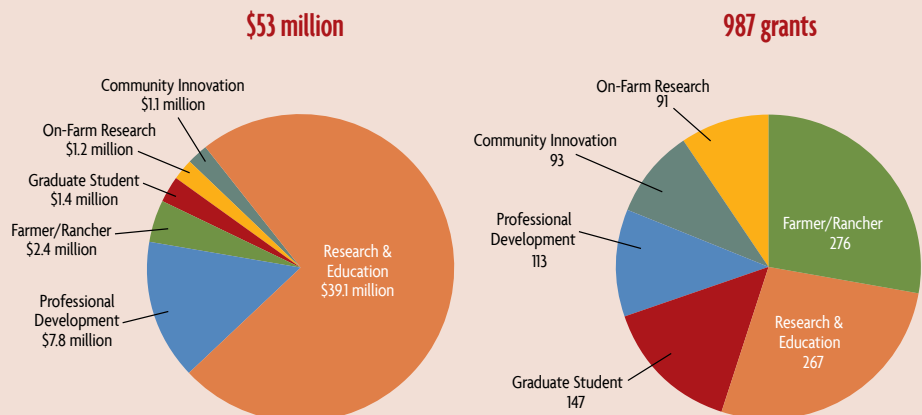
## Grant Proposals and Awards, 2014 and 2015<sup>1</sup>

Grant Type	Preproposals Received <sup>2</sup>	Full Proposals Invited	Full Proposals Received	Proposals Funded	Funding Total
Research and Education	153	48	43	11	\$2.1 million
Professional Development	25	16	12	7	\$842,141
Farmer/Rancher	N/A	N/A	96	13	\$197,118
On-Farm/Partnership	N/A	N/A	79	17	\$339,928
Graduate Student	N/A	N/A	116	21	\$186,484

<sup>1</sup> The Southern region's grant cycle is based on the year calls for proposals are released, whereas in other regions it is based on the year projects are funded. To parallel the other regions, the actual data used in this table reflects the South's 2013-2014 funding cycle.

<sup>2</sup> The use of a preproposal process varies by region. It serves to screen project ideas for the larger and more complex grant programs, to reduce applicants' proposal preparation burden and the proposal review burden for SARE's volunteer reviewers.

## Total Grant Awards in the South, 1988-2015



As Georgia SARE co-coordinator, Julia Gaskin pursues initiatives on organic agriculture, local food systems, cover crops, soil quality and grazing-based animal production. A key success has been forming the Georgia Sustainable Agriculture Symposium, a network of stakeholders from universities, government and the agriculture industry that aims to develop more food hubs in the state, in response to strong interest from farmers. Gaskin was awarded the Georgia Organics Land Steward Award in 2015 for her work as a soil scientist and champion of sustainable agriculture. *Photo by Merritt Melancon, University of Georgia Extension*



# Moving Beyond a One-Size-Fits-All Approach to Cover Crops

Thousands of Florida growers use cover crops, mainly to capture nutrients before they reach surface and groundwater, and to reduce erosion caused by heavy rains. There is less on-the-ground research, however, to demonstrate the other benefits of cover crops, notably pest control and the nitrogen contribution of legumes.

“Florida is a unique environment. A lot of the research that comes out of the Southeast applies to our growers, but not completely,” says University of Florida Associate Professor Danielle Treadwell. “There are opportunities to heighten the nutrient cycles on the farms and increase biodiversity when you add cover crops.”

Moving beyond a one-size-fits-all approach to understanding cover crops, Treadwell used a 2010 SARE grant to explore how they can help solve management issues and improve the bottom line in three production systems very representative of Florida agriculture: in row crops, vegetables and citrus. “Each collaborator walked away with a foundation and they have continued to build upon that knowledge,” Treadwell says.

Findings were shared with growers at conferences and field days around the region, giving them new options in how they use cover crops.

When Treadwell started working with Kirk Brock, he was already using cover crops on his 1,000 acres in rotation with peanuts, soybeans, corn and cotton to improve soil health and resilience to extreme weather events. “If you want to graph the yields over 10 years, using cover crops reduces the extreme ups and extreme downs from weather concerns,” says Brock.

However, Brock was still relying on purchased nitrogen fertilizer. So they conducted two years of field trials and found

that legume cover crops could be combined with cereal rye, replacing fertilizer applications on subsequent corn crops. “There wasn’t a difference in yield, so the study gave farmers new options, encouraging diversification in crop rotation,” Treadwell says.

Potato farmers typically plant sorghum-sudangrass between cabbage and potato rotations to improve the soil and control nematodes, though recently the cover crop has actually been found to attract nematodes. Working with potato farmer Daniel Johns and others in the region, Treadwell tested four alternative cover crops for their ability to suppress nematodes, finding that sunn hemp worked the best.

Treadwell shared her findings with potato producers representing 80 percent of the potato acreage in Northeastern Florida, where most of the state’s potatoes are grown. Since the project, some growers have switched to a different cultivar of sorghum-sudangrass that is less attractive to nematodes,

and others are exploring sunn hemp and millet as alternatives.

Similar to many organic citrus growers, weed management is a top challenge at Uncle Matt’s Citrus in central Florida. The 800-acre operation worked with Treadwell to look for a cover crop that would manage guinea

grass. “Historically, citrus cover cropping is with indigo and clover, so it was interesting to work with Danielle, who helped us



Former Farm Supervisor Doug Gergela harvests ‘Red La Soda’ potatoes that were grown following cover crops at the Hastings Agricultural Extension Center in northeastern Florida. The SARE-funded project on cover crops included extensive outreach in this part of the state, where the majority of Florida’s potatoes are grown. Photo by Danielle Treadwell, University of Florida

find another potential cover crop,” says Ben McLean III, vice president of Uncle Matt’s Citrus. Through their collaboration, McLean found the vigorously growing sunn hemp to be effective at outcompeting weeds. Going forward, the McLean family wants to figure out how much nitrogen is produced by sunn hemp and analyze the economics of planting the cover crop, information that could benefit the state’s 6,000 acres of organic citrus.

The results of this research have extended beyond the project’s collaborators to farmers in Florida and other subtropical regions as far away as Hawaii and the U.S. Virgin Islands, who are applying the findings to their own farms.

For more information, go to [www.sare.org/project-reports](http://www.sare.org/project-reports) and search for OS10-056.

**FREE RESOURCES!**

**SARE topic room:** *Cover Crops*. Find dozens of free educational materials and research projects on cover crops in this one-stop shop: [www.sare.org/cover-crops](http://www.sare.org/cover-crops).

**Grantee product:** *Annual Cover Crops in Florida Vegetable Systems* fact sheets. [www.sare.org/florida-cover-crops](http://www.sare.org/florida-cover-crops).

# Vibrant Networks and Useful Resources for Southern Farm Women

Anita Leonard grew up in an urban environment, but through hard work and valuable learning opportunities, her rural Mississippi farm is blossoming.

Leonard's husband works off-farm while she tends to their beef cattle, poultry, fruit trees and vegetables. Her goal is to generate a self-sustainable income from her Meadville farm, and she credits Annie's Project—a risk management education program for farm women—with taking her a big step closer to that goal.



Anita Leonard raises several kinds of animals along with fruits and vegetables on her Meadville, Ala., farm, while her husband works off-farm. She credits Annie's Project for equipping her with tools to start and manage her farm business. Photo by Kat Lawrence, Mississippi State University Ag Communications

across the South in recent years, its growth in states like Mississippi and Louisiana fueled largely by a 2012 SARE grant that trained dozens of Annie's Project educators.

The 18-hour workshop brings in guest speakers from the local agricultural business community to discuss such topics as finances, human resources and marketing with farm women. One of the main strengths of the program, says Bobbie Shaffett, a retired Mississippi State University Extension professor, is that it can benefit women of all experience levels.

"New farm wives or new farmers who participate gain many skills," Shaffett says. "Experienced farm women who already know a lot of the information enjoy networking and sharing their knowledge with others."

Shaffett coordinated the SARE grant, which funded two training events in

Mississippi where Extension educators from across

the South gathered to learn how to conduct

Annie's Project workshops. The

trainings drew 63 Extension educa-

tors from 12 uni-

versities—including

three historically black universities—

many of whom have gone on to conduct Annie's Project

workshops in their communities. In Mississippi, at least 16 Extension educa-

tors have gone on to hold Annie's Project workshops locally.

"The biggest impacts of our SARE project were taking Annie's Project to states where it had not been before, watching it grow into sustainable programming there, and



Alcorn State University Cooperative Extension specialists Carolyn Banks (right) and Helen Brooks participate in a hands-on activity during an Annie's Project training workshop. Courtesy Southern SARE

reaching new groups, such as 1890 land-grant institutions," Shaffett says.

Deborah Cross, a retired family and consumer science instructor with Louisiana State University Ag Center, attended one of Shaffett's training events and is now conducting Annie's Project workshops in her state. Like Anita Leonard, she sees value in the program's ability to help women improve the profitability of their operation.

"I've met a lot of people who farm but couldn't tell you the bottom line to get the product to the market," says Cross. "With Annie's Project, they see what their business plan is like, see the farm as a business and understand whether they are making money or need to do some diversification."

SARE's support of Annie's Project extends beyond the South. The program's national leadership team, based at Iowa State University, received a 2011 SARE grant to train more than 50 educators in the North Central Region. "In my nearly 40-year Extension career, I've had the opportunity to work with a lot of programs with different audiences, needs and interests," says trainee Willie Huot, a North Dakota State University Extension agent. "None have been as rewarding as Annie's Project, to see the impact the program has on women."

For more information, go to [www.sare.org/project-reports](http://www.sare.org/project-reports) and search for ES12-113.

**FREE RESOURCES!**

**Grantee product:** *Women Caring for the Land: Improving Conservation Outreach to Female Non-Operator Farmland Owners*, [www.sare.org/women-caring-for-the-land](http://www.sare.org/women-caring-for-the-land).

**SARE book:** *Building a Sustainable Business*. Download for free or purchase hard copies: [www.sare.org/business](http://www.sare.org/business).

"When I went through the program, I wanted to build a farm-based business," Leonard says. "It really inspired me and has helped me understand what I could sell and how to go about marketing items."

Annie's Project, a national program established in 2003, has been spreading

# Alabama Extension and Farmers Partner to Battle Pests

Insect pests love Alabama, with its hot, humid climate and long growing season. For vegetable growers who want to use fewer pesticides but face the risk of major crop losses, and especially for organic growers, who cannot use conventional chemicals at all, pests are a huge problem.



Alabama Extension Entomologist Ayanava Majumdar works with Gene Thornton to develop an integrated pest management (IPM) plan for his Roanoke, Ala., farm, including the use of insect monitoring and trap crops. The site-specific IPM strategies Majumdar is sharing with farmers across the state can reduce crop losses by 50 percent or more. Courtesy Ayanava Majumdar

But help is coming in the form of new pest management techniques and improved outreach, being delivered to farmers by Alabama Extension Entomologist Ayanava Majumdar.

Physical pest exclusion is one new tool Majumdar is bringing to farmers. Typically accomplished by growing crops inside structures covered with a shade cloth akin to mosquito netting, the strategy showed promise on Will Mastin's farm, where he tested it in 2013 with a SARE farmer grant. Inside the protected structures he lost less than 20 percent of a tomato crop to pests, whereas in the open field his loss was nearly total.

"We almost don't even have to worry about caterpillars inside of these structures anymore. It used to be a constant scouting routine," says Mastin, who grows produce for local markets around Baldwin County. "And so it saves us labor, it saves

us pesticide usage and we can focus on planting, harvesting and doing the things that we need to be doing instead of just trying to take care of our crops from the bugs constantly."

Mastin worked closely on the project with Majumdar. This is one example of how Majumdar is working tirelessly to improve vegetable growers' ability to deal with pests: He coordinates a program that delivers organic integrated pest management (IPM) information to small-scale farmers through workshops, publications and other outreach. The program is partly funded by SARE through Majumdar's position as a SARE state coordinator for Alabama.

"It's incredible because SARE funding has allowed me to develop a new organic movement in research and educational

activities, and it's been incredible because we've learned so much in very little time," Majumdar says.

Since it launched in 2012, Alabama's organic IPM program has reached nearly 1,000 producers with information that helped them protect crops worth an estimated \$2 million statewide. Through surveys, Majumdar found that Alabama vegetable growers who follow organic IPM recommendations can reduce their crop losses by 40-50 percent, significantly boosting their productivity with fewer pesticides.

Alabama's IPM program emphasizes a three-tier approach to pest management that coincides with USDA organic standards: preventative strategies such as crop rotations, trap crops and sanitation; mechanical and physical control, such as shade cloth exclusion and pest repellents; and biorational pesticides. "The bottom

line is, prevention is better than a cure," Majumdar says.

Majumdar coordinated the shade cloth trial on Mastin's farm, and has done so on other farms in the state. Mastin used the shade cloth on an existing high tunnel frame to exclude stink bugs, leaf-footed bugs and moths. While the shade

cloth protected his crops very well, the strategy comes with some challenges that growers must work out, including ventilation and the exclusion of pollinators and beneficial insects, Mastin says.

Majumdar estimates that producers could expect to spend \$250 to \$420 to outfit an existing high tunnel with shade cloth, depending on the mesh size. "The cost of the shade cloth has more than paid for itself in the reduction of labor and pesticides that we've had to use inside of the structure," Mastin says.

For more information, visit [www.sare.org/alabama](http://www.sare.org/alabama).

### FREE RESOURCES!

**SARE video:** Watch Ayanava Majumdar describe the impact of SARE funding in Alabama, in his own words: [www.sare.org/alabama-IPM](http://www.sare.org/alabama-IPM).

**SARE video:** Farmer Will Mastin discusses his experience with shade cloth in detail at [www.sare.org/mastin](http://www.sare.org/mastin).

**SARE bulletins:** Publications by Majumdar on trap cropping and pest exclusion: [www.sare.org/trap-cropping](http://www.sare.org/trap-cropping) and [www.sare.org/pest-exclusion](http://www.sare.org/pest-exclusion).

# 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.



## The SARE Learning Center [www.SARE.org/Learning-Center](http://www.SARE.org/Learning-Center)

Hundreds of educational resources on dozens of topics.

## Database of Project Reports [www.SARE.org/Project-Reports](http://www.SARE.org/Project-Reports)

Results from more than 5,000 SARE-funded research and education projects.

## State Programs [www.SARE.org/State-Programs](http://www.SARE.org/State-Programs)

SARE coordinators in every state and island protectorate offer learning opportunities.

### How to Order SARE Publications:

Books and bulletins are free to view online at [www.sare.org/Learning-Center](http://www.sare.org/Learning-Center). To buy books or order free print bulletins, visit [www.sare.org/WebStore](http://www.sare.org/WebStore) or call (301) 779-1007.



## SARE/NACAA Fellowship Defines Careers for Extension Educators

Since 2007, SARE and the National Association of County Agricultural Agents (NACAA) have partnered to offer the Sustainable Agriculture Fellowship: a two-year learning opportunity that exposes participants to sustainable agriculture systems across the country through a series of seminars and farm tours. To date, 36 Extension educators have participated, and the program has made a lasting impact on their ability to serve



SARE/NACAA Fellows visited Iowa during a 2013 farm tour. From left: Brad Burbaugh, John Porter, Maud Powell, Nathan Winter, Lara Worden, Thomas Maloney, Marlin Bates and Aaron Esser. Photo by Marie Flanagan

their farmer and rancher clients. Participants increased their knowledge of sustainable agriculture in a wide range of categories, according to a program evaluation by a former Fellow. More than that, it has shaped their careers. This is what they have to say:

*"I want to tell my fellow NACAA members that their participation in the SARE Fellows Program could possibly be the highlight of their career in Extension."*

Walt Bumgarner, Penn State Extension (2007 Fellow)

*"As a horticulture specialist I don't really spend too much time in a corn field or a bean field or at a dairy or other cattle operation. But this fellowship really allowed me to be in those places. It allowed me the opportunity to engage with those producers."*

Marlin Bates, University of Missouri (2011 Fellow)

*"The opportunity to take an in-depth look at two farms, with the guidance of Extension specialists, was the best model of professional development I have partaken in."*

Maud Powell, Oregon State University (2012 Fellow)

*"Our SARE Fellows are generally early or mid-career, and have gone on to serve in leadership roles in NACAA and Extension. They are leaders in sustainability for our Extension system and our newer educators."*

Mike Hogan, Ohio State University (Past President, NACAA)

Learn more at [www.SARE.org/Fellows](http://www.SARE.org/Fellows)

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