

2011-2012 SARE



SOUTH



NORTH CENTRAL



NORTHEAST



WEST

SUSTAINABLE AGRICULTURE RESEARCH & EDUCATION



REPORT FROM THE FIELD

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 pest management, energy, stewardship, marketing, systems research and much more.

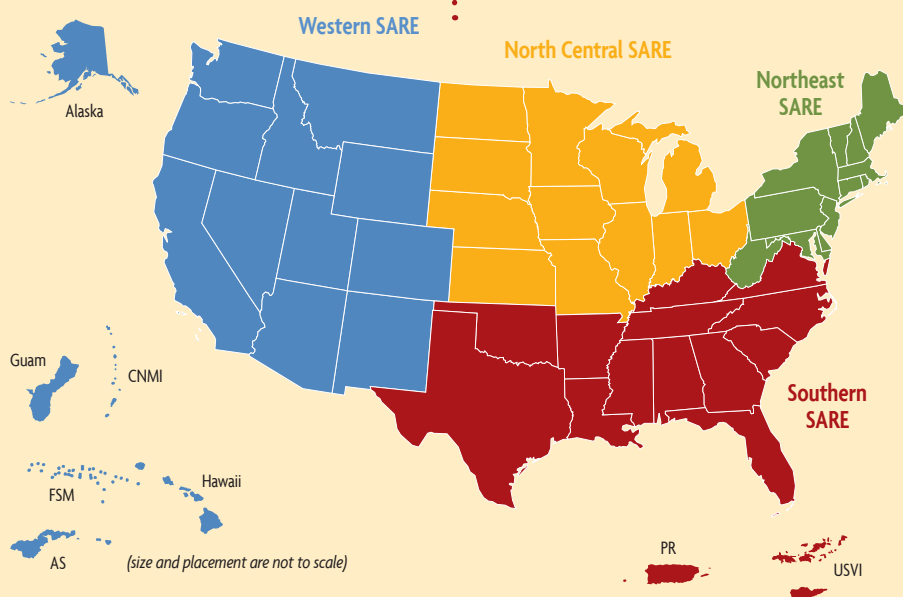


LOCAL LEADERSHIP, NATIONAL IMPACT

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.**

Photos by (clockwise from top left): Dena Leibman, SARE Outreach; courtesy Santa Cruz Farm; Dave Clark, USDA Agricultural Research Service (ARS); Dena Leibman; Natural Resources Conservation Service. **Cover photo:** USDA ARS Plant Geneticist Blair Waldron (right) and Utah rancher Bob Adams are studying forage kochia's potential to provide excellent grazing while combating weeds and wildfires (page 19). Photo by Emily Beus.

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United States
Department of
Agriculture

National Institute
of Food and
Agriculture





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

Letter from the Director

SARE passed a notable milestone in 2011: It funded its 5,000th project since the program began 23 years ago. Reaching this landmark provides a good opportunity to look back at accomplishments, and forward to those yet to come.

Collectively, these 5,000 projects represent a community of practice that is locally rooted yet nationally relevant. This community spans the country and all manner of agricultural enterprise, including farms both large and small, rural and urban, crop and livestock, conventional and organic. This community includes consumers and producers and people in between, working together in complex food and agriculture systems, people such as SARE grantees, the SARE coordinators in every state, and other dedicated professionals at universities, in Extension and our partner organizations. This diverse community is united in a shared commitment to improve agriculture, develop alternatives and create new opportunities.

The following pages describe this community, with stories highlighting recent activities in SARE's four regions. I think you will be impressed by the broad range of research topics and flexible approaches SARE supports. You will learn about innovation by farmers, ranchers, scientists and educators—and how these innovations grow from an idea to a prototype to proven results, and ultimately, to widely adopted practices that benefit producers and generate home-grown jobs across America. Mostly, you will read stories of inspired and inspiring people.

As we reflect on SARE's milestone, another one comes to mind, namely that the world population has just passed 7 billion people. This sobering fact should remind us that the first tenet of sustainable agriculture, as defined by the SARE enabling legislation (7USC Sec. 3103), is to "satisfy human food and fiber needs." Against this backdrop, SARE research and extension programs have an important role to help increase agricultural production and to do so in a sustainable manner. While we have often described sustainable agriculture as a three-legged stool that balances economic, environmental and quality-of-life concerns, maybe now is the time to add a fourth leg to the stool and expressly include productivity as one of the four core objectives we must simultaneously pursue and balance.

As we consider productivity, we must also consider producers, particularly mid-sized producers—the "ag-of-the-middle" farms that are too big to capture premium prices through direct-market channels and too small to capture the economies of vertical integration. Although they comprise a core segment of American agriculture, the ranks of mid-sized farms are shrinking while the number of very small and very large farms is increasing. Through our first 5,000 projects, SARE has already made enormous contributions to many types of farms, especially the viability of small-scale farms, direct-market channels and local and regional food systems. As we go forward with support for the next 5,000 projects, it is my hope that SARE will continue to serve all types of farmers and ranchers, and that we will make particular progress to further improve the sustainability of mid-sized farms that are at the core of American agriculture.

Robert Hedberg
SARE Director

“You will learn about innovation by farmers, ranchers, scientists and educators—and how these innovations grow from an idea to a prototype to proven results, and ultimately, to widely adopted practices that benefit producers and generate home-grown jobs in rural America.”

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, for questions about SARE information materials.

North Central SARE
(hosted by the University of Minnesota)
www.northcentralsare.org
(612) 626-3113
ncrsare@umn.edu

Northeast SARE
(hosted by the University of Vermont)
www.nesare.org
(802) 656-0471
nesare@uvm.edu

Southern SARE
(hosted by the University of Georgia and Fort Valley State University)
www.southernsare.org
(770) 412-4787
info@southernsare.org

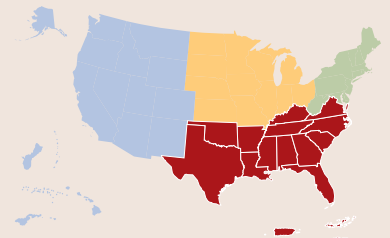
Western SARE
(hosted by Utah State University)
www.westernsare.org
(435) 797-2257
wsare@usu.edu

SARE Outreach
(hosted by the University of Maryland)
www.sare.org
(301) 405-8020
info@sare.org



SARE Shares in Every State: Arkansas SARE Co-coordinator Leslie Glover uses his long-held expertise and academic background in farming systems to share SARE research results with small-scale and limited-resource farmers. He educates them about sustainable methods, such as producing vegetables as an alternative to input-intensive row crops, water conservation methods and other practices. *Photo by Brad Mayhugh*

SOUTHERN SARE



Farmers across America's diverse southern landscape—from the tropical Caribbean to the arid Texas panhandle—are hungry for innovations that help save water and fuel, and of course, increase profit margins in this harsh economy. Southern SARE is striving to meet these needs by supporting sound, applicable research focused on improved practices in livestock and crop production, value-added products, and renewable energy, among other critical areas.

Take, for example, the fact that in the wake of high energy costs, the South is experiencing an explosion of interest in producing renewable energy on agricultural lands. Southern SARE supported two groups to develop an intensive three-day course to train Extension agents and other ag professionals in wind, solar and anaerobic digestion. The newly trained energy educators have already worked with farmers across the South to incorporate renewable energy into their operations (see page 6).

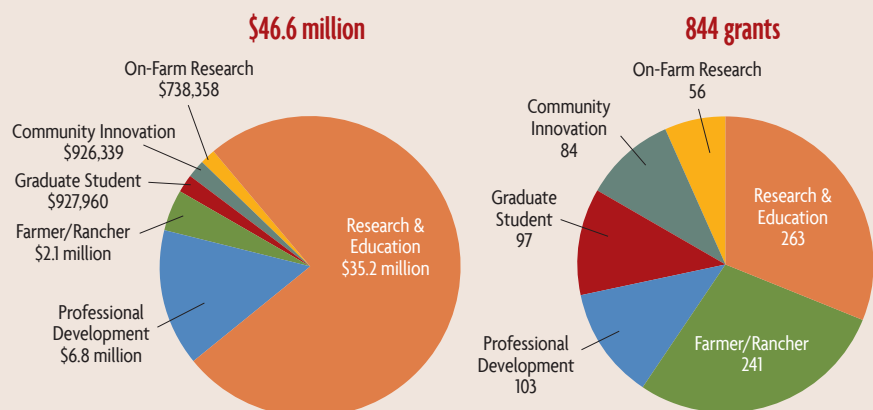
SARE-funded trainings are also teaching educators and ag professionals about the social, economic and environmental viability of pasture-based dairy, which has grown exponentially despite a downturn in conventional dairy operations. Nearly 90 percent of the trainings' participants now use pasture-based information in their farmer programs (see page 5).

And where mainstay crops are not paying the bills, profitable opportunities abound for farmers in select vegetable production. In Kentucky, where tobacco was once king, the sweet potato is making its way into the hearts of small farmers as a low-input, easy-to-store crop. University of Kentucky researchers have been working to develop sweet-potato production and marketing systems, with good farmer response (see page 7).

Underlying all that Southern SARE does is its mission to support research and education efforts that provide farmers with solid, reliable information applicable to their operations. That is why Southern SARE continues to support systems research, which studies the components of food production in their interrelated entirety rather than in isolation, more like how a real farm would operate. Southern SARE funded its first Large Systems Grant in 2011, which will provide long-term funding to help continue established systems-research projects. In addition, it developed a series of video modules that walk the researcher through the application process for systems-research grants.

As the South continues to find innovative ways to revitalize its farming economy, Southern SARE will be there, supporting solid research to advance profitable and sustainable agricultural practices.

From 1988 to 2010, Southern SARE has awarded...



Much-Needed Help for Georgia's Growing Pasture-Based Dairy Industry

For years, the rising cost of energy and feed, along with tightening credit, have forced droves of dairy farmers in southeastern Georgia to scale back or close shop entirely: From 1997 to 2007, the industry shed an average of 1,820 cows and 47 operations per year, according to USDA statistics. There is a bright spot, however: pasture-based dairies.



Beryl Landis, of Waynesboro, Ga., plants annual ryegrass and arrowleaf clover on his corn silage fields to provide excellent forage for his cows. These forages also increase soil organic matter and nitrogen for his corn crops. Photo by Dennis Hancock, University of Georgia

The numbers bear this out: Pasture-based dairies now represent more than 15 percent of the total herd in Georgia, up from a mere 1 percent in 2006. While only 20 out of about 270 dairy farmers are pasture-based, the herd on these dairies is typically 2-4 times that of their conventional peers. This growth is largely due to many farmers seeing the personal, environmental and financial advantages of these systems.

To help pasture-based dairy farmers develop and make the most of their operations, University of Georgia (UGA) researchers are using multiple SARE grants to create a body of technical knowledge specifically for these systems. "The growth we're seeing in this market is an opportunity for our educators to be involved, and to understand that the technical specifications for a conventional dairy are very different than for a pasture-based dairy," says

UGA Forage Extension Specialist Dennis Hancock.

Hancock and his colleagues used a 2009 SARE grant to stage training tours, workshops and a two-day, pasture-based dairy summit to fill knowledge gaps in key topic areas, including nutrient management, rotational stocking strategies, forages and economics. In total, these events have reached more than 200 personnel from Extension, the Natural Resources Conservation Service and other agricultural support agencies.

In addition, UGA researchers have received two other SARE grants to improve the efficiency of grazing systems through better forage selection and management, and irrigation scheduling.

"They're providing tremendous info that can really help people. I wish it had been available when we got started in 1993,"

says Desiree Wehner, who, along with her husband, Al, operates three grazing dairies in southeastern Georgia, with a combined herd of about 1,700 cows.

The Wehners, who transitioned from a conventional system about 20 years ago, allowed the UGA researchers to conduct moisture and nitrogen studies on one of their farms to better understand their pastures' needs at each time of the year. They have a more consistent, profitable system now, whereas in the past, Wehner says, "all we ever did was try to grow as much grass as we could, and sometimes we had too much, sometimes not much."

A key outgrowth of Hancock's SARE grant was the establishment of a farmer network in Georgia, northern

Florida and South Carolina. It now has 35 participants who use it as a venue for peer-to-peer learning.

"There's no way we can do all the research needed to answer all the questions that our pasture-based dairy producers have,"

Hancock says. "But when they get together and learn from one another, that's when they really start to make some progress. They vet each other's ideas."

For more information, go to www.sare.org/project-reports and search for LS07-196, ES09-096 and OS09-049.



During a University of Georgia field day in Screven, Ga., producers learn how to use baled silage as a cost-effective means of saving excess annual ryegrass grown in the spring, for use later on when it is needed. Photo by Dennis Hancock, University of Georgia

FREE RESOURCES!

SARE video: *Sustainable 12 Aprils Dairy Grazing*. To view this video and related free resources: www.sare.org/trantham.

Georgia Forages: For complete forage and livestock management resources compiled by the University of Georgia, see www.georgiaforages.com.

Thousands Trained in Renewable Energy and Efficiency

As fossil-fuel prices rise across the country, farmers are feeling the pinch, especially in the economically hard-hit areas of the rural South. Too many tractor passes can break a year's profits, as can the use of fans, machinery and other equipment running on expensive, non-renewable fuels.



Extension agents from around the South learn about, and get hands-on experience with, creating biodiesel. Along with gaining practical experience with a range of alternative energies, the participants in this three-day training enjoyed invaluable networking opportunities. *Courtesy the National Center for Appropriate Technology*

Yet the South has been relatively slow to adopt renewable energy and efficiency measures, according to energy specialists in the region, in large part because of a lack of information and training. That started to change with a three-day training session that sent a ripple through ag educators in the South: Within a year, that one training, with 26 educators, led to 44 local events and the training of at least 2,600 farmers, ranchers and others in the latest renewable energy and efficiency technologies.

"We felt this train-the-trainer concept really fit the energy topic well, especially in the South," says Mike Morris, an energy specialist with the National Center for Appropriate Technology (NCAT), which used a SARE grant to conduct the training.

"These topics present a lot of economic opportunity for rural America."

Conducted by Morris and Steve Moore, small-farm manager at North Carolina's Center for Environmental Farming Systems, the training covered a wide range of topics, including biofuels, strategies for improving energy efficiency, wind and solar energy, and working with utilities and equipment suppliers, among other topics. Participants visited a wood burning biomass power plant, a solar water-heated greenhouse and an energy-efficient dairy, along with hands-on demonstrations with biofuel refining and solar equipment.

An emphasis was put on the sustainability of on-farm energy, particularly with biofuels, Morris says. "It was not just about producing bioenergy, but doing it in a way that protects soil and water."

The training's organizers encouraged participants to stay connected with each other and become expert resources for their extension colleagues and rural constituents on the many energy-related incentive programs available at the local, state and national level. For example, Alcorn State University Extension Specialist Elizabeth Myles attended the training to broaden her knowledge of sustainable-energy topics and build professional relationships. Now, equipped with a large repertoire of educational materials, she is planning to conduct two sustainable-energy workshops for Mississippi farmers in 2012 and more workshops in Alabama and Georgia.

Another long-term success: Morris points to a training graduate in Texas, Marion

County Extension Agent Brock Fry, who began telling local

farmers about USDA's Rural Energy for

America program, which provides grants and loans for renewable-energy and energy-efficiency projects.

Applications to the program from Texas

residents jumped from five or six per year to more

than 30 last year, in large part

because of this graduate's efforts, Morris says.

"If I had my way, every county extension office would have at least basic information about the renewable-energy opportunities, incentives and programs available in their county," Morris says. "That would have a huge impact, because most people don't even know what's available."

For more information, go to www.sare.org/project-reports and search for ESo8-092.

FREE RESOURCES!

SARE bulletin: *Clean Energy Farming*. To order free copies or download: www.sare.org/energy.

eXtension: For Cooperative Extension's educational materials related to farm energy, see www.extension.org/ag_energy.

Databases: See the National Center for Appropriate Technology's Directory of Energy Alternatives (www.attra.ncat.org/dea) or the Database of State Incentives for Renewables and Efficiency (www.dsireusa.org).

The Lucrative Sweet Potato Takes Root

Small-scale tobacco farmers in eastern Kentucky who are looking for alternatives due to changes in the tobacco market are discovering that a relatively easy, often profitable transition lies in sweet potatoes. With relatively low input and capital costs and a short learning curve, they are able to earn gross returns of up to \$7,000 per acre, mostly through local sales.

“Sweet potatoes are a pretty good alternative, at least for our growers, because a lot of the equipment they used for tobacco can be used for sweet potatoes, particularly the transplanter. So they don’t have to buy a lot of new equipment,” says University of Kentucky Extension Vegetable Specialist Tim Coolong. “Economically, it’s been very good for them.”

Coolong received a 2009 SARE grant to research and demonstrate sweet potato growing on several farms and has helped about 15 farmers—most, but not all former tobacco producers—grow the highly nutritious vegetable.

Meanwhile, in Mississippi—the country’s third largest producer of sweet potatoes—SARE-funded research helps the state’s growers adopt sustainable practices and cash in on organic sales by showing them how

they can better manage their soil with cover crops and conservation tillage.

Only one grower in Mississippi currently produces organic sweet potatoes, yet organic can fetch a premium at fresh markets and through sales to processors, particularly for baby food, says Mississippi State University researcher Ramon Arancibia. “Companies like Gerber don’t want pesticides, or even a lot of fertilizers.”

Working with three farmers around Vardaman, Miss., and others in Arkansas, Arancibia’s trials found that an organically grown crop suffered far less pest damage than a conventionally grown one. In addition, he focused on showing the soil building qualities of cover crops. “Sweet potatoes are root



An advantage to growing sweet potatoes, especially for small-scale farmers, is that they have low nitrogen and water needs. Photo by Tim Coolong, University of Kentucky

vegetables, so they need a very healthy soil. Also, the soil structure needs to be very good so the potatoes can grow in a nice shape,” Arancibia says, referring to cover crops’ ability to improve organic matter and loosen hard-packed soils.

To help get the word out, Arancibia is sharing his findings with the 104-member Mississippi Sweet Potato Council, which represents nearly all the state’s growers. One farmer who collaborated with Arancibia is planning to plant a brassica cover crop on 50 acres next season, to see if it will combat nematodes.

Back in Kentucky, Coolong’s on-farm trials showed that aside from using pesticides to control wireworm damage, sweet potatoes require few inputs—and some growers are, in fact, pesticide free. Sweet potatoes have low nitrogen needs, and, in eastern Kentucky, do not require irrigation except in the case of extreme drought.

“There are a lot of nuances with sweet-potato production that this grant really allowed us to look at,” says Coolong, whose work translated into a detailed handbook and the formation of a regional grower’s association.

Two areas that require more work, he says, are establishing overwinter storage facilities and production of slips—the sprouts that come off a potato and turn into new plants. Slips are not grown locally and are expensive to buy from out of state, so showing local growers how to produce their own represents another opportunity.

For more information, go to www.sare.org/project-reports and search for OS09-047 and LS09-215.



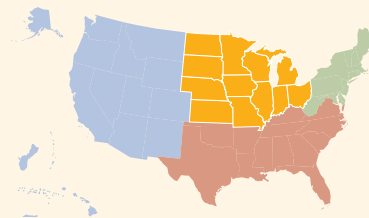
Morgan County Extension Agent Sarah Fannin stands next to a sweet-potato harvester the county bought and lends to local growers who have begun growing the vegetable with the help of Fannin and others. Photo by Tim Coolong, University of Kentucky

FREE RESOURCES!
SARE bulletins: *Transitioning to Organic Production and Meeting the Diverse Needs of Limited-Resource Producers*. To order free copies or download: www.sare.org/bulletins.
Sweetpotato Production for Kentucky: Starting January 2012, find a free download of this guide at www.ca.uky.edu/agcomm/pubs.asp.



SARE Shares in Every State: Wisconsin SARE Coordinator Diane Mayerfeld spearheads professional development in sustainable agriculture for Wisconsin educators, including mini-grants for projects such as the demonstration plantings for native pollinators shown here. She has written a sustainable agriculture curriculum for high school students and recently organized a region-wide conference on scaling up local food systems. *Photo by Lori Compas*

NORTH CENTRAL SARE



America's North Central region embodies what most people think of when they envision agriculture—endless rows of corn, strong family traditions and quaint rural towns. The region's farming and ranching tradition is this, of course, but it now includes more highly diversified farms, urban-rural partnerships, community supported agriculture, and other agricultural approaches that strive to drive rural and urban revitalization. NCR-SARE has made it a top priority to listen and respond to its constituents, since they are on the ground and know where information gaps reside as the region undergoes change. The region's grants program targets real needs, and includes a keen focus on sharing project results.

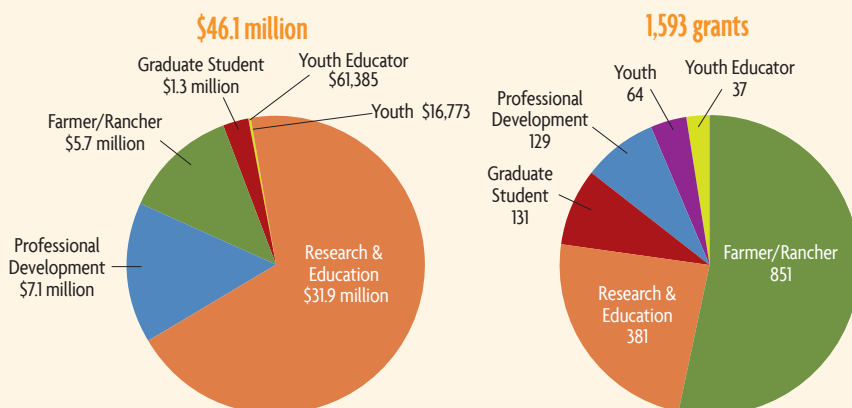
Take, for example, the growing call for vibrant, profitable local and regional food systems to supply consumers with fresh food and provide small- to mid-scale farmers with a livable income. In 2010, NCR-SARE's Professional Development Program hosted a two-day conference in Madison, Wis., which 80 educators representing the region's 12 states attended. They later formed networks to help scale up food systems in their areas. In 2011, NCR-SARE conducted a Listening Session with the Grazing Land Coalitions in Nebraska and the Dakotas, where SARE gleaned valuable information to guide the region's competitive grants and other programs. In the coming months, the program will host a training to share information and form educator networks on topics such as climate change, bioenergy crops and cover crops.

The three project profiles that follow are examples of grants awarded with the perspectives of NCR-SARE constituents in mind: Two brothers use a SARE grant to explore ways to raise grain yields by refining cover cropping techniques, and they start a business based on what they learned (see page 9); an Iowa State graduate student takes a SARE grant and turns it into 500-member stakeholder network that has served to strengthen the niche-meat processing industry (see page 11); and a University of Minnesota researcher pushes the envelope of pollinator research to find ways to help the beleaguered honey bee and the many economically vital crops it pollinates (see page 10).

But it is not enough to award grants and garner results. Those results must see the light of day, and NCR-SARE is helping grantees do just that. Its most visible effort is the new NCR-SARE website, which features NCR-SARE project reports, enhanced search capabilities, a Learning Center with free book downloads, online courses, grant information, videos and more.

Yes, change is happening in the North Central region, and NCR-SARE is welcoming and responding to it. But NCR-SARE's core value will never change: a regional agriculture that is sustainable for farmers, ranchers and their communities.

From 1988 to 2010, North Central SARE has awarded...



Dryland Cover Cropping Boosts Yields

Every drop of water counts for farmers who practice dryland cultivation, a practice that relies on rainfall without the benefit of irrigation. So, when it comes to incorporating cover crops into a dryland rotation, many farmers hesitate, wondering: “How much moisture is the cover crop going to demand, and will I pay for it later in lost cash-crop yields?”



During a field day at his farm in Bladen, Neb., Keith Berns discusses moisture-use data he gathered while conducting SARE-funded research on the use of cover crops in dryland farming. He found that some cover-crop mixes actually conserve moisture. *Photo by Joan Benjamin, North Central Region SARE*

This is the “first question and major concern any dryland farmer has about cover crops,” says Bladen, Neb., farmer Keith Berns. But thanks to SARE-funded research he and his brother conducted on their 2,000-acre farm—about two-thirds of it dryland—they now have an answer to share with their peers.

Keith and Brian Berns found that, in fact, cover crops can significantly boost corn yields in a non-irrigated setting. In one trial, they planted corn after a cover crop mix of grasses, legumes and brassicas, and saw a corn yield that was about 10 percent better than planting straight into wheat stubble.

“The results of this project have made us firm believers in cover crops,” says Keith Berns, who raises corn, soybeans and wheat, and has been practicing full continuous no-till for 12 years.

In their trials, conducted in 2008 and 2009, the Bernses tested cover-crop monocultures as well as mixes—including sunflowers, soybeans and oilseed radish—but found that mixes were the best performers, in part because they were the most frugal with water. Although a wet season skewed some of their moisture data collection, they found that the cover-crop mixes used far less water than the cover-crop monocultures, and were on par with water use in wheat stubble alone.

They acknowledge that they are not done exploring cover crops. “We will continue to experiment with different mixes, seeding rates and plant species,” says Keith. “We also hope to continue to monitor water usage of cover crops, and also measure yield in the crop following our cover crops.”

Additionally, they are experimenting with putting livestock on cover crops—looking

at grazing intensities, regrowth periods and nutritional quality.

In the meantime, the brothers are busy spreading the word about their findings and helping others adopt cover crops. During the course of their SARE research, they hosted two on-farm field days and spoke at nearly 25 public events, to a total of about 1,500 people. They also host an annual one-day cover-crop school in Bladen.

The SARE grant has yielded even more benefits: The Berns brothers have launched a new cover-crop seed business, and now maintain a website—www.greencoverseed.com—that contains practical information on their research. A highlight is their SmartMix Calculator, an online spreadsheet that calculates seed quantities and cost, carbon-to-nitrogen ratio (C:N), nitrogen-fixation potential and other factors for mixes of nearly 40 cover-crop species, including legumes, brassicas, grasses and broadleaf crops.

For more information, go to www.sare.org/project-reports and search for FNC07-653.



Along with their research, Keith and Brian Berns run a cover-crop seed business and host an annual cover-crop school where they discuss the benefits of different covers, including brassicas. *Photo by Joan Benjamin, North Central Region SARE*

FREE RESOURCES!

SARE books: *Managing Cover Crops Profitably*, 3rd Edition and *Building Soils for Better Crops*, 3rd Edition. Download for free or purchase hard copies: www.sare.org/books.

SARE bulletin: *Smart Water Use on Your Farm or Ranch*. To order free copies or download: www.sare.org/water.

Cutting Edge Research: Helping Bees Help Themselves

Diseases, pests and the mysterious phenomenon of colony collapse disorder pose a dire threat to the U.S. beekeeping industry and, in turn, to the \$20-billion-a-year crop industry that relies on insect pollination. Because of these increasing pressures, the ranks of managed bee colonies have plummeted in recent years: On average, beekeepers are losing 30 percent of their colonies every growing season.

While the exact cause of colony collapse disorder is unknown, researchers believe it to be the result of a combination of factors, one of which is the *Varroa destructor* (*V. destructor*) mite, a pest introduced to the country in the late 1980s. *V. destructor*, difficult to control because it has become pesticide resistant, attacks bees by sucking their blood, thus spreading viruses among colonies and weakening individual bees, making them susceptible to pesticides not intended to harm them.

Rather than relying on pesticides and antibiotics to control *V. destructor* and related diseases—a method that has become part of the problem—University

of Minnesota Entomologist Marla Spivak is advancing effective strategies that help bees help themselves.

Spivak and her team have received six SARE grants since 1997 to support their work showing beekeepers how to identify and breed for hygienic bees—bees that are adept at spotting infected immature bees (larvae and pupae) and quickly removing them

from the nest before a disease or pest can get out of control in a colony. “We mostly research ways for bees to keep themselves healthy, using their own natural defenses so we can avoid chemical inputs,” Spivak says.

Their research—now supported by a \$500,000 MacArthur Foundation “genius” grant—has demonstrated that colonies bred for hygienic behavior have good resistance to chalkbrood and American foulbrood diseases, and partial resistance to *V. destructor*. Over time, the establishment of disease-resistant bees has the potential to save commercial-scale beekeepers thousands of dollars each year in treatment costs while reducing the environmental impact of pesticide use.

Spivak’s SARE-funded research also includes innovative sampling strategies for beekeepers to determine the extent of an infection in a colony, and therefore how much of a treatment might be needed.

After helping three commercial-scale beekeepers in Minnesota establish hygienic disease resistance in their colonies, Spivak and her team are now working closely with some of the country’s largest bee breeders to adopt the sustainable pest management strategies that make sense for them, including breeding and sampling strategies. Many

of the breeders with whom they are collaborating sell queen bees throughout the country, giving Spivak’s team the opportunity to have widespread impact.

“We need genetically diverse bees,” Spivak says. “That is the impetus for me to work with bee breeders to help them select for hygienic behavior from among their genetically diverse, and tried-and-true lines of commercial bees.”

While much of Spivak’s research focuses on the European-imported honey bee—the primary victim of colony collapse disorder—she and her colleagues have also turned their attention to the wide range of native bee species that are also embattled, yet serve an important role in crop pollination. In 2010, Spivak co-authored and SARE published *Managing Alternative Pollinators*, a first-of-its-kind technical guide for rearing and managing key alternative species.

For more information, go to www.sare.org/project-reports and search for GNC07-083, GNC06-072, LNC05-264, LNC02-202, LNC99-152.1 and LNC97-117.



FREE RESOURCES!

SARE fact sheets: *A Sustainable Approach to Controlling Honey Bee Diseases and Varroa Mites*; and *Integrated Pest Management for Varroa Destructor in the Northeastern United States using Drone Brood Removal and Formic Acid*. Free download: www.sare.org/factsheets.

SARE book: *Managing Alternative Pollinators*. Download for free or purchase hard copies: www.sare.org/pollinators.



University of Minnesota entomologist Marla Spivak conducts research on breeding bees for hygienic traits, one of the many techniques she is investigating to help beekeepers reduce their reliance on antibiotics and pesticides. Photo by David L. Hansen, University of Minnesota

Grad Student Research Leads to Industry and Life Altering Change

When graduate student Arion Thiboumery discovered that his research hypothesis was off target, he experienced both the deep frustration, and beauty, of scientific discovery. But instead of giving up, he came up with two innovative solutions: establishing one of the most comprehensive stakeholder networks in livestock agriculture—and changing his life.



While conducting graduate research at Iowa State University, Arion Thiboumery spent time working at three meat lockers, which helped him make vital insights into the underlying issues that stunted the potential of small-scale meat processing. Photo by Samara Akers

Thiboumery assumed, as most did in agriculture, that there are simply too few small-scale meat processors to service producers. What Thiboumery discovered was that the issue at hand was actually that the industry as a whole was out of sync and in need of better coordination and resources. Today, at least in the Midwest, says Thiboumery, there is now adequate meat processing for small-scale producers.

This is due, in large part, to better industry-wide coordination and information springing from Thiboumery's SARE-funded graduate research at Iowa State University. Thiboumery found a need for networking, and formed the Small Meat Lockers Working Group. He then chose three lockers as case studies, working in their factories to truly understand the issues in play. He discovered, for example, an aging processor population and extreme

boom-and-bust seasonality that put processors out of business.

In the end, he thought simply expanding processing capacity might not be what producers and processors needed most. "The initial work was fruitful because it showed us that as you turn it all over you see that there is so much more there. We needed empirical evidence."

It became apparent to Thiboumery that stakeholders did not have the information they needed to run an efficient business, nor did they have sufficient networking opportunities with producers, consumers, processors, regulators and other stakeholders, which would help them learn new

approaches, avoid pitfalls and promote their businesses. So Thiboumery filled the gap. He held workshops on alternative pricing structures, facilitating networking and building off-season awareness. He produced cost-structure spreadsheets for processors and conducted surveys to show current pricing and practice trends. And he wrote the *Iowa Meat Processors' Resource Guidebook*, now used by extension agents and universities across the Midwest, and the carnivore's bible, *The Whole Animal Buying Guide*.

Eventually, Thiboumery was able to leverage his initial SARE grant into \$500,000 worth of assistance from other federal agencies, nonprofits and universities to engage stakeholders from across the nation. Together with Lauren Gwin of Oregon State University, he transformed the working group into the 500-member strong Niche Meat Processors Assistance Network. This is, today, a vibrant, national community of stakeholders housed on eXtension, the online home of USDA's

Extension Service. The working group's efforts have garnered media attention

far and wide, and, as he frames it, put "small meat lockers on the map."

Today, Thiboumery calls himself a "recovering academic," having chosen to walk his own talk instead. At 28 years old,

he shed his academic life and

today is vice president of Lorentz Meats, a mid-scale meat processor in Minnesota. The future for small-scale meat processing? Thiboumery has some predictions, but one, he says, is certain: To remain viable, the small-scale processing industry will need a next generation, like him, to embrace the trade.

For more information, go to www.sare.org/project-reports and search for GNC07-085.

FREE RESOURCES!

Niche Meat Processor Assistance

Network: For educational materials, tools, directories and other resources, see www.nichemeatprocessing.org.

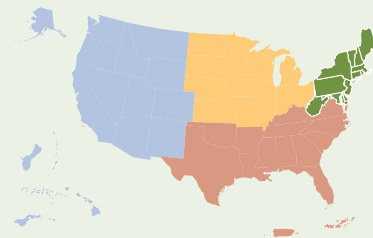
The Whole Animal Buying Guide: To download for free or purchase a hard copy, see <https://store.extension.iastate.edu>.

SARE book: *How to Direct Market Your Beef*.

Download for free or purchase hard copy: www.sare.org/beef.



NORTHEAST SARE



SARE's Northeast region is geographically small and densely populated, and the variation in soils, elevation and climate means that each part of the region has a farming culture of its own. This is why Northeast SARE uses a “many little hammers” paradigm, drawing on results from a wide range of projects to solve problems and build new insights that are localized but also can be applied broadly, across all states in the region, so that a hammer forged in Maine can be adapted to a nail in Delaware.

Building connectedness among the states means building richer relationships with the land-grant universities, investing in and improving state staff and making sure that promising local efforts scale up and add to a region-wide pool of knowledge. Much of the focus of the past two years has been on building capacity both close to the ground and up the ladder: More and better training, improved planning and a focus on projects that show potential for replication.

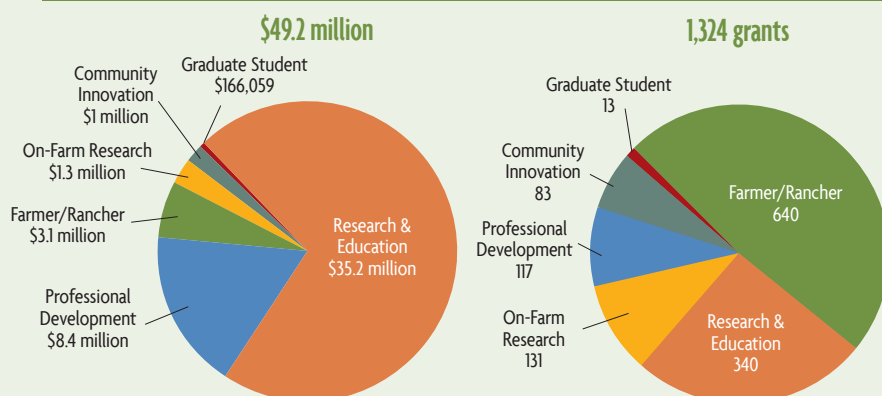
SARE's emphasis on innovation has led to a long history of granting early funding for new ideas, from community-supported agriculture to farm-to-school initiatives. As these ideas mature and move into the mainstream, next-step ideas start turning up in SARE proposals—new approaches like alternative farm financing, new crops like rice and heritage wheat, and new ways of thinking about issues like succession planning, which can prevent the breakup of working farms into suburban house lots.

The three projects profiled here seem, at first glance, highly localized, but all three point outward to ideas and approaches that are at the heart of the SARE mission. One of these projects shows how a project leader can use grant funds serially, in a string of small awards, to look at a single problem from many angles—in this case, the production challenges specific to onions grown in the fragile muck soils found in upstate New York (see page 14). Another explores how a change in technology—a new roller crimper—can encourage the wider adoption of soil conservation and reduced pesticide use (see page 15), and the third helps farmers turn their ideas into profitable and environmentally sound solutions, for example helping producers in the region's northern tier grow their own energy and plan for a post-petroleum world (see page 13).

All three projects are driven by certain ideas—that farmers are full partners in the research that affects them, that farmers are invested in good stewardship and that farmers can be agents of social and economic change. These ideas are deeply embedded in the SARE mission; these ideas also resonate with the next generation of sustainable farmers, who see from the outset that the profession will always make demands on their flexibility and willingness to innovate. As SARE welcomes and supports this rising generation, the program also puts in place the capacity to take the local and deploy it outward, so that good ideas can cross-pollinate freely in the farm community.

SARE Shares in Every State: Pennsylvania SARE Coordinator Charlie White uses his expertise in soil fertility, soil health and innovative cover cropping systems to educate farmers about recent research findings and innovations in the areas of new cover crop species and species mixtures, no-till cover-crop termination methods, cover-crop inter-seeding methods, and insect regulation. Photo by Brian Bates

From 1988 to 2010, Northeast SARE has awarded...



Extension Agent Dynamo + Farmer Ingenuity = Great Solutions

Heather Darby is all about energy, using her own abundance to help Northeast farmers advance their cutting edge ideas—in the end, to the benefit of hundreds of producers across the region. A recipient or participant in nine SARE-funded projects, she has partnered with researchers and farmers to help oilseed producers squeeze more value out of biodiesel, organic dairy farmers grow their own feed and grain growers tap a new market in local bakeries.



University of Vermont Extension Specialist Heather Darby looks at wheat grain with local farmers during a field day at Ben Gleason's farm in Bridport, Vt., where Darby is conducting research to help farmers raise baker-quality grain. *Courtesy the University of Vermont Extension NW Crops and Soils Team*

"I would say that every SARE grant I've received was generated because of the questions and interests of the farmers in Vermont and other nearby areas," says the University of Vermont extension specialist, who often uses her grants to advance great ideas to the point where they attract even more resources. The result: research developed into solutions that are truly useful to whole farming communities.

Many of those questions have been raised by the region's emerging community of biodiesel producers, who are pioneering the use of oilseed crops like sunflower and canola in New England. Darby has partnered with extension colleagues and farmers on two SARE grants to learn more about oilseeds—particularly pest and weed management—and to share their knowledge with others through an oilseed

producers' network.

"What we're studying is more what the requirements are to be able to grow these crops here," says Roger Rainville, an Alburgh, Vt., dairyman who hosts much of Darby's on-farm research.

Darby and Rainville have also discovered that oilseed meal—the main byproduct of biodiesel processing—can be used as a soil amendment that suppresses weeds and provides considerable nitrogen. Thanks

to this research, "most every farmer growing oilseeds has used it as a soil amendment at some point," Darby says.

Now, partnering on a SARE grant with Pennsylvania State University Research Technologist Douglas Schaufler, Darby is working with oilseed farmers to "close the loop" by producing food-quality oil that can be sold to restaurants and then later returned to farmers for biodiesel production. This two-stage life can increase the oil's value by up to 50 percent.



Vermont farmer Roger Rainville loads canola seed into his press as he prepares to make biodiesel. Rainville collaborates with University of Vermont Extension Specialist Heather Darby on many on-farm research projects. *Photo by William DiLillo*

Darby is also helping Vermont's wheat growers learn how to produce grain suitable for local bakers, who have been hesitant to source flour locally because of inconsistent quality. A major issue is insufficient protein in the grain, which is caused by insufficient nitrogen availability during plant growth. Darby has been working with local wheat producers since 2010 to test organic fertilizers and application techniques that will improve protein levels.

There are already results. "Some bakers have made loaves of bread from 100 percent Vermont wheat. Up until a year and a half ago, that had not been done before."

In two SARE-funded projects led by University of Maine Extension Educator Richard Kersbergen, Darby worked with dairy farmers to expand their knowledge of grain production, including the use of

cover crops and no-till with corn silage.

Again, the research was inspired by farmers, Darby says. "Grain prices are really high. They fluctuate rapidly and are one of the biggest input costs on most dairy farms. So farmers were wondering if it would make economic sense to grow their own grains, which to grow, and what the best production practices would be."

For more information, go to www.sare.org/project-reports and search for "Heather Darby."

FREE RESOURCES!

SARE video: *Energy Independence: On-Farm Biodiesel Fuel Production*. To view this video and related free resources: www.sare.org/rainville.

SARE books: *Crop Rotation on Organic Farms* and *Building Soils for Better Crops*, 3rd Edition. Download for free or purchase hard copy: www.sare.org/books.

SARE bulletin: *Clean Energy Farming*. To order free copies or download: www.sare.org/energy.

Research Leads to Profitable, Sustainable Approaches to Onion Production

Onions are one of New York's most valuable vegetable crops, but growers face a host of challenges: For example, bacterial rot cuts deep into profits, and fragile muck soil, in which most onions are grown, is susceptible to up to one foot of erosion every 10 years.



Cornell University Extension Vegetable Specialist Christine Hoepting found that New York and Pennsylvania growers could improve onion yields and reduce bacteria incidence by using alternatives to black plastic mulch, and by increasing planting density. Courtesy Cornell University Cooperative Extension

But the toolbox of solutions is expanding fast, thanks to promising SARE-funded research projects by Cornell University Extension Vegetable Specialist Christine Hoepting, who is using a series of grants to investigate new approaches from conservation tillage to mulches to planting techniques to soil fertility.

In one study, Hoepting got unexpected and positive results: She found that halving plant spacing to four inches could reduce yield lost to bacterial rot by 63 percent beyond growers' standards and could boost net profit by up to \$258 per 100-foot bed for fresh market onions. Using alternatives to black plastic mulch—which absorbs sunlight and can create favorable, warm conditions for bacteria—yielded similarly positive results.

“A lot of growers became aware of how they can manipulate mulches and plant

spacing, so they're experimenting on their own now,” Hoepting says.

One of those growers is Matt Mortellaro, who raises 200 acres of onions for retail distribution on his family's Elba, N.Y., farm. “We've increased densities of our transplanted onions,” he says. “It sometimes results in smaller bulb sizes, which can earn less on the market, but the increased quality more than makes up for it.”

Another unexpected finding helped Hoepting leverage a \$10,000 SARE grant into a \$220,000 grant from the Northeastern Integrated Pest Management Center: She is now studying the relationship between nutrient levels and bacteria incidence, after noticing that a low-lying area of one test plot suffered disproportionately high damage. She speculated that nitrogen buildup was feeding bacteria.

Mortellaro, like most of New York's

larger-scale onion growers, plants most of his crop in muck soil, which, created long ago from drained wetlands, is rich in organic matter but very friable. Wind damage poses a serious problem under conventional tillage practices, especially during planting season.

“I've seen 4-foot drifts of muck. It reminds me of snow,” Hoepting says. “Onions can be decapitated or pulled right out of the ground by strong winds when they're young.”

While most farmers plant protective windbreaks of barley between onion rows, a window of vulnerability exists in the spring, when both the onions and barley are young. With a SARE grant, Hoepting compared minimum-tillage systems that left the residue of fall-planted oat and wheat cover crops on the ground to a conventional system that plowed the residue under.

Hoepting, who received another SARE grant in 2011 to continue this research, found the residue left from minimum tillage effectively prevented erosion, and improved net profit by 9 percent compared to the conventional system.

“It's right only for certain acreage,” says Mortellaro, referring to a farm's most wind-exposed fields. But on the 30 acres where he takes advantage of cover-crop residue, “it's working to my economic benefit enough that I'm going to continue doing it.”

For more information, go to www.sare.org/project-reports and conduct a coordinator name search for “Hoepting.”



An example of bacterial bulb rot. Courtesy Cornell University Cooperative Extension

FREE RESOURCES!

SARE books: *Managing Cover Crops Profitably*, 3rd Edition and *Building Soils for Better Crops*, 3rd Edition. Download for free or purchase hard copies: www.sare.org/books.

Grant Puts (Good) Crimp in Farm Operations

It all began in 2002 with a \$6,500 SARE grant and the seed of an idea. Today, that idea has grown into hundreds of research projects around the country, an international business and a new, effective no-till tool that farmers are adding to the ways they suppress weeds in cash-crop fields.

The tool is the roller crimper, a drum with blades mounted to the front- or back-end of a tractor and used to roll down, crimp and kill cover crops, creating thick, weed suppressing mulch. Until the crimper, farmers were largely left with two weed-control options: cultivate the weeds into submission or spray herbicides. The former disturbs the soil and allows for erosion; the latter is often expensive for conventional farming, and unusable for organic.

"I had the idea for the tool," says Jeff Moyer, director of farm operations at the Rodale Institute in Kutztown, Penn. "But without SARE's help, it might not have happened. That first grant started a whole tidal wave of looking at cover crops differently and it allowed us to build the very first roller crimper."

Today, the roller crimper is a common sight on land-grant university research plots, according to Moyer, who leveraged

that first SARE grant into a larger USDA grant to further refine the tool. One Pennsylvania company, I&J Manufacturing, saw opportunity in the burgeoning technology and now has a thriving business building and shipping roller crimpers domestically and overseas.

Farmers across the country are starting to add the tool to their arsenal of weed control options. Kentucky farmer Joel Armistead, who is collaborating on an EPA-funded project with the nonprofit Cumberland River Compact to explore ways to reduce chemical inputs, says while he ran into problems with the weather, he was able to reduce his spraying considerably by first using the crimper and then spraying just enough to take down the rest of the cover crop.



Jeff Moyer, director of farm operations at the Rodale Institute in Kutztown, Penn., uses a front-mounted roller to kill a hairy vetch cover crop, while a no-till planter drops seed corn behind the tractor. Photo by Matthew Ryan for the Rodale Institute

SARE is continuing to fund other crimper research around the country to explore how the tool works in different climates, geography, and with different cash and cover crops. The crimper, while not a fix-all, has shown promise in using about 40 percent less energy than cultivating or spraying; reducing erosion; retaining moisture; and allowing for more flexibility, since roll downs do not need to be timed to dry conditions.

Tim Bock, who runs a 100-acre certified organic farm outside Kutztown, has tried the roller on more than 20 acres for another SARE-funded project. After two years of success, he plans to completely switch his soybean production to rolled rye. "The results have been outstanding,"

Bock says. "I've really reduced my weed pressure and drastically reduced the number of trips across the field. I eliminated a complete tillage cycle."

Moyer cautions that roller crimpers are not for farming 101. A farmer must be quite experienced with the nuances of their fields and work on rotations that match cover crops to the cash crop. "One must grow the cover crop with the same attention paid to the cash crop."

For more information, go to www.sare.org/project-reports and conduct a search for "roller crimper."

FREE RESOURCES!

SARE books: *Managing Cover Crops Profitably*, 3rd Edition, *Crop Rotation on Organic Farms* and *Building Soils for Better Crops*, 3rd Edition. Download for free or purchase hard copies: www.sare.org/books.

For roller crimper blueprints and related information from the Rodale Institute, see www.rodaleinstitute.org/no-till_revolution.

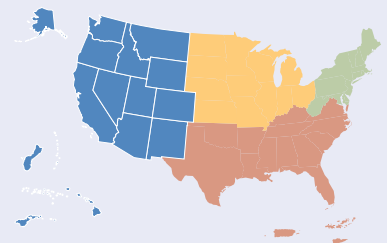


Roller crimpers, which roll down and crimp cover crops to establish a thick mulch, are being used by researchers around the country to demonstrate the tool's effectiveness in organic no-till systems. This roller crimper is at the Center for Environmental Farming Systems in Goldsboro, N.C. Photo by Andy Ziemiński, SARE Outreach



SARE Shares in Every State: Northern Marianas Islands SARE Coordinator Allan Sabaldica puts his background in veterinary medicine to good use: The crops he is holding are supplemental local feed for livestock and can potentially be used to treat animal diseases. He is currently working on a SARE grant to transfer knowledge about medicinal plants for livestock healthcare to the West Pacific. *Photo by Ron Daines*

WESTERN SARE



With its vast region covering 17 different states and protectorates—from American Samoa to Alaska, California to Wyoming—Western SARE could feel a bit challenged in meeting the research and education needs of such a widely diverse group of farmers and ranchers. In fact, western producers have a lot of commonalities arising from their shared love of the land and their communities, and a desire to innovate and remain viable in today's economic climate.

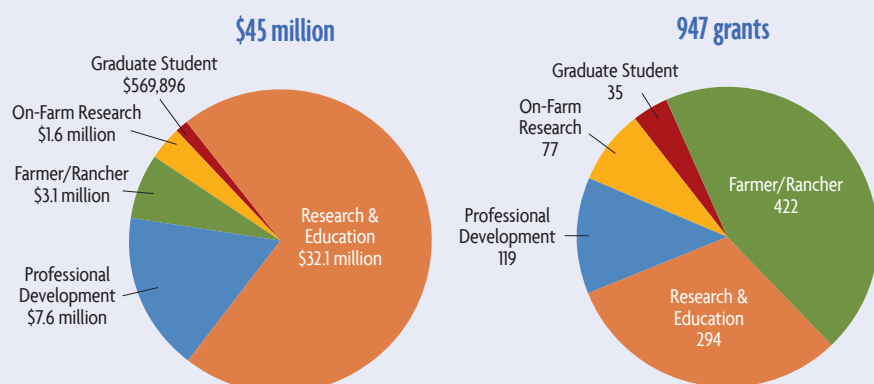
But what exactly are those commonalities and how can Western SARE use them, as well as local differences, to inform its programs? These questions were answered at seven Western SARE-sponsored conferences held in Guam, New Mexico, Wyoming, Washington, Hawaii, California and Alaska. Hundreds of farmers, ranchers and others in the ag sector participated, sharing ideas for the future direction and priorities of the regional SARE program. The lists were long, but Western SARE gleaned the ones oft-cited: filling gaps in regional agriculture infrastructure; addressing water quality and quantity concerns; providing adequate outreach to underserved groups; developing true cost analyses of sustainable agriculture; bringing youth into agriculture; researching impacts of food safety regulations on sustainable agriculture; and including sustainable energy in programs.

The true value of the conferences, however, was not just the listening and list making, but the quick follow up by the Western SARE Administrative Council, whose volunteer farmer, rancher and other ag professional members make SARE's regional grants and priorities. The council members directed SARE staff on ways they could fine-tune the program to reflect the conference gleanings, and in addition, funded nine competitive grants of up to \$50,000 each to target a priority at the local level.

The three projects profiled in this report, one of which was an outshoot of the listening sessions, exemplify the type of novel research and education projects that meet the unique growing and marketing needs of the West's producers. Blair Waldron's work with perennials and legumes is helping ranchers in the semi-arid Intermountain West better manage both their cattle and land (see page 19); Gail Feenstra's case studies, the project that grew out of the listening sessions, will improve regional retail marketing opportunities for farmers of all sizes (see page 17); and the landmark curriculum of Extension Agents Staci Emm and Loretta Singletary is helping hundreds of agriculture professionals bridge cultural- and knowledge-gap divides to better serve American Indians in four states (see page 18).

The number of proposals to Western SARE is on the rise—and regional staff will use all they have learned to work harder than ever to support western farmers' and ranchers' increasing resolve to become more sustainable.

From 1988 to 2010, Western SARE has awarded...



Behind Regional Distribution Successes

Even during a recession, San Francisco-based organic produce distributor Veritable Vegetable and its retail partners are helping regional farmers garner millions of dollars in sales for their organic crops. They do this by pursuing a simple marketing strategy: maintaining the farm label along the value chain, allowing consumers to know exactly where their produce comes from as it makes its way from field to kitchen.



As produce moves through the warehouse of San Francisco-based organic distributor Veritable Vegetable, the originating farm's identity is preserved, meaning consumers know exactly who they are buying their fruits and vegetables from. This values-based strategy has kept sales strong, even in a hard economy. Photo by David Matheson Photography

The strategy has worked: Veritable Vegetable has recently enjoyed massive growth in sales, a 46-percent increase from 2004 to 2009, when annual sales reached \$38 million. And many of the retail partners it sells to are also thriving. "We are making money, even during this bad economy," says a manager at Sacramento Natural Foods Co-op, which buys much of its produce from Veritable Vegetable. "We are getting more people coming in because in this economy, people want to keep local business supported."

Regionally based supply chains—which link farmers to nearby consumers, businesses and institutions, often through distributors—are growing in popularity around the country, and are driven by strong consumer demand. But not all are successful. The lesson to be learned from the Veritable Vegetable example, says Gail Feenstra, a food systems analyst at the University of California, Davis Agricultural Sustainability Institute, is that consumers do not want food that is merely local—they want food with a story. Marketing counts.

Feenstra and consultant David Visher, supported by grants from SARE and other programs of USDA's National Institute of Food and Agriculture (NIFA), studied five values-based supply chains in California, including Veritable Vegetable and Sacramento Natural Foods Co-op, to identify the challenges and opportunities associated with local food distribution and share findings with people thinking of starting such an operation.

Western SARE awarded Feenstra's 2010 grant in response to a special listening session it conducted in California, during which a diverse range of stakeholders said more research was needed on these alternative distribution channels. Her work revealed many findings that illuminated winning and losing strategies for all the players involved.

For example, along with marketing savvy, a deep understanding of the produce distribution industry is crucial for people embarking on this distribution model. Margins are so thin and price information so ubiquitous that in many cases, business

FREE RESOURCES!

SARE bulletin: *Clean Energy Farming*. To order free copies or download: www.sare.org/energy.

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

Check out USDA's Know Your Farmer, Know Your Food website: www.usda.gov/knowyourfarmer.

acumen is crucial to success, Feenstra and Visher say. As a result, they found that nonprofits can easily struggle to support these supply chains compared with private businesses, largely because nonprofits often have less industry experience.

Also, a farmer who wants financing to start a new distribution strategy will likely find obstacles at the bank, because traditional financiers are not familiar with alternative distribution methods.

"Farmers can't get loans to try new distribution strategies, for example if they want to try a branding strategy, or join an aggregation system, which might be a little riskier than going to your conventional wholesaler," Feenstra says.

That is what leads Feenstra and her UC Davis colleague, Shermain Hardesty, to the next phase of their research: learning more about the external participants in a values-based supply chain, including financiers, policy makers and regulators, and the business community, so that these stakeholders might become more knowledgeable about these supply chains and provide more effective support.

For more information, go to www.sare.org/project-reports and search for SW10-810.



Signs like this at the Sacramento Natural Foods Co-op, combined with other marketing techniques, including visits from farmers, help customers know the origin of the produce they buy. Photo by David Visher

Curriculum Helps USDA Build Bridge to American Indians

In the United States, more than one in three farms benefits from a range of direct payments by the federal government, according to USDA statistics. But when it comes to farms operated by American Indians, that figure plummets to nearly one in 10.



On the Duck Valley Indian Reservation, which spans northern Nevada and southern Idaho, horse and cattle ranching is vital to the local economy. It was one of the main reservations surveyed for *People of the Land*, a curriculum designed to help USDA officials improve American Indians' access to USDA services. Photo by Jay Paxson

Missing out on these programs—including conservation programs, disaster payments, loan deficiency payments and others—is one glaring example of how USDA professionals have long struggled to serve agricultural producers on American Indian reservations.

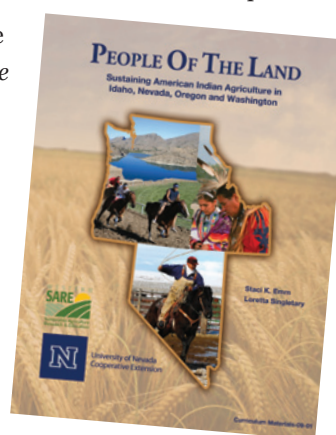
And it is one reason why University of Nevada Cooperative Extension Educators Loretta Singletary and Staci Emm used a SARE grant to develop a broad-based curriculum that helps USDA service providers in four western states understand the unique needs and complexities of agriculture on reservations. “It was important to design an educational program for USDA professionals that explained the obstacles that present themselves when trying to implement a USDA program on Indian trust land,” Emm says.

Along with widely varied cultural traditions, there can be entirely different systems of governance, land ownership and

resource management from one tribe to the next, all of which makes administering a USDA loan, grant or conservation program daunting.

Reception to the 178-page teaching guide, called *People of the Land*, has been so positive that USDA agencies and state departments of agriculture in all four states—Idaho, Nevada, Oregon and Washington—have begun adopting it, and its authors have had to print a second run.

“We’ve stepped up our outreach efforts with tribes immensely,” says Clint Koble, director of the USDA Farm Service Agency in Nevada. “We’ve made a much more conscientious effort in the last year than we have in a long time. A lot of that starts with *People of the Land*, which cleared up a lot of misconceptions.”



FREE RESOURCES!

SARE bulletin: *Meeting the Diverse Needs of Limited-Resource Producers*. To order free copies or download: www.sare.org/bulletins.

SARE books: *Building Sustainable Farms, Ranches and Communities*. Free download: www.sare.org/federalprograms. *People of the Land*. Free download: www.sare.org/peopleoftheland.

Particularly helpful for Koble and his staff of 27—all of whom have received training with *People of the Land*—is the section that explains how hundred-year-old federal policies have created huge land tenure problems, for example where a parcel of land given to an individual in the 19th century might have dozens of owners today.

“That really provides a tremendous challenge to American Indians who want to get financing, because the complexities of tribal land ownership can cloud collateral issues,” says Koble, whose agency provides a variety of loans.

To develop the curriculum, Emm and Singletary started by assessing the agricultural needs of American Indians on the 10 largest reservations in their four-state region, and by speaking with the agricultural professionals who serve them.

Further underscoring the importance of *People of the Land*, Emm and Singletary received a second SARE grant in 2011 to adapt the curriculum to the Navajo and Hopi reservations. Their work also earned them the 2011 National Extension Diversity Award, given to one recipient annually by

USDA’s National Institute of Food and Agriculture, and the Association of Public and Land-Grant Universities.

For more information, go to www.sare.org/project-reports and search for EW05-005 and EW11-006.

Perennial Forage Revitalizes Rangeland

Pervasive cheatgrass has long posed a threat to ranchers and their communities in the Intermountain West. Edging out native perennials and taking over entire rangelands, the annual weed compromises forage value for livestock, destabilizes soil, increases risk of wildfire and diminishes wildlife habitat.

“We’ve reached a point where a lot of times we can’t directly reseed natives into the environment. The soils have been changed” by years of dominance by cheatgrass, says Blair Waldron, a plant geneticist with the USDA Agricultural Research Service in Utah.

But there is new hope in forage kochia, a perennial shrub that Waldron and his colleagues have demonstrated is a stiff competitor against cheatgrass in semi-arid environments and provides excellent, protein-rich forage for cattle. Another promising strategy lies in grass-legume mixes, also a subject of Waldron’s research.

In four years of SARE-funded research, Waldron, Utah State University Beef Extension Specialist Dale ZoBell and others demonstrated forage kochia’s adaptability to semi-arid western rangelands.

They found pastures combining kochia and crested wheatgrass yielded six times more forage than comparison plots of crested wheatgrass alone, largely due to kochia’s tolerance of drought.

In previous research, they demonstrated the profitability of this nutritious blend: Grazing cattle on kochia and crested wheatgrass from November through January cost participating ranchers 25 percent less than feeding alfalfa hay, and resulted in similar body condition scores.

“We concluded these cows that were on forage kochia were near optimal for calving and rebreeding,” Waldron says.

By establishing forage kochia on rangeland damaged by invasive weeds, less land

would be needed to manage more beef cattle. This allows other land to rest, Waldron says. Additionally, because kochia is perennial, it can act as a barrier against wildfires that feed off dead annual weeds.

Waldron has begun a more recently funded SARE project to further expand a rancher’s toolbox, by exploring the potential of grass-legume pastures to meet nitrogen needs while promoting environmental stewardship. Says Waldron, “In the mid-1950s pastures had legumes, but legumes in pastures have become a thing of the past.”

Through on-farm research in southern Idaho and Utah starting in 2011, Waldron and his team plan to compare grass



Blair Waldron, a plant geneticist with the USDA Agricultural Research Service (right), works with Bob Adams (left) and other ranchers to improve rangelands. Photo by Emily Beus

monocultures with low- and high-tannin grass-legume mixtures, anticipating that high-tannin legumes may reduce potential problems with excess nitrogen in a grazing system. They hope to develop recommendations for which species and grass-legume ratios optimize a ranch’s economic and environmental sustainability.

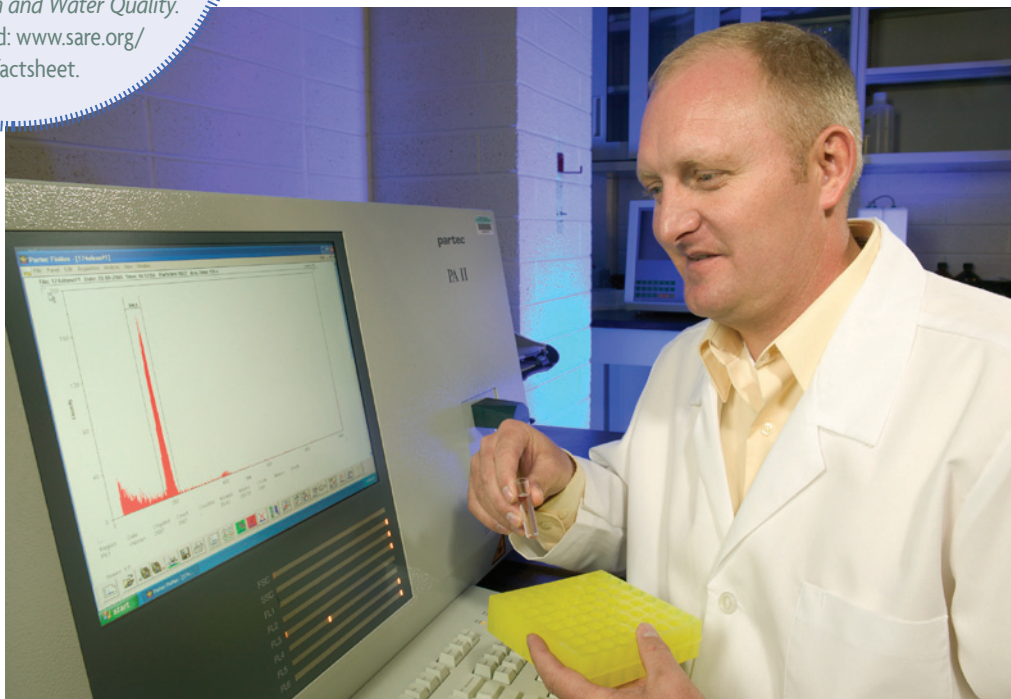
Waldron’s focus now is on different varieties of the shrub, a widespread forage in its native Central Eurasia. One promising variety leads to yields almost double the variety he has been promoting and grows nearly a foot taller, making it more accessible in deep snow.

For more information, go to www.sare.org/project-reports and search for SW04-060 and SW10-088.

FREE RESOURCES!

SARE bulletin: *Rangeland Management Strategies*. To order free copies or download: www.sare.org/rangeland.

SARE fact sheet: *Selecting Cattle to Improve Grazing Distribution Patterns, Rangeland Health and Water Quality*. Free download: www.sare.org/cattlefactsheet.



Using a flow cytometer, USDA Agricultural Research Service (ARS) Plant Geneticist Blair Waldron analyzes the DNA content of new types of forage kochia from Kazakhstan and Uzbekistan. Photo by Peggy Greb, USDA ARS

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 key, useful findings with farmers and ranchers, researchers, and ag educators. Here are some of the ways SARE shares:

New website: SARE.org!

Visit any of SARE's redesigned national or regional sites and navigate seamlessly between them to find a wealth of information:

Want a grant? All information about your region's offerings, under Grants

What does the research say?

Searchable database of 23 years of research and education results under Project Reports

Need info? Free videos, books, fact sheets, online courses and more in the Learning Center

Are you an ag educator? State-by-state programs under Professional Development

Where's the workshop? Nationwide calendar of sustainable ag activities under Events

Who is SARE? All about your SARE region in About SARE

And all sites are mobile-device friendly and offer a mirror site for people with slow internet connections. You can share SARE, too, with RSS, Facebook, email and other share functions.



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