



SARE Celebrating our first 20 years
Envisioning the next...
20th Anniversary Issue **20/20**

Advancing the Frontier
of Sustainable Agriculture

SUSTAINABLE AGRICULTURE RESEARCH & EDUCATION

SARE's **vision** is an enduring American agriculture of the highest quality. This agriculture is profitable, protects the nation's land and water and is a force for a rewarding way of life for farmers and ranchers whose quality products and operations sustain their communities and society.



SARE's **mission** is to advance—to the whole of American agriculture—innovations that improve profitability, stewardship and quality of life by investing in groundbreaking research and education.



SARE's 20/20 featured photographer is long-time sustainable agriculture advocate **Jerry DeWitt** (left). Jerry has served in myriad positions, including interim director of SARE and his current position as director of the Leopold Center for Sustainable Agriculture. Jerry's photos have been published in two books: *People Sustaining the Land* and *Renewing the Countryside—Iowa*. The images on the covers, page 2 and even-numbered pages starting on page 6 are his. Thanks, Jerry!

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from the director

Advancing the frontier of sustainable agriculture

IN 1988, when I submitted a proposal to the very first Western SARE grant competition—and even a decade later, when I stood as SARE’s new national director in front of the crowd at the ten-year anniversary conference—I never dreamed that sustainable agriculture would be where it is today. The vast wealth of innovation and experience SARE and so many others have cultivated during the last 20 years is truly becoming a critical part of everyday American agriculture. Huge shifts are happening.

- Cover crops now build soil health on millions of acres of farmland.
- Once few and far between, more than 4,000 farmers markets and 1,000 CSAs serve communities across the country.
- Organic sales have quadrupled in the last decade.
- Dairy farms and cattle ranches across the country have improved their operations through intensive grazing.
- Many pests and weeds can now be managed with far fewer chemicals.
- American consumers have never cared more about how and where their food is produced.
- Food companies, scientific societies and policymakers are placing sustainability at the top of their agendas.

We are proud of how SARE grantees—from every corner of the nation—

have advanced the frontier of sustainable agriculture. We are proud that our contribution to this great movement is paying off for the nation’s farmers—and the American public.

But can we rest? Are the majority of farmers and their communities sharing in this bounty? Are our water and land safe and clean? While we have made great strides, there is still plenty of work to do. To achieve our newly stated mission—*advancing sustainable innovations to the whole of American agriculture*—SARE must become an even stronger force for change.

This means more groundbreaking research that deepens our understanding and practice of sustainability in its many dimensions: social, economic and environmental. This means spreading our values and mission until sustainability lies at the core of *all* agriculture programs. This means supporting bold private initiatives, such as those we’re already seeing from some food industry leaders. This means supporting research that informs government policies. Most importantly, it means investing in a new generation of committed and creative leaders who can forge new paths to get us where we need to go.

In 2028, I expect to be among the many attending SARE’s 40th anniversary conference, listening to how today’s



Jill Auburn

explorations have blossomed into far-ranging practices, and being awed by new innovations and findings we can’t yet imagine. Yes, we have made great strides never imagined 20 years ago. But to move forward, to make this future possible, each and every one of us must take up the mantle of sustainability, incorporating its fundamental principles into our research, policies, on-the-ground practices—and everyday way of life.

SARE Director
Cooperative State Research, Education,
and Extension Service, USDA

Read on to learn about 20 years of SARE innovation, from the story of our evolution (pages 4–5) to our portfolio in seven priority areas paired with profiles of our grantees’ work (pages 6–19). ▶▶▶▶▶

20 YEARS OF SARE

4

before 1988

An idea ahead of its time: After publication of Rachel Carson's *Silent Spring*, the 1962 exposé about pesticides, reduced-chemical techniques take hold in a small but growing community of farmers and ranchers. In 1980, USDA publishes the landmark *Report and Recommendations on Organic Farming*. Its findings are just ahead of their time. The incoming administration disbands the report team, but its authors and others continue to press for change.

SARE is conceived: Congress responds to the growing chorus for a government sustainable agriculture program and passes the Agricultural Productiv-



North Central Region Photo Contest Winner, taken by Steve Pope: Pope is a long-time associate of Frank R. Reese, Jr., (depicted), who is a fourth-generation Kansas farmer and breeder of pastured heritage turkeys.

ity Act, which will become SARE. No funding accompanies authorization.

1988

Congress funds in millions: What some experts say will take more than a year takes eager sustainable ag pioneers only six months to establish: a science-based, grassroots, problem-solving, business-not-as-usual grant program. On hand is Congress' first appropriation: \$3.9 million.

What to fund? Never before has so much attention and money been readily available for researching sustainable agriculture. First up is testing and further developing fundamental approaches, such as cover crops, rotational grazing and composting.

1991–1994

The big buy-in: The Environmental Protection Agency contributes \$1 million per year to an EPA/SARE collaboration called Agriculture in Concert with the Environment. The program continues until 2001.

Spreading the word: Relatively few outside the sustainable ag community hear about groundbreaking work in SA, or know how to get started. SARE forms a national outreach office, which quickly begins producing practical, how-to bulletins and books.

Funding for farmers and educators:

Recognizing the importance of farmers'



Western Region Photo Contest Winner, taken by Heidi Rader: A third-generation Alaskan, Rader works as an Agriculture and Horticulture Agent at the University of Alaska, Fairbanks. This is a photo of Romanesco Veronica FI, which is grown and sold locally as it does not travel well.

on-the-ground experience, SARE begins funding farmer-led research directly. Congress also adds funds for SARE's Professional Development Program.

1995–2000

Public catches on: Sustainable and organic practices start hitting the mainstream press. *National Geographic*, for example, publishes a centerpiece article featuring SARE grantees' work.

Fine tuning the portfolio: SARE adds new target areas—marketing, local production and on-farm energy efficiency and renewables.

Major shift at USDA: A SARE-initiated working group on sustainable development persuades the Secretary

of Agriculture to issue a historic memorandum pledging that sustainability will be a key component of all the department's policies and programs.

New partners: The USDA National Agroforestry Center starts a six-year co-funding program with SARE to help farmers develop agroforestry. The Agricultural Marketing Service matches SARE funds with \$250,000 to examine the potential of new and emerging marketing opportunities in sustainable agriculture.

Next generation: SARE begins awarding grants to cutting-edge graduate student research.

Southern Region Photo Contest Winner, taken by Robert Friedman: Friedman photographs his sustainable farming experiences around the country and abroad. This photo was taken on a Georgia organic farm.



Northeast Region Photo Contest Winner, taken by Troy Bishopp: Known as “The Grass Whisperer,” Bishopp operates a fifth-generation, grass-based farm and also works as a county grazing specialist. He took this photo at Sunrise Dairy Farm in N.Y. Grazing cattle saves feed, fuel and labor costs, and builds a sustainable future for the next generation.

2001–2004

Smithsonian exhibit: A special SARE-supported exhibit debuts at the Smithsonian National Museum of Natural History, “Listening to the Prairie: Farming in Nature’s Image.”

Top practitioners recognized: SARE launches the Patrick Madden Award for Sustainable Agriculture to recognize stellar farmer and rancher innovation in the field.

2005–2007

Change happens! Evaluations of SARE programs show real progress on the ground: 64 percent of farmer/rancher grantees said their SARE project helped them achieve higher sales and 79 per-

cent experienced improved soil quality. Three-quarters of educators in two SARE regions have led at least one educational program to share innovations with farmers, ranchers and the public. And after reading a SARE publication, 53 percent of producers report using a new production technique.

2008

20th Anniversary! SARE celebrates 20 years of innovation on the farm and ranch—to date, 3,700 projects funded and an annual budget of nearly \$19 million. SARE plans for 20 more years!

Note: Our four timeline images are the regional grand-prize winners of SARE’s 20th Anniversary New American Farm Photo Contest.



ADVANCING THE FRONTIER OF STEWARDSHIP

STEWARDSHIP of the land and water: It's at the heart of sustainable agriculture, and SARE's research portfolio. Management intensive grazing, cover crops, nutrient management, conservation tillage, composting and a host of other sustainable practices all aim to protect our natural resources—and cut costs—by keeping soil and nutrients on the farm.

Stewardship is also about protecting natural resources in a way that preserves the family business and nearby communities. While SARE grantees have made great strides in developing best practices, SARE will continually seek out new opportunities to help farmers and ranchers keep operations profitable while being excellent stewards of the land and water.

Project Sampler

■ In Maryland, SARE cover crop researchers learned the best ways to manage not only rye, now the cover crop standard, but also mixtures of grasses and legumes. They found that mixtures are especially adept at keeping nutrients—particularly nitrogen—from leaching into the Chesapeake Bay. The mixtures also add nutrients for the next crop.

■ A SARE-funded research team in Minnesota created the Monitoring Tool Box to help farmers measure the impact of management intensive grazing systems on soil health and wildlife as well as farm finances and communities. The Tool Box quantifies the system's impact by evaluating pastures, streams, pests, economics and quality of life, among other indicators of change.

■ An Oregon researcher found that strip tillage effectively reduced soil disturbance. The method also saved time, labor and fuel, retained water, increased fertility and organic matter, and reduced erosion. Today, across the West, plows gather cobwebs as farmers hitch up tools that have a lighter touch on the land.

■ In Mississippi, educators disseminated information about sustainable livestock production to more than 1,600 participants at some 15 events, including face-to-face training sessions, field days and short courses. The project extended its reach by using a wide array of media, from popular press articles to the Internet. Multi-county teams throughout Mississippi continue to focus on sustainable beef production.

Getting the Word Out

The SARE library on stewardship is extensive, including such books as *Managing Cover Crops Profitably* and *Building Soils for Better Crops*; a conservation curriculum for small-acreage owners, *Living on the Land*; and bulletins, such as *Smart Water Use on Your Farm and Ranch*, *Profitable Pork*, *Profitable Poultry* and *Diversifying Cropping Systems*.

Patch Burning for Cattle and Prairie: Doing Well by Doing Good

Kansas rancher Jane Koger, who raises 125 head annually in a cow/calf herd, is trying an ambitious new strategy to protect the rare prairie ecosystem on her ranch. The resulting “patch burning” system she developed with conservation organizations, along with help from a SARE grant and her Natural Resources Conservation Service (NRCS) field office, seems a promising practice to maintain the health of her 4,000 acres of tallgrass prairie and its diverse native species.

Like her ranching neighbors, Koger used to burn her entire acreage of prairie yearly to improve its nutritional value for cattle. Yet full-scale burning destroyed habitat for species like the rapidly declining greater prairie chicken, as well as native plants.

Koger learned about a patch-burning project in Oklahoma that featured burning one-third of the property each

year, with a repeat cycle during the following three years.

Data from Oklahoma State University showed that yearling cattle will gain as well under patch burning as with annual burns.

Koger also rents land to two other ranchers, who raised 550 head of yearlings and 60 head of cows in the experimentally burned pastures. “We know we can produce Big Macs, but we’re losing some of our bird species,” she said. “This is a better way to protect them.”

The fires mimic historic patterns in nature. They also control the movement of the livestock, which migrate to the burned area a few days after the fire is out. The new growth is more palatable than older grasses, said Koger, who saw her cattle spend 80 percent of their time in a just-burned patch. Moreover, patch burning leaves two



MARYA L. WEIGELT

Above Jane Koger, a patch burning pioneer. Below Patch burning protects the prairie and maintains good cattle forage.

years of old-growth grass, creating more fuel for a hotter burn in the next cycle, which clears out invasive species.

More and more farmers and researchers are experimenting with patch burning. At South Dakota State University, for example, SARE-funded researchers are exploring the technique to better balance ranching with habitat diversity.

Koger understands that ecological considerations alone are not likely to be sufficient motivation for change among traditional ranchers. However, she says, “We do have high hopes that others might be willing to consider a proven double-bottom-line approach that allows them to do good for the environment while continuing to do well in the cattle business.” [For more information, go to www.sare.org/projects and search for FNC04-496.]



JEFF VANUGA, NRCS



ADVANCING THE FRONTIER OF **ORGANIC FARMING**

DEMAND for organic food is far outpacing supply as U.S. sales in this dynamic sector have quadrupled in the last decade. While many farmers have long been committed to organic production, new ones are joining the fold every day: All 50 states have USDA-certified organic farmland, totaling more than 4 million acres of range, pasture and cropland.

SARE was the first federal program to fund research in organic agriculture, a whole-farm management system that includes replacing synthetic materials with methods that mimic natural ecological processes. An independent study found that the SARE organic portfolio—about 12 percent of SARE’s research and education projects—provides what organic farmers need most: practical research and new innovation for best practices.

While early research explored the economic viability and environmental benefits of fledgling organic systems, SARE is now focusing on second-generation research, improving the functioning of organic systems and minimizing risks. SARE’s portfolio will continue to evolve to provide high quality research and information to transitioning farmers and ranchers and the ag professionals who work with them.

Project Sampler

- In North Carolina, long-time tobacco grower John Vollmer used a SARE grant to research organic methods and “unhook” from tobacco by growing organic strawberries. Vollmer’s successful transition allowed him to keep the farm in the family.

- SARE funds training in organic across the country: A two-year effort in Ohio used workshops and farm tours to teach key strategies for successful transition to organic grain and livestock production.

- Large-scale vegetable growers in California’s Salinas Valley successfully converted to organic, thanks to a SARE-funded research-grower initiative at the University of California. The researchers monitored fields and provided feedback to the growers, who, in turn, adapted their strategies.

- SARE-funded research at the Rodale Institute in Pennsylvania is helping solve a conundrum for organic farmers: How to control weeds and add natural inputs, such as compost, without using soil-eroding tillage.

Getting the Word Out

SARE’s Professional Development Program has provided Extension training in organic in nearly every state. Further, SARE has published an array of materials on organics, including a 32-page bulletin, *Transitioning to Organic Production*. SARE books such as *Building Soils for Better Crops* and *Managing Cover Crops Profitably* are rich with information on best practices.



Cornell University's Anu Rangarajan works to advance organic agriculture in the Northeast.

Tackling the Thorny Issues, Linking Practitioners

As the ranks of organic farmers swell in America, so does the need for answers to tough problems in organic agriculture. For example, how can weeds be controlled without soil-eroding tillage? How can risk be minimized? How can farmers learn from one another? Thanks to researcher/educators like Anu Rangarajan of Cornell University, new and transitioning Northeast farmers are getting some answers.

With funding from SARE, Rangarajan is advancing the next generation of organic agriculture with a three-pronged approach: conducting field research on new innovations, training educators, and bringing farmers and educators together.

In the field, Rangarajan has been tackling one of the thorniest issues in organic farming: reducing tillage. Many farmers cut back on tillage to combat soil erosion and compaction. This practice, however, conflicts with organic

agriculture, which has long relied on tilling to manage weeds and incorporate green manures, compost and other inputs.

Rangarajan is testing the effect of “zone tilling” on yields in both organic and conventional vegetable systems. Zone tilling limits tillage to four-to-eight-inch slots into which a farmer later plants. By leaving soil-building crop residue behind, the technique reduces soil erosion and conserves organic matter, key conditions for successful organic farming.

She credits SARE for giving her the necessary time and support to experiment with this long-term strategy. “Many grants give you money for a year or two but SARE is in it for the long haul.”

George Ayres of Fresh-Ayr Farm in Shortsville, N.Y. is a Northeast farmer benefiting from Rangarajan’s work. Ayres collaborates with Rangarajan on

research to build soil health by reducing tillage. Although he has not completely transitioned to organic, he has found that the water- and soil-conserving crop residue left behind by zone tilling helps build soil and manage weeds, thus reducing the need for fertilizers and herbicides. Says Ayres, “Anu is challenging us all to get away from chemicals entirely. That’s really the goal. We’d all like to be able to avoid buying herbicides if we can.”

Field research and collaboration must go hand in hand, according to Rangarajan, who is also SARE state coordinator for New York. She helped found NEON, the Northeast Organic Network, a forum for farmers, researchers, extension educators and nonprofits to share information across state lines. She also co-organized a SARE-funded, eight-month organic agriculture training for extension educators.

Emilie Swackhammer, one of 22 extension educators selected for the course, says she can now better assist transitioning farmers in Pennsylvania where she works. As a result of the seminar, Swackhammer was asked to join the board of directors for Pennsylvania Certified Organic, the state’s only USDA certifying agency.

Rangarajan is quite pleased with the results of the training program. “These educators are now developing training in their own states. The network is expanding.” [For more information, go to www.sare.org/projects and search for LNE06-245 and ENE04-086.]



ADVANCING THE FRONTIER OF

PEST MANAGEMENT

MITES AND DISEASE attack our pollinators, parasites infest our livestock, insects eat our crops, and weeds compete with crops for nutrients and sunlight. Every year, for example, agricultural pests damage or destroy more than 30 percent of crops worldwide, a number that has remained constant since the 1940s, despite widespread use of agrichemicals.

Pests develop resistance, overcoming the most potent single-tactic solutions. That's why SARE has long-focused on exploring a combination of ecologically based measures that manage rather than outright control pests. Such an approach necessarily considers the farm as a whole system, leading many farmers to redesign operations to capitalize on nature's own solutions. Today, thousands of farmers successfully combat pests with a toolbox of strategies: crop rotation, a variety of cover crops and forages, and better detection, to name a few.

As pests continually adapt to and resist our best efforts, SARE will also adapt its approaches, funding research that seeks successful, multi-faceted, systems solutions.

Project Sampler

■ Consider the corn rootworm, which has side-stepped every single-tactic solution ever developed. The multi-faceted approach has had more success. For example, an early SARE project in Minnesota explored the use of conservation tillage, manures and crop rotation. Not only was rootworm reduced, but also erosion, nitrogen leaching and weeds.

■ Hundreds of growers in the South adopted SARE-funded researchers' recommendations for pest-plagued cotton: conservation tillage, cover crops and various seeding tactics. The result: fewer pesticide applications, and also fewer earworms and budworms, and less erosion. Only yields—and profits—increased.

■ Many New England farmers have adopted a perimeter trap cropping strategy recommended by a SARE-funded researcher who tested the theory during two seasons—with terrific results. A Connecticut farmer planted squash around his cucumber field, sprayed minimally, and in the next years, harvested a bounty.

■ In Montana, a SARE project integrated sheep into wheat/alfalfa systems, which yielded multiple benefits: suppressed wheat stem sawfly, alfalfa weevil—and weeds. At the same time, ranchers gained a profitable commodity, lamb, which could be raised on low-cost and otherwise unused crop residues.

Getting the Word Out

In addition to countless SARE-funded field days and trainings, SARE has published several practical guides and handbooks, including *Manage Insects on Your Farm* and a 20-page bulletin, *A Whole-Farm Approach to Managing Pests*.

A Toolbox of Innovations to Control Small Ruminant Parasites

The growing ranks of ethnic groups across the South have spurred a sudden demand for specialty meats, particularly goat and sheep. Sales have been brisk. A wrench in the works, however, threatens the new businesses: widespread invasion of *Haemonchus contortus*, or barber pole worm.

The blood sucking parasite lodges in the animals' intestines, causing anemia, bottle jaw and eventually death if left untreated. Overuse of chemical dewormers has greatly increased the worms' resistance, making them almost impossible to control. One female can lay more than 5,000 eggs per day.

Thanks to funding from SARE, the Southern Consortium for Small Ruminant Parasite Control (SCSRPC) was formed to research and educate farmers on alternative parasite control. The consortium's scientist, veterinarian and extension members developed a toolbox of affordable techniques that dramatically reduced the need for costly and increasingly ineffective chemical deworming agents.

A diagnostic tool called FAMACHA is one of the consortium's important findings. The tool is a chart that matches eyelid color to anemia levels, an indicator of parasite infection. This allows farmers to target treatment only to infected animals, which in some systems has reduced use of deworming agents by 90 percent.

FAMACHA has become the standard in detection and costs only \$10 for a card printed with the chart. According

to Thomas H. Terrill of Fort Valley State University, one of the founders and current coordinator of the consortium, more than half of the charts—about 11,000—have been sold in the United States. "It's an indication of how big a problem it is in the U.S.," says Terrill. "The farmers were desperate and it's a cheap, simple tool."

Linda Coffey, a goat farmer and specialist, says FAMACHA has had a great impact. "It reduces dewormer use, thus saving money, and it slows down resistance problems. Just as important, it allows the farmer to select breeding stock that is not anemic. That strengthens the flock over time."

Feeding copper oxide wire particles to parasitized animals is another promising method. Although reasons are unclear, this reduces infection rates in lambs and kids up to 90 percent.

Terrill is focusing on sericea lespedeza, a forage containing high amounts of tannins, which dramatically reduce

parasites in many types of livestock. Terrill's project is one of a handful of SARE-funded research projects investigating the forage, including projects on an Ohio farm and at Louisiana State University. Another SARE project at the University of Maryland Eastern Shore is exploring high-tannin grain sorghum to control parasites.

Terrill says there is no silver bullet for parasite control. "It's a combination of tools. So we are moving into the next phase of trying to figure out the right anti-parasitic formula for each farm." [For more information, go to www.sare.org/projects and search for LS02-143 (SCSRPS), LNE05-232 (UMES), GS07-059 and GS05-047 (LSU), and FNC05-564 (Ohio).]

Tom Terrill (left) and Will Getz, researchers from Fort Valley State University, use the FAMACHA technique to better identify goats infected with parasites. This allows for more targeted use of deworming agents.



AYANNA MCPHAIL



ADVANCING THE FRONTIER OF **MARKETING**

NEVER BEFORE have American consumers cared more about how and where their food is produced. This provides a perfect opportunity for farmers and ranchers across the country to creatively direct market their products and capture more of the consumer dollar. Farmers markets, value-added products, pick-your-own farms, Internet sales and marketing to restaurants are just a few ways farmers are putting the power to turn a profit back in their own hands.

SARE supports this new breed of innovator, investing country-wide in a diverse array of marketing research and on-the-ground initiatives. To leverage even more support, SARE has partnered with USDA's Agricultural Marketing Service to further develop new and emerging marketing opportunities.

Today's markets pose grave challenges but also unprecedented opportunities for America's farmers and ranchers. Helping producers tap all the markets have to offer will remain central to SARE's funding portfolio.

Project Sampler

■ In Iowa, Jeff and Jill Burkhart had already opened an on-farm bottling plant and creamery before they received a SARE grant to test two marketing strategies: an open house and a website. To include other farmers in their venture, they turned the creamery store into a local foods marketplace, featuring farm products from 76 other Iowa families.

■ In Mississippi, more than 400 educators and processors received training in sugar cane and sorghum syrup production, processing and value-added marketing. Syrup prices increased more than four fold, returning nearly \$2,562,000 to producers during the four-year project, all thanks to a SARE project at Alcorn State University.

■ In the Northeast, SARE launched a farmer-educator program to ramp up educational efforts. Elizabeth Henderson, a renowned expert in community supported agriculture and a SARE farmer-educator, used SARE funding to help producers assess potential CSA ventures.

■ The Southwest Marketing Network, a collaborative of tribal communities and farmers, ranchers and service providers in the Four Corner states, used a SARE grant to develop "distance learning tools" to increase producers' profitability. The tools—training videos and DVDs—taught nearly 500 producers and buyers about such topics as cold-frame building and season extension.

Getting the Word Out

SARE's bulletin *Marketing Strategies for Farmers and Ranchers* offers tips and farmers' stories on how to get started. Farmers can dig deeper with SARE's book *How to Direct Market Your Beef*, the online *Direct Marketing Resource Guide*, and the SARE-funded *Legal Guide for Direct Farm Marketing*.



Left Red Tomato's marketing savvy on display with its Eco Apple branding. Below Michael Rozyne, founder of Red Tomato.

Fair Trade Strategy for Northeast "Eco-Growers"

For Northeast apple farmers it was a matter of survival. Facing a perfect storm of rising land, oil and labor prices, along with fierce competition from China and Chile, the apple farmers needed to find new revenue streams fast. They began a collaboration with Red Tomato, a Massachusetts-based nonprofit organization that helps connect consumers to family farmers who sell products grown with organic, integrated pest management (IPM) and biodynamic farming methods.

The apple farmers and Red Tomato launched Eco Apple, a project that markets locally grown apples certified by the IPM Institute of North America. The number of producers in the program quickly doubled, and Red Tomato's marketing savvy has placed their apples in national chains like Trader Joe's, Whole Foods and Stop & Shop, among others. Sales of Eco Apples have jumped from 7,500 cases in 2003 to almost 50,000 cases in 2007.

Eco Apple is just one program of

Red Tomato, which has been helping farmers maximize volume, quality and price for more than 10 years. SARE was one of Red Tomato's early supporters, awarding a grant that got the group off the ground and allowed it to experiment with different ways to help farmers. In those first years, Red Tomato tried acting as a distributor for small farmers' products. Enormous costs and brutal competition, however, forced it to shift to its current focus on marketing. "SARE recognized early on how important it was to support us at such an early stage," says Red Tomato founder Michael Rozyne. "They gave us money at the most crucial moment."

Rozyne was one of the original founders of Equal Exchange, an international coffee company that ensures fair prices for producers. With stiff competition squeezing many American small farmers out of business, Rozyne decided to implement a similar program for farmers at home. Starting with six producers, the organiza-

tion now works with 30 in the Northeast and 12 in the South, mostly fruit and vegetable growers.

John Lyman of Lyman Orchards, one of Eco Apple's originators, says that Red Tomato's pricing strategy was essential to his orchard's success. "They get a good premium on our produce, which we didn't get ourselves. Rather than a one-price-fits-all philosophy, they believe in the value of differentiation. With other brokers, you might be one of many, but with Red Tomato, their focus is on the supplier. The big difference with them is loyalty."

When SARE originally awarded its grant in 2002, a handful of Red Tomato producers collectively earned \$500,000. In 2007, the 42 producers working with the organization made an impressive \$2.1 million. With sustainable farming growing fast in the Northeast, Red Tomato's strategies are critical for ensuring fair trade for small-scale "eco-growers". [For more information, go to www.sare.org/projects and search for LNE02-165.]



PHOTOS COURTESY OF RED TOMATO



ADVANCING THE FRONTIER OF **SYSTEMS RESEARCH**

“WHEN WE TRY to pick out anything by itself, we find it hitched to everything else in the universe.” Naturalist John Muir’s quote holds especially true on the farm, where daily practices are closely linked to soil, water and, ultimately, the economic health of the farm. That’s why SARE has continually invested in what is called “systems” research, which explores not only the ecological but also the financial and social interactions that make a farm productive *and* healthy *and* a force for strong communities.

Consider one of SARE’s core values: “...SARE invests in holistic approaches where crops and livestock are pursued as part of a larger system that includes natural landscapes and resources, communities, livelihoods and human well-being.” SARE is committed to placing systems thinking at the heart of its initiatives, from large-scale research projects that simulate real farms to an expectation that all grantees consider impacts on farms, landscapes and communities.

Project Sampler

■ SARE provided funding for one of the first and longest running trials comparing whole systems: the Sustainable Agriculture Farming Systems (SAFS) project at the University of California, Davis. The experiment compared four systems, researching the effects of different management techniques on weeds, disease, soil quality, economic viability and more. The project showed concrete benefits of organic farming and best practices for area farmers.

■ In the long-term Wisconsin Integrated Cropping Systems Trial, small grains were added to a traditional corn-soybean rotation. This significantly reduced disease pressure and bumped up soybean yields. Based on 2004 prices, the expanded rotation returned \$43 more per acre than the original rotation.

■ West Virginia researchers found that sheep and chickens could be integrated successfully into crop rotations of four and seven years. They also found that crop yields benefited from compost applications. Insects, such as the Mexican bean beetle, and seed and root rot diseases were successfully managed using organic techniques.

■ SARE-funded research at Texas Tech University showed that farmers could successfully integrate pastures into existing cotton monocultures to reduce demand for water and energy. Compared to continuous cotton, the integrated crop/livestock system requires 23 percent less irrigation, 40 percent less purchased nitrogen fertilizer and fewer pesticides.

Getting the Word Out

SARE will publish a book providing how-to advice for scientists interested in systems research. From bulletins to books, almost all SARE materials contain information on applied systems research.



Left Paul Mueller, director of CEFS Farming Systems Research Unit. Below CEFS Pastured-based Dairy Unit.

Experimental Farm Helps North Carolina Farmers

Specialty crop farmer Alex Hitt hesitated when a team of scientists asked him to help launch a research project. Designed to test sustainable practices under the same skies and soil conditions as North Carolina's working farms, the 2,100-acre experimental farm would truly be a long-term commitment. Major results couldn't be expected for about seven years. The project would bring together myriad partners—from researchers to farmers to government officials and community leaders—and juggle as many viewpoints. "Its scope in terms of time and size was scary, but our determination to go ahead brought into focus just how important we believe long-term, field-scale systems research is," recalls Hitt

Today, 14 years after its dedication, the Center for Environmental Farming Systems (CEFS) has produced a wealth of field- and time-tested data. Scientists from CEFS partnering organizations—North Carolina State University, North Carolina A&T State University and the state department of agriculture—monitor everything from weeds to disease to soil health across six different farming research units:

dairy, pastured beef, organic cropping, small farm, alternative swine and farming systems. CEFS also offers training and market research in sustainably raised swine, organic grains and community supported agriculture.

The birth of this large-scale project wasn't easy. Before operations could begin, the partners spent four years hashing out details and mapping the site's widely varied farming conditions. SARE supported the project from the get-go. Says Paul Mueller, director of CEFS Farming Systems Research Unit, "SARE got us off the ground. It bought into the systems approach early on, and it continues to be a platform for systems thinking." SARE has funded the farming systems unit as well as a number of graduate and faculty projects.

The research has been steadily yielding information nuggets. For example, the CEFS organic transition experiment has showed that careful weed management can generate organic soybean yields equal to conventional beans during the first year of a transition.

CEFS researchers also found that conservation tillage can be a way to cut back on soil erosion. And rye, with its

allelopathic properties, can help reduce the need for herbicides. Mueller expects that in the next 3–4 years, the research will illuminate ways to significantly reduce tillage in organic systems.

"Nested" experiments—shorter-term projects within the ongoing longer-term efforts—are used to test specific questions arising from the main research trials. For example, one study compared heritage turkeys with conventional broadbreasted turkeys raised on pasture. CEFS' results helped several area farmers, including Hitt, introduce turkeys onto their farms.

Hitt credits his working relationship with CEFS for exposing him to many new ideas, such as grafted tomatoes and changes in irrigation to help reduce soil borne disease.

"Who knows what new idea we may glean next from the CEFS research," says Hitt. "These things slowly build in your head and then we take them into the field. That's what long-term systems research accomplishes." [For more information, go to www.sare.org/projects and use the search term CEFS.]





ADVANCING THE FRONTIER OF

CLEAN ENERGY FARMING

SINCE ITS BEGINNING, SARE has invested in clean energy innovation. Many practices at the heart of the SARE portfolio do triple duty: conserving water, soil and energy. Conservation tillage, for example, can dramatically cut back on tractor passes. Spare use of costly fossil-fuel-based fertilizers and pesticides saves energy, protects land and water—and helps balance the farm budget.

Today, as America's farmers grapple with large-scale biofuel production, global warming and whopping fuel bills, SARE is stepping up its commitment to clean energy innovation with research and on-the-ground energy initiatives in every corner of the nation. These projects are helping farmers make their operations more profitable and efficient with solar, wind, energy-efficient buildings, fuels grown and processed on the farm, and more.

Project Sampler

■ A Missouri orchard farmer used a SARE grant to test a still that turns waste fruit into fuel. He even constructed his own solar collector from a used satellite dish to preheat the still. He also planted pastures with nitrogen-fixing legumes to cut back on fertilizers.

■ In Vermont, one SARE-funded farmer is producing biofuel from his fields of brilliant yellow canola. Because of its deep root system, natural resistance to some pests, and the way the resulting fuel tolerates low temperatures, canola functions well as both an energy and cover crop. The farmer also sells the byproduct, canola meal, for cattle feed, which helps ensure profitability.

■ In the Texas panhandle, one rancher used SARE funds to experiment with drought-tolerant perennial forages to save on costly and fuel-intensive water pumping from the ever-lowering Ogallala aquifer.

■ Biogas technology has been used for centuries in Asia to treat organic waste, produce nutrient-rich fertilizer, reduce odor and other emissions, and generate renewable energy. Few U.S. farms currently use the technology, and current commercial designs don't apply to smaller farms. Researchers in Washington adapted three small-scale plants to cold weather and are testing them on farms in different agro-climates in the state.

Getting the Word Out

In 2008, SARE released *Clean Energy Farming*, a practical 20-page bulletin on how farmers and ranchers can use innovations to improve efficiency and generate renewable energy on the farm. SARE is also working with other agencies, including the Department of Energy, to share knowledge about the role farmers and ranchers can play in building a sustainable energy future.



VICTOR ESPINOZA, NMSU

New Mexico farmer Don Bustos uses a solar-heated greenhouse, allowing him to farm year round.

New Mexico Grower Saved by the Sun

Perched at the edge of the Sonoran desert, Don Bustos' family farm has always been endowed with ample sunshine and daylight. However, the New Mexico grower had long been bedeviled by cool temperatures that limit the growing season to four or five months. With the short season and rising fuel costs threatening his ability to support his family, Bustos decided to tap nature's own unlimited and free energy source: the sun.

Heating a greenhouse with solar power was a logical choice for Bustos, who incorporates principles of sustainability throughout his three and a half acres of certified organic land in the small town of Santa Cruz. "I wanted to be more light on the earth and use energy more consciously," said Bustos, who grows more than 72 varieties of horticultural crops.

Bustos also had a powerful economic incentive: One winter, he received a \$700 gas bill for one month's heat for the greenhouse. Thanks to a SARE grant, Bustos was able to test a root-zone thermal heating system.

To minimize costs, Bustos picked up recycled solar collectors from a building demolition site. Heating fluid runs from the panels through a closed-loop system of buried copper tubing to an underground tank just a few feet away from the panels. The tank's warmed water is circulated through plastic tubes under the greenhouse's beds, raising root-zone soil temperatures to a comfortable 48 to 52 degrees.

The first season was extremely successful, cutting annual heating costs from \$2,000 to zero and increasing yields 30–40 percent over those from the standard cold frame. The only

ongoing costs related to the solar heating system are a \$5 monthly electricity charge for two water-circulating pumps.

Thanks to the solar-heated system, Bustos can produce a steady supply of vegetables and greens from October to March. During frigid nights, Bustos uses sheets of polyester to create heat-retaining igloos over the beds. The system even works in reverse: When the soil is too hot during summer, Bustos runs the pumps to circulate water now cooled by the geothermal properties of underground storage.

Bustos has a solid, local market for his winter crop thanks to a strong collaborative effort among the New Mexico Department of Agriculture, private citizens and farmers that permits the Santa Fe school district to buy directly from growers. This helps him cut transportation-related energy use and adhere to his philosophy of marketing his food within 28 miles of his farm. Bustos is investigating how to get entirely off the grid by increasing energy efficiency, expanding the solar panels to the house and filling his tractors with biodiesel.

For Bustos, the solar greenhouse and its economic benefits fit perfectly with his philosophy of keeping the land in the family. "We wanted the ability to retain our land for future generations and not have to develop it into houses," said Bustos. *[For more information, go to www.sare.org/projects and search for FW05-011.]*



ADVANCING THE FRONTIER OF **COMMUNITY**

SUSTAINABLE AGRICULTURE is helping rewrite the story of rural America's out-migration. Between 2000 and 2003, population declined in nearly 60 percent of rural counties as young people and families followed the economic lure of larger cities. But in more and more communities around the country, a host of new initiatives and farm-based enterprises—from value-added products to horticulture education—are helping revitalize local economies.

SARE invests directly in community development initiatives and research through its Sustainable Community Innovation Grants in the South and Northeast, and other programs in all regions. SARE also partners with Regional Rural Development Centers, which directly involve land grant universities with communities to find new strategies for keeping people and profits at home.

Project Sampler

■ Southern SARE has teamed up with the Southern Rural Development Center to implement a community grants program. The program funds such initiatives as nutrition classes centered on local foods and agritourism training for county officials and farmers. Including a one-time contribution of \$200,000 from the Appalachian Regional Commission, the program has invested more than \$700,000 in 60 community projects.

■ In Maine's Hancock County, a SARE-funded project connects farms and schools to open new markets for farmers while improving child nutrition. As of fall 2007, a total of five schools—820 students—will regularly purchase from eight area farms. Maine Extension distributed a farm-to-school directory to every county office.

■ Latinos comprise one of the fastest growing farmer groups in America. A tri-state project in Illinois, Michigan and Missouri helped Extension and other educators design assistance programs for Latino communities. Another tri-state project in Illinois, Missouri and Nebraska trains educators on how best to assist beginning farmers.

■ Although the majority of Idaho and Washington farms are small, educators offer this group only limited assistance. Today, the SARE-funded Cultivating Success program trains educators in community-based sustainable enterprises. One result of many: Area universities now offer courses in the subject.

Getting the Word Out

SARE invests heavily in trainings, websites, community centers, educational curricula—such as *Tilling the Soil of Opportunity* (page 19)—and a host of other outreach efforts to help farmers and community members get, and stay, involved in revitalization.

Rural Revitalization through Farm-Based Enterprise

The ten U.S. counties with the greatest population losses between 2000 and 2003 are located in the western United States, and small towns are scrambling to save what is left of their communities. Like many other parts of the nation, western farmers are discovering that sustainably raised livestock and crops can help revitalize economies. And these farmers have an ally, John Allen, whose life's work is helping farmers develop the skills needed to build businesses that benefit the farm and also the surrounding community.

Allen, who works with the Western Rural Development Center at Utah State University, says the trick is to focus on farm-based businesses that produce and hire locally. "It's the multiplier effect. When I started in this business 20 years ago, if you spent one dollar in your community, it would get used two or three times around in the same town. But now, where everything

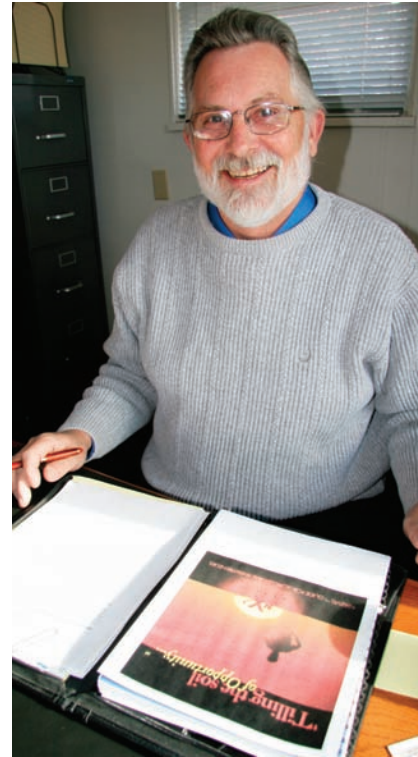
is owned externally, the money goes straight to the shareholders, who live outside the community."

Allen founded the NebraskaEDGE program in 1993 at the University of Nebraska, Lincoln. The program has helped thousands of people explore business opportunities. In 2000, Allen and NebraskaEDGE Associate Director Marilyn Schlake—both SARE grant recipients—led a team effort to develop what is now considered one of the important national training programs for agricultural producers, *Tilling the Soil of Opportunity: NxLevel Guide for Agricultural Entrepreneurs*. The course has been offered across 20 states at universities, small business development centers, and other educational facilities. More than 50 percent of the participants complete the course with a business plan.

Tim Nissen, born and raised in Cedar County, Neb., was one farmer who took the course. Industrial agriculture was squeezing his business and he needed to make changes. Tim enrolled in the 12-week intensive *Tilling the Soil* program, which opened his eyes to the potential of small-scale farming. In 2003, he turned his life around by opening a vineyard with his brother Dave in the grassy hills of Bow Valley.

Today, Westphalia Vineyards offers five varietals, one made with native wild plum. Nearly 60 percent of the customer base comes from outside the area.

Allen continues to find innovative ways to help rural communities, but



Above John Allen with *Tilling the Soil*, his groundbreaking course book for ag entrepreneurs. Left Turning a Nebraska farm into a vineyard has brought new income into the area.

now he is using SARE funds to develop workshops for western farmers and ranchers. By providing technical training in processing, packaging and labeling their products, along with Internet marketing strategies, Allen continues to help grow rural businesses and maintain rural communities.

"Our project draws upon SARE's historical values of matching farmers with educators. But this time we are moving into new territory by helping farmers break into the Internet and retail markets. That's the innovation."

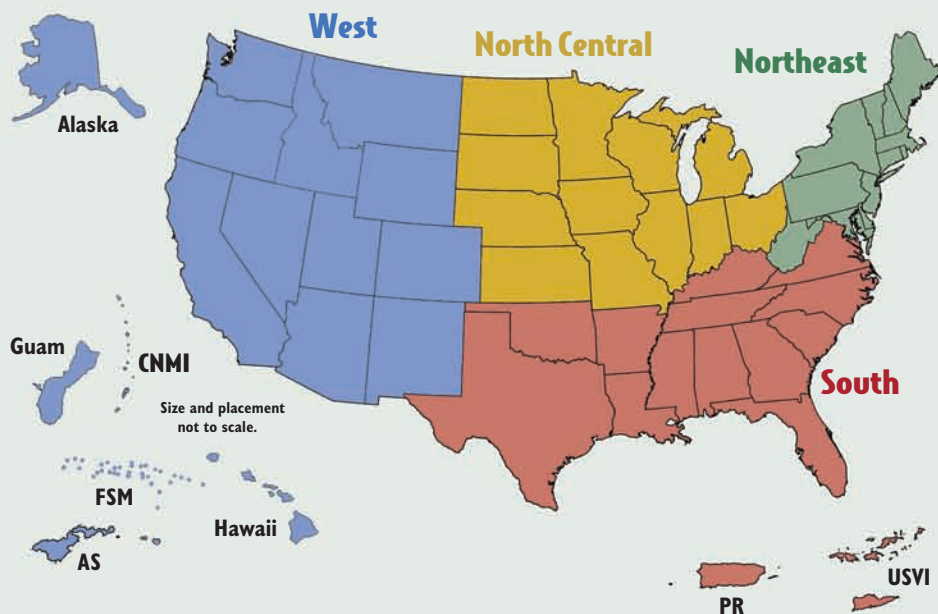
[For more information, go to www.sare.org/projects and search for EW06-005.]



COURTESY OF WESTPHALIA VINEYARDS

HOW SARE WORKS

The Sustainable Agriculture Research and Education (SARE) program works primarily through competitive grants, which are offered through four regions under the direction of councils that include farmers and ranchers along with representatives from universities, government, agribusiness and nonprofit organizations. SARE's national outreach office publishes practical, how-to books, bulletins and web resources for farmers, ranchers and educators. Since 1988, SARE has funded more than 3,700 projects.



Farmer/Rancher Grants – (FRGs)

Producers win grants ranging from \$1,000 to \$30,000 to conduct on-site experiments and share results with others.

Their ideas often stimulate more research through SARE's **R&E grants**, which are more effective when farmers and ranchers participate in the project, such as contributing on-farm research plots.



Professional Development Grants – (PDPs)

To spread the knowledge about sustainable concepts and practices, these projects educate Cooperative Extension Service staff and other agricultural professionals.

PDP grants help agricultural professionals stay current in the most pressing topics for **farmers and ranchers**.

Visit SARE on the Web at www.sare.org

Research & Education Grants – (R&Es)

Ranging from \$60,000 to \$150,000 or more, these grants fund scientists, producers, and others in an interdisciplinary approach.

Key research findings spread through the agricultural community thanks to agricultural professionals in Extension, NRCS and other agencies. Some professionals are aided by **PDP grants**.

Other grant opportunities...

Graduate students, community development practitioners and educators conducting on-farm research can apply for grants in some SARE regions.

SARE OFFICES

Contact the regional offices for requests for proposals, application deadlines and other information.

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(hosted by the University of Vermont)
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nesare@uvm.edu

Southern SARE

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Western SARE

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