

Minnesota Researchers Spill the Beans on Pulses

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When the United Nations announced that 2016 would be the “International Year of Pulses,” Craig Sheaffer wasn’t surprised. An agronomist with a bent toward organics, Sheaffer researches perennial native and introduced legumes, grasses, and woody species at the University of Minnesota (U of MN). He was well aware that pulses (also known as grain legumes), such as beans and peas, are gluten-free, high in fiber and protein, low in fat, and nutritionally a good complement to grain-based diets. He was also aware of the important role they can play in crop diversification on the farm.

“Crop diversification is the most powerful tool that farmers can use to reduce economic risk, disrupt pest cycles, and sustain soil quality,” said Sheaffer. “Soybean is the predominant grain legume in this region, but its excessive production offers little flexibility in terms of marketing. There is a critical need for more information on organic production practices for alternative grain legumes that have potential to fit our cropping systems.”

On any given day, almost 14 percent of the U.S. population eats dry edible beans, and according to the 2007 Census of Agriculture, four of the top five dry-bean producing states are located in the North Central region (Minor, 2016).

“Currently, the market for organic edible beans is often supplied by imports from other countries, despite the fact that Minnesota and North Dakota are leading edible bean producing areas in the United States,” explained Sheaffer. “This signals a market opportunity for locally grown organic legumes in the upper Midwest.”

With that in mind, Sheaffer applied for and received a \$199,217 NCR-SARE Research and Education grant to bring more agronomic and marketing resources to organic, edible legumes to stimulate both the production and consumption of grain legumes.

Sheaffer and his team, Tom Michaels, a bean breeder from the Department of Horticultural Sciences, and graduate students Claire Flavin and Hannah Swegarden, worked with local growers to examine the performance of several edible bean varieties, compare the agroecological value of edible beans and peas grown in rotation with other crops, and evaluate the effect of winter cover crops on yield and weed control in field beans. In terms of crop performance, they reported that Minnesotan organic farmers new to dry bean production should first consider reliable, stable market classes such as pinto, navy, and black to obtain stable yield and a reliable economic return. Regarding rotations, they found that either alfalfa or corn prior to dry beans is acceptable in rotations if there is adequate existing soil fertility. For producers to compare growing organic food grade and feed grade soybeans with pinto, turtle, and navy beans, they developed an “Organic Dry Bean Enterprise Budget,” a free tool for producers available online.

In conjunction with their production studies, they also worked with the Regional Sustainable Development Partnerships (RSDP) at the U of MN to analyze markets, develop crop enterprise budgets for organic edible beans, and identify marketing channels available to producers. They estimated the general size of the organic edible bean market, current sources for those edible legumes, and examined a mix of channels open to producers and growers looking to market edible legumes. The team even reached out to the U of MN’s College of Design’s surface design class to have 25 undergraduate students design images for bulk bags used to store and sell organic, locally grown dry beans.

“The market analysis suggests that small growers such as CSA or farmers market operations should grow heirloom dry beans rather than market class dry beans to differentiate their product,” said Sheaffer.

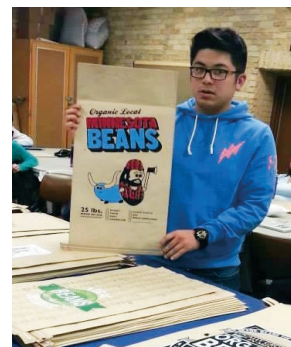


With SARE support, researchers at the University of Minnesota are expanding production and marketing of dry beans and peas. Photo by Marie Flanagan.

He explained that while yields can be lower, specialty products such as organic or heirloom beans can command a higher price from consumers. RSDP is currently working to help farmers set prices and deliver dry bean products into the hands of local consumers. As a result of this project, RSDP now has a full-time New Crop Market Integration Specialist to work on supply chain models for locally grown products.

“This project has spurred us to look at supply chains from a holistic perspective,” said Kathy Draeger, statewide director at RSDP. “We’re excited to be working to link the researchers, seed producers, farmers, processors, and distributors.”

Read more about Sheaffer’s NCR-SARE project, and the “Organic Dry Bean Enterprise Budget.” Simply search by the project number, LNC11-336 at <http://mysare.sare.org/> or contact the NCR-SARE office at ncrsare@umn.edu. Read more about RSDP’s work at www.extension.umn.edu/rsdp/.



A University of Minnesota College of Design student shares a bag designed for locally grown dry beans. Photo courtesy of the Regional Sustainable Development Partnerships.

New SARE Book: Systems Research for Agriculture

As farmers and ranchers strive to maintain profitability, they face a multitude of pressures such as protecting water and air resources, conserving biodiversity, and limiting soil erosion. Too often, however, single-faceted agricultural research fails to account for the complex links between critical environmental, social, and economic factors. The result? Piecemeal solutions to complex and interrelated problems. Now, SARE's groundbreaking *Systems Research for Agriculture* provides the theories and tools that researchers and producers need to design and conduct interdisciplinary systems research projects that advance sustainable agroecosystems.

Systems Research for Agriculture features multiple case studies, including SARE-funded research trials, which mimic an entire production system rather than substituting and comparing individual practices. Modifying research trials to

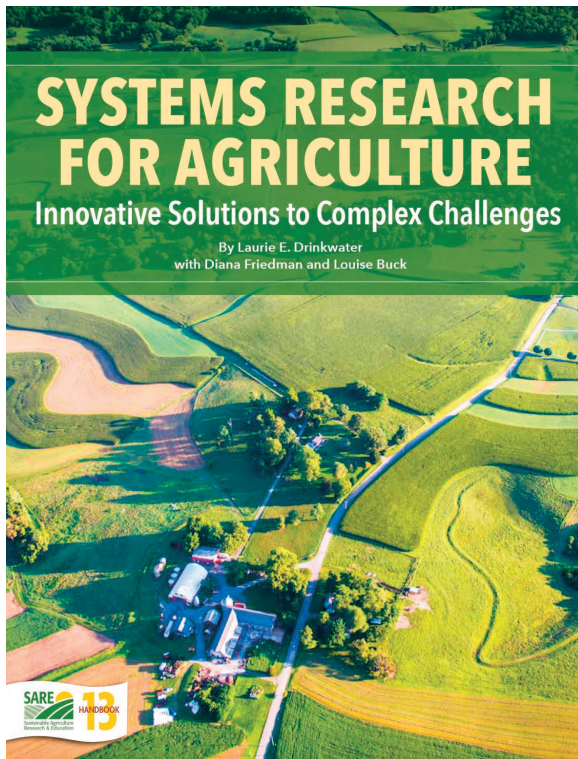
fit local best farming practices allows systems-level changes in economic, social and environmental conditions to emerge and be better studied. While the model requires close collaboration between researchers and producers, it provides producers with practical insight into the on-farm adoption of new techniques.

Systems Research for Agriculture addresses the theoretical basis for agricultural systems research and provides a roadmap for building effective interdisciplinary and multi-stakeholder teams. This handbook is essential reading for researchers and producers working together to plan, implement, and analyze complex, multifaceted systems research experiments.

Author Laurie Drinkwater is a professor in the School of Integrated Plant Science at Cornell University. She was raised in

Key West, Florida and became interested in agriculture while attending graduate school at the University of California, Davis. Her research focuses on improving the ecological efficiency and sustainability of agricultural systems by studying the mechanisms governing carbon, nitrogen, and phosphorous biogeochemistry in agroecosystems at scales ranging from the rhizosphere, where plant-microbial interactions dominate, to the field and landscape scale, where human interventions strongly influence ecosystem processes.

Systems Research for Agriculture is available as a free download at www.sare.org/Systems. Print copies can be ordered for \$20 plus shipping and handling. Discounts are available for orders of 10 items or more.



NCR-SARE Grant Project Highlights

Learn more about exciting SARE-supported projects! Use the project number listed with these projects to find more information at <http://mysare.sare.org/>, or follow NCR-SARE on Facebook or Twitter to receive regular updates like these.

With support from SARE, [University of Minnesota's GAPs Education Program](#) and the Hmong American Partnership hosted a vegetable washing and on-farm food safety workshop intended for immigrant farmers. This is SARE grant ONC16-016.

The [Center for Agroforestry at the Mizzou College of Agriculture, Food and Natural Resources](#) will train high school teachers with a newly developed agroforestry curriculum. This is SARE project ENC16-154.

[Jeanine Seabrook at Glass Rooster Cannery](#) received a SARE grant to work with farmers like Richard Jensen of Flying J Farm to scale up value-added local food in her community of Sunbury, Ohio. This is SARE project FNC16-1056.

With SARE support, the [Natural Fiber Alliance](#) and the [University of Minnesota Regional Sustainable Development Partnerships](#) hosted their 1st Annual Wool Conference in Minnesota. This is SARE project FNC14-965.

The Brandt family farms 1,150 acres in central Ohio. They began no-till farming in 1971 and have been using cover crops since 1978. SARE grants have supported some of their innovative work at [Brandt Family Farm and Walnut Creek Seeds, LLC](#). This is SARE grant FNC12-848.

[Frank Forcella's](#) SARE-supported work to develop an "Air-Propelled Abrasive Grit Management" system, a grit-blasting machine that weeds row crops like corn, was recently featured by *Modern Farmer* magazine. This is SARE grant LNC10-322.

With SARE support, [Amelia LaMair](#) took a group of Lutie School students to visit the Alford Forest in South Central Missouri to learn about sustainable forestry. This is SARE grant YENC16-099.

[Doug Landblom, NDSU Dickinson Research Extension Center](#) beef cattle specialist is in the sixth crop year of an eight-year rotation study started in 2010, and is seeing the rotational effect on soil health and crop productivity. This is SARE grant LNC16-381.

Free Grant Advising for NCR-SARE Grant Proposal Authors

NCR-SARE's State Coordinators are pictured here. Across the region, SARE State Coordinators work with SARE grant applicants to help make their grant proposals more competitive. Photo by Darin Eastburn.



Are you interested in writing a proposal for an NCR-SARE grant? Did you know that NCR-SARE can provide grant applications, reports from other projects, lists of funded projects, or other sustainable agriculture information? To receive more information about the NCR-SARE grant program's preproposal/proposal processes and timelines, contact the NCR-SARE office.

SARE State Coordinators

SARE sustainable agriculture coordinators help train agriculture professionals in sustainable practices, share SARE project results, and work with SARE grant applicants. If you have questions about SARE in your state, or have a grant proposal idea your SARE state coordinator can help. Find your SARE State Coordinator and view documents about funded grants in your state by visiting NCR-SARE online at www.northcentralsare.org/State-Programs. You can also sign up to receive notifications when grant programs are accepting proposals; simply contact the NCR-SARE office at ncrsare@umn.edu or 612-626-3113.

Grant Advising from Michael Fields

The Michael Fields Agricultural Institute (MFAI) provides free Grants Advising services with priority to two target groups in the Midwest. While their services are open to all farmers and agricultural entrepreneurs, priority is given as follows:

- In Wisconsin: All new or existing producers and agriculture-related businesses, as well as those working with them. Agriculture includes forestry and fisheries.
- In the Midwest: Beginning farmers, limited

resource farmers, socially disadvantaged farmers, and/or military veterans, as well as young organizations working with these farmers.

MFAI's Grants Advisors can help you apply to grant, loan, and cost-share programs (including SARE) of state or federal sources that could help you with specific projects to develop your agricultural, forestry or related business. These can be programs of any federal or state agency, not just the USDA, as well as private sources. They assist individual producers, associations of farmers, and agricultural, fishery, and forestry-related businesses to both search for and apply to programs for which they are eligible.

MFAI grants advisors help you determine what funding opportunities would be appropriate to achieve your goals. They will help you identify funding programs that best fits your project and outline a plan of work to meet the application deadline and all application requirements. If no known program fits, they will suggest other resources you may choose to approach. Examples might be federal, state, or local loan programs, loan guarantees, as well as resource information and resource persons.

The advisors will help you identify local partners (agency staff, nonprofit organizations, or local volunteers with experience in grants and project

management) to strengthen your project, to help you complete the proposal, and, if funding is awarded, to manage the project.

Anyone can ask to be on the advisors' email list to get funding program announcements ASAP.

For more information and to be on the e-list for program announcements, please contact MFAI and WFU's Grants Adviser, Kitt Healy, at (630) 346-4749 or gracekhealy@gmail.com. Also visit www.michaelfields.org/grant-advising-resources/.



Michael Fields Agricultural Institute's grants adviser, Kitt Healy, offers assistance to producers applying to public grant programs, like NCR-SARE. Photo courtesy of the University of Wisconsin.



Indiana School Raises Apples & Awareness

James A. Cole Elementary students learn about sustainable apple production and marketing through their SARE-supported school apple orchard (left and below). All photos by Sue Scott.

Forty-two percent of school districts surveyed by the USDA say they participate in farm-to-school activities, according to the 2015 Farm-to-School Census. That means as many as 23.6 million students are learning where their food comes from. Another 16 percent of school districts surveyed plan to start farm-to-school activities in the future. Farm-to-school activities can include having farmers visit the cafeteria, classroom, or other school-related settings; hosting farm-to-school related community events, and/or celebrating National Farm-to-School Month each October.

A few years ago, a small farm-to-school apple tasting took place at James A. Cole Elementary in Lafayette, Indiana in conjunction with Wea Creek Orchard. Later that day, Cole students took more apples off the lunch lines than ever before. Cole Principal, Mike Pinto, saw an opportunity and contacted Perry Kirkham, Wea Creek orchardist and program coordinator for research development at Purdue University, to explore opportunities to expand the program.

Pinto and Kirkham applied for and received a \$1,934 NCR-SARE Youth Educator grant in 2014 to start a small organic apple orchard at the rural elementary school. The project would allow Cole students from kindergarten through 5th grade to participate in tree care and growth, fruit production, and food preparation.

"I'm very interested in teaching kids how to grow food," explained Kirkham. "We thought this was a good way to teach students how to grow their own food, even if it's just on a very small plot of land."

They planted 12 disease resistant

apple trees on school grounds (2 trees per grade level) to involve the students in the actual production as much as possible. The younger grades helped plant the trees, took measurements of tree growth, and tracked physical changes like leaf and branch emergence. Older grades helped prune, learned to induce branching, and learned specifics about production such as measuring apple characteristics (taste, crispness, size). About 250 students were involved during the first year of the project. Today, the orchard is part of the grade level curriculum. Pinto and Kirkham reported that the most popular activity (as judged by student enthusiasm) was gauging how apples tasted. Students bite into apples to see how sweet they are, then compare the results to the sugar content and texture as judged objectively using a refractometer or a penetrometer, respectively.

"The most impressive result of the project is simply 'awareness,'" explained Pinto. "So many times, even in our rural setting, kids do not have a concept of where their food comes from. This awareness was cultivated by seeing the apple trees planted and then also speaking about the results."

Pinto also explained how consumerism was fostered through the project, as students (and adults) were able to differentiate types of

apples.

"So frequently, the four or five apple varieties available in the grocery store is the extent of the consumer palette," said Pinto. "This grant fostered a greater depth and breadth of student and adult understanding."

In association with the project, Cole has started a staff wellness initiative. In conjunction with Wea Creek Orchard, Cole provides staff members with a different variety of apple to sample each week. The sample includes information about its uses, texture, and sometimes-interesting facts.

"The idea is again to grow the palette of the adults," said Pinto. "For example, an old variety of apple called Russet Beauty was shared. It is not the prettiest apple — actually it's kind of ugly. It has the texture of a pear and kind of a similar taste. But many staff members enjoyed it and said they will try to buy it when offered. This is an interesting offshoot that is both healthy and also informative, and adds to the consumerism of our staff."

Learn more about James A. Cole's NCR-SARE Youth Educator project on the SARE project reporting website. Simply search by the project number YENC14-076, at <http://mysare.sare.org/> or contact the NCR-SARE office for more information at ncrsare@umn.edu.



Non-Profit Brings Conservation Strategies to Women Landowners

The percentage of women who are sole landowners is rising as women inherit land from husbands and fathers. The 2012 Census of Agriculture revealed that women farmers now control seven percent of U.S. farmland and account for three percent of sales.

Bridget Holcomb, Executive Director of the Women, Food & Agriculture Network (WFAN) has been particularly concerned with women landowners, whose numbers are rising, particularly in Iowa where women now own or co-own nearly half the farmland in Iowa (Duffy and Smith, 2008)

WFAN's mission is to engage women in building an ecological and just food and agricultural system through individual and community power. Among their activities, WFAN works with women landowners to provide education and resources about conservation methods. In 2010, Holcomb and WFAN received a \$81,766 NCR-SARE Research and Education grant to develop their Women Caring for the Land program, which works to inform and support women landowners in working with their tenants to improve soil and water conservation.

"Women own or co-own about half of agricultural land in the US, and yet this group has been omitted from most conservation outreach," said Holcomb. "Yet each time we hold a learning circle for women farmland owners they are eager to learn about conservation and immediately start thinking about how to incorporate what they learned into their farm management and share what they learned with their tenants. Adding women in the room—it takes rethinking our outreach and offering specialized events. But it is worth it: women farmland owners represent the biggest opportunity to expand conservation practices across our farms, and it is a ball to work with them!"

By 2013, WFAN and Holcomb were ready to share WFAN's Women Caring for the Land curriculum with other agriculture educators, so they applied for and received a \$61,054 NCR-SARE Professional Development Program grant to provide conservation agency and non-profit staffers with a professional development training on the Women Caring for the Land rationale and methodology.

With the PDP grant, WFAN staffers worked

with the state partners to identify locations for the trainings that best met their needs. Throughout the grant project, WFAN provided professional development training to 64 conservation professionals on how to provide outreach to women farmland owners. They also reached 216 women farmland owners, and Holcomb reported that six months after attending a learning circle more than half of these women had taken a conservation step.

"Women Caring for the Land meetings are designed to attract women who own land that is farmed in ways that may or may not fit the definition of sustainable agriculture, and the fact that we reach beyond traditional sustainable agriculture audiences is one of the benefits of these meetings," explained Holcomb. "The soil health message has been valuable for bridging the conversation about sustainable agricultural practices and their increased use and utility in dominant agriculture systems."

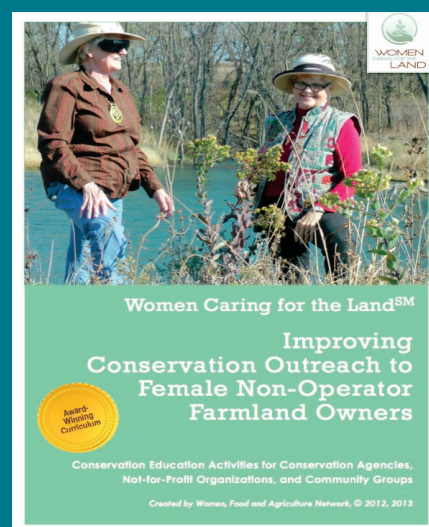
Holcomb believes that if Midwestern conservation partners can more effectively serve this segment of landowners before the land transitions again over the next decade, the positive impact on our land, water, and air will be tremendous. To that end, WFAN's *Women Caring for the Land* manual for improving outreach to women landowners is available online for free. The manual includes rationale, methodology, how-to, and 12 demonstration activities developed by conservation professionals.

"We are always impressed that women farmland owners, once they have a baseline of conservation knowledge, keep going," said Holcomb. "Our participants raid our information tables and follow-up with their local USDA offices and other conservation professionals. Our biggest hope is that we have shown conservation professionals that to reach women we need to rethink our outreach. If we are successful in reaching women we will have unleashed the biggest conservation force in agriculture."

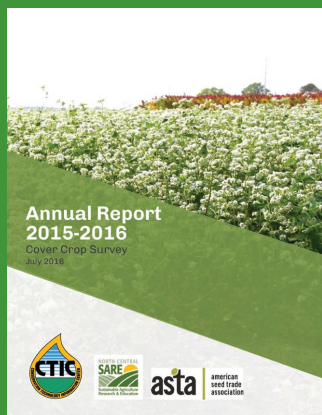
Read more about WFAN's NCR-SARE grant projects online on the SARE project reporting website. Simply search by the project numbers LNC10-317 or ENC13-137 at <http://mysare.sare.org/> or contact the NCR-SARE office for more information at ncrsare@umn.edu.



With support from SARE, the Women, Food & Agriculture Network (WFAN) is expanding conservation practices to women landowners. All photos by Bridget Holcomb.



Women Caring for the Land is a Manual for conservation professionals and community groups to improve outreach on conservation to female landowners. Find it online for free at www.northcentralsare.org/Women-Caring-for-the-Land.



2016 Cover Crop Survey Reflects Enthusiasm for the Soil-Saving Practice

Insight from 2,020 farmers from across the country reflected enthusiasm for cover crops and—for the fourth year in a row—found a yield boost in corn and soybeans following cover crops. Multi-year data shows the yield boost increases as cover crops are planted year after year, a revelation that points to an appealing long-term benefit of the conservation practice. The survey offers data unavailable elsewhere, providing a vital glimpse into farmers' use of and perceptions about cover crops. Previous SARE/CTIC Cover Crop Surveys have been used by researchers and farm groups, and even cited in Congressional testimony.

The survey was conducted in March 2016 by the SARE program and the Conservation Technology Information Center (CTIC) with help from the American Seed Trade Association and Purdue University.

Acreage planted to cover crops continued its steady rise among survey participants, reaching an average of 298 acres per farm in 2015 and projected to grow to a mean of 339 acres in 2016. Those figures are more than double the acreage survey participants said they planted in 2011.

Yield Benefits of Cover Crops

Corn yields rose an average 3.4 bushels per acre, or 1.9 percent, after cover crops, and soybean yields increased 1.5 bushels per acre, or 2.8 percent. Analysis of the survey data revealed that yield increases rose to 8.3 bushels per acre of corn after cover crops had been used for more than four years on a field. In soybeans, the average yield gain increased from 0.1 bushel per acre after a single year in cover crops to 2.4 bushels after four years of cover crops.

The modest average gains reported for 2015 are in line with agronomists' expectations for a good growing season, says Rob Myers, Regional

Director, Extension Programs for SARE at the University of Missouri.

"Cover crops really shine in challenging years, when the improvements they influence on soil moisture holding capacity and water infiltration can minimize cash crop yield losses to stress," Myers notes. "In a favorable growing season, we expect to see less of a yield impact. However, the link between the length of time in cover crops and yield improvements points to the long-term benefits of building soil health."

"It's also important to note that two-thirds of this year's survey respondents agreed that cover crops reduced yield variability during extreme weather events," he adds. "These farmers are taking the long view and recognizing that not every season turns out like 2015."

Myers added that a mild surprise in this year's survey was how many farmers reported a profit benefit from cover crops. Of the farmers surveyed, 33 percent found their profit improved as a result of using a cover crop, while only 5.7 percent said their profit decreased; remaining responses were split between those reporting no change in profit and those not yet having enough data/experience to evaluate profit impact.

More Than Money

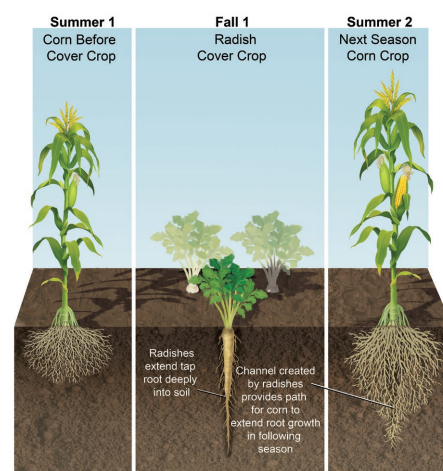
"The vast majority of cover crop users report the most important benefits of cover crops to be improved overall soil health, reduced erosion, and increased soil organic matter," says Chad Watts, executive director of CTIC. "Though the yield benefits, profitability and resilience provided by cover crops are widely recognized by the farmers in the survey, the benefits they highlight most are long-term soil health impacts."

The full report and other highlights are available online at www.sare.org/covercropsurvey.

Free Online Resources in Soil Health

A new library of cover crop and soil health images is now available for educators and producers to use to support the increased adoption of cover crops and other soil health practices.

The images in this database (like those pictured below) can be used freely for non-commercial purposes provided that proper attribution is used. The images include photos of equipment, aerial views of farmscapes, images of producers working with cover crops, and photos of various cover crop species. The database is searchable by keyword and each image is captioned for context. In addition to the images, the database also includes a soil health gallery with high-resolution illustrations. These illustrations are intended to help explain important concepts in soil health and cover crop management, and can be accessed in the gallery or in a Powerpoint that includes captions explaining the meaning of the illustrations. Find all of the images and figures at <http://covercropimages.sare.org/>.



South Dakota Rancher Explores Sustainable Livestock Fly Control

Calves learn how to walk through a fly trapping box on Linda Simmons' ranch in South Dakota. Photo by Linda Simmons.



Linda Simmons is a cattle rancher in Twin Brooks, South Dakota. Beef and sheep producers in northeastern South Dakota depend largely on native rangeland, and there are several species of flies that can cause serious economic losses there. Several years ago, Simmons experienced a failure with her feed-through insecticide plan.

“We had a terrible incident of failed insecticide control of flies one year after using feed through insecticide for two years,” recalled Simmons. “The third year was a sudden failure in mid season when calves were still young. We built a corral as fast as we could in order to have a vet come and treat all 70-some pairs. Every calf required an injection of antibiotics to save their eyes, and many needed their eyelids sewn with dissolving stitches to save an eye. We were lucky that none ended up blind after treatment. The cost was around \$5,000; that is unsustainable from any point of view.”

Simmons was concerned that perhaps her use of pesticides had resulted in pesticide resistance, as well as a reduction in populations of beneficial insects, such as dung beetles. Knowing that strategies for fly control are more effective when adjacent pastures and feedlots are included, **Simmons worked with the producers who were adjacent to her land and received a \$21,287 NCR-SARE Farmer Rancher grant to experiment with various reduced-pesticide fly control systems to help to conserve beneficial insects, especially the**

dung beetle.

Cattle manure is a popular breeding ground for flies and is an incubator for gastrointestinal parasites—a single manure pat can generate 60-80 horn fly adults. Dung beetles are particularly helpful because as they consume the manure, it becomes less available to host flies and parasites. In fact, fly populations have been shown to decrease significantly in areas with dung beetle activity (Thomas, 2001).

In order to reduce their dependence on pesticides, which can be harmful to beneficial dung beetles, the project organizers implemented a variety of strategies, including rotational grazing. They also built *nzi* [EN-zee] flexible cloth fly traps (‘nzi’ is the Swahili word for ‘fly’) and a trial of Willis Bruce’s “Walk Through Horn Fly Trap” using plans from the University of Missouri. To their knowledge, neither of these types of traps had been used on beef cattle at pasture in Northeastern South Dakota before.

“Bruce’s Walk Through Horn Fly Trap works well and it doesn’t require much labor to use,” reported Simmons. “It works so well we didn’t even have to place it where cattle use it every day. A few treatments a year headed off any need to treat with insecticides. This summer flies were even easier to control using it. I only needed it twice. It’s going to make me lazy!”

Simmons reported that the 30 ranchers and land managers who attended their project

field day proved that a lot of producers value dung beetles in the rangeland ecosystem for their contribution to the whole. She hopes this project will help promote a northeastern South Dakota method for monitoring and managing both fly pests and dung beetles for long term profits on livestock.

Over the course of this project, Simmons realized that there was a need for a planning and assessment guide for cattle and sheep raisers to do their own pest and beneficial insect monitoring. She developed a manual, *A Dung Beetle’s Place on Your Ranch*, for looking after dung beetles by reducing pesticides, using non-chemical controls, and using chemical controls carefully and thoughtfully

“This summer a friend of mine called me for fly control advice because of the project,” she said. “Unfortunately, he was already in the middle of a bad fly outbreak, and I am definitely not a veterinarian or expert on pesticides; that’s why I like the non-pesticide controls. They aren’t fraught with mistakes and don’t require any more expertise than teaching the cattle to walk around.”

Read more about Simmons’s NCR-SARE Farmer Rancher Grant project, find the plans for building a Bruce horn fly trap or *nzi* trap, and read *A Dung Beetle’s Place on Your Ranch* on the SARE project reporting website. Simply search by the project number, FNC14-977 at <http://mysare.sare.org/> or contact the NCR-SARE office at ncrsare@umn.edu.



The image on the left depicts a beef cow before walking through a horn fly trap. The center image depicts an animal after one pass through the horn fly trap. On the right, a fly trapping device is painted a specific shade of blue; researchers in Florida found the flies' color preference by using behavioral tests that determined which color a fly was most likely to travel toward (Koehler and Pereira, 2012). Photos by Linda Simmons.



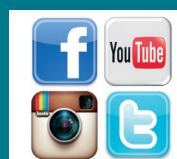
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Did you know NCR-SARE is on Facebook, Twitter, Instagram, and YouTube? Keep track of our grant opportunities, projects, events, and more. Search for North Central Region SARE and follow us!



ABOUT NCR-SARE

NCR-SARE funds cutting-edge projects every year through competitive grant programs, and has awarded more than \$50 million worth of grants to farmers and ranchers, researchers, students, educators, public and private institutions, nonprofit groups, and others exploring sustainable agriculture in the 12 states of the North Central region.

Are you interested in submitting a proposal for an NCR-SARE grant? Before you write the grant proposal, determine a clear project goal, and engage in sustainable agriculture research on your topic. Need help determining which program is best suited for your project? Go to www.northcentralsare.org/Grants for more information, or contact the NCR-SARE office.

For more information about any of the NCR-SARE grant programs, go to www.northcentralsare.org/Grants or contact the NCR-SARE office at 612-626-3113 or ncrsare@umn.edu.

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Darin Eastburn, Bridget Holcomb, Sue Scott,
Linda Simmons, University of Wisconsin, and
the Women, Food & Agriculture Network.

GRANT PROGRAM TIMELINES*

Farmer Rancher*

Early August - Call for Proposals Released
Early December - Proposals Due
February - Funding Decisions
Spring - Funds Available to Recipients

Graduate Student*

February - Call for Proposals Released
April - Proposals Due
Late July - Funding Decisions
September - Funds Available to Recipients

Research and Education*

August - Call for Preproposals Released
Late October- Preproposals Due
Late January - Full Proposals Invited
April - Full Proposals Due
Late July - Funding Decisions
Fall - Funds Available to Recipient

Professional Development Program*

February - Call for Proposals Released
Early April - Proposals Due
August - Funding Decisions
October - Funds Available to Recipient

Youth Educator*

Early August: Call for Proposals Released
Mid November: Proposals Due
February: Funding Decisions
Spring: Funds Available to Recipients

Partnership*

Early August: Call for Proposals Released
Late October: Proposals Due
February: Funding Decisions
March: Funds Available to Recipients

*Timelines are subject to change.

NORTH CENTRAL REGION
SUSTAINABLE AGRICULTURE RESEARCH AND
EDUCATION PROGRAM

CONTACT INFORMATION

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Online: www.northcentralsare.org



Bees and other pollinators help nearly 70 percent of all flowering plants to reproduce. Photo by Darin Eastburn.