

Non-Profit Shines Light on the Bison Advantage

When President Obama named the American bison, also known as the buffalo, as America's first national mammal in 2016, he recognized the ecological, cultural, historical, and economic contributions of North America's largest mammal. Estimates indicate that in the 15th century, as many as 30-60 million bison ranged across much of the United States, Canada, Alaska and northern Mexico. Bison were a significant spiritual symbol and source of food, clothing, and shelter for American Indians, but the ravages of westward expansion depleted the bison population, and by 1885 an estimated 750 animals remained. Thanks to combined conservation efforts among public organizations, American Indian communities, non-profit organizations, and private citizens, the U.S. bison population has climbed back to more than 380,000 on farms and ranches, Tribal lands, and federal and state lands (National Bison Association, 2017).

Jim Matheson encountered his first bison as a student at Montana State University in the late 1990s, where he learned more about what he calls the "keystone species of the great plains ecosystem." Today, Matheson is the Assistant Director of the National Bison Association (NBA), a non-profit whose mission is to bring together stakeholders to celebrate the heritage of American bison, to educate, and to create a sustainable future for the bison industry. Consumers appreciate that bison is a leaner meat—100 grams of raw bison (separable lean only) contains 109 calories and 1.8 grams fat (USDA, 2013). As for producers, Matheson says bison can offer a natural, sustainable ranching model.

"Bison restore the landscape they're being raised on when managed properly, which is the definition of regenerative and sustainable agriculture," explained Matheson. "Once you bring bison back to the prairie, other native species, from

birds to plants and flowers, follow suit. Further, the species is not domesticated, so producers utilize their still-intact instincts to their advantage, such as their metabolism slowing in the winter so they eat less. They require no shelter, survive and thrive in extreme weather, we don't artificially inseminate, so they breed naturally and without human intervention, and predation is not an issue as they take care of themselves. Match that with the strong and stable prices producers receive for their meat, and it's a great, profitable model of agriculture in today's gloomy market."

In 2014, Matheson and the NBA received a \$103,675 NCR-SARE Research and Education grant to conduct a program called *The Bison Advantage Outreach and Education Program*. With their project funds, they created a "Bison Advantage" curriculum, supported bison-specific research on pasture management protocols, and developed the second edition of the *Bison Producer's Handbook*, which features the grazing protocols developed through the project. Matheson says *The Bison Producer's Handbook* is a go-to resource for both beginning and existing bison producers in educating themselves.

"The great opportunity we saw in this project was the ability to develop a handbook for our industry that very much focuses on a sustainable and holistic approach to bison production," said Matheson.

Matheson's team facilitated six Bison Advantage workshops, five of which took place on working bison operations, and one at the National Buffalo Museum, which is home to a small herd of bison. In addition to these workshops, they presented at six NBA conferences, resulting in a total of 12 workshops/presentations. Attendees included extension agents, Tribal members, agricultural educators, experienced producers, and new/prospective bison producers with little background in bison. Matheson says

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Bison Advantage workshop participants got an up-close view of the bison herd at Snake River Farm in Becker, Minnesota. Photo by Jim Matheson.

they reached more than 500 producers directly through their workshops, and more than 1,000 when counting the NBA members who also benefited from the project deliverables.

"The resources and learning tools developed through this grant will allow us to continue to educate and encourage bison farmers and ranchers to raise their animals in a holistic manner, as we preach in our learning toolkit," said Matheson. "The NBA has also been approached by multiple extension agents, and Tribal organizations to facilitate similar workshops for their clientele as the word spread about our workshop series through the bison community."

Read more about Matheson's NCR-SARE project. Simply search by the project number, LNC14-356 at <https://projects.sare.org/search-projects/> or contact the NCR-SARE office at ncrsare@umn.edu.



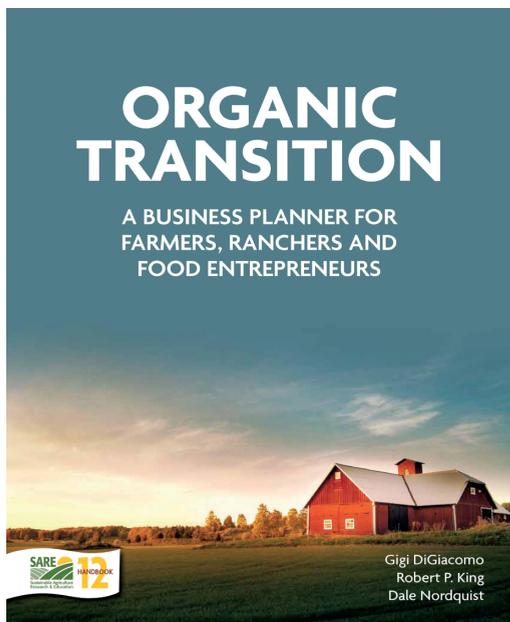
The Bison Producer's Handbook is available electronically for \$20 at <https://bisoncentral.com/product/bison-producers-handbook-2nd-edition-e-pub-version/>.

New SARE Resource for Organic Producers

In order to address the challenges for both new and experienced organic growers, SARE has now organized research results on organic production practices and approaches from over 30 years of SARE grants to researchers, farmers, ranchers, and Extension educators in the new, online Organic Production Topic Room.

In 1992, there were 3,587 organic operations in the United States. Almost 25 years later, that number has more than quintupled to 24,650 certified organic operations as of 2016.

What accounts for this explosive growth in organic products, which now comprise almost five percent of the U.S. food market?



In addition to SARE's new Organic Topic Room, SARE's book, *Organic Transition: A Business Planner for Farmers, Ranchers and Food Entrepreneurs* will help you develop an actionable business transition plan that is suitable for yourself, your management team or a lender. Order it online or get a free PDF at www.sare.org/Learning-Center/Books/Organic-Transition.

For one, consumers have responded to the environmental and health-related advantages of organically produced food. Between 2005 and 2015, sales of organic products skyrocketed from \$13.8 billion to \$43.3 billion, helping fuel the rapid growth of the industry.

Organic foods and products are also more readily available than ever before. A 2015 study by the Organic Trade Association showed that 78 percent of consumers who buy organic were able to purchase organic goods at supermarkets and approximately half of consumers who purchase organic were able to buy some of their organic goods at "big box" stores.

All of this consumer interest can be good for farmers and ranchers. Due to price premiums, farmers have the potential to achieve equal or greater profits than with their non-organic products. Responding to this need, certified organic acreage has more than quadrupled over the last 25 years, growing from 935,000 certified acres in 1992 to 4 million today.

However, organic farming and ranching can be challenging and complex. USDA certification regulations dictate specific growing practices, and farmers must choose from a list of approved materials for fertility and pest management. Managing a whole system can be more complex than managing a few crops and requires a more holistic approach. With organic farming, management strategies are rarely prescriptive. Instead, they are system based, meaning growers must have a broader and deeper understanding of their entire system.

Collated into one convenient, easy-to-navigate location, SARE's Organic Production topic room presents ample resources on organic production by topic. Visit the new online topic room at www.sare.org/Learning-Center/Topic-Rooms/Organic-Production.

NCR-SARE Grant Project Highlights

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

- With support from SARE, producers Dean and Debra Stevens and the Nebraska On-Farm Research Network have captured useful NDRE (Normalized Difference Red Edge) imagery using a drone, providing key data that can be used to improve in-season nitrogen applications. This is SARE project FNC17-1100.
- With SARE support, the University of Minnesota and a nonprofit, The Good Acre, are working with the Hmong American Farmers Association to test different cover crops in their hoop houses in Saint Paul, Minnesota. This is SARE project ENC15-145.
- Nick Vinje is a North Dakota grain farmer who wanted to put some cows on his land, and Clint Severance was looking for a place where he could graze his cattle. With support from SARE, they have entered into an agreement where both individuals see a benefit. This is SARE project FNC17-1098.
- Educators in Illinois received SARE support to assess the potential of different hazelnut and chestnut varieties to serve as sustainable alternative crops. The test orchard is offering educational opportunities and work experience for Casey-Westfield High School students. This is SARE project YENC15-082.
- With support from SARE, this Midwest Organic and Sustainable Education Service (MOSES) podcast features women throughout the Midwest who have hosted a MOSES "In Her Boots" workshop on their farm, offering listeners the opportunity to share the "In Her Boots" experience virtually and meet these women farmers. This is SARE project ONC15-006.
- Big Muddy Urban Farm helped 30 youth from the Gifford Park Youth Garden Program travel to Honey Creek Creamery in Nebraska. With SARE support, these youth learned about land stewardship and raising goats. This is SARE project YENC16-101.

Free Grant Advising for NCR-SARE Grant Proposal Authors

South Dakota SARE State Coordinator, Sandy Smart (left), is pictured here with Administrative Council member, Spencer Wood (right). Smart and the other SARE State Coordinators in the North Central region can provide valuable insight about the NCR-SARE grant proposal process. Photo by Marie Flanagan.



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, or visit www.northcentralsare.org/Grants/Write-a-Successful-Grant.

Before writing a grant proposal, determine a clear project goal and explore previous research. It often helps to contact NCR-SARE, local agriculture groups, the Natural Resources Conservation Service, and/or Extension educators to share ideas and invite participation.

Assistance from SARE State Coordinators

SARE has a network of state coordinators working in each state and island protectorate. They hold workshops and field days to share sustainable practices and research results, and generally serve as agriculture resources

in their state. 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/Professional-Development/State-Coordinator-Contact-Info. You can also sign up to receive notifications when grant programs are accepting proposals; simply go to www.sare.org/About-SARE/Join-Our-Mailing-List, or contact the NCR-SARE office at nrcsare@umn.edu or 612-626-3113.

Michael Fields Grant-Writing Assistance

Did you know that 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 organizations working with these farmers.

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

Hear from SARE Grantees at Farmers Forums

The NCR-SARE Farmers Forum is an event that gives NCR-SARE grant recipients the chance to share information about sustainable agriculture practices with a regional audience. The talks focus on research, demonstration, and education projects that promote sustainable farming and ranching. The projects emphasize the three pillars of sustainable

agriculture: environmental stewardship, profitability, and social responsibility.

The next Farmers Forums will be held at the Wisconsin Fresh Fruit and Vegetable Conference in January 2018 and at the 6th Annual Indiana Small Farm Conference in March 2018.

Highlights and videos from past Farmers Forums can be found on our website at <http://www.northcentralsare.org/Educational-Resources/Regional-Program-Materials/NCR-SARE-Farmers-Forum-Highlights>.

Non-Profit and Producers Partner Up Around Agroforestry

Savanna Institute Co-Executive Directors, Keefe Keeley (left) and Kevin Wolz (center) pose with producer Cathe Cappel (right) in front of some hybrid poplar trees at her farm in Champaign County, Illinois. Photo by Marie Flanagan.

Agroforestry helps farmers diversify products and income. Trees can produce an annual fruit or nut crop or a future timber harvest. Shrubs can be grown instead of, or with, trees and can produce a yearly crop. Forages and other fruit, vegetable, or specialty crops can be harvested for market or grazed by livestock. In addition to these harvests, tree and shrub crops can offer other benefits such as pollinator habitat.

Here in the Midwest, the Savanna Institute is working to lay the groundwork for widespread agroforestry. A nonprofit organization, they work in collaboration with farmers and scientists to develop perennial food and fodder crops within multifunctional polyculture systems grounded in ecology and inspired by the savanna biome. Keefe Keeley, Co-Executive Director of the Savanna Institute, says that edible agroforestry is intentionally designed and intensively managed to produce food, fuel, and fiber, while simultaneously farmers work to maintain and even restore soil, water, climate, and biodiversity resources.

“This approach adapts diverse agroforestry (DA) practices, including alley and multi-story cropping, silvopasture, edible buffers, and forest farming,” says Keeley. “It also draws ideas and techniques from aligned disciplines that apply ecological science to managing complex landscapes for multiple objectives: forestry, range management, agroecology, integrated pest management, organics, permaculture, and others.”

With support from a \$29,957 NCR-SARE Partnership grant in 2015, Keeley and the Savanna Institute had an opportunity to work with four farmers to research crop performance, pests, and pollinator activity in agroforestry systems.

“Agroforestry systems integrating fruit, nut, and forage components have potential to restore ecosystem services while simultaneously providing economically viable and nutritionally valuable staple-food crops at industrial quantities,” said Keeley. “Despite the increasing implementation of these systems with core crops such as hazelnut, chestnut, currant and apple, there has been no rigorous on-farm evaluation of the impact of various management strategies on growth and yields. Many of the component crops driving the adoption of edible agroforestry systems are relatively novel to the Midwest. Little is known about the pests/pathogens of these crops in this region, especially in a diversified context. Although agroforestry systems are inherently diverse, and mature agroforestry systems can increase diversity of arthropod communities, little is known about the potential of young agroforestry systems to foster arthropod diversity.”

Each collaborating farm planted rows of fruit and nut trees and shrubs with alleys of grass or alfalfa hay, and worked with the Savanna Institute to collect data. Their objectives included:

- Evaluating the growth and yield of DA systems across a range of management strategies.
- Identifying baseline pollinator communities present in and interacting with DA systems compared to adjacent land-uses.
- Identifying and monitoring pests affecting

the novel woody perennial crops in DA systems.

- Documenting the establishment and growth of DA systems via time-lapse photography.
- Distributing results via printed materials, online media, and field days.

The project served as a first step for the Savanna Institute in exploring the input/management tradeoffs in DA systems. Keeley says the knowledge gained of critical pests, arthropod communities, and monitoring methods will support management decisions and appropriate future studies in DA systems.

“We found that even while tree crops were still very young, fields with agroforestry plantings offered a good home for helpful arthropod groups, like pollinators, spiders, and other natural pest predators,” said Keeley.

Keeley says understanding the tradeoffs and benefits of agroforestry is key to other farmers deciding if and how to adopt perennial cropping systems themselves.

“Most importantly, this project helped farmers document what’s working well and what needs work, and then helped them share that with other farmers,” said Keeley.

Learn more about this NCR-SARE Partnership project on the SARE project reporting website. Simply search by the project number ONC15-005 at <https://projects.sare.org/search-projects/> or contact the NCR-SARE office for more information.

To sample pollinators in the various land-use systems, (A) bowl traps were set out in the morning and recollected at the end of the day. Example bowl traps in (B) forest and (C) soybean are also shown. Photos courtesy of Savanna Institute.



Tribal Educators Gather for Sustainable Agriculture Workshops

In 1987, just before the SARE program funded its first grant, the Intertribal Agriculture Council (IAC) was founded to provide a unified effort to promote change in Indian agriculture for the benefit of American Indian people. For more than thirty years, the IAC has been conducting a range of programs designed to further the goal of improving Indian agriculture. Collaboration between the USDA Office of Tribal Relations and the IAC resulted in Technical Assistance Centers to increase access and use of USDA programs and services by Indian producers and Tribes. IAC technical assistance providers share information about federal agency regulations and processes, and assist with everything from financial planning, to crop insurance, to conservation practices (USDA FSA 2013). Dan Cornelius is the IAC technical assistance specialist for midwest Tribes, which includes the states of Illinois, Iowa, Michigan, Minnesota, and Wisconsin. He works to strengthen regional connections through networking and educational opportunities. In 2012, he was searching for a way to promote knowledge development and sharing among educators working directly with American Indian farmers, ranchers, and other food producers. [Cornelius applied for and received a \\$75,000 NCR-SARE Professional Development Program \(PDP\) grant to conduct a sustainable agricultural workshop series for Tribal educators.](#)

Cornelius tapped into his network of state extension agents, academic experts, and local Tribal staff and food producers to find workshop instructors. Although stand-alone workshops were hosted, many workshops were hosted at food and agriculture events in Wisconsin, Michigan, and Minnesota such as the MOSES Organic Farming Conference, the Indigenous Farming Conference, and the Food Sovereignty Summit. Cornelius says hosting workshops at larger events allowed busy Tribal educators to combine multiple events and leverage funding. From a seed saving train-the-trainer event at the 2014 Food Sovereignty Summit, to a 2015 Gathering of Native Americans event with the Shakopee Mdewakanton Sioux Community about traditional tobacco, the events provided a forum to convene a variety of educators. The primary accomplishment, according to Cornelius,

was hosting education sessions in conjunction with the Great Lakes Intertribal Food Summit in 2014, 2015, and 2016, where workshop sessions covered topics including Good Agricultural Practices and the Food Safety Modernization Act, seed saving, butchering, tree syrup and sugar production, community food sovereignty assessments, USDA financing opportunities, and food hubs.

“Many events supported by this PDP grant have received tremendous positive feedback, particularly the initial Food Sovereignty Summit, but the 2016 Great Lakes Intertribal Food Summit at Gun Lake’s Jijak Camp sparked a response unlike any other event,” reported Cornelius. “Social media absolutely exploded following the event, and many organizations have contacted the IAC for assistance in hosting similar events that combine traditional teachings with modern agricultural education and outreach.”

Cornelius says food sovereignty is a critical issue for many Indian people. As defined by the U.S. Food Sovereignty Alliance, food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. Cornelius said there has been a rise in the overall presence of indigenous food and noted that these IAC events have started to inspire more mainstream conferences to include more indigenous food.

“From the Tribal perspective, food sovereignty is a crucial issue,” said Cornelius. “We need sustainable production practices, but we also need economic sustainability. Building and sharing knowledge, connecting resources, and providing mentorship opportunities will help us reach those goals. This grant was a lifeline to make it possible to bring people together, and when you bring together educators, they can take that knowledge back to their communities. This has become a collective movement, and more capacity has been built. More partnership and mentoring opportunities are coming up.”

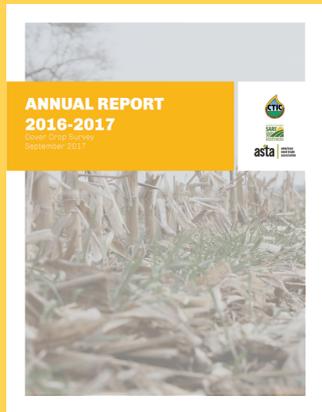
Read more about Cornelius’s NCR-SARE grant project online on the SARE project reporting website. Simply search by the project number ENC12-128 at <https://projects.sare.org/search-projects/> or contact the NCR-SARE office for more information.



A team prepares a batch of hominy in copper kettles at the 2016 Great Lakes Intertribal Food Summit held at Gun Lake Pottawatomi’s Jijak Camp (top).

Tribal educators gather to discuss common challenges and success strategies at the 2015 MOSES Conference (middle).

The Jijak seed bank, located directly next to the seed saving classroom, at the 2016 Great Lakes Intertribal Food Summit (bottom). All photos by Dan Cornelius.



2017 Cover Crop Survey Responders Say Cover Crops Boost Yields and Weed Control

SARE/NCAT-ATTRA Conference, April 3-5, 2018



Following the use of cover crops, farmers reported increased yields of corn, soybeans and wheat, and improvement in the control of herbicide-resistant weeds, according to a nationwide survey. In addition, the survey of 2,012 farmers showed acreage planted in cover crops has nearly doubled over the past five years. Survey participants—88 percent of whom use cover crops—reported that after cover crops:

- Corn yields increased an average of 2.3 bushels per acre, or 1.3 percent.
- Soybean yields increased 2.1 bushels per acre, or 3.8 percent.
- Wheat yields increased 1.9 bushels per acre, or 2.8 percent.

This marks the fifth consecutive year in which the survey reported yield increases in corn and soybeans following cover crops (find previous surveys at www.sare.org/covercropsurvey). It is the first year the survey team was able to calculate the impact of cover crops on wheat yields. The poll was conducted by the Conservation Technology Information Center (CTIC) with help from Purdue University and funding support from SARE and the American Seed Trade Association (ASTA).

Herbicide-Resistant Weed Control

“In addition to yield increases, farmers reported other benefits to cover crops, ranging from improved soil health to better control of herbicide-resistant weeds,” notes Rob Myers, Regional Director of Extension Programs for NCR-SARE at the University of Missouri. “For instance, 85 percent of the farmers who used cover crops said they have seen improvements in soil health. That reflects long-term thinking and a growing understanding of the enduring value that cover crops deliver.”

Myers adds that 69 percent of the respondents said cover crops always, or sometimes,

improved control of herbicide-resistant weeds. That is a significant number, he notes, as a majority of respondents—59 percent—reported having herbicide-resistant weeds in at least some of their fields.

Business Opportunities

The last USDA Census of Agriculture found that farmers planted more than 10 million acres of cover crops in 2012. The new agricultural census, which will begin this fall, is likely to find several million additional acres of cover crops planted in 2017.

The growth of cover crop use is likely to expand a range of business opportunities throughout agriculture. Twelve percent of the surveyed cover crop users hired aerial applicators to seed their cover crops, while 8 percent hired an ag retailer or co-op, and 69 percent hired another farmer to do the planting. Asked who they wanted to buy cover crop seed from in the future, 43 percent said they would like to buy from specialized dealers.

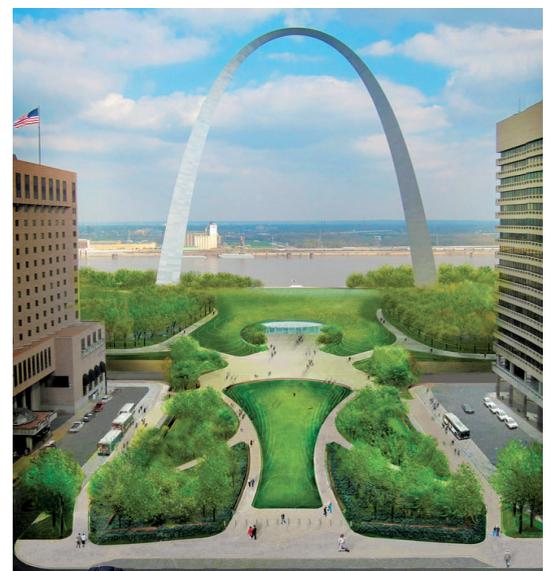
“The SARE/CTIC Cover Crop Survey is a great opportunity to gather insight into the purchasing decisions of farmers when it comes to cover crops,” ASTA President and CEO Andy LaVigne says. “The data from the previous four years’ surveys shows this is an important time to be involved in this space within the agriculture community, and ASTA members are pleased to support the efforts of SARE and CTIC to gain insight into the cover crop seed needs and requests of farmers nationwide.”

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

The Our Farms, Our Future Conference, hosted by the Sustainable Agriculture Research and Education (SARE) program and the National Center for Appropriate Technology’s National Sustainable Agriculture Assistance Program (NCAT-ATTRA) will be held on April 3-5, 2018 in St. Louis, Missouri.

Every decade SARE hosts a conference to look at the progress of sustainability in agriculture and to understand our vision of the future. The Our Farms, Our Future conference is an incredible opportunity to join with many key stakeholders in the sustainable agriculture community. Participants will engage in important dialogue about the trajectory of sustainable agriculture in the next 30 years. Engaging panels, technical and issue-oriented breakout sessions, art and storytelling opportunities, long networking breaks, poster sessions, exhibitor booths, and farm tours will all contribute to creating an unforgettable experience.

The conference will be hosted at the Hyatt Regency in Downtown Saint Louis next to the Gateway Arch. When conference registration opens, SARE will post information about how to book a room at our discounted conference rate. For more information, visit the conference website at <http://ofof.sare.org/>.



Urban Farmers Seek Sustainable Intensification

Improved soil management practices have led to increased yields and reduced labor for two urban farmers in Springfield, Missouri. Photo by Melissa Millsap.



Developing and maintaining healthy soils is a vital activity for producers. For urban producers, issues such as soil contamination and compaction are major concerns, but soil productivity is also a primary focus for growers who aim to intensify production on a small plot of land. Simply put, sustainable intensification optimizes resource utilization and management. On the same area of land, producers use fewer inputs and generate greater yields (United Nations FAO, 2017).

At Urban Roots Farm in downtown Springfield, Missouri, owners Adam and Melissa Millsap have been farming and sustainably intensifying their operation since 2010. They have introduced high tunnels, bio-intensive crop planning and successions, and soil management strategies on .5 acres of urban land. Today, they harvest more than 500 pounds of produce per week, offering a 24-week vegetable community supported agriculture subscription (CSA) as well as a winter CSA. Because they're committed to the local food community in Springfield, they offer locally produced eggs, bread, mushrooms, and coffee in their CSA shares as well. As their farm grows, the Millsaps have looked for innovative ways to sustainably intensify production, but they have concerns about depleting their soil health with intensive production.

"We are always seeking methods, tools, and philosophy with the potential to make our farm more productive, more sustainable, and more efficient," said Adam Millsap. "The natural nutrient cycle dictates that a farm, which strives to operate within the constructs of nature, return as much plant matter to the soil as possible. Of course for this plant matter to be converted back into useful nutrients takes time and space, two commodities often in short supply on a tiny vegetable farm."

Millsap says that to remain profitable, they need to plant a new crop as quickly as possible after harvest, which limits the time available to allow soils to rest, and affords little opportunity to allow

crop residues to decompose in place.

With support from a \$6,334 NCR-SARE Farmer Rancher grant in 2015, Millsap started to work on a method for getting crop residues to rapidly decompose in place, hoping that they could drastically reduce the labor and tillage required to return nutrients to their soil. Prior to the grant project, the Millsaps had been moving coarse crop residues to a compost pile and incorporating fine residues with multiple passes of a rototiller. They would then move finished compost back to the bed, and till again to prepare a suitable seed bed.

"We spent a lot of time moving things to and from the bed, and eroding our soil structure through repeated tillage, in order to effectively recycle plant nutrients," explained Millsap.

Taking the advice of Jean Martin Fortier (author, *The Market Gardener*, 2014), they tested a system using a flail mower, opaque plastic sheeting, and a rotary harrow to cycle nutrients, purge weed seed from the soil, and prepare beds for successive planting.

After harvest in 2015, they set aside a test plot to begin their experiment. First, they used a flail mower to finely shred the crop residues in the field. Next, they covered the residues with high quality silage tarps to create suitable conditions for decomposing microorganisms. After 1-3 weeks, they removed the sheeting and used a rotary harrow (instead of a rototiller) to prepare their soil for planting. Finally, they planted their crops. After the first year, they immediately noticed improvements.



"It would not be an overstatement to say this system is revolutionizing our operation," said Millsap.

Millsap says the system has improved their labor situation, yields, and soil conditions. They have reduced the labor needed to move materials around, manage weeds, prepare products for market, and prepare beds for planting. Their soil structure is significantly less compacted, and requires less work prior to planting. Although their planting beds are not re-cropped as quickly since implementing the system, they have found that with the reduction of weed pressure, and reduction of prep time required for planting, they are able to have a larger percentage of beds in production because they are able to plant them as soon as they are ready.

"The ideas we implemented through this grant were not new ideas, but ideas which are not yet in widespread use," said Millsap. "It is our hope that we can continue to provide a functioning model for innovations which improve the profitability of micro and small scale farming. We talk about this project with everyone who shows the slightest interest, and it's our hope they will do the same after they've given it a try."

Read more about the Millsaps' NCR-SARE Farmer Rancher Grant project on the SARE project reporting website. Simply search by the project number, FNC15-1006 at <https://projects.sare.org/search-projects/> or contact the NCR-SARE office for more information.

Reluctant to use more plastic on their urban farm, the Millsaps purchased high quality silage tarps, which they hope will last several seasons—they expect to see a reduced need to cover the beds as the weed bank is depleted. Photo by Adam Millsap.



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Did you know NCR-SARE is on Facebook, YouTube, Instagram and Twitter? 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 look for 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 or contact the NCR-SARE office at 612-626-3113 or ncrsare@umn.edu.

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Dan Corneilus, Marie Flanagan, Adam Millsap, Melissa Millsap, Jim Matheson, and University of Wisconsin.

NCR-SARE GRANT TIMELINES*

Farmer Rancher*
Mid 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
October- Preproposals Due
Late January - Full Proposals Invited
April - Full Proposals Due
Late July - Funding Decisions
Fall - Funds Available to Recipients

Professional Development Program*
February - Call for Proposals Released
Early April - Proposals Due
August - Funding Decisions
October - Funds Available to Recipients

Youth Educator*
Mid August: Call for Proposals Released
Early 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

Main Office Phone: 612-626-3113
Email: ncrsare@umn.edu
Online: www.northcentralsare.org



University of Minnesota (U of MN) professor and researcher, Craig Sheaffer, shares information about intermediate wheatgrass (kernza) with NCR-SARE staff, state coordinators, and administrative council members during a SARE project tour in Minneosta. This is SARE project LNC10-319. Photo by Marie Flanagan.