

Reaping the Rewards of Our SARE Investment



UNIVERSITY OF ILLINOIS
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NCR SARE Farmer Rancher
Grant Recipients in Illinois
from 1992-2008

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Lastly, I would like to thank each of the Illinois NCR SARE Farmer Rancher Grant Program recipients for taking the time to share their thoughts and show how their innovation and dedication to sustainable agriculture is making a difference on their farms, in their communities, and across Illinois.

Credits



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Contents

- | | | |
|--|---|--|
| <p>1 A Farmer's Marketplace of Ideas</p> <p>2 Starting Small, Dreaming Big</p> <p>3 A Picture's Worth a Thousand Prawns</p> <p>4 Aquaponics Combine Fish, Tomatoes, and Ingenuity</p> <p>5 Patience and Persistence</p> <p>6 Putting Water to Work—More Ways Than One</p> <p>7 Hoop Dreams</p> <p>8 Fire Blight and Apple Scab Meet Their Match</p> <p>9 Detours on the Road to Success</p> <p>10 A Forest Reborn</p> <p>11 The Science of Fighting Flies</p> <p>12 Where the Ostriches and Buffalo Roam</p> | <p>13 Creating a Buzz for Disease-Resistant Bees</p> <p>14 The Reluctant Pioneer</p> <p>15 Putting Okra to the Test</p> <p>16 Giving it Their All</p> <p>17 Breaking From the Herd with Rotational Grazing</p> <p>18 Illinois Wine Country</p> <p>19 Paddlefish, Poaching, and Ponds</p> <p>20 The Best of Years, the Worst of Years</p> <p>21 A Spring Runs Through It</p> <p>22 Pizza Farm Gives Kids a Taste of Sustainable Ag</p> <p>23 Composting Manure, Taming a Menace</p> <p>24 Aquaponics: A Dream System</p> | <p>25 Grazing the Intensive Way</p> <p>26 Worm Castings Act as 'Super Humus'</p> <p>27 Life Lessons for Cowboys and Cowgirls</p> <p>28 Growing Excitement Among Youth</p> <p>29 The Hairy Vetch Option</p> <p>30 Getting to the Root of the Problem</p> <p>31 Seeding Worms Boosts Soil Tilth—Naturally</p> <p>32 Giving Okra a Second Chance</p> <p>33 The Canada Connection</p> <p>34 List of Recipients</p> |
|--|---|--|



A Farmer's Marketplace of Ideas

Illinois farmers do groundbreaking work in more ways than one. They don't just break the soil when planting seed; they also break new ground by planting innovative, new ideas. For proof, simply sample the pages that follow, which highlight the state's impressive lineup of farmer/rancher projects from the North Central Region Sustainable Agriculture Research and Education (NCR SARE) program.

Through NCR SARE, farmers in the state have found new ways to raise fish and freshwater prawns, test cover crops, produce healthy eggs and meats, rejuvenate the soil, experiment with organic pest-control methods, reinvigorate wine production in Illinois, breed disease-resistant apples, and raise buffalo, ostriches, and Rocky Mountain elk. Some NCR SARE recipients have even reached out to urban youth with horseback riding, while others have converted vacant Chicago lots into flourishing gardens. And that's just for starters.

This publication provides personalized glimpses of these and many more projects, which NCR SARE has been helping to make possible ever since farmer/rancher grants were first offered in 1992. Think of this publication as a farmer's market of sorts—a marketplace of ideas.

Nationwide, the SARE program had its genesis in 1988, with the singular mission of strengthening rural communities, increasing farmer and rancher profitability, and improving the environment by supporting research and education. Between 1992 and 2007, Illinois has been awarded 43 SARE grants totaling \$245,545.

The goal, with this publication, is to share the innovative work that NCR SARE recipients have done over the years because education is a key component of the



Sustainable Agriculture Research & Education

What is Sustainable Agriculture?

Sustainable agriculture is an integrated system of plant and animal production practices that aims at these long-term goals:

- Satisfy human food and fiber needs.
- Improve environmental quality and the natural resource base.
- Make the most efficient use of non-renewable resources and on-farm resources.
- Integrate, where appropriate, natural biological cycles and controls.
- Sustain the economic viability of farmer operations.
- Enhance the quality of life for farmers and society.

program. These projects do not just help individual farmers; they also inform other producers throughout the state and nation. Therefore, when the NCR SARE program awards grants, they're not just looking for people who are willing to test a new sustainable agriculture technique; they're looking for people who will share what they learn through demonstrations, field days, learning circles, or other means.

For example, Brenda and J.C. Lyons (page 16) have become nationally known as experts in raising shrimp since they received their first SARE grant in 2003. Their outreach draws people from all across the United States, culminating every year in a highly successful fall festival. Joel Rissman, meanwhile (page 23), has been featured in a traveling Smithsonian Museum exhibit highlighting his innovative operation.

SARE is divided into four regions, with Illinois being a member of the 12-state North Central Region. Four grant programs provide funds for sustainable agriculture projects, which target: (1) research and education; (2) professional development; (3) graduate students; and (4) farmers and ranchers. The profiles in this publication feature only the farmers and ranchers of Illinois.

The farmer/rancher grants can be for up to \$6,000 for individuals and \$18,000 for groups of three or more separate operations. But behind the grant figures and other statistics are real people, working hard on the Illinois countryside to try out new ideas and give their own personal touch to sustainable farming practices.

As NCR SARE recipient Michael Herren (page 12) said, he was attracted to the program because "the people receiving SARE grants were doing things others weren't doing. So I was putting myself with people who were innovative and cutting edge."

So explore these stories and enjoy. This farmer's marketplace of ideas is open for business.

—Deborah Cavanaugh-Grant,
Illinois Sustainable
Agriculture Coordinator

Starting Small, Dreaming Big

Godwin Akpan, Kankakee, Illinois

Establishment of an Organic, Sustainable, Small-Scale Farm Producing Livestock (Goats/Chickens) and Vegetables for Niche Markets in Chicago

Coodinator: Godwin Akpan

Location: Chicago, Illinois

SARE Grant: \$5,991

Grant Year: 2007

Project Number: FNC07-685

Chicago's United Human Services Center purchased 25 acres near Kankakee and is using organic farming to improve the lives of youths and adults. It's a mixed-farming operation with livestock and vegetables, and they hope to be self-sustaining in three years.

Godwin Akpan has a dream—a dream to revitalize a struggling community in Central Illinois using specialty vegetables, pastured poultry, and goats.

Akpan is executive director of United Human Services Center (UHSC), a not-for-profit organization that has been operating within Chicago for more than three years. "UHSC caters especially to abused women and involves citizens in gardening activities," he says. "In the summer of 2007, the gardens produced enough vegetables for everyone and to share. Participants learned simple and effective techniques of vegetable production in small spaces, weeding, trellising, and storage of produce."

From this experience, UHSC recognized the need to educate more people in a larger area, so they purchased a 25-acre plot in Pembroke Township—a community about 60 miles south of Chicago in the southeast corner of Kankakee County. A number of the residents are African-American organic farmers.

Through organic farming, Akpan says he hopes to help create a community that will improve the general lives of youths and



The interest in organically grown vegetables, herbs, and livestock is growing...

adults in Pembroke Township economically, socially, and educationally.

The interest in organically grown vegetables, herbs, and livestock is growing in Chicago and surrounding cities. The Muslim and Hispanic populations are a particularly strong niche market for goat meat.

With that in mind, Akpan and UHSC intend to develop a mixed-farming operation consisting of livestock and vegetables on a 3- to 5-acre model farm within the 25-acre farm—using the SARE grant to jumpstart his dream. The goal is to have a self-sustaining system in three years.

His plan is to start small and trust nature.

"We'll start with four does and a buck," says Akpan. "Assuming that they are good mothers, they will each produce twins. Half of those are expected to be females, ready to breed in a year."

By the end of the second year, he expects there to be approximately 20 goats in the herd. The males will be sold for meat and the income reinvested in the farm.

Vegetables to be planted in raised beds will include peppers, tomatoes, garlic, greens (turnips, mustard, collard, kale, and Swiss chard), okra, sweet potatoes, peanuts,

and various herbs. Plans also include planting blackberries, blueberries, and peach and apple trees. A major market will be the farmers market in Kankakee. Vendors at the farmers market can buy from the farm and eliminate transportation costs.

Structures on the small farm will be kept to a minimum. A water source will be established by sinking a borehole. Because of the presence of predators, dog- and coyote-proof fencing will be erected on two of the acres. A simple shed for a goat refuge during adverse weather and pasture poultry hoops will be constructed. Additionally, a simple set-up for vegetable washing and packing will be located within the farm.

Although it will be necessary to purchase some equipment to work the farm, the bigger machinery will be leased as needed.

To promote educational opportunities, UHSC will work closely with University of Illinois Extension to organize a twilight tour of the garden and a morning farm tour during mid-season crop production. UHSC has already initiated a 4-H Youth program for the area, providing each child with a small plot and the opportunity to plant a vegetable of their own choice.

"The people of Pembroke are organic farmers, and they will learn some simple techniques such as trellising for higher productivity from this project," says James Theuri, Extension educator at the Kankakee County Unit. "Godwin Akpan will also be an inspirer of younger people to get into farming. A lot of Pembroke people are aging and do not have young farmer entrepreneurs to take on the land after them."

Akpan is realizing his dream to bring sustainable agriculture practices to the residents of Pembroke Township—starting small in hopes of benefiting the environment and improving the lives of an underserved population in Central Illinois.

By Debra Levey Larson

A Picture's Worth a Thousand Prawns

Robert Boyd, Cobden, Illinois

Alternative Agriculture in
Southern Illinois

Coordinator: Robert Boyd

Location: Cobden, Illinois

SARE Grant: \$2,530

Grant Year: 2001

Project Number: FNC01-382

Robert Boyd produced a polyculture of freshwater prawns and rainbow trout for retail sale. He also formed the Shawnee Freshwater Prawn Growers Association and developed an innovative way to harvest prawns.



...ABC News covered
the festival...

All it took was a picture. "One look at one of those blue claws, about 18 to 20 inches long, and I was captivated," says Robert Boyd, who owns 34 acres of non-tillable land in Cobden, Illinois.

Boyd saw the photo of a local teacher's freshwater prawn in the newspaper and was instantly hooked. He went on to receive a SARE grant in 2000 to produce a polyculture of freshwater prawns and rainbow trout for retail sale.

Using 10 acres of his land, Boyd's aquaculture system consisted of an indoor nursery for juvenile freshwater prawns and two 1/2-acre ponds, which he stocked with prawns from June until harvest time in September. From September through May, he stocked the ponds with rainbow trout.

The grant covered the equipment, juvenile stocking, and feed.

Prawns are very large shrimp, which can reach sizes of 22 inches long. Boyd explains that freshwater prawns have advantages over marine shrimp, being higher in protein and lower in fat and sodium. They have sweeter, denser meat than shrimp, with a taste closer to lobster. They are also absent of iodine, allowing many people who are allergic to shellfish to eat them. In fact, Boyd has a friend who is extremely allergic to shellfish but was able to eat his prawns without a reaction.

"He said they tickled his throat a little bit. But any other time, if he just touches marine shrimp, he'll swell up," says Boyd.

However, Boyd cautions that an allergic reaction to prawns is still possible, because

iodine isn't the only trigger. In some cases, a particular enzyme found in the prawn or shrimp can set off an allergic reaction.

Boyd says his aquaculture system, which has now shifted to largemouth bass, is environmentally friendly. He buys only feed with natural ingredients and uses no chemicals or antibiotics. He also says he is a year or two away from becoming organically certified.

Boyd did not follow the traditional method for harvesting prawns, which is to drain the pond at one end and haul them out by hand. With such a system, a lot of mud gets caught in the prawns' gills and can require hours of purging to clear out all the mud.

"That really diminishes the quality of the prawns," he says.

Instead, Boyd and Chris Breden, a field technician with the Illinois Fish Farmers Coop, pioneered the use of an external catch basin. They inserted a 12-inch drainpipe at the deepest part of the pond, making it possible to drain the prawns into a catch basin that was created using a 750-gallon septic tank. This system puts far less stress on the prawns.

"It was a very economical way to get what I was trying to get done. And it worked perfectly," he says.

During his first year of production, Boyd stocked 16,000 freshwater prawns in the two ponds and harvested 700 pounds; and each year after that, his production has increased. In his most successful year, he stocked his ponds with 20,000 prawns and harvested 1,000 pounds.

In 2001, Boyd formed the Shawnee

Freshwater Prawn Growers Association, which started out with nine growers who came together to obtain cheaper prices on feed and share information with each other. Boyd and the other prawn growers in the area also held extremely popular festivals during harvest time to sell their prawns live.

People traveled from all over the Midwest to join in the festivities, including four elderly women from Kentucky who came every year, set up their lawn chairs, sipped wine, and dined on shrimp gumbo and shrimp kabobs. Boyd would sell 120 pounds of shrimp tails on kabobs in four hours.

He drew over 600 people to some of his festivals, which featured live music, wine and vendors. The festivals also drew national attention, with articles showing up in *USA Today*, the *Chicago Tribune*, the *Washington Post* and other publications. In 2002, ABC News covered the festival, airing the story on "World News Tonight with Peter Jennings."

By 2003, the Shawnee Freshwater Prawn Growers Association had grown to 66 members and Boyd taught a class at Shawnee College on prawn production.

But in 2004, the state government shut down the state-of-the-art fish processing plant in Pinckneyville, which Boyd says nearly killed the prawn industry in Illinois.

After the plant closed, the Freshwater Prawn Growers Association dropped back down to less than 20 members. Today, the only people who still produce prawns in Illinois are those who continue to host harvest festivals, selling all of their shrimp live.

Although Boyd is no longer among those still producing prawns, he considers the prawn/rainbow trout project to have been extremely successful.

"I determined that in a time when corn, soybeans and other conventional farming commodities lack the profitability needed to make maximum use of small acreages of ground, alternative agriculture products can be profitable," he says. "Small family farmers can add considerably to their financial income for a reasonable amount of cash outlay up front."

By Jason Peterson

Aquaponics Combine Fish, Tomatoes, and Ingenuity

Lori Bahre, Oakdale, Illinois

Growing Fish and Plants in an Aquaponic System

Coordinator: Lori Bahre

Location: Oakdale, Illinois

SARE Grant: \$4,848

Grant Year: 2004

Project Number: FNC04-533

Lori Bahre developed an aquaponics system, which is housed in a 30- by 50- foot greenhouse. The system proved successful, producing significantly more vegetables than her traditional garden.

Fresh fish and homegrown tomatoes sound like the beginnings of a perfect summer meal. They're also the ingredients of a productive aquaponic system, and many growers are finding that the challenge of developing such a system is well worth the effort.

Lori Bahre of Oakdale, Illinois, is one of them.

"We had as many tomatoes from the 12 plants in our aquaponic system as we had from 50 plants in our garden," said Bahre. She received a SARE grant in 2004 to develop her system, which she houses in a 30- by 58-foot greenhouse on her property. She is amazed with her results.

"The tomatoes in the greenhouse were ready by the end of April, while the garden tomatoes weren't ready until the first of June," Bahre says. "The greenhouse tomatoes also grew faster and taller than the ones in the garden and no one could tell the difference in taste."

Aquaponics integrates aquaculture (the cultivation of fresh fish) and hydroponics (supplying nutrients and water directly to the roots of plants, without soil) in a recirculating "closed water loop" cycle. Fish waste that accumulates in the water as a byproduct of an aquaculture system is collected and channeled to the grow beds.



"...having produce early makes people come back every week."

The nutrient-packed fish waste, rich in nitrogen and other byproducts, fertilizes the planted grow beds. The grow beds, in turn, digest the waste, reducing or eliminating the toxicity before the water is returned to the fish tanks clean and recycled.

However, Bahre's system is not hydroponic in the strict sense of the word because she plants her grow beds with an inert material.

"I tried rock wool at first and it kept the roots too wet," she says. "They didn't survive. So I planted them in perlite only and they grew wonderfully."

Bahre also grew green peppers. "The peppers grew well in the rock wool and directly in perlite as well."

Bahre's grow beds are 14 by 16 feet and she has tried different combinations each planting season.

"At first I just had everything in separate beds," she remembers. "Last year I tried planting the tomatoes in the center and the peppers on the outside. It definitely worked better having them intermixed. You utilize the whole space."

Bahre sold her produce at the local farmer's market from early May to late August and found that "having produce

early makes people come back every week." Bahre plans to increase sales by introducing other types of produce into the system.

Although an aquaponic system requires a good deal of work, Bahre believes the results are worth it.

"Everything tastes as good or better than the traditional garden vegetables, and they're healthier," she says. "People like the idea that there aren't pesticides on their produce. Besides, the plants produce more and they produce longer."

Bahre hopes to be able to share the lessons she's learned with the community at large.

"One of the professors at Southern Illinois University is excited about the greenhouse because he can teach his students about aquaponics and it's close by," she says. "We also plan on having FFA groups come out, and whoever is interested in bringing their class can do so."

"We'd be excited to show anyone how an aquaponic greenhouse works," Bahre says.

By Leanne Lucas

Patience and Persistence

Kim Burkhart, Ogle County, Illinois

Cover Crop Management in the Upper Midwest

Coordinator: Kim Burkhart

Location: Leaf River, Illinois

SARE Grant: \$2,332

Grant Year: 1995

Project Number: FNC95-117

Kim Burkhart's first try with cover crops did not take hold because planting was delayed. But his next attempt produced better results, boosting his soil's fertility with "green manure."

Kim Burkhart knew precisely what he was getting into when he started planting cover crops. He knew it would take patience and a willingness to experiment.

"You have to go into cover crops with an open mind if you want them to work," says Burkhart, who operates a 230-acre farm in Ogle County, Illinois. Ten years after his first experience with cover crops, Burkhart stuck to his word and has patiently tried it again, this time with greater success.

The first attempt came in 1995, when he obtained a SARE grant to use cover crops to put fertilizers back in the ground, rather than relying on synthetic chemicals.

"I believe in a more natural, non-traditional type of farming. I try to let things evolve the way God intended them," says Burkhart. But as he discovered, complications can arise—and they did. That first year, most of the cover crops planted on his 20-acre plots did not survive the winter.

"Most things you try for the first time happen that way," says Burkhart. "There are a lot more ways to do something wrong than right."

Burkhart had to plant his cover crops—clover and rye—through aerial seeding. But



...rye increased
organic matter and
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capacity.

his helicopter pilot was not able to plant until early fall, due to an increasing need for pesticide spraying that year.

Because Burkhart's cover crops were seeded so late, his clover was not able to establish itself before winter, and all of it was winter-killed. However, his rye still came up in the spring and improved his soil.

According to Burkhart, the rye increased organic matter and boosted the soil's nutrient-holding capacity. "When you get a good stand of rye, it also chokes out the weeds really well," he says.

This was not the first time that Burkhart has seen benefits from his conservation-minded methods. During a heavy rain in 2008, he says he watched fields on certain nearby farms suffer severe erosion. But Burkhart's land was fine because he no-tills his ground. He also uses minimal amounts of pesticides and no residual herbicides. He says it keeps his soil healthy and has not hurt him economically.

After the initial year with clover and rye, Burkhart was not able to put cover crops to the test again anytime soon. He says he was just too busy and had to deal with a serious soil compaction problem. But just a couple of years ago, Burkhart was inspired at a

no-till conference in Cincinnati to try cover cropping again.

At this conference, he learned how each species has unique strengths, so he decided to change his game plan a little bit. To maximize his yields, Burkhart chose to use a mixture. The mixture included oilseed radish, hairy vetch, red clover, and grass rye.

He used the mixture for the first time in 2007 but was not able to plant it early enough again, and the cover crops did not become well-established. Burkhart was determined to get his cover crops down in time in 2008, so he planted them in corn during the summer.

This time: success.

"I've learned from my failures that a lot of times there just isn't enough time to do everything in the fall," he says. "I've learned that timing is very critical."

Burkhart is continuing to make changes and adapt as he goes along.

"You just have to have patience," he says. "You have to go in with the attitude that it's going to work."

By Jason Peterson

Putting Water to Work—More Ways Than One

Three Rivers Community Farm, Elsah, Illinois

Water Conservation and Grey Water Recycling at Three Rivers Community Farm

Coordinator: Amy Cloud

Location: Elsah, Illinois

SARE Grant: \$5,000

Grant Year: 2006

Project Number: FNC06-606

Amy Cloud and her husband, José Lara, obtained a SARE grant to design and build a system that collects and recycles water being used to wash their produce. The system consists of a sloped 4- by 16-foot concrete floor, which drains into an underground tank.

After three years of drought in Southern Illinois, water has become a precious commodity. That is why Amy Cloud and her husband, José Lara, obtained a SARE grant to design and build a system that collects and recycles the water being used to wash their produce.

"I feel a responsibility to being a steward of the city water, trying to get as many uses as possible from it," says Cloud, who founded Three Rivers Community Farm with Lara in December of 2006.

Cloud grew up on a 1,000-acre corn and soybean farm in Michigan, but she says she did not want to run a conventional farm, nor did she want to work behind a desk in the corporate world.

"So I just stumbled on this whole idea of organic farming and CSA's," she explains. "I always wanted to farm; I just needed to find the type of farming that fit."

Cloud and Lara lease 12 acres from Principia College, a small Christian Science school. Before they met, she had worked on organic farms in Massachusetts,



...they will collect and reuse about 55,000 gallons the first year...

Michigan, and northern Illinois since 2000. But after marrying, the time was ripe to operate their own farm, just a half hour north of St. Louis.

"I like being able to see all 12 acres of our farm, rather than driving around 1,000 acres to see everything," says Cloud. "Our whole farm is right there in front of us."

Cloud and Lara currently run a 150-member Community Supported Agriculture (CSA) operation and take their products to a farmer's market in St. Louis every Saturday. They sell 60 different vegetables, as well as meats on a small scale.

The property has no electricity, and their only source of water comes from a city water line. Ideally, they would like to build a well. But Elsah is located on bluffs overlooking the Mississippi River, so it is impractical to do so.

Currently, they wash their produce in Rubbermaid tubs, but most of the water goes back into the ground, creating large mud puddles and causing soil erosion. To deal with this problem, they received the grant in April of 2007 and set to work designing the new water-handling system.

With the new system, the water used to wash produce will flow to a sloped,

4- by 16-foot concrete floor, which drains into an underground tank. They are also planning to create a gutter system to collect roof runoff from their barn, funneling the water into a cistern located at one of the corners. Then a solar pump will convey water from both the cistern and the underground tank into a drip irrigation system.

The irrigation system will probably reach only a third of their acreage, Cloud says. They plan to irrigate the rest of their land from a 500-gallon water tank on the back of a truck—a tank filled with water from either the cistern or the underground tank.

Cloud projects that they will collect and reuse about 55,000 gallons the first year but will increase the total considerably down the road as their operation expands. City water recently spiked from \$5 per thousand gallons to \$6.50 per thousand gallons, so they use it sparingly.

2007 was very successful, Cloud says, and they plan to increase the CSA by about 50 members each year until they reach roughly 500 members, if all goes as planned.

"I like the concept of CSA's, being able to bypass the middle-man and determine what we consider to be a fair price for our product," says Cloud. "It's a win-win situation. People are getting the best produce around, and we get the opportunity to grow more interesting and tasteful varieties."

By Jason Peterson

Hoop Dreams

City Farm, Chicago, Illinois

Resource Center City Farm

Coordinator: Kristine Greiber

Location: Chicago, Illinois

SARE Grant: \$5,950

Grant Year: 2004

Project Number: FNC04-518

Ken Dunn has been transforming vacant lots in poor Chicago neighborhoods into small, inner-city "farms" for years. A SARE grant made it possible to experiment with low tunnels—miniature hoop houses that extend the growing season through the winter.

Cabrini-Green has long had a reputation as one of the most disadvantaged neighborhoods in Chicago, an area dominated by drug dealers, gang activity, and litter-filled, vacant lots. However, when Ken Dunn looks at Cabrini-Green, he sees untapped resources and a chance for growth.

Growth as in gardens, that is.

"The devastated and neglected communities in Chicago have plenty of vacant land and plenty of people who need work. I thought it would be intriguing to put those two elements together to increase employment and beautify Chicago's neighborhoods," says Dunn, founder of the Resource Center, a Chicago non-profit organization.

The Resource Center operates City Farm, a project that transforms vacant lots in poor Chicago neighborhoods into small, inner-city "farms," producing vegetables at cheap prices for the local community. In 2004, they received a SARE grant to experiment with low tunnels, which are miniature hoop houses that extend the growing season on these farms through the winter.

The hoop structures were just the latest improvement to an operation that has its roots in the 1960s, when Dunn left his family farm in Kansas to study philosophy at the University of Chicago.

"The thing about philosophy is that it's not just about reflecting on things, but changing them," Dunn says. So he decided



...change was needed
in Chicago's poorest
neighborhoods...

change was needed in Chicago's poorest neighborhoods and began restoring vacant lots, in cooperation with the city. In 2000, this work officially became known as City Farm.

Today, City Farm operates three inner-city farms, two of which they own—a 1-acre farm and a one-third acre site. In addition to the permanent farms, they have a temporary site at Division and Clybourn Avenues, located right between Cabrini-Green and the highly affluent Gold Coast.

Although City Farm works in some fairly rough areas, Dunn says they have not had any serious safety problems. The workers get started at 6 a.m. and finish up around 3 p.m., before gang members and drug dealers come out on the streets.

"We take advantage of the peaceful portion of the day," he says.

Over the years, the city has allowed City Farm to use, for no charge, numerous temporary sites, but these farms can fall victim to their own success. If the farm helps to make the neighborhood a more attractive place to live, developers may determine that a stronger financial incentive exists to build in the neighborhood; consequently, the farm will have to leave and the developers will build over the farm site.

"Instead of putting down roots and fighting all of the forces that would displace us, we just move on," says Dunn. "There's more work elsewhere."

The vacant lots are often in pretty bad shape when they get started on them, he also explains. Before City Farm works on a lot, they seal the ground with a layer of clay

and cover it with about 2 feet of compost. To create compost, City Farm collects scraps from nearby cooking schools, restaurants, and hotels.

According to Dunn, the farms sell half of their produce to high-end restaurants in Chicago, which pay a considerable price for their high-quality, organically grown product, particularly tomatoes. This income makes it possible to sell the other half of their produce to the local neighborhood at prices that low-income residents can afford.

"I'm not buying from them because it's a good cause, although I'm happy it's a good cause," says Sarah Stegner, a chef at the Ritz-Carlton hotel. "I'm buying from them because they have great tomatoes."

The SARE grant made it possible for City Farm to build 12 low tunnels in 2004, each one of them 30 feet long and 7 feet wide, says Tim Wilson, general manager of urban agriculture for the Resource Center. These hoop-like structures are roughly hip height, standing 3 feet tall at the apex. They are held up by PVC pipe, curved like ribs and anchored in running boards. Wilson says they use clear plastic for the cover, the lightest overwintering plastic available.

The low tunnels were successful, making it possible for the farms to grow vegetables through the winter very effectively, Wilson says. To help maintain warm enough temperatures and fight off wind, they use a double-cover system. Inside the low tunnels, they use smaller hoops, which provide another cover of plastic and another level of protection for the vegetables.

City Farm mainly grows winter lettuces in the low tunnels, Wilson says, but they also grow other small greens, such as arugula, claytonia, and mizuna.

Everyone involved with City Farm, from the workers to the people in the community, benefits from these lots, Dunn says. Workers get the satisfaction of running a local food system and residents of the neighborhoods have a more pleasant place to live, as well as new job opportunities.

"The city is also a winner," Dunn says.

"The city provides their lots for our use for no charge, but we provide beautification and protection at no charge."

By Jason Peterson

Fire Blight and Apple Scab Meet Their Match

Eckert Orchards, Belleville, Illinois

Breeding Better Apple Varieties for the Midwest

Coordinator: Jim Eckert

Location: Belleville, Illinois

SARE Grant: \$13,748

Grant Year: 1999

Project Number: FNC99-270

Jim Eckert received a SARE grant to find new apple varieties that are resistant to diseases such as fire blight and apple scab. The goal is to identify varieties suitable for the lower Midwest without the use of pesticides.

Just call them Johnny Appleseeds for the new millennium. Jim Eckert and other growers from four states in the Midwest are spreading apple-tree seedlings, but with a new twist. The seedlings are hoped to be resistant to fire blight and apple scab, two of the most notorious diseases to Midwest apple producers.

Eckert, president of Eckert Orchards in Belleville, Illinois, is one of a group of growers from Illinois, Indiana, Ohio, and Kentucky, who decided they were going to embark on an apple-breeding project to find varieties suitable for the lower Midwest—varieties that would be resistant to disease without the use of pesticides.

To begin the project, the producers made controlled crosses, which resulted in 10,000 seedling apple trees. According to Eckert, the current growth and viability of the project is exceptional, but winnowing through all that they are learning will take time.

"This is a 10-year project, 10 years and more," says Eckert. "The first seedlings from



...this adventure has provided something to be learned at most every turn...

controlled crosses went in the ground in the year 2000, and we evaluated apples in 2005 and 2006, so some of these seedlings have started to produce.

"A lot of the parent material we're using has some disease resistance in it," he adds. "We're hoping that the material coming out of the crosses would exhibit this resistance, especially to the two really devastating diseases, fire blight and apple scab. If that's true, if we can get that resistance and put it into something commercially acceptable, that will be a great thing."

In addition to disease resistance, Eckert's group hopes to develop apple varieties that will produce large fruit size, cropping reliability, good flavor and appearance, acceptable storability, and minimal pre-harvest drop.

Private apple breeding was not part of Eckert's previous experience, "so this adventure has provided something to be learned at most every turn," he says. "For instance, when we started this project, we sited some of the seedlings at various growers' farms. In hindsight, we learned

that wasn't a good thing, because growers can come and go. When one grower went out of business, the farm was sold to developers and that planting (2,000 seedlings) was lost."

Today, Eckert's group has partnered with an arboretum in Ohio that provides land resources where seedlings can be established in a place that's "going to be there for the long haul," he notes.

Other producers in this group include Mitchell Lind and Dianne Miller, both in Ohio, Ed Fackler and David Doud in Indiana, and Ray Armstrong in Kentucky.

By developing and producing new varieties, these Midwest producers hope to help other farmer increase profitability, reduce pesticide costs and maintain a healthy orchard business.

By Leanne Lucas

Detours on the Road to Success

Les and Penny Gioja, Champaign, Illinois

Linking Downstate Illinois Small-Scale Goat and Sheep Producers

Coordinator: Les and Penny Gioja

Location: Champaign, Illinois

SARE Grant: \$2,338

Grant Year: 1998

Project Number: FNC98-245

Les and Penny Gioja set out to link small-scale goat and sheep producers to a lucrative meat market in northern Illinois metropolitan areas. But the Giojas and other downstate producers changed their marketing approach and now sell their goats and sheep in areas closer to home.



...what we're involved in now is a local growing concept...

Les and Penny Gioja picked an unfortunate day to start transporting goats from downstate Illinois to markets in the northern Illinois metropolitan area—January 1, 1999. That was the first of a three-day snowfall, which eventually left just over 21 inches of snow in Chicago—the city's second-greatest snowfall of all-time.

Conditions were so bad on the way home, Les Gioja recalls, that their empty trailer threw them off of the road several times. They eventually had to park the trailer in an empty lot and come back later to pick it up.

As this event came to symbolize, the best-laid plans don't always come out the way you expect. When the Giojas began their SARE project in 1998, their objective was to link small-scale goat and sheep producers to a lucrative meat market in northern Illinois metropolitan areas.

"But what we accomplished was a little different than what we set out to do," says Gioja.

Before they could sell to any of the northern Illinois markets, he says it was necessary to produce a fairly large number of goats per week. The Giojas run a small operation near Champaign, Illinois, so their plan was to unite small, downstate producers, pool their resources, and transport goats to the Chicago area to meet whatever quotas they could.

A group of six to eight of the producers decided to share in the transportation of goats. But after the 1999 snowstorm, he says, "We learned early on that transportation could be a problem."

In addition to the logistics of transporting livestock, there was the question of liability.

"In one of our shipments, we had one producer who had three animals die," says Gioja. "When an animal dies, whose responsibility is it? We're taking it from the producer to the processor. When does liability change hands?"

"Even if the animal doesn't die, if it's a long trip the animal will lose weight, and

animals are bought and sold on a weight basis," he continues. "Where do you make up that money? Those are big issues that came into effect and caused us to rethink the whole process."

Eventually, their buyer decided to look for a local group to supply the animals he needed, and the Giojas and the other downstate producers decided to change their marketing approach.

"In fact," says Gioja, "what we're involved in now is a local growing concept. The food you eat really should be grown pretty close by and you should limit transportation."

Today, the Giojas raise and sell goats, sheep, chickens, turkeys, ducks, geese, and cattle. They also sell milk and eggs, and the majority of their customers are from the surrounding area.

Although the goal of connecting downstate producers to the northern metro areas never did come to fruition, Gioja is pleased with the overall outcome of the project.

"The whole process actually started a number of things that have been very useful," said Gioja. "For instance, the Illinois Meat Goat Producers started with this project, and they're still in operation today. We also wanted to develop a directory of processing plants and producers. Another organization has finished that, so it's available as well.

"Our ultimate goal was to encourage other producers to get started and to provide an outlet for small growers to be able to sell their animals," Gioja adds. "In that respect, we've been very successful. We created a network that's been very beneficial, and that network started with this grant."

By Leanne Lucas

A Forest Reborn

Kevin Green, Fithian, Illinois

Sugar Maple Control and Hardwood Restoration in Central Illinois Woodland

Coordinator: Kevin Green

Location: Fithian, Illinois

SARE Grant: \$5,000

Grant Year: 1998

Project Number: FNC98-231

In response to the overpopulation of maple trees in the Midwest, Kevin Green received a SARE grant to restore a portion of the woods on his family farm to a more traditional oak/walnut/hickory forest.

More than 100 years ago, prairie fires regularly swept across the Midwestern plains. Those fires primarily eliminated maple trees because the nut trees (such as oak, hickory and walnut) were more resistant to fires. But as humans took control of the prairie, the natural process that kept a healthy balance in the tree population was eliminated and hard maple began to take over. Hard maples grow more readily in an open space with full sunshine, so today when a nut tree dies, a hard maple usually takes its place.

Kevin Green, a farmer near Fithian, Illinois, has decided—with the help of a SARE grant—to take a portion of the woods on his family farm and restore it to a more traditional oak/walnut/hickory forest.

"I took approximately 2 acres (of a 40-acre woods) and tried a variety of techniques to eliminate the maple trees and allow the nut trees to regenerate themselves," says Green.

First, Green cut the smallest maple trees (the size of a pencil to a broomstick) flush with the ground and sprayed the stumps with the herbicide Garlon. On trees with a diameter of 6 to 8 inches, Green made several inch-deep cuts all the way around



...as humans took control of the prairie, the natural process that kept a healthy balance in the tree population was eliminated...

the tree and sprayed Garlon in the girdlings. The largest maple trees, with diameters of 8 inches and up, were cut and harvested for firewood and lumber.

"On the trees that were cut off at the base, or the trees that were girdled, we had about a 90- to 95-percent non-survival rate," said Green. "After two or three years, if any of those grew up again, we would re-spray them."

Next, Green chose different areas of open forest, partially shaded forest, and densely shaded forest and tried three different methods to regenerate the nut trees in each area.

"Our first method allowed the areas to naturally regenerate. Whatever nuts fell from the trees, we let nature take its course," says Green. "We also planted bare root stock—seedling trees that come 20 to a bundle that fits in a grocery sack. Those are maybe a foot tall. Finally, we planted slightly larger trees from 1-gallon pots."

What were his results?

"Pretty much what you can imagine," he says. "In densely shaded forest, the natural generation worked the best and the potted plants all died out. In open forest, with no canopy, the potted plants flourished."

Today, Green says, the natural takeover by the hard nut trees is doing quite well.

"There are hundreds of tall oak and hickory and walnut trees out in that part of the woods. It's real nice down there. It looks like a traditional hardwood forest."

At this time, Green has no plans to market the byproducts of the forest, "although I certainly could if I wanted to," he says. "Income could definitely be garnered from the sale of nuts, firewood, or lumber. Veneer logs would be another byproduct, although it takes about 100 years to get a good veneer log. So those will be there for my grandchildren or great-grandchildren."

Green primarily uses the area for the personal enjoyment of his family and friends.

"It's an excellent deer habitat," he says, "so we mainly use the area to hunt. In fact, it's been so attractive to deer that a friend and I go down periodically and thin out a few more maple trees. It's also been a great habitat for morel mushrooms."

Green is clearly pleased with the results of his project, so much so that he has only one regret.

"I think I should have been more aggressive," he says. "Had I known then what I know now, I would have hired several people and done a lot more acreage."

By Leanne Lucas

The Science of Fighting Flies

Lisa Haynes and Eric Thorsland, Mahomet, Illinois

Determination of an Economically Optimal Organic Control of Onion Maggots in Allium Crops

Coordinator: Lisa Haynes

Location: Mahomet, Illinois

SARE Grant: \$1,405

Grant Year: 2004

Project Number: FNC04-497

Lisa and Eric Haynes tested three organic methods for controlling onion flies—parasitic nematodes, ground organic cinnamon, and kaolin clay. They found the nematodes to be the most useful method.

Lisa Haynes, a nuclear engineer by training, has made something of a science out of controlling onion flies.

In 2005, Lisa and her husband, Eric Thorsland, received a SARE grant to look into methods of controlling an onion fly infestation, which was damaging anywhere between 10 to 50 percent of her onion crops yearly on their 17-acre farm.

"The onion fly maggots will just bore into the onion and either kill it or damage it," says Haynes, who became attracted to organic farming as a nuclear engineering graduate student while working on the Blue Moon farm in Urbana. Haynes does most of the hands-on work on the farm, while Thorsland tends to the mechanical needs in addition to his off-farm job.

Their 2 acres of vegetable production is split into four fields, where she rotates (1) allium crops, (2) sweet corn and squash, (3) beans and peas, and (4) other vegetables and annual flowers. But the flies primarily target the allium crops—leeks, garlics, and onions.

With the SARE grant support, Haynes tried out the three most promising organic methods for controlling the flies—parasitic nematodes, ground organic cinnamon, and kaolin clay.



...the three most promising organic methods for controlling the flies—parasitic nematodes, ground organic cinnamon, and kaolin clay.

Currently, she has found the parasitic nematodes to be the most useful method to control the onion fly problem. After applying the nematodes, about 15 percent of her crop was damaged in 2007, but only 2 percent was severely injured. Severe damage is defined as damage that impacts marketing.

She sprays her crops with parasitic nematodes just as the onion fly eggs reach the hatching stage. The nematodes then bore into the eggs and kill the larvae, she says. Typically, there are three generations of onion flies in a year, and she says you have to hit each generation.

While the nematodes target the pests in the maggot stage, the other two methods—cinnamon and clay—target them in the fly stage. Haynes applied the cinnamon as an olfactory disruptor. In other words, it masked the scent of the onions, so the flies would not be attracted to the crops.

The main drawback to this method was efficiency, she says. Haynes tried to mix the cinnamon into a suspension so she could

spray it on the crops, but it just dispersed and floated on the top. It also took longer to clean out the sprayers after every application than it actually took to spray the crops. In the end, she found that the easiest way to apply cinnamon on the crops was by sprinkling it.

The clay, meanwhile, was effective because the onion flies do not like landing on the abrasive surface created by the clay and stay away from the crops when they are covered in it. The clay also tastes bad to the flies, which consume the clay while trying to clean themselves.

The clay had to be washed off of the produce before it was sold at the market. But the drawback was that it would leave behind a white residue on the leaves, which customers might think was mold. But Haynes still likes the idea of using clay on crops like apples and plums, because it washes off easily from them.

A couple of less successful methods that Haynes experimented with were row covers and heritage turkeys. The plastic row covers tore easily and didn't do a good job covering the leeks and garlic, which reach several feet in height. The turkeys helped control some of the flies; but despite being kept in a moveable coop, many of them were killed by "a particularly nasty predator."

However, Haynes did have success in combining the parasitic nematodes with one other control method—trap crops. She planted giant onions between the old onion field and the new field with the goal of intercepting the onion flies on their way to the new field. Haynes likes this method because she prefers to spray as little of the crop as possible, even with organic products.

"But if I use trap crops again, I would go with elephant garlic, which they go for more than anything. It would be a more effective trap crop than a big, old onion."

By Jason Peterson

Where the Ostriches and Buffalo Roam

Michael Herren, Kampsville, Illinois

Establishment of Native Warm and Cool Season Grasses on Highly Erodible Land

Coordinator: Michael and Debi Herren

Location: Kampsville, Illinois

SARE Grant: \$2,951

Grant Year: 1994

Project Number: FNC92-022

Michael and Debi Herren raised eyebrows when they started raising buffalo, ostriches, and mountain elk. They also found success with four native, warm-season grasses for the buffalo to graze on: big bluestem, Indiangrass, eastern gamagrass, and switchgrass.

When Michael and Debi Herren started raising buffalo, ostriches, and Rocky Mountain elk in 1986, "Everybody was sure we were nuts," says Michael Herren. "But they and I couldn't really understand the value of the buffalo at the time. We did things for the love of it, not for the money."

Herren stuck with his gut, purchasing six buffalo for his 320-acre farm in Kampsville, Illinois—a herd that grew to 60 brood cows in 10 years. It paid off well, and by the time he got out of raising buffalo in 2005, the value of calves had risen from \$400 to about \$2,000 apiece.

To improve grazing land for the buffalo, Herren decided in 1994 to establish native warm-season grasses on highly erodible ground. That's when he found out about SARE.

"The people receiving SARE grants were doing things others weren't doing," he says. "So I was putting myself with people who were innovative and cutting edge."

With the grant, Herren planted four warm-season grasses: big bluestem, Indiangrass, switchgrass, and Eastern gamagrass. One of the reasons for planting these grasses, he says, was his unhappiness



Handling the 1,000- to 1,500-pound animals that graze on this grass called for creativity.

with fescue, due to fungus problems, and the observation that buffalo and elk do not really like it. Also, being an avid hunter and enjoying wildlife, warm-season grasses provided great habitat—protective cover and a great food source.

Of the choices, he says, switchgrass handles the stress of forage production and grazing the best of all. But all of the grasses took a couple of years to establish.

The grasses require no other input except fertilizer, if desired, which increases tonnage and growth. Herren usually burned the grasses every other year in sections, leaving some for habitat. Burning every other year puts nutrients from the dead plant material back into the soil in usable components of potash and phosphate.

Handling the 1,000- to 1,500-pound animals that graze on this grass called for creativity. To herd the buffalo through chutes, he used a shield mounted on the front of his tractor. Herren also installed an electrified, high-tensile fence, which was cheaper than regular fencing and has greater longevity.

Herren and his wife sold buffalo burgers at festivals and events where people

simulated what the world was like in the 1700s and 1800s with black powder guns and buckskins. The Herrrens also made a profit selling gift packs containing a selection of one or more of 14 different meat products.

However, profit is not the only benefit Herren received from raising buffalo. He says raising the animals brought him lasting friendships. For instance, if it were not for buffalo, Herren would never have met the man he now describes as the best of friends and "a grandpa" to him—Ray Smith from Longford, Kansas.

"Uncle Ray," as Herren called Smith, was one of the pioneers in buffalo, raising about 800 at his peak. He even led Herren and his wife on a once-in-a-lifetime trip to the Arctic Circle on sleds and snowmobiles, coming within 900 miles of the geographic North Pole. According to Herren, the passing of this friend was one of the reasons he got out of the business.

"It just wasn't the same without him."

Today, Herren spends most of his time running a hunting business on his land, and an airstrip accommodates out-of-state hunters on some of the land where the buffalo once roamed.

The buffalo may be gone from his land, but he says the experience was rewarding in more ways than one.

"It was a tough start, but my wife and I worked hard and the buffalo were financially rewarding in the end," he says. "We had 20 years of success and good luck and never got hurt. I met some wonderful people, made lifelong friends, and had some fun. It was a wonderful education and a great time. What more can you ask for?"

By Jason Peterson

Creating a Buzz for Disease-Resistant Bees

Stu Jacobson, Rochester, Illinois

Northern Production of Disease and Mite Resistant Queen Honeybees

Coordinator: Stu Jacobson

Location: Rochester, Illinois

SARE Grant: \$4,409

Grant Year: 2006

Project Number: FNC06-641

Stu Jacobson and fellow beekeeper Steven Staley raised and marketed a line of honeybee queens that are resistant to the most problematic parasitizing mites, the Varroa destructor and Tracheal mites.



“Varroa mites are like little vampires...”

Beekeeper Stu Jacobson compares it to having a family of roaches living in your lungs. That is what it is like for a honeybee when it is parasitized with Tracheal mites, one of a pair of mites plaguing Midwest beekeepers. The other problematic mite, Varroa destructor, parasitizes developing bee pupae and feeds on hemolymph (insect blood) of both the pupae and adults.

“Varroa mites are like little vampires,” says Jacobson, who is also a retired researcher for the University of Illinois at Springfield.

Thanks to a SARE grant, Jacobson has been raising and marketing a line of mite- and disease-resistant honeybee queens—a safer alternative to battling the mites with hazardous chemicals.

Colonies of honeybees stay warm in the winter by beating their wings rapidly and clustering together, Jacobson says. But when a bee is parasitized with Tracheal mites, the mites take up residence in its breathing tube and also feed on the bee’s blood. As the mites do damage, it becomes harder for the honeybee to beat its wings at a rapid rate. And when a considerable number of bees suffer from these parasitic mites, it is very difficult for the cluster to stay warm, especially in the cluster’s core, where the rearing of offspring takes place.

Varroa mites, meanwhile, can spread viruses such as Deformed Wing Virus when they feed on honeybee blood and have

been shown to spread the virus associated with Colony Collapse Disorder. In addition, Jacobson explains, the adult bees that survive being parasitized as pupae emerge weakened and often unable to fly, making them nearly worthless to the survival of the colony. Eventually, the colony will die due to the inability of its small population to store sufficient honey or keep warm enough during winter.

Honeybees are tropical insects, but they are able to adapt to more temperate climates by residing in cavities in trees and by keeping the core temperature of their cluster at 90 to 93 F while raising offspring, a process that inconveniently begins in late January.

“It could be 20 below outside, but the interior of the cluster, where the offspring is being raised, requires 90-degree temperatures,” says Jacobson, who gives talks around the Midwest on the subject.

The Tracheal mites showed up in the United States about 15 years ago, soon followed about five years later by the Varroa destructors. Scientists do not know how the mites arrived in the United States, he says, although one possibility is that they came in along with the Africanized bees from Mexico. Regardless of how they got here, they spread like wildfire.

Initially, scientists developed hard chemicals to combat them, such as fluvalinate and coumaphos, but they had negative effects on honeybee reproduction.

Even the “soft,” or naturally occurring chemicals, such as thymol and menthol, are stressful on the bees, he says. What’s more, the mites can build a resistance to the chemicals.

Jacobson worked with fellow beekeeper Steven Staley to produce queens from the Minnesota hygienic line. The Minnesota hygienic is an Italian bee that “has a noticeable capability to remove pupae that are parasitized by mites, as well as those with serious diseases like American Foulbrood,” Jacobson says.

He also says “you can go a long way to reducing chemical usage” if you combine Minnesota hygienic bees, or other resistant lines, with additional strategies, such as placing a screen on the bottom of the hive instead of a solid board.

To raise the queens, Staley transfers very young female larvae from selected breeder colonies and places them in artificial queen cells. Next, he puts 40 of these cells into a very large colony lacking a queen, so the workers will develop the larvae into queens. When a queen is almost ready to hatch, he shifts her cell to a small colony that needs a queen. A few days after the queen hatches, she goes out on mating flights.

The second part of their project was marketing the queens. Jacobson and Staley had fair success in 2007, although they got a late start and produced only 75 to 80 queens. Their earliest queens did not come out until mid to late June and they primarily sold them to local beekeepers. Jacobson believes they will have more success if they shoot for mid to late May.

According to Jacobson, there is a major need to promote and explain the advantage of disease-resistant lines to beekeepers across the country. What makes promotion difficult is that when most local beekeepers need new honeybee queens, they’re usually just looking for a “warm body” to keep the colony from collapsing. Disease resistance isn’t at the forefront of their minds.

“That’s why I’m beating the disease-resistant drum,” he says.

By Jason Peterson

The Reluctant Pioneer

Larry Kennel, Lowpoint, Illinois

Strip Cropping in a Four-Crop Rotation

Coordinator: Larry Kennel

Location: Lowpoint, Illinois

SARE Grant: \$3,428

Grant Year: 1994

Project Number: FNC94-063

Larry Kennel switched to a four-crop rotation (alfalfa, corn, soybeans, and wheat) using no commercial fertilizers or other chemicals. This program reduced investment risk, provided better than average returns, and boosted fertility levels.

Larry Kennel was never so happy to be wrong.

When the land that Kennel was farming in 1991 changed ownership, he was told he could either stop using chemicals on his crops or he could find different land to farm. Ten years later, Kennel was honored by the Illinois Department of Agriculture as the 2001 R. J. Vollmer Sustainable Agriculture Farmer of the Year.

Although he was reluctant to make the switch, it did not take long for Kennel to realize that the move to organic farming was a good one.

"We learned we could be more profitable with crop rotations than by depending on expensive chemicals and fertilizers. And at the same time, we could reduce erosion and protect the environment," said Kennel, who ran the 270-acre Blue Heron Farm with his two brothers in Lowpoint, Illinois, in Woodford County.

Kennel, who passed away in 2002, received a SARE grant in 1994 to adapt a tillage system in which he planted in 30-foot strips. The system was a four-crop rotation (alfalfa, corn, soybeans, and



"...we could be more profitable with crop rotations than by depending on expensive chemicals and fertilizers..."

wheat) using no commercial fertilizers or other chemicals. Planting in 30-foot strips would allow more sunlight and air to the crops than narrower strips.

"We knew from previous studies that corn planted in 30-foot strips would produce about 15 percent more yields," said Kennel.

Kennel divided his farm into two halves—one half stripped with wheat and corn and the other half stripped with alfalfa and soybeans. When the wheat reached maturity, the adjacent rows of corn were roughly the same height and did not shade it. In addition, the beans were never outgrown by the alfalfa, leaving them with enough access to sunlight.

The following year, Kennel would plant the corn and wheat where the alfalfa and beans had been and vice versa.

Kennel used a 15-foot power-take-off-driven rotary tiller to plant the corn and beans; and he used a no-till drill to plant the alfalfa, wheat, and rye. Early in the spring, Kennel would rotary till the previous crop to allow the weeds to germinate. Then he tilled the ground again before planting to kill off all the weeds.

The experiment reaped better results than he had expected. According to Kennel, weed control was "outstanding in the corn and very good in the soybeans."

"The advantage to this program is reduced investment risk with better than average returns," he added.

Soil tests also showed that fertility levels on the farm rose—partly due to using alfalfa as a green manure. And by 1994, the Blue Heron Farm was certified organic.

Kennel, with the help of Sun Foundation Center, spread the word by holding two meetings about his project—one before he started the grant and one after his grant was finished. Kennel's operation also drew media attention from several outlets. Publications such as the *Peoria Journal Star*, *Sun Foundation Journal*, and *Illinois AgriNews* covered his sustainable practices.

"When you can make money and be good stewards of the land, it is a win-win situation," Jeff Kennel, Larry's brother, told the *Sun Foundation Journal*.

By Jason Peterson

Putting Okra to the Test

Jon Klingenberg, Butler, Illinois

Okra Test Trial of 16 Varieties in an Organic Farming Operation

Coodinator: Jon Klingenberg

Location: Butler, Illinois

SARE Grant: \$4,118

Grant Year: 2003

Project Number: FNC03-489

When Jon Klingenberg tested 16 varieties of okra, he found that Cajun Jewel outperformed them all, with almost double the productivity. He sees both potential and drawbacks to okra as a large-scale grain crop.

It is only fitting that a variety with a name like "Cajun Jewel" would emerge as the most productive okra variety on Jon Klingenberg's farm. After all, okra is a critical ingredient in that Cajun-cooking classic—gumbo.

The question is: Can okra ever become an important ingredient in Illinois agriculture?

Klingenberg, an organic farmer from Butler, Illinois, aimed to find some answers, testing 16 varieties of okra in 2004. He says all but one germinated nicely; and of those that germinated, all 15 were about the same in productivity, with one significant exception.

"The Cajun Jewel produced almost double anything else," says Klingenberg, a retired electrical engineer who conducted the varieties test with a SARE grant and assistance from Western Illinois University. The runners-up in productivity were two Clemson varieties, which are commonly recommended in Illinois—Clemson Spineless and the newer Clemson Spineless 80.

Klingenberg was attracted to okra because it is a highly nutritious vegetable. The seed or grain has similar protein and high-quality oil levels to soybeans. It has about 19 percent protein and an oil with qualities comparable to olive oil.



...it contains as much oil as soybeans...

He also found that with a little cultivation, the 15 varieties did not face any weed pressures on his 40-acre farm, which is located about 45 minutes southeast of Springfield. Weed control is important in row crops for organic farmers. In addition, none of the varieties had insect problems or suffered shattering, which is when the grain falls out of the pods.

That's the good news. But there is another side to the okra picture.

Okra was once considered as a potential large-scale grain crop in the 1940s, Klingenberg says, but it was bumped aside during the soybean revolution. One of the greatest obstacles to okra as a large-scale crop continues to be the harvesting process.

Okra is a non-determinant, which means it just keeps growing until it is killed by the first frost, Klingenberg explains. Because you cannot run something green and growing through a combine, okra cannot be harvested until after the first frost and after it has been given time to dry. The problem, he says, is that while producers wait for okra to dry after the frost, this is the time when many parts of Illinois see cold, autumn rains. Those rains can create serious mold problems in okra before you can get in there to combine the seed.

One solution, Klingenberg says, is to wait until you have enough pods and then cut them off and windrow the okra—before

the first frost. Then let the windrowed okra dry and pick it up using a combine with a special head.

Although okra needs help on the harvesting side if it is ever to be grown as a large-scale grain crop, Klingenberg says that in most other ways, "It has one advantage after another." For instance, it contains as much oil as soybeans; and if you remove the oil for use as a cooking oil, it can be made into a highly nutritious livestock feed. It doesn't even have to be heated or extruded, as is necessary with soybeans.

Klingenberg had hoped to produce flour from the okra because it is a non-gluten and would be in high demand from those with gluten sensitivity.

"I've had a lot of calls from people interested in a non-gluten okra flour," he says, but it requires a special machine to crack off its hard seed coat. He wasn't in a position to purchase the equipment.

According to Klingenberg, okra should be planted when the soil temperatures are around 70 F. Most people, who handpick the okra, space the plants about a foot apart. But Klingenberg opted for a closer, 6-inch spacing—"a much higher rate, more or less like corn," he says. "The proper planting rate is a study in itself."

Klingenberg still grows some okra on his farm, where he primarily raises grass-fed beef and has begun growing produce. As a former president of the Illinois chapter of the Organic Crop Improvement Association, he is committed to organic crops. And he remains upbeat about the potential for okra, despite its current limitations. For instance, he says genetic work might be able to someday produce a determinant variety of okra, a plant that would stop growing before the first frost. That could open the door to wider uses.

"So I'm still motivated," he says.

By Doug Peterson

Giving it Their All

Lyons Fisheries, Sandoval, Illinois

Reinventing the Family Farm

Coordinator: Brenda Lyons

Location: Sandoval, Illinois

SARE Grant: \$5,263

Grant Year: 2003

Project Number: FNC03-446

The Lyons developed a simple prawn farm, which has expanded to include tilapia and rainbow trout, with plans to add largemouth bass and hybrid striped bass in the near future.

Brenda and J.C. Lyons really did their homework. To create what is now Lyons Fisheries, a highly successful aquaculture enterprise in Marion County, the Lyons read stacks of books, did research on the Internet, visited other aquaculture farms, took some college classes and attended a University of Illinois Extension workshop on business plan writing.

"We even talked one farmer out of a couple of juvenile prawns so that we could observe their habits and cycles," Brenda Lyons adds. "Research was the key to our success."

After nearly five years of research, planning and construction, they created what began as a prawn farm. Today, Lyons Fisheries has expanded to include tilapia and rainbow trout, with plans to add largemouth bass and hybrid striped bass in the near future.

The Lyons received their first SARE grant in 2003 to develop the aquaculture operation. J.C., a machinist by trade, planned and designed the facilities, including a nursery, hatchery and grow-out ponds. Brenda helped with the construction and contributed her experience in accounting, management and marketing.

In their first year of production, the Lyons supplied four farms with 65,000 juvenile prawns. The second year they provided 10 farms with 143,000 juvenile prawns and finished construction of their grow-out ponds, which yielded 600 pounds of freshwater shrimp. The Lyons now hold



"There was so much interest in our project that we found ourselves giving impromptu tours."

an annual Prawn Harvest Festival in late September to promote the prawn farm and introduce the general public to freshwater shrimp.

In 2004, the Lyons received a second SARE grant to help expand the business. In the off-season, they grow red tilapia in the nursery in the two 9,000-gallon shrimp tanks, and the half-acre grow-out ponds are stocked with 7- to 9-inch rainbow trout fingerlings in the winter months. An aspirator aerator is used to keep the ponds from freezing. The Lyons then hold "Trout Fishing Days" for three consecutive weekends in April, and they offer a cleaning station and recipe booklet to help boost sales. Any remaining trout is vacuum-packed, frozen, and sold at the fall festival.

Like any new entrepreneurs, the Lyons encountered their share of problems. "In 2004, we lost our stock of baby prawns—twice," says Brenda. "The first time we had chloramine in our water source. We made two trips to Mississippi to replace what we lost and restocked our ponds, but herbicide overspray from a neighboring farm contaminated everything."

The Lyons eventually contracted with another farmer to grow prawns for them that year.

"In an aquaculture venture, when things get bad, they get bad real fast," says Brenda. "You need to be prepared ahead of time, as well as have the ability to move quickly to remedy the problems that can occur. Technical assistance is a must for every fish and shrimp farmer from coast to coast."

The Lyons are also learning how to scare off the blue heron that "fish" in their ponds.

"The herons do a lot of damage," says Brenda. "They poke holes in the trout, but the trout are so heavy the heron can't get them out of the pond after they've stabbed them, so of course the trout die and then we have a real mess."

Their successful venture takes its toll in other ways as well.

"We worked so hard for so long that I got very tired and overwhelmed," says Brenda. "There was so much interest in our project that we found ourselves giving impromptu tours. One day I had to stop in the middle of making a sandwich to give a 45-minute tour!"

Because Brenda and J.C. both work off the farm as well, Brenda says, "I just had to make myself slow down. This year, I'm playing catch-up. I hired a housekeeper and we have more help at the farm."

The Lyons also began charging for their tours and consultations, although school groups and other educational organizations often get a break.

The Lyons work hard to give back to the community. In addition to their regular tour days, they have set up educational displays at the DuQuoin State Fair, the Illinois State Fish and Shrimp Festival at DuQuoin, the Sustainable Ag workshop put on by the University of Illinois and the Heartland Aquaculture Conference.

The Lyons' advice for other potential prawn farmers?

"Do your homework," says Brenda. "Test your market and be prepared to give it your all."

By Leanne Lucas

Breaking From the Herd with Rotational Grazing

Raymond Meismer, Washburn, Illinois

Incorporating Rotational Grazing in the Crop Rotation

Coordinator: Raymond Meismer

Location: Washburn, Illinois

SARE Grant: \$5,000

Grant Year: 2000

Project Number: FNC00-309

Raymond Meismer used a SARE grant to install a new water system and convert his acres of natural forage into rotational grazing. He divided his land into 15 paddocks and rotated cattle every three or four days.

Cows clearly have a herd mentality. When cattle used to wander down to a spring to drink on Raymond Meismer's land, they did so as a herd. But problems soon arose because the weaker, more cautious calves could not get enough water. Just when the calves managed to squeeze past the other cows and began to drink, the lead cows were ready to go. So they left as a herd, and the calves went thirsty.

But that wasn't the only problem, Meismer says. By the time the calves started drinking, the other cattle had walked, urinated, and defecated in the water. Calves will not drink if the water is too dirty. And to make a bad situation even worse, he says, the herd's traffic caused streambank erosion.

Back in 2000, Meismer owned roughly 20 head of cattle grazing on 20 to 30 acres of natural forage on his 300-acre farm. But the water problems inspired Meismer to obtain a SARE grant to install a new water system and to convert his acres of natural forage into managed pasture—also known as rotational grazing.

"I became interested in rotational grazing because I thought I could possibly increase my stocking rate on pasture, while



"...I could possibly increase my stocking rate on pasture, while minimizing the impact on the Illinois River Watershed..."

minimizing the impact on the Illinois River Watershed," says Meismer, whose land is located in Washburn, Illinois, 30 miles northeast of Peoria.

With natural forage, or permanent pasture, grass is grazed down so low that the vigor of the grass is hurt severely and may not grow back. Oftentimes, he says, you wind up with weeds instead.

With rotational grazing, however, you divide your pasture into small units, or paddocks. Then you rotate your cattle from paddock to paddock, allowing the grass to re-grow in the other paddocks.

Meismer says he divided his land into 15 paddocks, about 2½ to 3 acres each. He rotated the cattle every three to four days, giving each paddock about four weeks to re-grow. Depending on the time of year, the cattle would graze the grass down to about 2 to 3 inches. He separated the paddocks using an electric fence with a step-in steel post.

Meismer also received help from University of Illinois Extension and the Natural Resources Conservation Service in researching the right watering system. They

discovered a fairly low-tech system that has been around for over a century—a hydraulic ram pump.

The force of falling water operates the pump, creating enough hydraulic pressure to force the water through a garden hose up the hill and into the paddock. The water is then stored in a 500-gallon storage tank, which has a drinking tank attached to it.

"The system works well," says Meismer. "It allows several cattle to drink from the drinking tank and have enough to satisfy their thirst without draining the storage tank." It also solves the calf problem, since the cattle have no problem drinking at the tank alone or in small groups.

The SARE grant funded the watering system and some of the temporary fences for the paddock development.

Meismer also converted some of his cropland to grazing land. He says portions of this cropland was marginal land, most of it rolling or surrounded by trees, and he figured he could make more money with the additional cattle than through corn. This turned out to be true. Meismer was able to add 17 cattle with his new rotation on 72.1 acres. His net return for the calf production was \$65.05 per acre, compared to \$55.73 per acre for corn and \$59.70 per acre for soybeans.

But that was at 2000 prices.

In 2007, the price of corn increased to \$3.80 per bushel. So he wound up selling the 17 cows that he had added and converted much of the land back into cropland—all corn.

However, he still rotationally grazes his pastures and uses the watering system but on slightly less land. Also, Meismer plans on burying a waterline in the future so he will not have to move his water hose around constantly.

"If I could move the cattle without having to move the water system, it would make things a lot easier," he says.

By Jason Peterson

Illinois Wine Country

Gene Meyer, Pittsfield, Illinois

Expansion of Grape Production

Coordinator: Marchell Baehr

Location: New Salem, Illinois

SARE Grant: \$4,940

Grant Year: 1998

Project Number: FNC98-237

The late Marchell Baehr was among those who helped to revitalize the Illinois wine industry in the late 1990s. A SARE grant allowed him to plant 10 acres of grapes and experiment with different varieties.

Most people do not think of Illinois as wine country. But it was one of the leading wine-producing states before the government put a federal ban on the sale and consumption of alcohol in 1920. That's when wineries across the country were shut down and vineyards were uprooted for more profitable crops.

While the infamous mobster Al Capone was keeping Chicagoans happy with all the hard stuff they could handle during Prohibition, Illinois wine production was not as thriving. It dropped from being the fourth largest wine-producing state in the nation to boasting a mere 12 operating wineries by the late 1990s.

That has since changed.

Pike County farmer Marchell Baehr was among those who helped the industry build itself back up by attacking the problem at its roots—its plant roots, to be exact. In 1998, Baehr received a SARE grant to help increase grape production in Illinois, providing him with the resources to plant 10 acres of grapes on his farm in New Salem. Baehr mostly planted Catawba, Vignoles, Chamborcin, and Norton grapes.

Meanwhile, across the state the Illinois wine industry roared back onto the scene with more than 70 wineries currently



...grape and wine production in Illinois is the result of the healthy soil, good climate, and an advantageous terrain...

operating. Illinois is now among the top 12 wine-producing states in the country.

Although Baehr passed away seven years ago, his vineyard—Rolling Hills Vineyard—is still operating. Meyer, a friend of Baehr's from Pittsfield, became operating manager of the vineyard as a retirement project but has hardly treated it that way.

Meyer decided to stop growing Chamborcin grapes because of low production, and he also added some new varieties, such as Edelweiss grapes, which are about twice as productive as the Vignoles. According to Meyer, Baehr also operated a test plot with 22 different varieties of grapes. But only six of the original varieties are being grown in the plot today.

"I've changed some things during the few years I've been here," says Meyer.

He explains that the resurgence of grape and wine production in Illinois is the result of the healthy soil, good climate, and an advantageous terrain. He says that

grapes thrive on well-drained soil, growing best on hillsides.

"You plant grapes where you wouldn't plant your other crops," he says.

According to Meyer, "A lot of people will say that we get some great fruity flavors in our grapes in Illinois. More so than a lot of the California grapes."

He also says he sells most of his grapes within Illinois—primarily to four wineries, which purchased over 100,000-plus pounds of his grapes in 2008.

Meyer served on the Illinois Grape Growers and Vintners Association, and in 2000 he helped to form the Western Illinois Grape Producers Association Cooperative—where growers in the area can help each other save money on chemicals and other tools.

However, Meyer is not planning on expanding the Rolling Hills Vineyard. Coming up on 66 years, he says he does not have the energy for that.

"My retirement project has already gotten a little out of hand," he says.

By Jason Peterson

Paddlefish, Poaching, and Ponds

Scott and Kami Miller, Chrisman, Illinois

North Central Region
Paddlefish Polyculture

Coordinator: Scott Miller

Location: Chrisman, Illinois

SARE Grant: \$14,378

Grant Year: 2001

Project Number: FNC01-338

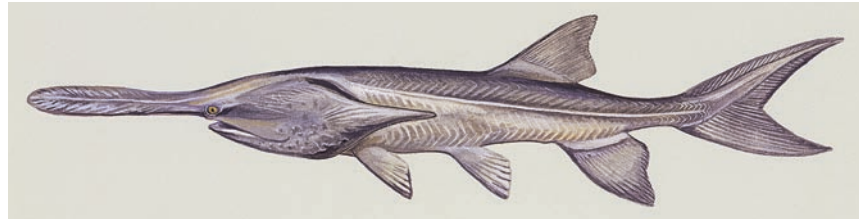
Scott Miller was able to raise paddlefish to marketable size in only a year—much faster than expected. Paddlefish clean the water but don't compete for food with other fish in the pond.

The most popular sources of top-quality caviar can also be the most threatened of fish. For instance, the high-in-demand Blue Sturgeon was nearly wiped out in Russia due to poachers looking to make a fast ruble, says Scott Miller, an Illinois farmer.

Miller and his wife Kami are hoping the same fate is not in store for paddlefish, a freshwater fish known by its long, bill-like snout and large mouth. He says that the caviar industry has begun to consider paddlefish because the eggs from females make "fairly high-quality caviar."

Paddlefish also have the potential to improve water quality, so Miller received a SARE grant in 2003 to raise paddlefish in a poly-culture system. He monitored both their growth and their impact on water quality as they grew under different conditions over a two-year trial period.

Miller's goal was to determine if the paddlefish could reach marketable size in a farm pond in two years, which is how long it takes for them to reach market size in native water. To his surprise, the paddlefish reached marketable size (18 to 24 inches) in only a year. Intrigued by these results, Kentucky State University agreed to purchase Miller's paddlefish and stock them into rivers and reservoirs.



"...the eggs from females make "fairly high-quality caviar."

"What we were trying to do is grow juvenile fish to a larger size and transplant them into rivers and reservoirs where their survivability will be much higher," says Miller, who owns and operates a 75-acre farm in Chrisman, Illinois.

If caviar production from paddlefish does take off, it is crucial that paddlefish be produced commercially, Miller says. Otherwise, the poaching of paddlefish from wild sources will increase heavily, and the species could face the same threat as the Blue Sturgeon.

"If you get people raising them commercially and feeding the market, people would be less likely to poach," he says.

Miller used four ponds during his research—two existing ponds on his farm and two others donated by area farmers. He stocked one pond with paddlefish and largemouth bass; he stocked the other ponds with paddlefish and multiple species such as catfish, bluegill, bass, and perch.

Through trial and error, Miller discovered that the most productive stocking rate was 50 paddlefish per acre—although he did go as high as 100 per acre. With good aeration, he believes you could stock as many as 200 to 250 per acre.

Paddlefish are plankton feeders; and as a result, they do not compete for food with other fish and they help to clean the water. "They basically swim through the water with their mouths open, filtering out plankton," Miller says.

"In a commercial fish pond, you're always going to have too much plankton because you're supplemental feeding," he explains. "Every day, you're adding fertilizer with the feed. But if you've got paddlefish in there, they'll be picking up the waste. They will help your water quality."

He noted an improvement in water quality in all four ponds. For instance, they had little problem with surface moss in two of the ponds, thanks to the paddlefish.

Miller found that the paddlefish helped to filter out some of the nitrates in water—although he says they did have nitrate problems in two ponds when the water temperatures were high.

Paddlefish require more oxygen than the other fish he stocked, Miller says. As a result, he dealt with survivability issues in all four ponds. However, he says this problem could be easily avoided by using supplemental aeration—the circulation of air through water.

"If you're going to make it work, you're definitely going to need supplemental aeration," says Miller. The only drawback is that aeration is fairly expensive.

"It all comes down to money," he says.

Because of the expense for aeration, Miller decided not to pursue paddlefish production long-term and is currently raising largemouth bass. But he still sees that raising paddlefish with supplemental aeration is a viable option.

"We have proven that these fish are quite useful and can produce an added income for fish or non-fish farmers who have farm ponds," he says.

By Jason Peterson

The Best of Years, the Worst of Years

Beth and Jody Osmund, Ottawa, Illinois

Bringing the Retail Dollar Home

Coodinator: Beth Osmund

Location: Ottawa, Illinois

SARE Grant: \$5,938

Grant Year: 2007

Project Number: FNC06-611

With the help of a SARE grant, Beth and Jody Osmund jump-started a successful meat CSA. The grant allowed them to purchase a cold-plate, ice cream freezer in which to store the meat, as well as a trailer for transporting the freezer to farmer's markets.

Beth and Jody Osmund were fast asleep when a fierce storm, dumping 6½ inches of rain, rolled through their area in late August of 2007. They woke up to discover that about 400 of their chicks had drowned in 18 inches of water that had pooled in the low end of their pasture. This just added to the losses that the Osmunds had already suffered in 2007, more than in any previous year. But despite the losses, 2007 was also the best of years, thanks to their focus on retail meat.

"2007 was simultaneously our most successful year and the year we've suffered the greatest losses," says Beth Osmund, co-owner of the 85-acre farm in Ottawa, Illinois. "That's because the scale of what we were doing was that much bigger."

With the help of a SARE grant, the Osmunds were able to jump-start a meat CSA (Community Supported Agriculture) in 2007. The grant allowed them to purchase a 6-cubic-foot, cold-plate, ice cream freezer in which to store the meat, as well as a trailer for transporting the freezer to and from farmer's markets.

For a \$240 fee, plus a small delivery charge, Osmund says CSA members share in the "risk as well as the bounty," receiving a package of frozen meat, about \$80 to \$85 worth, each month for three months.



"2007 was simultaneously our most successful year and the year we've suffered the greatest losses..."

The Osmunds had been running a vegetable CSA for five years. But she says they have phased out the vegetable CSA and in 2008 are focused only on meats. Meat CSA's are not as common as vegetable CSA's, she says, so this "puts us in a unique position. There are only a couple of other farms offering the kind of meat we do."

In addition, they can offer the meats year-round, and the work is less grueling.

"My short explanation for why we're focusing only on meats next year is that I've never once had to weed the freezer," says Osmund.

The Osmunds go to farmer's markets twice a week—on Saturdays and Sundays. They sell their meat at a local market in Ottawa, as well as at the Logan Square farmer's market on the north side of Chicago. Generally, she says, they sell more steaks than roasts in Chicago and vice versa in Ottawa.

According to Osmund, they do not give their animals growth hormones or antibiotics. By keeping drugs out of the food chain, she says, the result is better-tasting, healthier eggs and meat—chicken, beef, pork, and turkey.

"The animals are healthy because they're well taken care of," Osmund explains. "Our animals are in small groups; they're not in a large, concentrated feedlot situation where the goal is to put as many animals in as small a space as possible and fatten them as quickly as you can."

The cows have to be rotated on a regular basis when the pastures become grazed down. But the pigs, which are kept in open pens in fields, do not have to be moved as often. The chickens and turkeys, meanwhile, spend a couple of weeks in the brooder before being moved into 10-by-10-foot pens, each of which holds between 75 to 90 chickens. It takes eight weeks from hatching until the chickens are ready for the butcher.

One problem the Osmunds have had to contend with is predation. Rats got into their brooder in 2007, killing about 100 chicks. In addition, raccoons found a way into the pens, costing them about another 100 chickens. However, they alleviated the raccoon problem by rigging an electric fence about 6 inches off the ground around the pens, and in 2008 they have added two livestock guardian dogs.

Meanwhile, the customer response to their meat CSA, Osmund says, has been overwhelmingly positive. As she puts it, "99.9 percent of the people come back and say 'Oh my gosh you're right, that was the best chicken I've ever had' or 'I've never had steak like that before.'"

However, Osmund says they have learned they need to focus their operation, which is one reason they have decided to specialize in meats only.

"It's a lesson we continually have to learn," she says. "We have to keep focused enough to be successful and diverse enough to continue enjoying and challenging ourselves."

By Jason Peterson

A Spring Runs Through It

Mike Rahe, Jacksonville, Illinois

Trout and Walleye Production in Freshwater Springs in Illinois

Coordinator: Michael Rahe

Location: Jacksonville, Illinois

SARE Grant: \$4,834

Grant Year: 1998

Project Number: FNC98-235

Mike Rahe created two spring-fed ponds for fishing, which he offers as an added attraction with his fee-hunting business on 550 acres. Inspired by his trout fishing trips in Wyoming, Rahe decided to bring the same experience to central Illinois.

Mike Rahe was fishing with a friend on his pond when he hooked a 10-pound rainbow trout. The powerful fish snapped Rahe's ultra-light, 4-pound line and made its getaway while Rahe rushed to re-rig his line. The bobber was still attached to the line, giving away every movement by the fleeing fish. Quick on his feet, Rahe's buddy cast his line, hooked the bobber and reeled in the large fish, which was over 2 feet long.

Afternoons like this are one of the bonuses of owning your own freshwater ponds stocked with 200 pounds of fish.

In 1998, Rahe successfully created two productive spring-fed ponds, thanks to a SARE producer grant. However, his goal was not to sell the fish for commercial purposes; instead, he uses the ponds in conjunction with his fee-hunting business on Springview Acres—Rahe's 550-acre owned and leased hunting spread near Jacksonville, Illinois.

Or, to put it in fishing terms, he uses the ponds as a lure.

"It gives my customers a unique experience," says Rahe, who also works for the Bureau of Land and Water Resources in the Illinois Department of Agriculture. "My clients can come and trout fish when they're not busy hunting."



"My clients can come and trout fish when they're not busy hunting."

Rahe has opened up his farm to fee hunters for the past 15 years, one of the first in his area to do so. Today, he says, about 20,000 people come to Illinois from out-of-state every year to bow hunt; and an additional 3,000 to 5,000 come to gun hunt. Pike County, where Rahe's land is located, is one of the top counties in the nation for trophy white-tail bucks.

But Rahe wanted to offer more than hunting to those who stay in his two cabins. Inspired by his trout fishing trips in Wyoming, Rahe decided he could bring that same experience to central Illinois. So he stocked the ponds in 1999 with rainbow trout and largemouth bass.

One pond is directly fed by the spring that flows year-round from the base of a hill, while the second pond is directly downstream from it, closer to the creek that cuts across his property.

For good reason, these ponds are relatively small—about 1/10th of an acre. Rahe stocks the uppermost pond with rainbow trout, a coldwater fish. If he made the pond too big, the water would get too hot in the summertime and the trout would not survive.

According to Rahe, the spring water feeding the ponds remains 55 F all year round; as a result, the water in the ponds never rises above 70 F, even on 100-degree days at the peak of summer.

In addition, the two ponds are surrounded by forestry cover, so minimal sediment and runoff gets into the water. The ponds are essentially pure spring water.

Rahe originally stocked the lower pond with walleye and then smallmouth bass, but neither would eat the fish food. So he finally converted the pond to largemouth bass and bluegill. He restocks the ponds about every two years.

One problem Rahe has run into is predation by herons and raccoons. The raccoon problem is not too bad, he says, and he obtains a permit in the fall to trap them. However, herons are a protected species, so there isn't much he can do about the two or three birds that come by every day to feed on his fish.

Rahe dug out the edges of the ponds, making it more difficult for the herons to find shallow water in which to stand, but they continue to be somewhat of a problem. He lost about one-third of the fish his first year.

Another ongoing battle is with vegetation, such as moss and coontail. He controls them with rakes and a little bit of copper sulfate.

Rahe stocks the pond with relatively large fish, about three-quarters of a pound, even though larger fish are more expensive. He wanted visitors to be able to start catching them right away, so he made sure the fish were already eating size.

Rahe does not charge anyone for the fishing. It comes as a part of his hunting package. He is now looking to build a third and larger pond, which will be about 1¼ acres, but not spring-fed. The bass and bluegill from the second pond will be used to stock the new pond. He then plans to stock catfish in the second pond to provide additional recreational and eating opportunities.

By Jason Peterson

Pizza Farm Gives Kids a Taste of Sustainable Ag

Louis and Isabel Reuschel, Golden, Illinois

Reuschel's Sustainable Demonstration Farm

Coordinator: Louis Reuschel

Location: Golden, Illinois

SARE Grant: \$3,800

Grant Year: 1999

Project Number: FNC99-283

Louis and Isabel Reuschel developed a sustainable demonstration farm so the public could view the production and processing of grain, as well as many conservation practices. They also created a "pizza farm" to show kids where food ingredients come from.

“Sustainable agriculture” isn't in most kids' vocabulary. But pizza is.

So Louis Reuschel and his wife Isabel decided to bring a fun, educational component to the 154-acre farm they converted to sustainable ag several years ago, with the addition of the "R Pizza Farm" in 2004.

"Young children aren't knowledgeable about sustainable ag," says Reuschel, the former owner of Ocean Farm in Golden, Illinois. "So we invested in the pizza farm, and that program brings a lot of youngsters out to visit. Once they're here, they view the whole program, and I think they get a really good feel as to why we do sustainable ag."

The "pizza" is a circle about 200 feet in diameter, with sections containing the different foods that go into pizza, such as wheat, tomatoes, peppers, onions, herbs, chickens, goats, calves, and pigs. A walkway around the pizza farm allows visitors to feed and pet the animals, as well as touch, taste, and smell the different ingredients.

"It lets them know where their food comes from and what it looked like before it got to their plates," says Reuschel. "I know they come away with a much better understanding of what goes into a pizza."



“...they come away with a much better understanding of what goes into a pizza.”

Reuschel received his first SARE grant in 1999 to develop a sustainable demonstration farm. He converted his farm, near the restored, historic Golden Windmill grain mill, to allow the public to view the production and processing of grain.

"We've always been good stewards of soil and water," explains Reuschel. "We've done a lot of soil conservation work with NRCS and Extension over the years. So sustainable ag seemed like a natural thing to do, just another step forward from where we were at."

Some of the conservation practices on Ocean Farm include a native grass stand, a tree program, a pond constructed for fishing and personal enjoyment, as well as several different soil conservation practices.

In 2004, Reuschel received a second SARE grant to determine which of six different tomato varieties would produce the best quality tomatoes grown under organic conditions.

Another goal for the project was to determine the advantages of different growing conditions, so Reuschel planted five of the varieties in three different locations—a traditional garden setting, a hoop house, and a greenhouse. He also surveyed customers to determine their

favorite varieties. His project produced interesting, if not profitable, results.

"We used organic fish fertilizer on outside tomatoes and the traditional garden setting had a fairly good yield, although gophers, worms, and drought were a problem," says Reuschel. "Overall, the inside tomatoes yielded the best because they took about 75-percent less labor. We didn't have to water them as often, there were less weeds and bugs, and the season lasted about a month longer."

Reuschel also learned there is no single variety that can meet all customers' needs.

"Different customers prefer different varieties for their uses," he says. "One variety might have the best taste, but not be easy to use. Another might be easy to slice, but doesn't necessarily taste the best."

Reuschel was pleased to find out that there is a lot of interest in locally grown organic tomatoes.

"I live in a small rural town, and people appreciate high-quality food. We were able to sell all of the tomatoes we had to the restaurant, to the grocery store, and to the nursing home," he says. "The market is there. We could have even added several customers if we had more tomatoes."

Reuschel sold Ocean Farm to Bill York in the fall of 2006.

By Leanne Lucas

Composting Manure, Taming a Menace

Joel Rissman, Leaf River, Illinois

Low-Cost Waste Management in Beef Cattle Operation

Coordinator: Joel Rissman

Location: Leaf River, Illinois

SARE Grant: \$3,277

Grant Year: 1994

Project Number: FNC94-079

Joel Rissman built a retention pond and composting pad to deal with runoff coming from his farm's manure piles. By composting manure, he eliminated offensive odors, made it easier to haul the manure, and improved the land surrounding his cattle fields.

Every time that it rained, Joel Rissman noticed that runoff water coming from his farm's manure piles created severe weed problems behind his cattle yard. Rissman knew he couldn't fight the forces of nature, so he worked with the runoff instead. He diverted the runoff to a retention pond and used this new water source for his manure composting system.

Not only did the new system solve his weed problems, it reduced the risk of manure-laden runoff reaching a creek less than a mile away.

"The idea was to give myself a water source for composting manure. You have to use water to create an ideal environment for the micro-life to break down the manure," says Rissman, who farms 372 acres with his uncle in Leaf River, Illinois. He also uses the retention pond water to irrigate sweet corn, vegetables, fruit trees, flowers, and the lawn. Runoff, once a menace, has become his ally.

To build the retention pond and concrete composting pad, Rissman received a SARE grant from the University of Illinois. He built the pond directly behind



Runoff, once a menace, has become his ally.

the cattle yard and placed the composting pad between the cattle yard and the pond. Rissman also created grassed waterways, running along cattle yard fences from the composting pad to the retention pond.

The 50-by-50-foot pond is sloped to reach a maximum depth of 7 feet and was designed to handle a one-time 5½-inch, 24-hour rainfall. He sealed the bottom of the pond with a thin layer of bentonite topped with a quarter inch of high-calcium lime, preventing water from seeping into groundwater.

The compost pad, meanwhile, was built to hold four compost piles, each one about 10 feet wide by 5 feet tall, says Rissman. The sides of the pad slope away from the pile so that any runoff water will drain into the grassed waterways and travel straight to the pond.

The composting process actually starts in the cattle shed, Rissman explains. When the floor is bare, he puts down a 1-inch layer of high-calcium lime. The purpose of the lime, says Rissman, is to "help absorb the nitrogen-rich urine." This minimizes the loss of nitrogen in the form of ammonia.

When the bedding in the shed reaches a depth of about 4 inches, Rissman sprays it down with a compost starter inoculant, which jump-starts the breakdown process.

Then he re-sprays the pile about once a week. By the fourth to sixth week, Rissman cleans out the shed, moving the manure to the compost pad.

By composting manure, Rissman benefits in numerous ways. Besides eliminating the offensive odors of raw manure, he says the piles lose about 60 percent of their volume and about two-thirds of the weight, making the manure significantly easier to haul around. In addition, the nutrients in compost are already broken down and plant-available, and the process renders pathogens and weed seeds unviable.

As a result of the system, Rissman says he has seen great improvement in the land surrounding his cattle fields.

"I have never seen so little weed problems in the once affected area," he says.

Most importantly, Rissman was able to solve three problems—raw manure management, cattle yard runoff, and self-sustaining fertilization—with one simple, inexpensive solution. He says he has been able to eliminate the use of commercial fertilizers, saving money.

Through this experience, Rissman says he has also learned that there are many low-cost solutions to problems in agriculture.

"Projects such as this do not throw a lot of money at the problem, hoping for a quick solution," he says. "The huge base of farmer ingenuity and know-how can help alleviate many troublesome problems."

By Jason Peterson

Aquaponics: A Dream System

B & SRR Youth Center and Academy, St. Anne, Illinois

Raising Tilapia Fish in Tanks Along with Plants and Vegetables in Beds

Coordinator: Irene Seals

Location: St. Anne, Illinois

SARE Grant: \$15,930

Grant Year: 2003

Project Number: FNC03-441

Irene Seals created an aquaponics system, which consists of a 500-gallon fish tank and three beds tiered on top of each other. Waste from the fish fertilizes the plants in the beds, while plants purify the water before it flows back to the fish tank.

When Irene Seals moved from the South Side of Chicago to a small farm in Pembroke, Illinois, with her husband in 1982, she was less than enthused about it. The land was barren, she says, except for "a lot of junk" that had to be cleared before they could build a barn and house. Accustomed to the noise and the lights of the city, she also had trouble getting used to the eerie quietness of the farm.

Irene moved to the farm because her husband Frank used to live on a farm growing up, and he dreamed of raising horses. His dream came to pass, and it has become Irene's dream as well—B & SRR Youth Center and Academy.

Frank has since passed away, but Irene continues to run the 15-acre farm just 15 miles east of Kankakee. In 2005, she received a SARE grant to expand the operation, which includes 30 horses along with pastured chickens, turkeys, and rabbits. With the funding, she developed an aquaponics system, a method for growing plants and fish in a recirculation system in which the plants nourish the fish and the fish nourish the plants.

The system, which operates in a greenhouse, consists of three, 4- by 8-foot beds, tiered on top of each other, with



...the plants nourish
the fish and the fish
nourish the plants...

plants grown in the top two beds and gravel filling the bottom bed. Meanwhile, the fish are stored in a 500-gallon water tank.

Every half hour, Seals says, water circulates through the system, moving from the fish tank to the three tiered beds. It moves up from the bottom bed, filtering through the gravel and flowing over the plant beds. Then the water returns to the fish tank, and the cycle begins again.

The waste from the fish acts as a fertilizer to the plants, Seals explains, while the plants absorb certain nutrients, purifying the water before it flows back to the fish tank. The rocks in the bottom bed filter out any excess fertilizer.

In the beds, Seals grows mostly herbs, such as basil, oregano, and chives. She originally tried raising catfish in the fish tank but was unsuccessful. She says the catfish population may have been too large, so the system was unable to filter out the ammonia fast enough.

When Seals found a reliable tilapia source, she started out with 200 fingerlings. It takes a year for the fingerlings to reach full size, about a pound and a half. The system has worked well, she says. They lost only 50 fish in the first year, which is to be expected, and saw great results from the plants, which are grown pesticide-free and

sold at farmer's markets.

The SARE grant covered the greenhouse construction, the beds, and the tanks. "Without it, I would not have been able to fulfill my dream," she says.

Along with the three-tiered system, Seals has a smaller, three-barrel aquaponics system that can nurture about 25 to 30 fish. The system is comprised of three 55-gallon barrels, one containing the fish, another containing the plants, and the third containing the rocks. Seals primarily keeps catfish in the barrel system, although she rotates in tilapia.

While constructing the greenhouse for the system, the main problem they encountered was with heating. Due to their inexperience with greenhouses, she says they built the greenhouse 2 feet higher than it should have been. A lot of heat was wasted and heating in the winter became costly.

"It gets pretty chilly in the greenhouse during the winter," she says. So they are looking into ways to provide solar heat to supplement the corn-burning furnace.

B & SRR farm operates an extensive outreach program to kids, with a lot of them coming from Pembroke and Chicago to help on the farm. Most of the youth come for the summer program, which rewards work in the garden and greenhouse with horse riding—a major incentive for the kids. The most devoted youth even come on the weekends during the school year.

Today, Seals has grown fond of the country, and the peacefulness that once irked her is now a part of her life.

As she puts it, "Now it's hard to go back to the city, the noise, and the crowds. I love the country. I wouldn't go back to the city for anything."

By Jason Peterson

Grazing the Intensive Way

Jason Smith, Greenfield, Illinois

Year-Round Management Intensive Grazing

Coordinator: Jason Smith

Location: Greenfield, Illinois

SARE Grant: \$5,820

Grant Year: 2002

Project Number: FNC02-409

Jason Smith used management-intensive grazing to extend the grazing season from five months per year to nine. He also reduced feed costs by \$.90 per head per day.

Some say it is better to be lucky than good. But when Jason Smith extended the grazing season for his cow-calf beef operation from five months per year to nine, he was a little bit of both.

In 2002, while Smith was in the planning stages of implementing a management-intensive grazing system on 80 acres of previously cropped land, he received a well-timed SARE grant.

"The grant came at an opportune time to move forward with the plans," says Smith, who farms 480 acres in Macoupin County. But although the timing may have been fortuitous, the success of the project was much more than blind luck. It was carefully thought out.

Management-intensive grazing requires that cattle be moved from paddock to paddock, allowing the plants in each paddock to recover and produce new growth after it has been grazed.

"Management-intensive grazing has definite profit advantages over row crops," says Smith. "However, it is a system that requires a significant outlay of funds for fencing, watering, and forage seed. It also requires a good deal of time and physical labor."

By extending the grazing season for his 45 beef cows, Smith's goal was to increase profits through reduced hay feed costs



"Management-intensive grazing has definite profit advantages over row crops..."

in the winter. This is important because, according to Jim Gerrish of the University of Missouri Forage Systems Research Center, winter hay feeding is one of the two greatest single-item budget line costs in most cow-calf operations. (The other big item is land costs.) Gerrish also says that in areas on a line south of Springfield, Illinois, "The reason most cows don't graze in the winter is lack of pasture, not excessive snow cover."

By extending his cattle's grazing season four months, Smith was able to reduce feed costs by \$.90 per head per day. However, he says they have not yet been able to get the grazing season to extend beyond November.

To implement this system, Smith installed a five-strand, high-tensile fence around 80 acres of land. Then, using a two-wire, high-tensile fence, he divided the acreage into seven paddocks. Smith let the animals graze one paddock until it was almost grazed down, and then he moved them to the next one.

Smith used most of the grant money to install two automatic, frost-free watering systems located near the center of the 80 acres. The system pumped water roughly 1,300 feet from the nearest pond. The

cattle, meanwhile, were within a walking distance of at most 800 feet from the watering systems.

"The terrain is pretty rugged," says Smith. "There weren't a lot of choices for location, but this way the cows have easy access to it."

Smith seeded orchardgrass on 60 acres of the plot, and on the other 20 acres, he seeded a mixture of rye, oats, and turnips. The 80 acres had previously been seeded with corn, but according to Smith, it did not yield well because of erosion.

The gross revenue for the 45 beef cows during the grant period was \$21,000. The estimated gross revenue for the same land planted to corn yielding 100 bushels per acre at the price then of \$2 per bushel was \$16,000.

Today, Smith has continued management-intensive grazing, only now he has about 90 head of beef cattle. And although he was one of the first to introduce the extended grazing system in his area, he's seeing a lot more interest.

"Managed grazing is not only economically advantageous, but it also helps to control erosion better than cropped land," says Smith. "It is a profitable and worthwhile endeavor."

By Jason Peterson

Worm Castings Act as ‘Super Humus’

Don and Glenda Spiker, Wheeler, Illinois

Use of Worm Casting Extract in Ag Production

Coordinator: Don Spiker

Location: Wheeler, Illinois

SARE Grant: \$4,048

Grant Year: 2004

Project Number: FNC04-536

Don and Glenda Spiker found ways to reduce the use of synthetic fertilizers and fungicides by applying liquid casting extract from worms. He compared three application systems.

Most people associate manure with the smelly confines of a hog barn. Few people picture earthworms. Yet worms provide what some argue is one of the most effective, natural, and environmentally friendly fertilizers to be found.

The business is called vermiculture, and its popularity is growing—for good reason. Don and Glenda Spiker apply a liquid “casting extract” (castings are earthworm manure) through the irrigation system at golf courses in combination with foliar feeding. And they have shown that the product has “tremendous potential” to reduce the use of both synthetic fertilizers and fungicides.

“We reduced the cost of maintenance over \$40,000 a year on an 18-hole course,” Don Spiker notes.

With this success behind him, Spiker wanted to see if worm-casting extract could also be used to reduce costs in row crop production while decreasing dependency on synthetic fertilizers and pesticides. Therefore, he received a SARE grant in 2004 to do just that on 20 acres of soybeans and 20 acres of grain sorghum. On the grain sorghum land, he compared three application systems (see figures 1, 2, and 3).

As these figures indicate, the extract strips without additional side-dressed nitrogen had slightly lower yields than the other two application systems; but it had the greatest net return per acre. The strips with no extract had the lowest net return per acre.

According to Spiker, however, the extract did not show any advantage when used on the soybean land. Also, the tests to see if



“We reduced the cost of maintenance over \$40,000 a year..”

the worm-casting extract increased microbial diversity in the soil were inconclusive. Nevertheless, he believes the extract has the potential to increase microbial populations, which should make more of the fertilizer that is already in the soil available to the plant.

Meanwhile, the soil tests confirmed what Spiker had noted in two previous years. Almost all of the tests showed higher nitrogen levels on the grain sorghum land where the extract was applied.

“You cannot make conclusions on one year of tests, but it does warrant more study,” he says.

As Spiker puts it, the casting extract may not be a miracle cure for the row crop farmer, but it has “the possibility of being able to reduce the amount of fertilizers being applied to the land.”

The Spikers began their venture into vermiculture in December of 1998 after deciding to sell the stock from their 150-sow, farrow-to-finish hog operation when the hog market crashed. Then in late 2003, Spiker began working with Larry Martin of Vermitechnology Unlimited to develop a worm-casting extractor, which turns the castings into a liquid that can be sprayed on the crops.

They give their worms a ground feed mixture, and as this material passes through the worm, it is altered both chemically and physically, Spiker says. The result is a “super humus” product that contains rich proportions of water-soluble nutrients and a high concentration of beneficial bacteria and microbes, he says. The football-shaped particles also improve aeration and allow for excellent drainage so roots don’t become waterlogged or develop root rot.

Don and Glenda Spiker live on their 230-acre family farm (Don’s father purchased the first 80 acres in 1940) and today market worm castings to golf courses, vegetable and flower greenhouses, retail customers, and organic farms across the United States. They also sell worms in the bait and composting market and manufacture worm-casting extractors.

When you use this odorless, non-burning product in greater concentrations than usually found in nature, Spiker says, “The results are truly spectacular.”

By Leanne Lucas

Figure 1. Extract Strips

100 gallons of worm-casting extract.....	\$3.70 per acre
40 pounds per acre, 28% nitrogen pre-plant	\$16.00 per acre
Total cost of nitrogen sources per acre	\$19.70 per acre
Yield per acre.....	130 bushels
Price per bushel.....	\$2.33
Gross per acre.....	\$302.90
Net per acre.....	\$283.20

Figure 2. Extract/Sidedressed Strips

100 gallons of worm-casting extract.....	\$3.70 per acre
40 pounds per acre, 28% nitrogen pre-plant	\$16.00 per acre
40 pounds per acre, 28% nitrogen side-dressed.....	\$16.00 per acre
Total cost of nitrogen sources per acre	\$35.70 per acre
Yield per acre.....	133 bushels
Price per bushel.....	\$2.33
Gross per acre.....	\$309.89
Net per acre.....	\$274.19

Figure 3. No Extract Strips

40 pounds per acre, 28% nitrogen pre-plant	\$16.00 per acre
80 pounds per acre, 28% nitrogen side-dressed.....	\$32.00 per acre
Total cost of nitrogen sources per acre	\$48.00 per acre
Yield per acre.....	134 bushels
Price per bushel.....	\$2.33
Gross per acre.....	\$312.22
Net per acre.....	\$264.22

Life Lessons for Cowboys and Cowgirls

Reginald and Brenda Stewart, Pembroke, Illinois

To Be Able to Introduce Healthy and Economical Agriculture to a New and Lost Generation

Coodinator: Reginald Stewart

Location: Momence, Illinois

SARE Grant: \$16,830

Grant Year: 2006

Project Number: FNC06-632

Reginald and Brenda Stewart run a farm and a summer camp, complete with horseback riding, to give city kids a taste of country living. A SARE grant made it possible to expand their farm, sell produce at farmer's markets, and start a CSA.



"...farming allows kids to see that tomatoes don't just come off of store shelves..."

A camper shuffles into the Run-away Buckers Cowboy/Cowgirl camp with his jeans sagging below his hips. But before the camp's owner, Reginald Stewart, even has to say anything, the camper is on his way to the barn to get a hay string to use as a belt.

The kids at Stewart's camp learn the rules quickly.

"If you don't wear a belt, that means your pants sag. And if your pants sag, that means you're not interested in riding horses today," says Stewart, who runs the camp with his wife Brenda on their 8-acre farm about 17 miles from Kankakee.

In addition to the horses, the summer camp is a working farm; and thanks to a SARE grant, the Stewarts were able to expand the farm, plant new crops, travel to different farmer's markets, and purchase equipment necessary for the markets, such as baskets, tables, and canopies.

The grant also allowed them to implement a "time CSA." Rather than paying a fee, members of the CSA (Community Supported Agriculture) invest their time by helping with the planting, picking, and distribution. In return, they share in the harvest.

Stewart grew up in a rough area on the west side of Chicago. But his dad owned farmland in Pembroke, Illinois, and

would take Stewart and his siblings there on the weekends to divert them from the rampant gang activity in his neighborhood. Stewart says he was not crazy about the farming, but he enjoyed the horses and even participated in rodeos with his brother and cousins.

His father's strategy worked. Stewart had no arrest record and did not get drawn into any of the gangs.

Stewart now has a family of his own, and about 10 years ago they left Chicago for Pembroke Township to find some peace and quiet. However, he and his wife noticed that the Kankakee area had limited opportunities for youth. So they decided to start the camp in 2002.

"Kids always look to television and music, which makes the bling-bling and city living look attractive. They overlook the great potential they have right here in their own backyard," says Stewart.

The horses were a natural draw, and the camp started out by offering only horseback riding. Irene Seals, owner of nearby Boots and Saddles Ranch and a longtime friend of Stewart, allowed the Stewarts to use her horses to teach equestrian skills. Once they got the equestrian program on its feet, the camp expanded into farming in 2006.

"The farming allows kids to see that tomatoes don't just come off of store

shelves," Stewart says. "Greens aren't just something that momma throws in a pot."

The camp typically runs from late June to the middle of August, with two sessions offered: a weekday and a weekend session with breakfast and lunch provided. The emphasis is on attracting African-American youth, although the camp does have Caucasian and Hispanic participants as well. The only requirement is that you have a love for horses or farming, he says.

Stewart farms about 5 acres of crops, and all of the kids have a hand in something. However, Stewart can take only the older youth to the farmer's market—mostly eighth-graders and high school students. These kids have to prepare an inventory before they leave for the market and need to know the expected revenue.

In other words, they get a crash course in consumer economics.

But most of all, the campers learn respect and discipline, Stewart says. The first thing campers learn is to respect the animals, which is especially important when dealing with larger animals.

The camp also has a segment called "life lessons," which teaches the kids teamwork, sharing, communication, and responsibility. And it works. Stewart says he has had parents come to him and say their kids have been asking them what chores they can do around the house. They say, "Momma, what do you want us to do? Mr. Stewart always makes us work."

There have been tragic stories, such as one boy who was killed in a drive-by shooting in Chicago. But Stewart has seen a lot of growth in his campers, some of whom have gone on to study engineering and agriculture. One girl, who started attending camp as a freshman in high school, is now studying veterinarian medicine at Elmhurst College.

"Some of these kids have problems, and we learn to deal with it," Stewart says. "But they're not problem kids."

By Jason Peterson

Growing Excitement Among Youth

John and Ida Thurman, Hopkins Park, Illinois

Future Farming Families

Coordinator: Ida Thurman

Location: St. Anne, Illinois

SARE Grant: \$14,970

Grant Year: 2002

Project Number: FNC02-428

Ida and John Thurman are introducing a new generation of youth to farming through the Youth Garden Project. Included in the project is community service, much of it revolving around senior citizens.

When John and Ida Thurman moved to Hopkins Park, Illinois, cousins who moved there a year earlier told the Thurman's children not to let on that they lived on a farm or they would be teased. Sure enough, their kids were teased for being "too country." That's when the Thurmans decided something needed to be done about the lack of excitement about farming in the area, especially among young people.

"When we got here," Ida Thurman says, "the younger families weren't farming. It was only the old people."

But that is changing. Since that time, with the help of a SARE grant, the Thurmans have been hard at work educating young people about sustainable agriculture.

Ida Thurman grew up on a farm in Mississippi, where her grandmother—affectionately known as Big Momma—would often babysit her. It was in her grandmother's garden that Ida first gained an appreciation for another Big Momma of sorts—Mother Earth. Today, she and John operate L & R Farms in Hopkins Park, just outside of Kankakee. On this farm, they



"The kids learn to care for something other than themselves..."

raised nine children who, as she puts it, have learned to "see harmony with life's processes on Mother Earth."

One of their family rules has always been that the children could not go out and play until they finished their chores. So when neighborhood kids would come over, they would help with the chores and then go play. That is where the idea for the project came from.

"We thought it would be great not only to educate our own children but the neighboring children as well about the importance of sustainable agriculture," Thurman says.

The SARE grant made it possible for them to expose youth and their families to horticulture through the Youth Garden Project. The Thurmans, along with fellow farmers, Herman Wallace and Leslie Wright, helped the youth develop several different gardens. Then Youth Captains recruited

Crew Members to prep, plant, weed, and harvest vegetables. Some of the youth also worked at farmer's markets in Kankakee, Joliet, and Chicago.

"The little ones really look up to Youth Captains and Crew Members as role models as they teach the little ones friendship, cooperation, sharing, and respect for themselves, others, and the natural world," Thurman says.

Another key component of the Youth Garden Project, says Thurman, is community service, much of which revolves around senior citizens. The kids deliver packages of vegetables to senior citizens in the community and they regularly visit the senior citizen center. The youth also constructed a senior garden outside of the center that the senior citizens help manage.

"The kids learn to care for something other than themselves," says Thurman.

The Thurmans are part of the Pembroke Farmers Cooperative, a co-op of largely African-American farmers. They grow an array of vegetables, such as peas, beans, corn, okra, tomatoes, greens, and watermelon, and they raise chickens, goats, cattle, ducks, geese, pigs, and guinea fowl.

Youth coming to their farm have learned about free-range poultry, pastured pork, rabbits, and vermicomposting, among other things. In addition, the kids assist with moving cattle from paddock to paddock, as well as taking care of the pigs and free-range poultry. Today, when the school bus passes by their land, the kids on board love to see the animals.

As Thurman puts it, "I see a growing excitement about farming that we didn't see when we came here."

By Jason Peterson

The Hairy Vetch Option

Walt Townsend, Geff, Illinois

No-Tilling Hairy Vetch into Crop Stubble and CRP Acres

Coordinator: Walt Townsend

Location: Geff, Illinois

SARE Grant: \$3,760

Grant Year: 1993

Project Number: FNC93-028

Walt Townsend was looking for a way to improve soil tilth on land coming out of the Conservation Reserve Program. He settled on no-tilling a hairy vetch cover crop into the CRP land. He also no-tilled hairy vetch into wheat stubble ahead of corn.



Planting hairy vetch on CRP land was so successful that it drew attention from many circles.

Back in 1996, over 25 million acres of Conservation Reserve Program (CRP) land was poised to go back into crop production nationwide—unless the CRP was renewed. In Walt Townsend's county alone, about 90 percent of the 34,000 acres enrolled in the CRP were expected to go back into production. Most of this land was classified as highly erodible, where tillage should be kept to an absolute minimum.

In Southern Illinois, Townsend was looking for a way to improve soil tilth on land coming out of the CRP without disturbing his soil through tillage. After a successful experience with hairy vetch in 1992, he had a hunch that no-tilling this cover crop into the CRP land would work well.

So he decided to find out.

With a SARE grant from the University of Illinois, Townsend experimented with no-tilling hairy vetch into a heavy stand of fescue on CRP land, as well as into wheat stubble ahead of corn and milo. It was a challenge, for fescue was considered difficult to no-till into.

"I wasn't familiar with anyone who had experience with no-tilling hairy vetch into a heavy stand of fescue," says Townsend, who farms in Geff, Illinois, about 50 miles south of Effingham.

Townsend thought that if he mowed the fescue closely, the hairy vetch could compete. So he mowed the fescue to about 4 inches and the vetch grew through and over the grass.

"The vetch smothered the fescue right out," he says. "No burndown was used."

Planting hairy vetch on CRP land was so successful that it drew attention from many circles. *Farm Journal* took pictures of his land for a feature on his system and Townsend spoke in numerous cities about this work.

The only thing that kept Townsend's hairy vetch program from really taking off across the state was the development of Roundup Ready soybeans in 1996. Roundup Ready soybeans allowed farmers to use Roundup to kill fescue and weeds without

harming soybeans. Several years later, Roundup Ready corn provided even more options, so farmers didn't see the need to smother the fescue with a cover crop such as hairy vetch.

"People were more comfortable with using chemicals than a cover crop," Townsend says. "So they jumped on the Roundup bandwagon."

In Townsend's system, no-tilling hairy vetch into wheat stubble ahead of corn also worked well, producing 80 to 100 additional pounds of nitrogen and creating a much looser seedbed for future crops than a straight fescue sod, he says. In addition, broadcasting and disking hairy vetch into wheat stubble ahead of milo satisfied much of the nitrogen needs of the crop.

The only problem Townsend encountered was that the vetch did not tolerate wet soils. In one spot, the field dropped off toward a small creek and all of the vetch there died out. In such situations, it is necessary to add more nitrogen, he says.

The SARE grant provided funds to buy a heavy-duty no-till drill. "Without the grant I would likely have gone to conventional tillage to bring my 280 acres of CRP land back into crop production. But that would have increased my costs and soil erosion."

Much to Townsend's surprise, however, the Conservation Reserve Program continued beyond 1996, and he re-enrolled his land. Today, Townsend still has about 300 acres in CRP with contracts coming up in 2010.

What's more, today he still likes the idea of hairy vetch.

"I like vetch as a cover crop," he says, "and when it becomes adaptable to other situations, I'm going to use it."

By Jason Peterson

Getting to the Root of the Problem

Ralph Upton, Jr., Springerton, Illinois

Long-Term Benefits of Cover Crops and Crop Rotation

Coordinator: Ralph Upton, Jr.

Location: Springerton, Illinois

SARE Grant: \$4,818

Grant Year: 1997

Project Number: FNC97-196

In trials conducted on his Springerton farm, Ralph Upton compared three cover crops: ryegrass, hairy vetch, and cereal rye. Ryegrass turned out to be the best of the three, with better rooting depth and more water availability. It also boosted corn productivity.

Ralph Upton was curious. While walking his cornfields one day, he noticed a patch of corn in very poor condition standing within a mere 20 feet of his healthy corn. To investigate, Upton ran a backhoe through his field and found something under his ground that would lead to dramatic changes in farming methods—changes that would lead to better rooting, higher yields, and fewer pests in his crops.

What Upton found beneath his ground was a siltpan—a naturally deposited layer of silt due to weathering soil. The siltpan prevented crop roots from penetrating any deeper than a few inches into the ground, stunting his corn.

"Where we had good corn, there was no siltpan. The roots were able to get down deeper," says Upton, who farms 2,000 acres of corn, soybeans, and wheat in Southern Illinois.

After witnessing successful uses of cover cropping on a trip to Tennessee, Upton was curious to see if he could solve the siltpan problem if he no-till planted winter cover crops every year. So, in 2004, he received a SARE grant to research cover crops and their effects on soil quality and productivity.

Upton's land is predominantly Bluford soil—a thin soil with a lot of restrictive



"...all across the board, we've had improvements."

rooting characteristics. The siltpan layer was about 2 inches thick and could be found roughly 4 to 6 inches below ground.

Upton brought in a soil scientist to assess the situation. But the scientist told him there was no way he would be able to get roots more than a couple of feet below his soil.

But Upton proceeded anyway, conducting trials in which he compared three cover crops: ryegrass, hairy vetch, and cereal rye. Mike Plumer, a University of Illinois Extension natural resources educator, helped Upton conduct his trials and record the data.

According to Plumer, the hairy vetch worked well but was extremely difficult to manage. He also says the cereal rye did not root as deeply as the others and could grow to 7 feet tall, making it tough to handle.

"The ryegrass, which grows to 18 inches, turned out to be the best of the three," says Plumer. "It gets better rooting depth and has more water availability. And for some reason, it seems to increase the productivity of the crop."

When Upton planted ryegrass, he was able to get roots down to 55 to 60 inches, over 2 feet deeper than the soil scientist's assessment.

Despite the deeper rooting, the siltpan

still exists, says Plumer. But in the top 12 inches, bulk density is decreasing, which is a measurement of soil compaction. He says it takes a number of years to fully break through the siltpan.

In 2005, Upton and Plumer did a number of trials comparing productivity from conventional tillage, no-till with no cover crops, and no-till with cover crops. They found that conventional tillage yielded 87 bushels per acre of corn, no-till with no cover crop yielded 124 bushels, and no-till with a cover crop yielded 137 bushels.

"The results for no-till ryegrass were greater because of better rooting and moisture retention," says Plumer. "We saw an improvement in soil fertility, a reduction in bulk density, and an increase in yields. So, all across the board, we've had improvements."

As an added bonus, Upton unexpectedly discovered that ryegrass causes soybean cyst nematode populations to decrease. Apparently, ryegrass exudes a substance that causes the nematodes to hatch in the fall instead of the spring. When that happens, Upton says, the winter kills them off.

Despite the successful results, Plumer thinks that ryegrass cover cropping is primarily effective on soils similar to Upton's. He is currently working on comparisons with darker soils located further north.

"Black soils normally don't have as severe root restrictions, so it's not as big of an issue for them," he says.

However, Plumer says that roughly 35 to 40 percent of the soil in Southern Illinois is similar to Upton's soil, but only about 2 percent of that land is being cover cropped. Regardless of what the other farmers are doing around him, Upton is sticking to his guns.

"No matter what, every year I try to get my cover crops planted," he says. "I think of my soil quality now compared to 20 years ago, and there's just no comparison."

By Jason Peterson

Seeding Worms Boosts Soil Tilth— Naturally

Bob Van Hovel, Crescent City, Illinois

Night Crawlers as Natural Soil Conditioners

Coordinator: Robert Van Hovel

Location: Milford, Illinois

SARE Grant: \$4,340

Grant Year: 1993

Project Number: FNC93-038

To improve his soil, Bob Van Hovel seeded thousands of night crawlers into part of an 80-acre field as well as in a 23-acre field. The night crawler "castings" boosted organic matter in the soil and reduced fertilizer needs.

It's been more than 10 years since Bob Van Hovel added thousands of worms to his soil to enrich the land. But he can still see the evidence of their presence in his fields.

"Even to this day, I can go out there and see 'midins,'" Van Hovel says. Midins are the husks and other plant material that the worms pull down into the soil. If he pulls up this plant material, he'll find burrows below where the nightcrawlers can be found.

Van Hovel, with the help of a SARE grant, "seeded" thousands of nightcrawlers in his soil to improve the soil quality in the mid-1990s. He planted worms in part of an 80-acre field as well as a 23-acre field on a farm that totaled roughly 1,000 acres at the time. The other part of the 80-acre field was used as a control plot.

"I had very few earthworms in these particular fields—zero to none," says Van Hovel, a farmer near Crescent City, Illinois, about 60 miles north of Champaign. "Even though I had no-tilled for years, I just wasn't seeing the populations that I thought I should see. So my project was to



"...I can have worms do what fertilizer does at \$50 an acre..."

get a hold of the nightcrawlers and actually seed them over a couple of my fields to see if they would make a difference."

According to Van Hovel, nightcrawlers pull the residue, such as leaves from beans or corn, down into the soil profile. Then they chew the residue and expel "castings," which boost organic matter in the soil and reduce the need for fertilizer.

Van Hovel chose nightcrawlers because they burrow deep into the soil and create extensive channels, which allows natural drainage.

During the spring and fall, Van Hovel planted the worms every 10 feet, drilling 6-inch holes and burying the nightcrawlers. He eventually switched to simply placing the worms underneath the crop residue, which was much faster. After the first year, he planted rye grass to provide the worms with a food source that would also protect them over the winter.

For a three-year period, Van Hovel checked portions of the fields daily to see if the worms had increased in population. The only time of year that he did not check was in the dead of winter when there was

too much snow cover. He found that the populations did go up and continue to remain high today.

Van Hovel no-tills his fields and hasn't plowed for close to 25 years, creating a better environment for the worms. Nightcrawlers are very picky about their environment, he says, for they do not like low, wet spots or high spots. They dislike high clay content but also cannot tolerate soil that is too sandy.

Van Hovel would like to apply manure to his land because the nightcrawlers are attracted to it "and populations would explode." He currently does not have access to manure, since he does not own any animals, but he says it is something he would like to do down the road.

Since seeding the worms, Van Hovel has noticed a clear change in the soil and has been able to cut back on fertilizer.

"I only use a starter fertilizer now," he says. "But I used to broadcast N, P, and K (nitrogen, phosphorus, and potassium). It's amazing what these creatures can do for you. It's all about economics and efficiency in farming, so if I can have worms do what fertilizer does at \$50 an acre, there is no reason not to. That's it in a nutshell why I did this."

By Jason Peterson

Giving Okra a Second Chance

Michael Vincent, Pike County, Illinois

Integrated Cultural Production Methods for Maximum Okra Seed Yields

Coordinator: Michael Vincent

Location: Urbana, Illinois

SARE Grant: \$4,933

Grant Year: 2004

Project Number: FNC04-540

Michael Vincent experimented with row spacing, nitrogen application, and pest control to make okra productive on his farm. He also worked with an engineer to develop an okra-friendly mechanical harvester.

When most people think of okra, they picture a hearty southern gumbo. But

Michael Vincent sees more, for he is interested in the nutritional value of the mature seed.

According to Vincent, okra seed is 25 percent protein and 21 percent oil. The protein profile is similar to soy and the oil is 69 percent unsaturated. What's more, okra also is drought resistant and has fewer pests than soybeans.

People are so used to thinking of okra as a novelty crop that they ignore its potential, Vincent says. But he was hoping that he could give this overlooked crop a second chance through a SARE grant. In particular, he wanted to find out what works best for seed production.

Vincent was introduced to okra in his family's garden, for okra has been traditionally raised as a fresh vegetable instead of allowing it to mature for seed production. Therefore, he didn't give it much thought until a study in Alabama showed that okra seed out-produced soybeans 4,500 pounds to 3,000 pounds



Okra seed oil
doesn't degrade at
high heat and could
replace expensive
cottonseed oil...

on the same acreage. And this was okra that hadn't been selectively bred for seed production.

"There is still the potential for serious gains," he says.

However, reaching that potential has meant a lot of work on his Pike County farm. Vincent has experimented with row spacing, nitrogen application, planting date, and pest control. He's also working with an engineer in Wisconsin to develop an okra-friendly mechanical harvester.

"We're trying to thrash the seed pods while leaving the stems standing; that way we won't pull all of the plant material through the harvester, which will ease the separation of the seed from the stover and lower power requirements." Vincent says.

Despite a few setbacks, such as storms destroying test plots and seedling-munching voles, the results have been promising.

Okra has few natural predators, Vincent says. He had trouble with grasshoppers

and stinkbugs but never enough to justify pesticides. Okra also avoids the rusts and nematodes that plague soybeans.

However, he has had to deal with infections by rhizoctonia, which plug up the plant's vascular system similar to way cholesterol plugs people's arteries. Dry weather stress at planting caused this infection, but later-planted okra did not show symptoms. Vincent planted on three different dates—May 17, June 7, and June 28—and he found the middle planting date to be the highest yielding because of the absence of disease.

If selective breeding can increase seed yields, Vincent sees a lot of economic potential. Okra seed oil doesn't degrade at high heat and could replace expensive cottonseed oil in factory food fryers.

Okra could even be added to corn and soybean rotations to reduce certain insect pests and other pathogens.

According to Vincent, okra has several mechanisms that allow it to survive and produce seed in drought conditions: a large taproot system for extracting moisture and nutrients from greater depths; and an "indeterminate growth nature" that allows the plant's reproductive stage to be spread over a longer time period.

All of the seed yield does not have to be filled at one time, and the okra can go completely dormant if conditions are very harsh; then it can come back and produce seed when it rains.

"These properties have broadened my horizon on the suitability of okra as an oilseed crop," he says.

By John Marlin

The Canada Connection

Pam and Larry Wilkey, Carterville, Illinois

Production of Black Bass in Southern Illinois Coal Mine Lakes

Coordinator: Pam Wilkey

Location: Carterville, Illinois

SARE Grant: \$5,000

Grant Year: 2001

Project Number: FNC01-385

Pam and Larry Wilkey transformed a spring-fed, 15-acre lake into a lucrative business, producing largemouth and hybrid bass for sale in markets as far away as Toronto. The Wilkeys raise the fish in netpens, an unconventional but highly successful approach.

If you ever find yourself shopping in a Toronto market for fresh fish, do not be surprised if you come across largemouth bass that have made the long haul to Canada from southern Illinois. Just look for the market that has aquarium-like containers where you pick out your own live fish and they file it for you on the site.

Pam and Larry Wilkey raise these fish on lakes near Carterville, Illinois, seven miles east of Carbondale. They sell largemouth and hybrid bass to a company in Toronto, as well as to a second market in Chicago. But the Wilkeys' aquaculture operation never would have taken off without a SARE grant, which enabled them to transform an unused, 15-acre, spring-fed lake into a lucrative side business. They later added a 5-acre lake to the operation.

"I just thought this water could make us some money," says Pam Wilkey, who works in human resources for the state of Illinois. The Wilkeys also thought they would try something a little different; they would raise the fish in netpens, rather than raceways. Netpens are large, submerged cages, while raceways are long, narrow channels dug into the land.



"People in this area hadn't raised fish in cages and they looked at us like we were nuts."

"Netpens are pretty unconventional," she points out. "People in this area hadn't raised fish in cages and they looked at us like we were nuts." But the Wilkeys have been successfully fish farming now since 2001; and since then three other operations have sprung up in the area, raising fish using their approach.

About 50 years ago, much of the land around Carterville was coal-mined, and a plethora of lakes sprouted up in the strip-cut areas. The Wilkeys purchased their land in 1994 from a man whose father coal-mined. But the idea to raise fish on this land did not come to the Wilkeys until they read in the local newspaper about someone else in the area raising catfish in raceways. So she contacted the Small Business Incubator at Southern Illinois University, which helped them get started and recommended the SARE grant program.

"We couldn't have done this without the grant. It enabled us to buy the pens and build the docks as well as buy the food," says Wilkey.

The Wilkeys bought six small pens with a capacity of 800 to 1,000 fish each from a

college student moving to Oregon. Today, they have expanded with the addition of six larger pens, which each hold 2,000 fish. In all, the Wilkeys now raise 17,000 fish—a significant increase over the 3,400 fish they raised that first year.

The Wilkeys do the harvesting from the dock, which the cages are attached to by bungee cords. After strapping a tarp around the pen to keep some water inside the cages, they hoist the pens out of the water and use nets to transfer the fish to large coolers, which have oxygen running through them. Their contacts in Canada pick up the fish several times a year, transporting them back to Toronto live.

During the first year of the project, the Wilkeys raised 1,600 smallmouth bass, 8,000 largemouth bass, and 1,000 hybrid bass. But they no longer raise smallmouth because of the difficulty in locating a source for them.

Wilkey says they have had to deal with some mortality losses, but it has not been too bad—typically about 10-percent mortality. 2007 has been the most difficult year, as they lost 1,000 fish. A fungus concentrated in one pen and worked its way into the fishes' livers. But they treated the fish with teramycin and cured it.

Wilkey says their ultimate dream is to raise eggs from hatching until they are fingerlings and then transfer the fingerlings to a holding tank in a pole barn. When the fish get strong enough, they would be moved into netpens in the strip-cut lakes.

For Wilkey, the fish farm is her passion—something she wishes she could afford to do full-time.

"Truly, I enjoy it," she says. "It's something I can't explain. Some people like to run marathons. I like to raise fish."

By Jason Peterson

NCR SARE Farmer Rancher Grant Recipients

In Illinois from 1992-2008

Animal Production: Apiculture

Hive Management

Northern Production of Disease and Mite Resistant Queen Honey Bees (FNC06-641)
Stu Jacobson, 6201 New City Road, Rochester, IL 62563,
(217) 498-7223

Animal Production: Aquaculture

Freshwater Fish

Growing Fish and Plants in an Aquaponic System (FNC04-533)
Lori Bahre, 9735 Branch Road, Oakdale, IL 62268, (618) 329-5338

North Central Region Paddlefish Polyculture (FNC01-338)
Scott and Kami Miller, 15654 N. 1650th St., Chrisman, IL 61924,
(217) 465-5486

Production of Black Bass in Southern Illinois Coal Mine Lakes (FNC01-385)

Pam Wilkey, 955 Vermont Road, Carterville, IL 62918,
(618) 985-3933

Trout and Walleye Production in Freshwater Springs in Illinois (FNC98-235)

Michael Rahe, 1630 S. Hardin, Jacksonville, IL 62650,
(217) 243-9508

Freshwater Prawns

Reinventing the Family Farm (FNC03-446)
Brenda Lyons, 573 Red Stripe Road, Sandoval, IL 62801,
(618) 247-8477

Three Little Fishes (FNC04-520)

Brenda Lyons, 573 Red Stripe Road, Sandoval, IL 62801,
(618) 247-8477

Alternative Agriculture in Southern Illinois (FNC01-382)

Robert Boyd, 1855 Kratsinger Hollow Road, Cobden, IL 62920,
(618) 833-6409

Integrated System

Raising Tilapia Fish in Tanks Along with Plants and Vegetables in Beds (FNC03-441)

Irene Seals, 2729 A-S 13810 E. Road, St. Anne, IL 60964,
(815) 944-8000

Animal Production: Beef Cattle and Bison

Grazing Systems

Establishment of Native Warm Season and Cool Season Grasses on Highly Erodible Land (FNC 92-022)

Michael and Debi Herren, R.R. 1, Box 77, Kampsville, IL 62053,
(618) 653-4254

Incorporating Rotational Grazing in the Crop Rotation (FNC00-309)

Raymond Meismer, 1443 Pleasantview Road, Washburn, IL 61570,
(309) 248-7255

Year-Round Management Intensive Grazing (FNC02-409)

Jason Smith, 712 Route 108, Greenfield, IL 62044, (217) 368-3026

Animal Production: Poultry

Free Range/Pastured

Free Range/Pastured Poultry Comparison Demonstration with an Organic Feed Component (FNC98-005)
John and Ida Thurman, P.O. Box 392, Hopkins Park, IL 60944, (815) 944-9914

Crop Production: Agroforestry

Woodlot Management

Sugar Maple Control and Hardwood Restoration in Central Illinois Woodland (FNC98-231)

Kevin Green, 17938 N. 680 E. Road, Fithian, IL 61844,
(217) 354-4030

Crop Production: Field Crops

Cover Crops

No-Tilling Hairy Vetch Into Crop Stubble and CRP Acres (FNC93-028)

Walt Townsend, R.R. 1, Box 77, Geff, IL 62842, (618) 897-2560

Cover Crop Management in the Upper Midwest (FNC95-117)

Kim A. Burkhart, 3597 W. Lightsville Road, Leaf River, IL 61047,
(815) 757-7260

Long-Term Benefits of Cover Crops and Crop Rotations (FNC97-196)

Ralph Upton Jr., R.R. 1, Springerton, IL 62887, (618) 757-2369

Crop Rotation

Strip Cropping in a Four-Crop Rotation (FNC94-063)

Larry Kennel, R.R. 1, Low Point, IL 61545

Implementing Sustainable and Organic Practices Using Rotary Tillage and No-Till Equipment to Farm in 30-Foot Strips that will Meet ASCS Erosion Mandates (FNC95-99)

Larry Kennel, R.R. 1, Low Point, IL 61545

Re-Introduction of Flax as a Viable Economic and Rotational Crop in an Organic System (FNC 99-249)

Joel Rissman, 9497 W. Lightsville Road, Leaf River, IL 61047-9617,
(815) 938-3042

Re-Introduction of Flax as a Viable Economic and Rotational Crop in an Organic System (Phase II) (FNC01-375)

Joel Rissman, 9497 W. Lightsville Road, Leaf River, IL 61047-9617,
(815) 938-3042

Fertilizer Management

Use of Worm Casting Extract in Ag Production (FNC04-536)

Don Spiker, 12877 N. 600th St., Wheeler, IL 62479, (217) 683-2336

Crop Production: Fruit Crops

Variety Evaluation

Breeding Better Apple Varieties for the Midwest (FNC99-270)

Jim Eckert, 901 S. Greenmount Road, Belleville, IL 62220
(618) 233-0513

Expansion of Grape Production (FNC98-237)

Marchell Baehr, Rolling Hills Vineyard, P.O. Box 127, New Salem, IL 62357 (217) 285-2215

Crop Production: Vegetable Crops*Cultural Practices*

Integrated Cultural Production Methods for Maximum Okra Seed Yields (FNC04–540)

Michael Vincent, 18133 259th Ave., Hull, IL 62343, (217) 432-5440

Okra [*Abelmoschus esculentus*], an Oilseed for Stressful Conditions of the Midwest (FNC05–565)

Michael Vincent, 18133 259h Ave., Hull, IL 62343, (217) 432-5440

Equipment/Tillage

Water Conservation and Grey Water Recycling at Three Rivers Community Farm (FNC06–606)

Amy Cloud, 15 LaSalle St., Elsay, IL 62028, (618) 374-9470

Integrated Systems

Resource Center City Farm (FNC04–518)

Kristine Greiber, 222 E. 135th Place, Chicago, IL 60627, (773) 821-1351

Variety Evaluation

Okra Test Trial of 16 Varieties in an Organic Farming Operation (FNC03–489)

Jon Klingenberg, 13138 Witt Ave., Butler, IL 62015, (217) 594-7356

Conducting a Variety Trial to Find the Best Marketable Organic Tomato Product (FNC04–524)

Louis Reuschel, P.O. Box 204, Golden, IL 62339, (217) 696-2493

Disease/Pest Management: Vegetable Crops*Cultural Control*

Determination of Economically Optimal Organic Control of Onion Maggot in Allium Crops (FNC04–497)

Lisa Haynes, 480 CR 2500 N, Mahomet, IL 61853, (217) 586-5632

Economics/Marketing: Animal Products*Direct Marketing*

Linking Downstate Illinois Small-Scale Goat and Sheep Producers (FNC98–245)

Les and Penny Gioja, 1689 CR 400 E., Champaign, IL 61822, (217) 863-2758

Bringing the Retail Dollar Home—Increasing Profitability of Small-Scale Meat Production Through Direct Marketing (FNC06–611)

Beth Osmund, 1985 N. 3609th Road, Ottawa, IL 61350, (815) 431-9544

Education: Training

Future Farming Families (FNC02–428)

Ida Thurman, P.O. Box 392, Hopkins Park, IL 60944, (815) 944-9914

Student Producers of the Future (FNC03–457)

Louis Reuschel, P.O. Box 204, Golden, IL 62339, (217) 696-2493

To Be Able to Introduce Healthy and Economical Agriculture to a New and Lost Generation. (FNC06–632)

Reginald A. and Brenda K. Stewart, 14317 E. 2000 S. Road, Momence, IL 60954, (815) 944-9234

Economics/Marketing: Goats, Poultry, Vegetables*Direct Marketing*

Establishment of an Organic, Sustainable Small-Scale Farm Producing Livestock (Goats/Chickens) and Vegetables for Niche Markets in Chicago (FNC07–685)

Godwin Akpan, 1809 W. 51st St., Chicago, IL 60609, (773) 776-7349

Economics/Marketing: Grain Crops*Market Study*

Marketing of Small Amounts of Organic Grains Through Alternative Broiler Feeds and Direct to Consumer Sales (FNC07–671)

Lisa Haynes, 480 CR 2500 N, Mahomet IL 61853, (217) 586-5632

Education: Networking*Farmers/Educators/Consumers*

Phase I of Reuschel's Sustainable Demonstration Farm (FNC99–283)

Louis Reuschel, P.O. Box 204, Golden, IL 62339, (217) 696-2493

Natural Resources: Soil Quality*Organic Matter and Soil Biology*

Nightcrawlers as Natural Soil Conditioners (FNC93–038)

Robert Van Hoveln, 1586 E. 1200 North Road, Milford, IL 60953, (815) 473-4445

Waste Management: Rural Waste*Composting*

Low-Cost Waste Management in Beef Cattle Operation (FNC94–079)

Joel Rissman, 9497 W. Lightsville Road, Leaf River, IL 61047-9617, (815) 938-3042

Notes

