

## SARE

## Farmers Forum Highlight

The **Farmers Forum** publication contains short stories on presentations made during the 2010 Farmers Forum at the National Small Farm Trade Show and Conference™ in Columbia, Missouri, in November 2010.

Last year's speakers included people with North Central Region-Sustainable Agriculture Research and Education (NCR-SARE) grants, and others with great information to share.

The same will be true this year at the Nov. 3-5, 2011, Farmers Forum in Columbia.

NCR-SARE offers **competitive grants and educational opportunities** for producers, researchers, educators, youth, institutions, organizations, and others exploring sustainable agriculture in America's north central region.

The Farmers Forum is one of many educational efforts NCR-SARE helps support. It provides farmers, ranchers, and others the opportunity to share their sustainable agricultural practices and ideas with a national audience.

Talks focus on projects that are profitable and good for the environment and local communities.

To see the terrific topics on the 2011 Farmers Forum agenda, visit the [www.smallfarmtoday.com](http://www.smallfarmtoday.com) website, click on 19<sup>th</sup> National Small Farm Trade Show and Conference, and then on Farmers Forum.

As you look through the **Farmers Forum Highlights**, you'll see FNC, YNC, or YENC numbers listed with most project titles – these are NCR-SARE project numbers.

To learn more about the projects, go to the national SARE website at [www.sare.org](http://www.sare.org) and click on the Project Reports tab. There you'll find full reports for the projects, which you can locate by the project number.

For information on this year's Farmers Forum and the National Small Farm Trade Show and Conference of which it's a part, and to register for the Nov. 3-5 event, see [www.smallfarmtoday.com](http://www.smallfarmtoday.com) or call 1-800-633-2535.



<http://www.sare.org/ncrsare>



Photo by Joan Benjamin

Brandon Jaeger explains how grain amaranth is grown and used. The tiny seeds can be popped, ground into flour, or cooked as a cereal.

FNC08-730 Athens, OH – Brandon Jaeger

## A Cooperative Small Farm Effort to Meet Local Demand for Staple Seed Crops in the Appalachian Ohio Region

**Objective:** To solve the problem of a lack of locally procured staple seed crops by demonstrating small-plot commercial production, gathering agro-economic data and experience, and providing interested farmers and landowners with opportunities to be involved, helping them with appropriate equipment and market channels to support their startup in production.

**Results:** Staples are basic dietary items such as flour, rice, or corn. This project builds on SARE project FNC07-663, "Growing Highly Nutritious Staple Food Crops Using Intensive and Sustainable Agriculture Systems," in which we practiced permaculture – or self-sustaining ecosystem – techniques in test plots, and found community interest in the staple food crops we were producing.

We started the current project with heirloom dent corn, black turtle beans, and spelt, reasonably similar to common commodity feed crops of corn, soybeans, and winter wheat. We thought that advantageous

to help commodity farmers transition to organic/chemical-free food production for regional consumption.

In the first season one participant planted 3.5 acres of 'Reid's Yellow Dent', which we'd grown in project FNC07-663 and was popular for tortillas at a local bakery. The crop succumbed to moisture-related molds; accompanying mycotoxins made it unsuitable for human consumption.

In the second season two Amish farms joined the project and grew 2 acres of their own heirloom yellow

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## Multispecies Pasture Stacking

**Objective:** To make more effective use of our pasture acreage by implementing Multispecies Pasture Stacking (msPS), which will require less labor, improve the family's quality of life, and provide better soil, water, and animal health.

**Results:** Multispecies Pasture Stacking is two or more species grazing the same pasture. Our farm is home to Hereford/Angus beef cattle, Jersey dairy cattle, Cornish Cross broilers, Bovain layer chickens, Pekin and K. Campbell ducks, BB White turkeys, and Polypay sheep, all of which are incorporated into our msPS system, with the ruminants' diet 100 percent organic grass and hay.

We've found that while msPS takes some time to implement, and more management, it's entirely feasible for multiple species of animals to graze in the same pastures. This system requires less labor, provides better livestock health and faster

growth, and is environmentally kind. The benefits of fewer acres and pesticides used offset the extra management.

Through our project our children have gained sustainable agriculture training they value. We've added to our local economy as 16 farms/rural businesses within a 15-mile radius of us now cluster market our products together at the farmers market, and are beginning to collaborate to sell at the wholesale level. We also work together for agritourism bus tours, and our farm now hires help for weekly and seasonal farm tasks.

All our meat and dairy products are direct marketed off the farm, at the local farmers market, or to groceries, restaurants, and delis. Trickle-down economic impact from laborsaving msPS allows us to operate an inspected processing facility and hire three to six people once or twice a week for 36 weeks a year.

Plus, less erosion and better pasture health benefit our environment.

## Planting and Growing Giant Miscanthus as a Bioenergy Crop in Missouri

**Objective:** To determine the commercial viability of Giant Miscanthus as a bioenergy crop.

**Results:** I'm a native seed and turf seed grower who grows several hundred thousand pounds of seed in western Missouri. *Miscanthus giganteus*, also called elephant grass, was a natural fit for my cropping cycle of grasses.

Miscanthus grows to around 10 feet and looks like sugar cane. I grew 20 acres of it last year; it's planted with rhizomes, not seed, likes wet, gumbo-type ground, likes a lot of water, and thrives in wet years. If you buy rhizomes from a local grower it's likely to take about \$5,500/acre to establish. I'd recommend planting a 1-acre nursery the first year, then harvesting those rhizomes in two years for planting. I'd expect that would plant around 50 acres.

You can expect to harvest 8 to 12 tons per acre in three years.

Foxtail and common

ragweed were the biggest weed problems, and that was only during establishment. By the second year the Miscanthus was so thick weeds weren't a problem. If I would change anything, I'd like to no-till plant Miscanthus in a chemical-killed annual ryegrass field. I think that

would help tremendously on weed control.

I think Miscanthus is best planted as a small acreage scale crop because it costs so much in labor and plant material to plant large areas. I planted 2 acres of red clover around the Miscanthus as a border to prevent the rhizomes from migrating. Miscanthus is sterile and not invasive like a weed, but it will

multiply by itself.

For this crop to be successful, there need to be biorefineries to process it, something interested producers may organize to build, depending on local interest.

I belong to the Show Me Energy Cooperative, which has received a USDA grant to determine farmer interest in growing large quantities of cellulosic crops for energy.



Photo by Steve Flick

Giant Miscanthus rhizomes were soaked in water, then loaded into a modified Bermudagrass sprigger in a 2008 planting experiment. The planting rate was 4,840 rhizomes per acre.



Photo by Steve Flick

Steve Flick experimented with various ways to plant Giant Miscanthus including hand planting, and soaking rhizomes in water (shown here) before planting with a modified Bermudagrass sprigger.

# On-Farm Composting: Economics and Effects on Vegetable Produce Yield and Soil Physical and Chemical Properties

**Objective:** To determine if it's more economical to buy compost or to make it, and to compare the impact of different soil amendment regimes (compost, fertilizer, nothing) on soil properties.

**Results:** Our farm consists of approximately 90 acres, mostly pasture; we have 10 acres comprising the house, barns, machine shops, gardens, and greenhouses. A major portion of the gardens, as well as the greenhouses, form the basis of a small-market garden business.

The first year, I planted duplicate replicates of a control and three treatments — farm compost; Bradfield® Vibrant Veggie, a 2-3-6 alfalfa-based fertilizer, and Microleverage® Humified Compost. I selected four different types of vegetable crops to compare — root crops, leafy greens, flowers, and solanaceous crops. A cool, wet spring resulted in poor seeded crops germination, and conditions were conducive to early blight development in the tomatoes. Peppers were the only successful crop.

In the second year's trials I added an additional treatment, composted poultry litter, and selected a popular heirloom tomato as a summer crop for four replicate 10 by 10 foot plots of each treatment, applied prior to planting. Tomato numbers and weights were measured from three consecutive weeks of harvest.

I had no particular expectations with respect to the efficacy of any one treatment I tried over the other, and thought there might be greater treatment differences than I actually observed.

I was pleased my compost compared favorably with others tested. I found while one treatment had a possibly greater apparent benefit for tomatoes, a different treatment was more beneficial

for turnips. If I were to repeat this study, I would probably follow treatments over a longer period with respect to soil changes; I think it takes repeated applications to provide long-term benefits for soil qualities.

With this project I relearned there is a limit to how many factors you can juggle at a time and

still gain a significant insight into cause and effect relationships. I was pleased to realize the financial benefit of making rather than buying compost.

I have a greater appreciation of the relative benefits of some of the other treatments I tried, and gained more insight into producing the respective crops.



Photo by Dorothy Canote

Turnips responded best to farm compost and one commercial compost treatment, while heirloom tomatoes produced similar yields under four different compost treatments. A buckwheat cover crop controls weeds in the neighboring plot.



Photos by Jennifer Canote

Dorothy Canote's farm-made compost cost about \$0.33 per pound, using a labor cost of \$10 per hour.

## Problems Affecting Small-Scale Farmers

(Editor's Note: Tayo Aregbe worked with Godwin Akpan on FNC07-685 (page 5), and spoke at the 2010 Farmers Forum.)

**Objective:** Project Agrilink is a U.S.-based, not-for-profit organization to support and assist farmers in developing nations by creating an environment that enables efficient agricultural development and sustainability. We're presently focused on African nations.

**Results:** I served as Volunteer Agriculture Program Coordinator with the United Human Services Center (UHSC) in Chicago; a survey there showed most participants were African immigrants who haven't been able to farm, but would like to do so.

Between 1960 and 2007, the number of African immigrants to the U.S. grew from 35,355 to 1.4 million, with most growth occurring since 1990. This is expected to cause a rise in demand for fresh, local, organic produce as African immigrants seek fresh fruits, vegetables, and foods they know.

Problems facing African immigrant farmers include:

- They don't know where to start as beginning farmers in the U.S.
- They are farming in a very different culture, climate, and landscape, which raises many questions.
- Because of homeland land-tenure issues, they fear they can't start farming in the U.S., plus access to credit is tough.
- They must navigate paperwork unfamiliar to them.
- Authorities may not be interested in making land available, something encountered when the UHSC sought use of idle vacant lots for a city garden project.



Photo by Jide Aregbe

Students working on a Project Agrilink on-farm training program in Africa move harvested cassava to a processing site.

I think the move toward more localized, farmers market agriculture can help immigrant farmers, as can their settling together where they can share knowledge of organic growing methods and soil. Education about U.S.

farming can help immigrants when they arrive and consider being a farm worker or a self-employed small-scale farmer, as can provisions for credit and farmers market opportunities.



Photo by Jide Aregbe

Young African farmers who received training in the Project Agrilink program prepare land for a new farming session.

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

**Objective:** To produce vegetables, goats, and chickens for Chicago niche markets and to establish a small, sustainable farm that becomes a center for outreach to 4-H youth and adults.

**Results:** I am executive director of United Human Services Center (UHSC), a not-for-profit organization in Chicago that works with abused women and involves citizens in gardening activities. Our initial efforts in gardening produced food for clients and taught us more education was needed for more people, so UHSC acquired a 25-acre plot in Pembroke Township, 60 miles south of Chicago where many immigrants have small farms.

From land clearing to harvest, this has been a rewarding experience. We became a showcase to residents and potential farmers, as well as student organic agriculture interns, and 4-H youths. The University of Illinois Agriculture Extension Unit was a notable project partner.

In June and July 2009 we harvested our first crops from the farm – 1,500 pounds of tomatoes; 500 pounds of okra; 1,000 pounds of peppers; 500 pounds of cucumbers – benefitting our low-income, no-income, and needy populations.

In June 2009 there were 600 families contacted and informed of the benefits of organic farming and healthy eating. Educational sessions were mandatory for participants, with baskets of fresh fruits, vegetables, and herbs as rewards of attendance.

By July 2009 clients had tripled and UHSC expanded. We have added

knowledgeable supporters and educators who are prepared as trainers for a community Farmers Training Center in Pembroke, Kankakee, IL. Eighty people attended the last UHSC mandatory meeting in July, and 35 signed up to become students at the Farmers Training Center. We plan to train low-income Chicago residents and immigrant farmers on livestock production, organic

food production, processing, and marketing to promote agriculture nationwide.

We have started a city farm garden project to teach youth how to identify and cultivate vegetables and other produce for organic food production.



In 2009, 1,500 pounds of tomatoes were raised in a Chicago community garden in an effort led by United Human Services Food Pantry director, Godwin Akpan. The tomatoes and other crops were distributed to over 100 families in the area.

FNC09-773 Greenville, IL – Amy Marcoot

## Adding Value to Our Seventh Generation Dairy Farm by Turning Our Milk into Farmstead and Artisan Cheeses

**Objective:** To demonstrate the roles and value of farmstead, artisan cheese-making in farm sustainability.

**Results:** We experimented with many different styles of cheeses in 2010, testing them at farmers markets. We began making cheese at least three times weekly March 31.

We currently make 13 different cheeses – four raw-milk aged cheeses (cheddar, Alpine, Appenzeller, and tomme) that age in our manmade cheese cave a minimum of four months, and six pasteurized cheeses (pepper jack, tomato basil jack, havarti, Gouda, farmhouse cheddar and baby Swiss). We also make three fresh cheeses (three quark varieties, fresh mozzarella, and three varieties of cheese curds).

We know community education is important to our value-added project so people understand the importance of what we're doing and how it positively affects them and the environment. We've worked hard to educate people on farmstead cheese's value; ours is made from Jersey milk, all natural, no hormones, grass fed.

Of course, the most important thing we do is create a product consumers want. With our grant we bought 100 cheese molds that help us create a great product and be cost effective. We've added 1.33 full-time equivalent (FTE) positions, and expect employment to increase.

We've grown in understanding the cheese market and in making and caring for our cheese, and have competitive products and prices. We've gone from selling only at farmers markets to selling in 23 stores in an elite St. Louis grocery chain, and in five restaurants and five smaller grocery stores. We expect this to increase.

We plan to increase tourism to our farm to educate consumers, and to host more school and tour groups. Our on-farm retail store brings people to us; viewing windows in the Grade A and Grade B sides of our production facility allow people to watch, ask questions, and learn.

## Elderberries: Growing and Marketing

**Objective:** To better grow and market elderberries, which are increasingly in demand because they are rich in nutrients and antioxidants.

**Results:** I am a farmer participant in NCR-SARE Research and Education grant, LNC10-324, Developing Successful Marketing Strategies for Elderberry Growers and Value-Added Processors: a Model for Specialty Crop Development in the U.S., coordinated by Michael Gold, professor in the University of Missouri (MU) Center for Agroforestry at Columbia.

I have the largest elderberry farm in the U.S., and a great interest in seeing the elderberry market expand. I've been growing elderberries since 1998, about the time MU began its Elderberry Improvement Project, performing needed research on elderberries and releasing two varieties, 'Wildwood' and 'Bob Gordon.'

Missouri has a climate favorable to elderberries; researchers currently are looking at ways to get a consistent harvest each year. I'm part of a cooperative,

Missouri River Hills Elderberry Producers; we collect wild and cultivated berries from growers statewide, process them into juices and jams, and sell them under the River Hills Harvest label.

Ripe elderberries have a dark purple color, and we pick them as bundles, not

individual berries. We prune our plants back in the fall; if you cut them to the ground you have a 10 percent loss in production for the next season. I create a native permaculture – sustainable, diverse agriculture of native plants – in my elderberry fields by interplanting other native species.



Terry Durham grows many varieties of elderberries to see which perform best on his farm. 'Adams 2', shown here, is an older variety released in 1926. It ripens early, is sweeter than most elderberries, and has very large clusters of purplish/black berries.

Photo courtesy of Elderberry Life

## Freshwater Shrimp: Improved Nursery Technology Project

**Objective:** The culture of freshwater shrimp *Macrobrachium rosenbergii* in temperate regions continues to expand to meet increased demand in local markets, leading to annual increases in production and number of farm enterprises. Our operation needs to develop innovative nursery techniques to produce larger quantities of juvenile shrimp in our existing indoor recirculating systems to meet the increased seed stock needs of new farmers in our region.

**Results:** Our 132-acre family-owned fish farm has 60 ponds on 90 acres. For 45 years we've raised a variety of fish; for the last five we've also operated the only Ohio shrimp nursery, serving 35 growers.

I proposed designing, engineering, and building a

new nursery system, hoping to increase juvenile shrimp production by 40 percent in the same water volume. We used materials that increase substrate surface area but not substrate volume. Increased surface area means more nitrogen-consuming bacteria

so nitrification occurs in the tank. Nitrification is important to keep the toxic level of the ammonia at a safe level. Substrate design provides increased habitat for juvenile shrimp, enhancing survivability.

We used an existing 15,000-gallon nursery tank to stock juvenile shrimp, and fed multiple times daily for 42 days. We collected water quality parameters and monitored shrimp for growth, survival, and feed conversion ratios.

The new system increased

juvenile shrimp production by 34 percent in the same volume of water. Survival rate was 80 percent, up from 70 to 75 percent. All biofiltration occurred in the tank.

Using this new technology we can increase the number of juvenile shrimp produced using the same amount of water, which helps conserve water and maintain lower-cost juveniles so shrimp farmers we sell to can remain profitable.

Next time I'd add more substrate to increase production.

# Evaluation of Production Efficiencies and Market Season Extension Options for RainFresh Harvests Year-Round Production of Herbs and Specialty Vegetables

**Objective:** To measure production inputs and returns for three intensive production systems, and evaluate on a per square foot comparison to determine yields and net returns; and to examine the potential for extending the market season to use surplus yields through the use of value-added processing options.

**Results:** This project builds on my earlier SARE grant, FNC04-510, RainFresh Harvests Year-Round Food Production System for Central Ohio.

I studied three cropping systems, collecting results over three years. The three systems are a BioIntegrated Greenhouse (BIG) – this system combines aquaculture with cultivating plants in water – a Passive Solar Greenhouse (PSG), and raised bed Field Crops (FC).

While BIG had the longest harvesting period, it also had the highest energy use and investment cost. Supplemental heating by a small propane heater during the coldest winter months made returns per square foot the poorest of the three methods. Supplemental hand watering was regularly required in summer.

BIG did provide competitive advantages with client restaurants, based on consistent demand and supply.

PSG, similar to a typical high tunnel but with a few modifications to promote year-round growing, showed its primary advantage in early spring and late fall with higher yields than because of better light and in-ground raised beds as compared to BIG. PSG provided significantly longer harvest periods than FC raised beds.

PSG requires access to power to continually inflate the double-layered covering

and for irrigation, critical in this covered environment. In summer excessive heating and drying, even with regular watering, tended to reduce yields. My focus for future PSG cropping will be cooler season crops to target early spring and late fall markets.

Drip irrigation significantly reduced labor inputs for all crops in PSG and FC. Overall water usage was highest for BIG, followed by PSG, then FC.

The FC raised beds had yields similar to the other cropping systems per square foot, with yields more concentrated during the shorter growing season. Irrigation by regular rainfall during two of the three seasons was an advantage, reducing labor significantly and providing an ideal growing environment most of the season. Heavy rain delayed plantings all three seasons.

During 2010, continuous wet conditions promoted downy mildew growth, significantly reducing yields. The raised beds were critical for allowing added drainage during these wet periods; other local farmers who didn't have raised beds suffered greater losses.

I see use of row covers and low tunnels as potentially viable for extending season harvests, although 2009's success wasn't duplicated in 2010 because of a wet spring that delayed planting, and an early fall cold snap followed by heavy snow

and winds that significantly damaged the row cover, causing freeze damage before any crop was harvested. I'll be working in 2011 to refine this use.

I'm also considering higher return crops for BIG, to take advantage of year-round growing conditions and summer temperatures cooler

than the PSG, which offer more desirable conditions for micro-green production.

After energy and labor, water is the most critical input item that needs further research. Intensive crop production currently relies on high water usage.



Barry Adler's BioIntegrated Greenhouse (left) is powered by a wind turbine and solar array, and is heated with a solar radiant floor system; the Passive Solar Greenhouse (right) has no supplemental heating.



Herbs grow in pots filled with vermicompost in troughs above fish tanks that overflow into a five-step biofiltration system before recirculating back to plants.



Row covers retain heat in the passive solar greenhouse for a December crop of arugula.

Photo by Barry Adler

Photo by Joan Benjamin

Photo by Barry Adler

# Low-Input Pasture Renovation Through Multispecies Intensive Grazing

**Objective:** To practice low-input pasture renovation and document improvements that can be made by adding intensively grazed sheep and goats to our management system that already includes pasture-raised poultry.

**Results:** Like so many communities in our country, ours no longer gets the majority of its food from local sources. I work at the personal, community, and state level to change this trend, and return local food choices.

Our area is challenging for crop production, but grass grows well here, making it good for pastured livestock. Details of this work should interest other area residents who would like to return their farms to productive use. We are measuring and documenting pasture changes using soil tests, forage nutrient analysis, photos, and forage/forb surveys. We have 12 paddocks in 6.5 acres to document how each responds to intensive grazing.

In 2009 we installed fencing, purchased net fencing, and acquired 18 feeder lambs and six wether goats. The animals grazed each of the 12 paddocks at least twice; maximum number of times a pasture was grazed was seven. Two hundred pasture-raised broiler chickens were raised in three paddocks.

I found some paddocks quite acidic, and am watching how they respond to grazing to see if measurable differences result. Several paddocks are predominantly undesirable red fescue, which I hope to reduce through intensive grazing.

The first year I'd thought the goats would more quickly affect brushy areas, but

have learned it will take several years. One paddock dominated by Reed Canary Grass and Goldenrod showed an amazing transformation; the animals seemed to really like Canary Grass, had many opportunities to graze it, and there was lush regrowth with much clover.

In 2010 I introduced five mixed breed dairy goat wether kids to the pasture May 1, and 34 Border Leicester cross lambs May 18. Each of the paddocks was grazed approximately six times; at the end of the season I continued the paddock rotation and added hay as needed. I also had 300 pasture-raised broiler chickens on three paddocks.

In 2011 I am raising 200 broilers on two paddocks. I use net gates to divide a paddock, starting the ruminants in one half of the paddock and after 12 hours removing the net gates to allow them access to the full paddock. I feel I got better use of forage and manure distribution, and could increase rotation frequency without much extra work.

Rain in 2010 nearly doubled that of 2009. I saw multiple parasite issues, and some young broilers just introduced to the pasture drowned. Weather issues required changes in my management techniques developed through years of mild drought. I look forward to comparing 2011's final soil and forage tests and plant survey with 2009's baseline information.



Photo by Jane Hansen



Photo by Jane Hansen

Jane Hansen renovates a fallow pasture using goats and sheep (top photo), and chickens (above) in a management-intensive grazing system. Each species grazes differently and the result is a diverse pasture with more desirable plants.



Photo by Kim Cassano

Sheep help renovate a fallow pasture by grazing; they prefer forage plants while goats prefer woody plants.

# Assessing the Sustainability of Growing Nontraditional Fruit Tree Crops in the Upper Midwest: A Collaborative Agroforestry Approach

**Objective:** To find diverse fruits suitable for Midwest organic production that can be easily grown, have minimal labor, establishment, and management costs, and are nutrient rich, appealing, and accessible to consumers. To use the design of the orchard to stimulate use of sustainable agriculture methods that demonstrate ways to conserve moisture, build soil fertility, manage for wildlife, and reduce weed competition. To provide growers outreach and educational resources on the value and potential profitability of growing these fruits.

**Results:** In 2008 we began transitioning 1 acre to an organic mixed-fruit orchard designed for sustainability. We like to grow unusual fruit, and planted aronia, Russian quince, European black, red and white currant, Saskatoons, seaberry, and American elderberry. These expand varieties of Midwest-grown fruits and are high yielding, environmentally friendly, and nutritious.

Our key recommendations for others considering fruit production/agroforestry include:

- Design your orchard so the system does the work for you. For example, we have

integrated agroforestry practices such as using forest garden guilds as a design tool for our orchard layout. Forest garden guilds are perennial polycultures of multipurpose plants that partition resources and create networks of mutual support. Short term, weed management to get plants established is a large portion of our labor, but long-term, by planting species complimentary to spacing (canopy tree such as quince and a shrub layer such as honeyberry) and function (seaberry is a nitrogen fixer as well as a healthful fruit), we can

create mini-ecosystems that provide for food (fruits), fiber (hop vines), fertility (seaberry and comfrey), fodder, 'farm'-aceuticals (elderberry), and fun.

- Stack functions – plant species/implement tasks that serve more than one function on the landscape. For example, the currants we are growing have both fresh and direct market appeal for our CSA members and a new restaurant account, as well as value added potential.
- Establish a mentor relationship with another grower to help you learn.
- If possible, allow three years to transition your land before you plant; at least one year minimum.
- Winter rye isn't a good cover crop for us; it was not able to compete with the cool season grasses. White clover did not give us good results in the first year;

however, in the second year we have seen good establishment in our orchard floor mix, along with our fescue mix.

- Woodchips and clean wheat or oat straw are good mulches. Laying down cardboard and/or newspaper with wood chips and straw on top has proven to be doubly effective for weed management going into the 2011 growing season.
- Have a watering system in place – young trees need 5 to 10 gallons per week.
- Deer fencing is a must.
- If you are planning on staying small scale (1-3 acres), borrow or rent equipment as needed; don't buy. We do almost everything by hand.
- Consider your own plant propagation program to save costs; select disease-resistant, edible cultivars.
- Have a site map in place before you plant.



Transitioning steps for creating guild plantings – winter cover crop, mowing, tilling – year one of the project.



Sheet mulch progression methods used for soil building and weed management. The 1,500 gallon cistern collects rainwater from the barn roof; the water is gravity fed via hoses to irrigate the orchard.

Photos by Erin Schneider

Photo by Erin Schneider

# Increasing the Production and Use of Disease- and Mite-Resistant Queens Adapted to Northern Conditions

**Objective:** To increase the number of beekeepers raising queens and bees for sale in Illinois; to increase their capacities to select a diverse breeding pool of northern-adapted bees with resistance to bee diseases and Varroa mites; to facilitate a regular exchange of both locally adapted stock and of information among queen producers; to promote Illinois-raised queens and bees to Illinois beekeepers.

**Results:** Prior to this project, we estimate Illinois beekeepers raised 150 to 200 honeybee queens each year. During 2009 and 2010, an estimated 1,600 queens were produced, almost all of which were raised by eight beekeepers participating in the workshops we held to meet our goal of increasing the number of beekeepers raising queens and bees for sale in Illinois. During 2009 and 2010, seven one-day and two two-day workshops were attended by 118 beekeepers who were taught skills to help them raise queens.

Workshop participants learned about testing honeybee colonies for disease

resistance, and how to select breeding stock that possesses resistance to bee diseases and Varroa mites. The SARE project has led to increased interest in using disease- and mite-resistant lines through the purchase of breeder queens of several lines. Breeder queens result from a breeding program based on artificial insemination. They cost \$150 to \$500 each and can be used to produce hundreds of daughter queens. We saw numbers of breeder queens purchased increase in 2009, and again in 2010.

Facilitating a regular exchange of locally adapted stock and of information among

queen producers was addressed by follow-up meetings of workshop participants, plus a 2010 meeting where a USDA bee geneticist presented information on genetics and on breeding for Varroa mite resistance.

Formation of the Illinois Queen Initiative (IQI) is an important SARE project result. The Initiative promotes disease- and mite-resistant queens and bees with superior survival and productivity under Illinois conditions. The IQI is a non-formal organization; members are beekeepers who support the IQI (and the SARE project's) objectives; almost all of them have taken the queen rearing workshops. There are 36 paid members and a "working board" of five persons.

Promoting Illinois-raised queens and bees to Illinois beekeepers was addressed by presentations to many groups, and a website ([www.illinoisqueeninitiative.com](http://www.illinoisqueeninitiative.com)). Almost all presentations aimed at promoting our queens to Illinois beekeepers were in state; two were in Missouri.

Eventual impacts of the SARE project and IQI should prove significant

to Illinois beekeepers, and potentially other states. Illinois beekeepers spend an estimated \$1.5 million on queens and packages of bees annually. In the past several years an increasing number of beekeepers are seeking locally adapted, disease-resistant stock. Buying locally adapted queens produced in Illinois keeps a large portion of those funds in the state.

In the past four to five years, beekeepers here and in other northern states have experienced annual losses of 50 percent or more of their colonies to rigorous winters, mites, and diseases. Stocks adapted to Illinois conditions experience far less winter losses than bees produced in Sunbelt states. Healthy, populous colonies that survive the winter make far more honey – an estimated 60 to 100 pounds more – than new colonies started with packages purchased from the Sunbelt.

But the real importance of honeybees for human nutrition isn't the honey they produce, it's the pollination services they provide that make possible virtually all fruit and a large percentage of vegetable crops production.



Photo by Joan Benjamin

Beekeeper Stu Jacobson inspects his bees and looks for the queen bee in one of the hives.



Photo by Joan Benjamin

Stu Jacobson prepares the bee smoker as he gets ready to work with his bees. Smoke keeps the bees calm when Jacobson opens the hives.

# Eliminating Invasive Buckthorn with Goats, an Ecological and Habitat Restoration Study

**Objective:** To determine how quickly and completely a herd of Spanish meat goats can clear land of invasive buckthorn trees, and to gain knowledge to set a fair price for renting them out to do so. Currently, grazing prices are: \$3 per 2-year-old goat per day, \$2 per yearling per day, and \$.25 per day for kids over 2 months of age.

**Results:** I found that in general, for any amount of buckthorn, for any number of goats, if it takes two to three days for the goats to defoliate the area the first time, it will take them three to five hours to defoliate it on subsequent grazings spaced four to six weeks apart. I found female goats will eat weeds down to the dirt, and male goats don't eat as far down.

Goats prefer to eat woody plants, favoring buckthorn, multiflora rose, and honeysuckle over young oak or hickory. Their second choice is broad-leaved plants like thistle, burdock, and curly dock. Goat-grazed weeds take longer to grow back than do cut weeds.

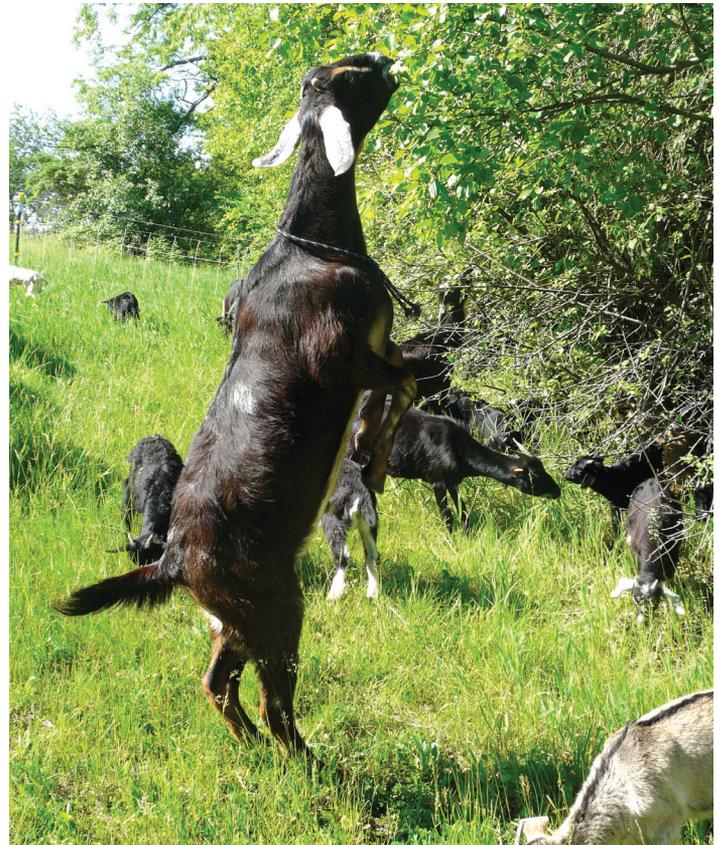
Goats can be used without any cutting as long as the buckthorn stand is young enough for them to reach all the leaves on the targeted plants.

If stems are small enough, goats will stand up and bend them down. When one goat does this, the others mob in and strip the plant bare, sometimes stripping stems up to 10 to 12 feet tall.

Goats will make bedding areas that can leave bare ground. If you spread seeds of cover crops or native grasses there, goats will trample the seed into the ground, increasing the soil-to-seed contact and successful germination. This, along with the goats eating invasive plants, helps restore native communities faster, with less energy and expense.



Goats are browsers — they prefer woody plants to grass. They can quickly defoliate a brushy area, which makes goats extremely useful for controlling weedy plants without herbicides.



The goats that make up Kim Hunter's Green Goat Grazing Service eagerly control weedy vines like poison ivy and invasive trees like buckthorn.

Photo by Kim Hunter/www.thegreengoats.com

Photos by Kim Hunter/www.thegreengoats.com

## Pasture-Raised Turkeys and Other Poultry in a Low-Input Orchard

**Objective:** Continue hatching eggs from my own heritage breed turkeys, with a higher hatch percentage; add a small-scale orchard of disease-resistant dwarf fruit trees to increase the nutrition of my turkeys' daily diet while providing fertilizer and pest control for the orchard; market my birds to a larger-scale market.

**Results:** This is my second year participating in a SARE Youth Grant project. Last year the few poults that hatched under my turkey hens wandered off the nest and died, so I had to decide whether to use an incubator or hens for hatching.

I decided to do both to see which would have a higher hatch percentage. The hens hatched more, and as eggs hatched I put all hatchlings in a brooder. Thirteen poults lived out of 16 hatched.

The first year of my project I raised Royal Palm and Bourbon Red turkeys; the second year I raised Royal Palm.

To fill purchase orders, I bought similarly raised, heritage breed turkeys. I cleared more money on the birds I bought and resold than on those I raised myself because of the feed required to overwinter the parent stock, and the amount of expensive, high-protein feed that poults need for a good start. Yet I'm not sure I would always find a source of pasture-raised, heritage breed birds at a reasonable price, so I continue to raise my own.

I chose four apple, three pear, two nectarine, one cherry, and one apricot tree for my orchard, which should eventually provide my family fruit from June through late October if we can keep my milk goats out of the orchard. After I planted my trees, two of my

dairy goats broke in and killed two trees.

Until the orchard starts producing, I won't know exactly how grazing the birds under the trees will help.

Because of other activities and a death in my family I hadn't taken time to market my turkeys for

the Thanksgiving market, but I was fortunate at the National Small Farm Trade Show and Conference to meet two ladies who market pasture-raised birds around the St. Louis area.

I had several of my birds with me for my presentation, and was able to sell 15 birds to the two women. They then resold the birds to their customers, after processing. I took the birds to be processed and learned that in processing, the plucker may tear limbs

from birds; I had one bird missing a leg, so had to discount that bird's price.

Birds sold in the St. Louis market brought about \$2 per pound more than they brought in my area. Both ladies have large email lists of people interested in purchasing naturally and/or locally raised food. I see how such marketing would help my business, and am pursuing a new SARE Youth Grant to explore such opportunities.



Will King prepares to give a presentation on heritage-turkey breeding characteristics at the 2010 Farmers Forum using one of his Royal Palm turkey hens as an example.

# Native Youth Teach Healthy Diets (Learning to Love Vegetables)

**Objective:** To develop a new marketing/outreach plan for our weekly youth-run farmers market in Minneapolis to increase participation and support, and to support youth in teaching the urban Native community about the importance of fresh, organic produce as part of a healthy diet.

**Results:** Dream of Wild Health, a 10-acre Native-owned farm in Hugo, MN, that's part of the St. Paul-based nonprofit Peta Wakan Tipi, cultivates approximately 2 acres of organically grown vegetables. We have a collection of rare, heirloom seeds donated by Native families that we grow out for seed preservation.

In July and August, our Garden Warriors (ages 13 to 18) provide a weekly farmers market at a place convenient to Minneapolis's urban Native population. We offer

freshly picked produce at low cost, knowing many in our community can't afford fresh vegetables.

We thought low participation overall from the Native community in buying our produce was because people often don't have transportation to the market, especially from St. Paul, and there's a lack of income and knowledge about the importance of fresh, organic, locally grown food in a nutritious diet.

We relocated our original Minneapolis market to Little

Earth of United Tribes, the largest Indian housing development in the country, and launched a second farmers market on Payne Avenue in St. Paul, convenient for program participants at the nearby American Indian Family Center. Both locations help eliminate the transportation barrier.

While we publicized the markets several ways, we found most people either heard about them from someone they knew or read about them on the Indian listserv where we placed notices. Not part of established farmers markets, our stand-alone markets lacked visibility.

From the project, we learned lack of transportation, income, and knowledge of

how to cook fresh vegetables all must be addressed to improve participation. We provided cookbooks to help with the latter, and vouchers for vegetables, both greatly appreciated.

Having youth run the markets continues as a powerful motivation for their learning about vegetables, nutrition, organic farming, and our program. Before each market, we talked about the vegetables we were selling, their benefits, and how to prepare them, information youth took pleasure in sharing as they sold produce. This year our youth leaders will make healthy-nutrition presentations to 18 Native schools and organizations.



Photo by Dream of Wild Health staff



Photo by Jodi Bean

Two Garden Warriors from the Dream of Wild Health (DWH) Farm staff one of two stand-alone farmers markets they operate in Minneapolis, MN, with Diane Wilson, DWH Operations Director (left) and NCR-SARE representative, Joan Benjamin (right).

Growing and harvesting vegetables are part of the Dream of Wild Health (DWH) Farm summer program for Garden Warriors (youth ages 13 to 18). Native young people learn the basics of organic, sustainable farming as well as how to cook simple, nutritious meals.

# Comparison of Coverings over Permanent Raised Beds to Extend the Growing Season for Year-Round Food Production

**Objective:** To evaluate food production results of three different removable covers in various combinations when placed over permanent raised beds (low tunnels), observing four crops' growth to determine which covers and their combinations might enable successful winter production in this Zone 5 location.

**Results:** With eight permanent raised beds, I used one uncovered as a control and on the others tried different combinations of low-tunnel covers suspended on two courses of pipes arched over the beds.

The south walls of all beds were wrapped in common black construction plastic (removable in summer) to use the concrete block wall as a passive solar collector. In the center of each bed I placed soil probes at 4 inch depths. Air temperature was measured 6 inches above the soil. All probes were attached to a micro-data collection station to measure internal minimum and maximum soil and air temperatures relative to ambient air.

Crop planting, growing, and harvest records were matched to various cover combinations and temperature measurements to identify optimal conditions in which to grow winter-hardy crops of fava bean, Swiss chard, beets, and perennial onion. Observations were made as ambient air temperatures permitted. Manual ventilation was provided to beds when external air temperatures were above 40 degrees.

Yields were affected by voles – not anticipated. In beds that survived the voles, there was enough growth to provide beets and chard an early spring start. Onions did well under the covers, and are a viable crop

for the process.

Soil temperatures were similar among all treatments; solar temperature gains under covers also were surprisingly similar – and significant. For example, in February one bed had a nighttime temperature of 28 degrees and a daytime temperature of 105 degrees.

I saw sustained growth under all cover combinations. Even single plastic layers provided some growth protection, with double plastic layers requiring closer observation for extreme



Photo by Linda Hezel

Linda Hezel designed permanent raised beds with covers (low tunnels) to fill a gap in year-round local food availability; test crops were fava beans, Swiss chard, beets, and onions.

heat on sunny days with above-freezing ambient air temperatures. Only onions survived in the uncovered bed, but didn't flourish.

It's possible to grow food year-round in covered raised beds in Zone 5, with



Photo by Linda Hezel

Bucket drip irrigation is a low-tech solution for watering crops on small farms and in small spaces; the investment is minimal, and the system can be installed and used by one person.

crop selection being crucial. Covered beds (low tunnels) at a minimum are a valuable season-extension tool in fall, and allow earlier sowing and transplanting in spring.

## YENC09-010 Tecumseh, NE – Jessica Jones

### “Sow What?”

**Objective:** To offer an educational program to educate girls in grades 9 through 12 about sustainable agriculture, its effects and opportunities.

**Results:** As a University of Nebraska–Lincoln Extension educator, I collaborated with the Spirit of Nebraska Girl Scout Council to offer a program that fits Girl Scouts' leadership experience in becoming environmentally aware and learning about the food system and sustainability.

Through a series of day-long meetings April through October, girls explored their place in the global food network, exploring where their food comes from and how their food choices affect the earth.

They visited a farmers market, local dairy, and food cooperative, learning about the food network in their communities, and gained insights into how they can improve their involvement in the food network.

They investigated local agriculture practices and learned of challenges faced by people who produce food in their region and for the larger food network. A focus on the issue of hunger helped them consider how their decisions



Photo by Jessica Jones

Middle and high school-aged girls from southeast Nebraska looked at how their food choices impact planet Earth and were empowered to make a difference through hands-on activities from the Girls Scouts “Sow What?” curriculum.

and actions affect the world's food network.

Participants identified projects to help educate others about sustainable agricultural practices. They were introduced to environmental issues and sustainable agriculture careers. They broadened their horizons, met new people, and enhanced their skills and learning.

# Kenyan Women’s Community Sustainable Farming (CSF) Project: Cultivation of Mwangani (*Cleome gynandra*)

**Objective:** It is difficult for members of the local Kenyan immigrant community to acquire Mwangani, a culturally important, highly nutritious cultivar. Through collaboration with the International Outreach Church and Valley Natural Food Co-op, the Kenyan Women’s CSF Project is designed to provide Kenyan women opportunities to plant, harvest, and sell Mwangani to promote traditional food, sustain their culture, and provide economic security.

**Results:** Our project is sponsored by the International Outreach Church in Burnsville, MN. We initiated a community garden project at the church, from which grew this project for Kenyan women farming Mwangani, which they value for its nutritional and medicinal purposes. The leaves are boiled and then

stir-fried with other vegetables such as tomatoes or onions. This is a daily staple for Kenyan families.

Our project started later than expected because of a last-minute USDA requirement for a seed permit for *Cleome gynandra*. We had planned to use one-half acre for the project but

reduced that to one-quarter acre, based on the late start and factors that arose because of it. Eight Kenyan women agreed to start the project.

We began to amend the soil immediately, surveying, staking, tilling, removing debris,

trenching, composting, hand raking, and planting. While trenching we uncovered large amounts of concrete and asphalt; we reused some for a patio area at a water station. Because of the debris we did a soil test and received no concerning findings.

We added a permaculture – self-sustaining ecosystems – specialist to our consulting team after submitting our grant, and redesigned the garden to increase sustainability and create a more diversified climatic agricultural system through enhanced slope landscape design using berms and swales.

Rainwater trapped in the swales decreases water expenses and preserves natural resources. An additional grant through the city for a curb cut redirects rainwater runoff from the street into the project.

Working in the garden is a social event; Kenyan farming is primarily by women, and older women teach female children 7 to 16 about Mwangani, growing and using it. Social skills are taught while working on the

crop, with cultural practices from growing to cooking to medicinal uses of the vegetable passed generation to generation.

The Mwangani is much appreciated by the Kenyan population. Members of the Kenyan community hear about the vegetable’s availability by word-of-mouth, and their interest in buying it is high. Families come to the site to buy on harvest days.

In August and September approximately 60 plastic grocery bags of Mwangani were harvested, each containing approximately 36 ounces. The women kept 50 percent of their harvest and sold the rest to other Kenyan families at \$25 per bag, happy to earn income growing this labor-intensive vegetable.

We’ve found providing access to land for farming meets cultural and nutritional needs; farming bridges intercultural relationships and provides a sense of belonging that contributes to a healthy community. New crops mean new markets, and we see unlimited potential for future opportunities.



Photo by Elizabeth Kackman

Kenyan women living in Minnesota pose for a photo as they harvest a food plant from their homeland, *Cleome gynandra*, spiderplant.



Photo by Tom Kackman

Kenyan farmers living in Minnesota rake compost over tilled ground to prepare the soil for planting *Cleome gynandra*, spiderplant.



Photo by Elizabeth Kackman

Kenyan farmers gather a fourth harvest of *Cleome gynandra*, spiderplant.

# Adding Value to Missouri Finfish and Shellfish by Developing a Mobile Processing Unit

**Objective:** For aquaculture farmers to learn to process their finfish and shellfish according to food safety regulations, and to lease a mobile processing unit (MPU) from Lincoln University, allowing them to add value to their product by selling to the St. Louis grocery store and restaurant market.

**Results:** The three aquaculture – growing fish for sale – farms involved in this project are looking to increase profit margins and the amount of sustainably grown product through the use of an MPU. All three have completed Hazard Analysis and Critical Control Point (HACCP) training to be able to safely process our aquaculture products for market.

We've obtained two significant marketing contracts that will allow increased sales, profit margins, sustainability, and increased opportunities for employment in the rural areas where the farms are located.

We had intended to partner with Lincoln University in Jefferson City, MO, on MPU development, but the university was unable to develop the unit, so we are looking at two other options. One is to partner with the Missouri Department of Agriculture to modify their MPU developed for fruit and vegetable processing, and the other is to obtain a loan through Missouri Business Development Group for Floating Farms, an aquaponic greenhouse operation in Licking, MO, to develop the MPU.

Once we have the MPU, we expect to be back on schedule within three months.

Like most local food projects, relationships are key. Collaborators involved

in various stages of the project include Associate Professor of Economics Emmanuel Ajuzie and Research Farm Investigator Chuck Hicks, both of Lincoln University, and Nancy Smith of Sappington Farmers' Market in St. Louis. Ajuzie helped explore marketing options using a New Generation Growth Cooperative model that can be transferred to future generations of producers, Hicks assisted with initial



Photo by Randy Wood

Basil and other herbs grow in recirculated water at Floating Farms hydroponic greenhouse. Randy Wood plans to add fish to the system once a mobile processing unit is completed.

work on the MPU, and Smith helped establish

producer and marketing relationships.

## Beneficial Bees from a Teenager's Perspective

**Objective:** My goal is to become a producer of raw, organic honey. In doing so, I expect to advance knowledge in the science and economics surrounding beekeeping, knowing honeybees are very important to sustainable agriculture.

**Results:** I learned a lot about bees as part of this project, including the fact that a bee makes one-twelfth teaspoon of honey in her lifetime, and it takes 576 bees working their entire lives to fill one cup.

I learned a bee carries one drop of nectar back to the hive per trip, and it takes three drops of nectar to make one drop of honey. It takes 14,400 foraging trips to produce a cup of honey. Bees visit 50 to 100 flowers on each forage from the hive, and fly about

41,000 miles to fill one cup with honey.

There can be four to eight different pesticides in one bee pollen load.

I learned that during the 2007 to 2008 growing season, in samples from beekeepers in 23 states and one Canadian province, researchers found 121 different pesticides and metabolites in the 887 wax, pollen, bee, and hive samples taken. Of the 259 wax and 350 pollen samples, nearly 60 percent contained at least



Photo by Amanda King

Amanda King learned to start her own bee hives with packaged bees so she could start them on clean frames with no pesticide residues.

one systemic pesticide. That's a type of poison that doesn't stay on the plant's surface, but is taken up inside the plant, where honeybees feed.

I also researched raising organic honeybees without using pesticides.

# Alternative Broiler Breeds in Three Different Pastured Poultry Systems

**Objective:** To compare the commonly used Cornish Rock Cross broiler and five newly available alternative breeds in three different pastured poultry systems.

**Results:** Working with Jane Hansen (FNC08-710, page 8) and another farmer friend, Kim Cassano investigated the performance of six broiler chicken hybrid breeds on three farms using three common pasture production systems: free range as promoted by Herman Beck-Chenowith; day range, using the Andy Lee pen style; and the enclosed pen model Joel Salatin pioneered.

To determine the breeds' abilities to meet profitability, sustainability, and quality of life goals, they evaluated growth rate, feed consumption, carcass yield, mortality rate, activity level, and overall profitability potential.

Each farm raised 50 straight run chicks of each breed – 300 chickens per farm. Breeds were Cornish Rock Cross, bred for traits desirable for large scale poultry houses; Freedom Ranger; Moyer's K-22; Silver Cross aka Kosher King; Red Ranger; and Super Dixie.

Cornish Rock Cross grew the fastest, ate the least feed to reach market weight, and had the highest carcass yield. Patterns were similar in data from both free range and day range farms.

Freedom Rangers grew the fastest of the alternative breeds, ate the least, and had the highest carcass yield. The K-22s came in last with both systems.

Cornish Rocks and K-22s showed the greatest

mortality – 14 percent – on the free range farm. Silver Crosses, Red Rangers, and Super Dixies lost less than 5 percent of their numbers.

Flooding affected mortality on the day range farm. Discounting flood losses, Freedom Rangers showed the highest mortality rates at 18 percent, with Cornish Rocks, K-22s, and Red Rangers at 12 percent, and Silver Cross and Super Dixies below 5 percent.

Mortality was consistently 6 percent for all breeds in the Salatin model.

Comparing input costs, on the free range farm Cornish Rocks had considerably lower feed and chick costs. Input costs were more closely clustered on the day range farm, with Cornish Rocks still leading, as they did in the Salatin model.

While the Cornish Rock Cross showed the lowest input costs on all three farms, Cassano remains unhappy with the breed's mortality rates, lethargy, and limited genetic diversity. She plans to raise alternative breeds using the data collected in this project – likely a combination of Freedom Ranger, Silver Cross, and Red Ranger. She will refine her choice to those most suited to her farm as she continues to monitor performance and health.



Alternative broiler breed trials in a free range style pasture system.



The Freedom Ranger is one of five alternative broiler breeds used in a side-by-side trial of free range, day range, and enclosed pen pasture production systems.



Alternative broiler breed trials using day range pasture pens.

Photo by Kim Cassano

Photo by Kim Cassano

Photo by Jane Hansen

# Demonstrating Higher Yields and Market Opportunities of Mixed Annual and Perennial Intensive Planting in Appalachian Ohio

**Objective:** To demonstrate and test organic practices that use intensive polyculture plantings to bear the greatest yield from small plots, while ensuring soil conservation and health, to provide Appalachian Ohio landowners with sustainable farm income options that address the challenges of soil, topography, and irregular plots.

**Results:** Because of injury and machinery breakdown that delayed needed work, I requested and received a no-cost project extension to March 2013.

At the start of the grant and through summer 2010 I focused on laying black plastic and white plastic on two areas within our fenced site to control weeds. We learned about dynamic accumulators that “glue” the soil together and shuttle biologically available nutrients from soil to plant. We have some already on site and decided they will be part of the project planting.

We studied the succession model where design is phased into being, and decided to

keep several plants on-site (chickweed, dead nettle, dandelion, bittercress) to act as ground cover advantageous for fragile soil. We anticipate many will be phased out as other dynamic accumulators and crop perennials mature.

Despite setbacks, we’ve drawn the site for laying out beds and done site analysis that reveals soil variation, sun and shade, an area that holds water, and several patches of unwanted

perennials. We decided to lay beds along two contours that span the site, maximizing soil, light, and shade microclimates.

At summer’s end we found black plastic more effective than white in suppressing weeds. The white acted like a greenhouse, with lush vegetation growing under

it. By late winter it seemed the black plastic had caused a degree of soil compaction, perhaps from rain and weight of snow over winter.

For 2011 we’ll focus on planting stone fruit, berries, and nut perennials with nitrogen-fixing ground covers, asparagus, and dynamic accumulators.



After designing the layout for an intensive fruit and vegetable polyculture planting, Michelle Ajamian uses black plastic mulch to smother weeds before putting in a permanent planting.



Michelle Ajamian and Brandon Jaeger in front of a buckwheat cover crop planting tucked into a small growing area in Appalachian Ohio.

Photos by Joan Benjamin



Buckwheat makes a good quick ground cover: it grows, blooms, and breaks down in 70 to 90 days; suppresses weeds; and attracts beneficial insects.

## Connecting Farmer to Consumer Through Small Businesses of Rural Main Street

**Objective:** To successfully connect three groups in our county of 6,000 people – consumers who want to know more about their food sources, retail businesses looking for local suppliers of food to provide what customers ask for, and local producers seeking profitable markets for food they grow using sustainable methods.

**Results:** I learned economic factors still have the greatest impact on success or failure of locally grown food making inroads into the retail systems. If a person can't compete within the global economy on production costs and pricing, consumers willing to pay premium prices for locally grown foods are needed.

Perishable goods especially suffer this condition, but processed foods also are difficult to get into the distribution system. I found while consumers say they want locally grown food, most aren't willing to pay more than 5 percent higher when price is the issue. I

also found local producers want to be successful but are reluctant to join together with other producers.

Attendees at my presentation at the National Small Farm Trade Show & Conference asked questions about local food opportunities, and showed interest in my advice on raising poultry, offered in another session.

In my session I noted there are people who place great value on food eaten near where it's grown, rather than food transported great distances, and the importance of targeting consumers willing to pay a premium to get what they want.



Photo by Greg Shipe



Photo by Carissa McKenzie

Growing and selling foods locally can bring growers premium prices but there are risks involved. For example, farmers producing local grapevines for Kansas wine must deal with severe weather fluctuations. Above left, Carissa McKenzie observes while Josh removes grapevines killed by late-season frost in Davenport Winery and Orchard in Eudora, KS, in May 2011. Vineyard owner, Greg Shipe, must remove damaged vines (above right) before replanting, then wait three to five years before new grape production begins. Davenport Winery uses only locally sourced grapes, limiting wine production to Kansas grown fruit.

I also noted a Maine study that indicates shifting 1 percent of consumer expenditures to direct purchasing of local food products could increase farmers' incomes as much as 5 percent.

My recommendations included considering the possibilities within your reach before putting seed into the ground, knowing your costs and your consumers, and understanding how the food system works.

## Student Report on the Northern Michigan Small Farms Conference

**Objective:** To increase participation among area students in attending the 2010 Northern Michigan Small Farms Conference.

**Results:** This SARE grant allowed me to go to the 2010 Northern Michigan Small Farms Conference as a speaker, and 12 other students interested in farming to receive scholarships to attend. Each student committed to preparing a written essay or poster on something they learned at the conference.

During the conference's "youth track" I spoke about the importance of community

gardens in fostering adoption of sustainable gardening practices. I also discussed the "grow an extra row" program where people grow an extra garden row to donate to food pantries so people who normally can't afford healthy organic fruit and vegetables get them through the food pantry.

I enjoyed learning at other presentations after mine was done.

A few weeks later, all of us

the grant sponsored for the conference met, discussed the presentations, and made posters showing the information discussed. We put the posters in our schools to better educate other students about eating locally and sustainable living. I was asked to speak to one school's middle and high school students about community gardens and eating locally.



Photo by Abby Amick

Carissa McKenzie surveyed visitors about local food preferences at the Kansas Sampler Festival in Leavenworth, May 7, 2011.

# Mentoring of Young Adults with Nonfarm Background in the Production and Local Marketing of Organic Vegetable Crops

**Objective:** To give young adults with an interest in agriculture the opportunity to experience “hands-on” production, tillage, harvesting, and marketing techniques involved in growing organic produce, and to make them aware of real and potential problems involved in that production process.

**Results:** I am a retired agriculture education teacher with a 125-acre farm, approximately one-half acre of which was used for three garden plots. Previously that

half acre was used for organic garden and crop production.

I worked with two brothers, first meeting with the young adults and their mother to discuss my expectations and

goals for the project. They provided verbal agreement and commitment to participate, and we started at the beginning, teaching them about seeds, how deep to plant, when to plant, etc.

They developed gardening skills, confidence in interacting with the public in marketing their produce, and a better understanding and appreciation of quality food stuffs for

themselves and their family. At a field day, they shared with attendees what they had done, how they did it, and how they felt about what they accomplished.

It was both a worthwhile and a learning experience. Were I to do this again, I would put more emphasis on preplanning.



Photos by Clarence Burton

Thirty five people took the end-of-the-season garden plot tours given by the Strunck brothers, who successfully planted, harvested, and sold produce at a farmers market for the first time.



With the help of his mentor, Dusty Burton, Christopher Strunck learned how to prepare seed potatoes for planting, grow the plants, and sell the harvest.



## YNC09-043 Missouri Youth – Ashley Painter

# Intensive Grazing with Water Fowl Around Raspberries (*Rubus idaeus* L.) to Reduce Weeds

**Objective:** To use domestic waterfowl to reduce weeds in a planting of domestic raspberries.

**Results:** I used adult geese – Roman Tufted and Toulouse – and ducks – mostly Kaki Cambell; unfortunately, I put them out to pasture after weeds were thick and woody, making the weeds hard for the waterfowl to eat. Because of a summer drought I let the waterfowl free range for food; while free ranging they preferred staying near the chickens, so I didn’t see them do any noticeable weeding in the raspberry planting.

Three things I would do differently next time are: Use a larger area and set up more shade shelters; till the area around the raspberries in early spring; and put the waterfowl out as soon as the weeds start coming up, before the raspberries.

I expected different results – with starting late and the drought, the waterfowl didn’t do as well as hand weeding. Next year I’ll put the waterfowl out earlier.

In this project I learned about alternative/historical weed control methods that are easier on the environment, and learned much about the temperament of geese. For instance, they can get very angry if you hurry them, they like to stare at their reflections in chrome, they don’t like dogs, and while you can hold a goose to avoid it biting you or flogging you with its wings, it doesn’t stop the goose from scratching you with its feet.

# Building a Market for Local Produce in the Foodservice Industry

**Objective:** To build a market based on solid information and relationships, and prepare our cooperative for a more ambitious position in the Memphis area produce market.

**Results:** Our co-op of 12 growers produces a number of fruit and vegetable crops; the fruits are grown in a cooperative-owned 100-tree orchard. We've been selling produce at two farmers markets, to senior citizens through the voucher program, to families through a community-supported agriculture (CSA) program, and to two restaurants. We have a refrigerated truck and backup tractor to support produce operations, and recently decided to go from 2 acres per grower to 5.

To develop our produce business into a major income source, we must develop our marketing and distribution

system and connect to lucrative markets. We need to find customers who make substantial produce purchases weekly and want to buy quality produce from local growers. Usually this means selling to food service outlets.

Developing such markets is time-consuming. We need hard data on competitive pricing and quality requirements, and our co-op needs to coordinate individual activities to produce an optimum product mix over the maximum feasible time span, in quantities that meet customers' needs.

Small farms' direct marketing necessarily is based on relationships and



Photo by Joan Benjamin

The Family Farmers Cooperative received a Southern SARE Producer Grant to help them scale up their direct marketing and distribution system for fresh produce. Andre Mathews coordinated the grant project and shared the co-op's plans with the Farmers Forum audience in 2010.

service, not price and volume. We need to emphasize communications with customers, flexibility, and planning.

I'm seeking new customers by contacting either chefs or owners of 50 restaurants we've identified, plus managers of institutional food services, and gathering

data on the amount and mix of produce they use, delivery frequency, quality standards, price requirements, competition, seasonal variation tolerance, and interest in buying local produce. I give them brochures, product lists, and samples, working to recruit them as co-op customers.

## Staple Seed Crops

continued from page 1

dent corn, sold as whole corn and corn flour. We've begun working with a Toledo tortilla factory to provide corn products, and expect to increase our heirloom corn production.

Because it's difficult in our region to grow hard winter wheat that holds up in baking, we chose spelt, which grows well here. We market spelt berries as a grain to cook like rice or barley, and spelt flour to use like whole wheat flour. A local pizzeria advertises their locally grown and ground spelt crust. We're working with bakeries to develop other spelt flour products.

From 6 acres one participating farmer harvested

10,600 pounds of black turtle beans that went to households, restaurants, and food processors. He plans to increase his bean acreage and add adzuki beans. We plan to add pintos, too.

We also successfully grew 2.5 acres of amaranth, which has value-adding potential.

Ohio University's Department of Mechanical Engineering has a grant to develop portable threshers and de-hullers that we've started taking to community gardens and farms to demonstrate processing small plots of staple crops, thus introducing staple crops to community gardeners, and middle and high school students learning food entrepreneurship.

Our work to connect farmers and the market with locally grown, high



Photo by Joan Benjamin

Brandon Jaeger explains how filters on his French stone flour mill keep flour dust out of the air during grinding.

nutrition staples was achieved through collaborations and networking, and we've developed a robust network of market partners. We're also

collaborating with partners outside our region in staple food system improvement.

# Introduction to Management-Intensive Grazing

**Objective:** To explore the why, fundamentals, and outcomes of management-intensive grazing.

**Results:** Management-intensive grazing is a goal-driven approach to managing grassland resources. It involves lifestyle, finances, resource conditions, and production strategies. It started in Scotland in the 1700s.

Decisions include what kind of cattle or other species to graze, how many, when, and how long.

Fundamentals of successful grazing management include meeting the nutritional needs of livestock from the standing pasture; optimizing pasture yield, quality, and persistence maintaining/enhancing the natural resource base of soil, water, plant community, and wildlife habitat; and integrating into a practical system.

Pastures are divided into smaller paddocks so cattle graze a smaller area at a time instead of the entire pasture. Grazing time depends on local conditions. In one example, using a 12-paddock system, cattle graze for three days on each area of pasture (paddock) to ensure they don't eat down to the root or pull the root, and to provide pastures not being grazed a rest. Every 36 days cattle are grazed back in the first area where they started.

Management-intensive grazing provides savings in the cost of supplying a unit of energy to ruminants, comparing: pasture, \$100; alfalfa hay, \$152; Timothy hay, \$161; all types of hay, \$162; corn silage, \$195;

dehydrated forage, \$320; grains, \$457.

Landscape, forage, livestock, water, and fencing are the components of a management-intensive grazing system.

On large installations, permanent fence and watering points have the advantages of relatively low cost, minimal daily labor, and low maintenance. For small operations, permanent fence and watering points have the disadvantages of relatively high cost and limited management flexibility.

Using portable fencing and water facilities provides maximum management flexibility and lower initial

capital cost, and works well on rented land. It requires more daily labor, and more maintenance.

Layout and design guidelines discussed included: Keep livestock within 800 feet of water; make paddocks as near to square as possible – cattle usually are closer to

water in square paddocks; follow landscape lines for paddock boundaries; make paddocks of similar grazing capacity to keep diet more consistent and provide ease of rotation management; and plan lanes for livestock movement only, to minimize erosion.



Photos by James Jarman



Grazing schools are a way for farmers and ranchers to get hands-on experience with management-intensive grazing. They learn about paddock layout, fencing options, watering systems, and fertility. Participants shown in these photos attended Callaway County Grazing Schools in Missouri.

## Alpaca Fiber

(Editor's Note: Diane Peckham spoke at the 2009 Farmers Forum.)

**Objective:** To provide a fine fiber usable for many value-added products from livestock that impact the land lightly.

**Results:** My husband Nick and I purchased our first two alpacas in 1990, and now have 40, plus two red Angora goats, all of which we shear, and I spin their fleece.

We shear the goats twice a year and get 5 to 10 pounds of fleece each; the alpacas we shear once a year, and each provides 4 to 8 pounds of fleece. I shear the alpacas in April so they stay cool in the summer and have enough growth by winter to keep them warm.

I send the fleece to a mill to be washed, carded, and made into batts, which I use as batting, or stuffing, for rugs. Many people want natural fiber products.

I also send fiber to an alpaca fiber cooperative that combines it with alpaca fiber from others for use in gloves, hats, socks, and scarves. I have a gift shop that showcases my alpaca products, and those of others.

Alpacas are gentle and easy to care for, and leave a



Diane Peckham displays alpaca fiber products that are sold in her gift shop, including yarn (above), and wall hangings, rugs, and felt toys (right). Diane and other alpaca growers make alpaca fiber products for Heartfelt LLC, a partnership of mid-Missouri alpaca breeders.



Photos by Diane La Mar

light footprint on the earth. They chew off grass rather than pull it up by the roots, and step with small footpads instead of hooves. The herd uses a common dung pile,

concentrating manure.

Living in the country, raising these animals, and being able to make rugs and other products with their fleece is a pleasure.

## YENC09-019 Ceresco, NE – William Powers

## Healthy Farms, Healthy Kids!

**Objective:** To increase the knowledge of sustainable family farming in Nebraska and encourage the next generation of farmers.

**Results:** Our program focused on youth. It began with youth familiar with farming and a full track of youth sessions at the Nebraska Sustainable Agriculture Society annual conference (see [www.healthyfarms.org](http://www.healthyfarms.org)). There, both sustainable agriculture experts and youth with sustainable agriculture projects led sessions.

Next, we took youth from Lincoln, NE, to an organic dairy farm near Raymond, NE, where they saw firsthand the inner workings of what makes a farm sustainable. Prior to the trip we held a youth scholarship essay contest where children wrote essays on "What Sustainable Agriculture Means to Me."

Those who submitted essays received full scholarships for the farm trip, where they went on a pasture walk, milked cows, made butter and cheese, and helped with basic farm chores.

After the farm, the youth visited a farmer's market, seeing how food moves from farm to market to consumer. They interviewed farmers at the market, asking where, why, and how they farm. They learned the value of knowing where their food comes from, and the work it takes to produce that food.

At the farmers market the youth purchased ingredients for salsa, which they made and enjoyed.



City kids from Lincoln, NE, sample butter and buttermilk they made by shaking fresh cream in jars.



Doug Dittman shows city kids how to milk cows at Branched Oak Farm, a 230-acre certified-organic grass-based dairy.

Photos by William Powers

In the first part of the grant we focused on children already involved in sustainable farming at some level, working to increase their capacity to learn and be engaged through a diversity of subjects.

In the second part we exposed children who knew little about it to farming. A rough survey of the youth told us only one had ever been to a farm, yet they were fascinated by the inner workings of the farm visited.

Results exceeded our

expectations. The children's smiles and excitement over farming makes it an easy decision to continue to grow and expand this project.

*Editor's Note: For information on sustainable agriculture youth programs nationwide see "Sustainable Agriculture Resources and Programs for K-12 Youth" at [www.sare.org/Learning-Center/Courses-and-Curricula](http://www.sare.org/Learning-Center/Courses-and-Curricula).*

# Youth Driven Community Service Garden

**Objective:** To educate our Stratford Nature Club for Kids (SNCK) and People in Need (PIN) participants about sustainable agriculture; to engage SNCK in all aspects of a community service garden; to use sustainable gardening practices to provide PIN fresh organic produce; to partner with PIN to increase awareness and understanding of the value of locally grown organic foods produced sustainably; to offer educational workshops to PIN benefactors; to inspire community groups and individuals to give through other community gardens.

**Results:** I'm the field trip and camp coordinator for the Stratford Ecological Center, a 260-acre working farm and nature preserve at Delaware, OH. Our mission is to educate community youth and adults about where their food originates.

Our community garden is an extension of our work, and was a huge success. SNCK, which includes youth ages 6 to 12, produced 1,000 pounds of fresh organic produce for our local food bank, up from the 660 pounds the year before. New education activities experientially immersed youth in sustainable agriculture.

SNCK youth learned about sustainable agriculture through designing and growing an organic garden from seed to harvest. From March through August, children learned many things. First were the needs of PIN. Next, they selected seeds, planned the garden, and worked it through the growing season. They learned such things as what healthy, living soil is, how plant diversity benefits the garden, knowledge of composting, and the value of team work to accomplish a shared goal.

We didn't have the participation we hoped from PIN clients, but we did have well-meaning volunteers who served a greater need while learning and feeling

good about their work. We learned there's a need for PIN recipients to know how to cook and eat the donated produce; next year recipe cards for meals with basic ingredients will be part of the garden project.

The children and I gained a better appreciation for the growing needs of our community and for the food bank, and a greater understanding of how important locally produced food grown in a sustainable manner is to our community's health and vitality.

In the Community Service Garden at the Stratford Ecological Center, children learned how to grow healthy food like squash using sustainable agriculture practices. They also learned how to give back to their community by sharing the food they grew with a local food bank.



Photos by Jane Walsh



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