NEBRASKA Sustainable Agriculture Society

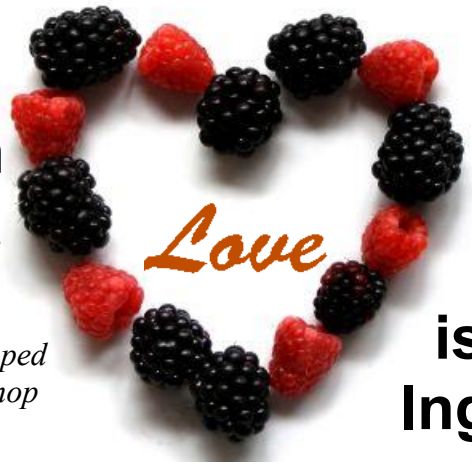
Features:

Regular Columns:

Promoting agriculture and food systems that build healthy land, people, communities, and quality of life for present and future generations.

By Erin Barnett, director of LocalHarvest

When Love is an Ingredient



A little while back, I was on a road trip and stopped at a coffee shop for a snack.

I picked up one of the extra large cookies on the counter to see what was in it, and there, listed at the end of the usual ingredients was "love."

It felt a little gimmicky—but it got me thinking: If we can put love into food, all sorts of possibilities open up, including how we think about good food.

We who appreciate good food sometimes struggle when it comes to describing it. Does it need to be grown within a certain number of miles? Does all organic food count? What if its parent company was a multinational? It gets complicated.

Maybe there is some shorthand that would help, and maybe that shorthand is this: Good food is grown and prepared with love.

What does that mean, exactly? How do we add love to our food? For myself, one important piece is simply paying attention to both the ingredients and the act of cooking.

It's the easiest thing in the world to throw together a quick supper while thinking a thousand racing thoughts about everything but the vegetables in my hands. But really, it is almost as simple, and infinitely more satisfying, to close the mental door on the day, focus on the task at hand, and take note of the fact that this food—this onion, these beans, this rice, **this food right here—will nourish me and my family, will become the energy that sustains us**.

Being mentally present and open-hearted changes what happens in the kitchen. It's noticeable. My husband appreciates food and the effort home-cooking requires, and even when I've just thrown dinner together, he looks at it and says, "Thank you for cooking, sweetie." But when I've really put my heart into it, he'll almost always say something like, "Wow, this is beautiful." And it is.

Love changes food and the way we perceive it. I think this is one reason so many of us are drawn to farmers markets, farm stands, and CSAs. Much of this food has been loved its whole life, and some part of us knows that. While not every farmer would use the word "love" in relation to what he or she does in the fields, I think it's a fair descriptor of what's going on when someone works for months to raise a crop, poring over crop rotations and seed orders, scraping weeds away from seedlings, sifting soil between their fingers to test the moisture, and getting up at four o'clock every morning to care for animals and load trucks and do the million other things necessary to bring in the harvest. **Such work requires sustained attention, and usually, what people attend to deeply opens their hearts.** Crops raised in this way, like meals prepared with care at home, are good food.

When we give our full attention to that which sustains us, whether we are growing, preparing, serving or eating it, that attention becomes a form of blessing. And we, too, are blessed.

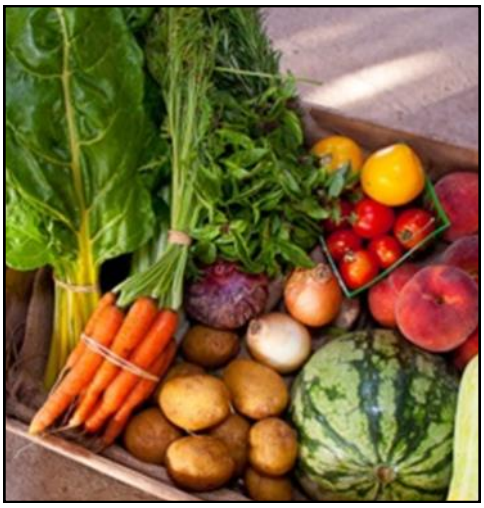
By Erin Barnett, director of LocalHarvest

Survey: Member Retention is Top Challenge for CSAs

Several months ago, a survey was sent to all of the CSA (Community-Supported Agriculture) farmers in LocalHarvest in cooperation with researchers at Lehigh University and the University of Maryland. We were interested in learning more about how our CSA farmers are setting up their programs, interacting with their members, and using technology to support their CSA. More than 850 CSA farmers participated in the survey, and here are some of the results.

One thing the researchers found is that the vast majority of these farmers rely on the Internet to spread the word about their business. Over 80% have their own websites, and 75% use Facebook to connect with their members. Back in 2000, when we launched LocalHarvest, many farmers did not have reliable Internet access, and only a handful were selling their products online. Times have changed, and farming has changed, too.

The aspect of the survey that was most interesting to us was the piece about CSA member retention. Many CSA farmers tell us that one of the most difficult aspects of running their CSA is increasing their membership. In many areas of the country, the public now has a number of CSAs to choose from, and that increased competition affects individual farms' CSA capacity for growth. Member renewal rates also affect growth. When member renewal is low, farmers have to recruit many new members just to keep their CSA the same size. In this survey, 41% of CSA farmers reported what we would consider a very good to excellent member retention rate of more than 75% in 2011 to 2012. Approximately 30% reported a 50 to 75% return rate, and another 30% had less than half of their membership return in that period.



Many factors go into a shareholder's decision whether or not to re-join a CSA for another year; among them the quality and quantity of the food relative to expectations, a sense of connection with the farm, life circumstances, and what we would call "rightness of fit." Our sense is that this last piece might be the most significant.

As the CSA model becomes more popular and available, a wider diversity of people are trying it. For some, it's a great match and becomes their new way to eat. Other people discover that they don't like to cook nearly as much as they thought they did or that they really only want to eat a few kinds of vegetables. Unless they find a friend to split a box with, CSA may not be for them.

The researchers analyzed their data to find the practices that most influenced member renewal rates. Two things that CSA farmers can do in this regard, the survey found, are:

1. Hosting special events on the farm;
2. Building personal relationships with members.

This makes sense. Many people join a CSA in order to develop a connection with a farm, so farms that are good at this will likely keep more members from year to year.

Far and away the strongest correlation for member retention found by the study is allowing members to choose what items go in their baskets. The traditional agreement in a CSA is for members to accept whatever the farmer puts in the weekly box; nowadays, however, an increasing number of members and potential members are looking for more choice in their CSA.

Some farmers meet this need by setting up farmers' market-style tables at the pick-up location and allowing members to choose their own vegetables within certain parameters. Others offer members the option to customize their box online, either completely or by selecting "Box A" or "Box B" each week.

If you are a CSA member, your yearly commitment to a particular farm means a lot to that farmer! When a farm has earned your loyalty, your annual CSA membership is a great contribution to your local food system. It contributes to that farm's stability and capacity for growth.

Sometimes a long-term relationship with a farm may require communication, should issues arise. Are you getting too much produce and thinking of leaving the CSA because you don't like to waste it? Talk with your farmer! Getting what feels like too little for the money? Talk with your farmer!

Many concerns can be worked out if addressed directly; if left un-communicated, they sometimes grow into a general sense of dissatisfaction, which doesn't serve anybody.

The **NSAS Newsletter** is a bimonthly publication of the Nebraska Sustainable Agriculture Society (NSAS), a private non-profit organization. Our mission is to promote agriculture and food systems that build healthy land, people, communities, and quality of life for present and future generations. The purpose of this newsletter is to inform our readers on sustainable agricultural issues, resources, and activities. This newsletter is a NSAS membership benefit.

NSAS Staff

William Powers, Ceresco
Executive Director
402.525.7794
healthyfarms@gmail.com

Jill Wubben, Hartington
Membership Coordinator
jillw@hartel.net

Ali Clark, Omaha
Urban Agriculture Intern
a.clark0425@gmail.com

Sandy Patton, Brunswick
Farm2School Coordinator
sandyp@conpoint.com

Newsletter services provided by Brhel Communications, rita.brhel@gmail.com

By Rita Brhel, NSAS member

Can Backyard Chickens be a Business?

John Wallace didn't waste any time after buying his first house in Lincoln to build a small doghouse-size coop for two white hens from his sister's farm flock. The chickens are now not only pets but near daily suppliers of fresh eggs, a sustainable way to get rid of kitchen scraps, and their manure makes for effective garden fertilizer.

"Their eggs are way better than store-bought eggs," Wallace said.

The Backyard Poultry Movement

For decades, chickens were never seen inside city limits of most urban and suburban areas. It was actually against the law to have any traditional farm livestock on a residential property.

Then, about 10 years ago, chickens began showing up in the backyards of London. The trend quickly spread to Seattle and Portland, just in time for the local foods and urban farming movements. Backyard chickens are now a common sight in cities across the country and are even catching hold in rural communities as well.

With this drive to challenge the law—and the tradition—of what animals can be considered pets is a surging interest to turn these backyard coops into miniature farms, earning a few dollars per carton of fresh eggs.

Some cities, including Lincoln, allow residents special permits for backyard flocks that have the potential to become an egg-laying business.

But Matt Russell and Pat Standley of Coyote Run Farms in Lacona, Iowa, say that making a poultry business profitable is harder than it looks.

About Coyote Run Farms

Coyote Run Farms was founded in 2005. Its 110 acres grow garden-fresh produce, beef cattle, and pastured poultry, from which eggs are the main moneymaker. Total yearly sales on eggs are approximately $17,000.

"It's the staple," Russell said. "People do crazy things to get our eggs. We do crazy things to get them our eggs. People are very dedicated to our eggs."

Before purchasing the first 5 acres of Coyote Run Farms, Russell kept a couple chickens in his backyard. But his interest quickly outgrew the confines of his then-urban property.

After moving to Coyote Run, Russell and Standley kept 50 hens the first year, in 2005, producing 12 dozen eggs a week. In 2012, their chicken numbers were up to 300, and they were easily selling the 140 dozen eggs a week. There were plans to add 150 hens this year.

Efficiency is the Business

"We invested as our market grew," said Russell, adding that their first chickens were given to them and their first coops were built of recycled materials.

"The checklist is the same for any scale of backyard poultry, whether 5, 50, or 500," Russell said, and includes housing, feed and water, predator protection, veterinary care, a place to dispose of the manure, egg storage, cartons, any licenses, replacement birds, and specifications for organic, pasture-based, or other operation types. "A lot of these things, you can just build yourself very small, but then need to build up as you add chickens," Russell added.

They have since built house-size, wooden-frame coops and now purchase chicks on a regular basis to keep the flock at its most productive.

"Pullet eggs are really rich and good for a year, but after a year, they really start losing quality," Russell said, which is why Coyote Run replaces its hens every 18 months. The older hens are butchered and offered to customers. Many backyard poultry owners wince at this thought, but Standley says that this is what they have to do keep productive.

"And I think I'm a more compassionate farmer than most," said Standley, a retired zookeeper. "A producer who had a cow that didn't calve one year would sell her. I think a bit different about that."

Coyote Run uses commercial breeds that lay all of their eggs within the first couple of years, one a day, and then are barren for their rest of their lives. Backyard poultry owners are often drawn more toward the more colorful, rarer heritage breeds but while these hens will lay for all of their years, they don't lay daily and usually take winters off. Egg businesses need the efficiency of the commercial breeds, in order to keep the egg price down, Standley says.

Another consideration with a fresh egg business is safe egg handling. All egg businesses, small and large, should have a license. For farm-size businesses, this doesn't usually cost anything or require an inspection as long as the eggs are marketed as farm-fresh. These licenses can be obtained through the state ag department. Beyond that, the eggs need to be picked up daily, cleaned, and stored in a refrigerator.

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The Challenge of Marketing

One of the bigger challenges to any small business is marketing. Russell finds himself often explaining the difference between farm-fresh and store-bought eggs: "They're completely different products. Once they try our eggs, they can tell the difference," he said.

But first, they have to be willing to try them. Farmer-direct selling requires relationship marketing—the farmer and the customer needs to find a connection, become friends, and manage a give-and-take relationship based in trust and transparency. This doesn't come naturally to everyone, Russell says.

"We have about 125 regular customers, but we maintain regular correspondence with about 300 people," Russell said.

Calculating the Price Break

Finally comes pricing the product so that it sells but it also gleans a profit. Russell and Standley admit that they continue to struggle with this.

"There is the argument that you should keep raising the price until the demand slows down, and that is when you've found the right price," Russell said. "We find this really hard to do."

Coyote Run started out selling eggs for $3 a dozen. After four years of records showing that they were just breaking even, Russell and Standley increased the price to $3.50 a dozen. In 2012, though, with feed prices increasing, so did the selling price of the eggs—up to $4 a dozen.

"About 60% of the price goes to feed and bedding," Russell said.

It seems expensive, but egg production has more potential to be lucrative than many other local foods ventures, Russell says: "We focused on eggs, because they were more profitable than meat birds. You would always have to be looking for the input that sneaks up on you in processing and marketing."

And because of their marketing efforts, "at $4 a dozen, we will have no problem selling every egg we produce," Standley said.

But this isn't the case everywhere. Karla Hanson of Monona, Iowa, says she and her husband started with a backyard coop, but then interest grew in her hens' eggs and soon they found they were adding chickens to keep up with the demand. But she says the egg business isn't profitable and doesn't have promise to be.

"In some communities, at most all that consumers will pay is $2 a dozen," Hanson said.

Russell says this is because it's difficult for small operations to be efficient enough to price eggs within reach of customers.

Weighing Decisions

Producers also have to discern between potential decisions that could make or cost money, Standley says. For example, there may be an interest from customers in organic eggs.

"Becoming certified organic provides us no benefit, because we are already at our max for consumers," Standley said. "Becoming certified organic would add cost for the certification fee and rules that would further add cost."

Rather, Coyote Run is scaling up for efficiency. More investment in housing and technology is improving efficiency, Standley says. Instead of using portable chicken tractors that sit on the ground, which are not predator-proof, Coyote Run built several coops on wheels converted from trailers, which can be pulled around the pasture but allow the birds to be locked up at night like in a permanent coop. Wood chips are more expensive bedding than straw, but are also more absorbent and last longer. Pasturing the hens year-round requires more labor but cuts feed costs drastically.

All in all, there are a lot of variables when considering turning a backyard coop into a business. Russell and Standley say that people really need to consider what their goals are—to have a hobby or a business.

"If I had a hobby farm, I'd definitely get guineas and peafowl and I love emus, but this is a business," Standley said. "If they don't make money, they don't belong here."

NSAS members Rita and Mike Brhel own Firefly Meadows Farm near Fairfield, Nebraska, where they sell eggs. Beyond her work in child advocacy and parent education, Rita uses her UNL Ag Journalism degree to write on agriculture for several publications.

NSAS Programs

Healthy Farms Conference, the annual meeting of the NSAS held in February in an Eastern or Central Nebraska community

Western Nebraska Sustainable Agriculture Conference, a joint NSAS-University of Nebraska-Organic Crop Improvement Association event held annually in the Panhandle

Farm Beginnings Nebraska, a joint NSAS-University of Nebraska 10-week course for beginning farmers and growers

Nebraska Beginning Farmer Mentorship Program, connecting beginning/transitioning farmers and growers with mentors knowledgeable in sustainable practices

Market Nebraska, an online interactive map of Nebraska's local foods outlets

NSAS Memorial Library, a collection of books on sustainable practices housed at Ceresco, many of them donated by the family of the late holistic grazing expert Terry Gompert

Farmer Support Group, an in-person discussion group for all farmers and growers that meets monthly at Ceresco

Western Nebraska Fruit and Vegetable Group, an in-person discussion group for growers in the Panhandle

Nebraska High Tunnel Project, workshops and a webinar educating growers on high tunnels

Farm2School Project, connecting local foods producers with interested school cafeterias

NEWS ALERT:

GE Wheat, By Monsanto, Found in Oregon Shuts Down Wheat Exports

On May 29, the USDA announced that a small number of volunteer wheat plants in an Oregon field had tested positive for genetically engineered (GE) glyphosate-resistant wheat. Extensive testing confirmed the wheat as variety MON71800 developed by Monsanto.

The detection of this wheat variety does not pose a public health or food safety concern. Monsanto worked with the FDA in 2004 to complete a voluntary food and feed safety consultation. Completion of the FDA consultation process means this variety is as safe as non-GE wheat currently on the market.

The USDA began an investigation into this matter on May 3 when an Oregon State University scientist notified USDA's officials that plant samples they had tested positive for a protein that made them resistant to glyphosate.

As of today, the USDA has neither found nor been informed of anything that would indicate that this incident amounts to more than a single isolated incident in a single field on a single farm. All information collected so far shows no indication of the presence of GE wheat in commerce.

Investigators are conducting a thorough review. They have interviewed the person that harvested the wheat from this field as well as the seed supplier who sold the producer wheat seed; obtained samples of the wheat seed sold to the producer and other growers; and obtained samples of the producer's wheat harvests, including a sample of the producer's 2012 harvest. All of these samples of seed and grain tested negative for the presence of GE material.

Investigators are continuing to conduct interviews with about 200 area growers.

On June 13, the USDA validated an event-specific PCR (DNA-based) method for detecting MON71800 (provided by Monsanto to the USDA on May 23). The USDA validation process included a specificity study and a sensitivity study. The USDA determined that the method can reliably detect MON71800 when it is present at a frequency of 1 in 200 kernels. The USDA has provided the DNA test method to detect this specific GE variety to our trading partners that have requested it.

Major markets, such as Japan, Korea and Taiwan, have postponed imports of U.S. white wheat as they continue to study information from U.S. officials to determine if any future action may be required. USDA officials will continue to provide information as quickly as possible as the investigation continues—with a top priority on giving our trading partners the tools they need to ensure science-based trade decisions.

About NSAS

NSAS is a non-profit, grass-roots membership organization. Initiated more than 30 years ago by farmer members, NSAS has grown into a dynamic organization with members from all across Nebraska. We welcome farmers and non-farmers alike… Everyone eats!

Our mission: To promote agriculture and food systems that build healthy land, people, communities and quality of life, for present and future generations.

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Staff

Kim Mosel
PROGRAM ADMINISTRATOR
86536 State Spur 45A
Page, NE 68766
402-620-2701
ociane1@yahoo.com

NEWSLETTER CONTACT:
Liz Sarno, Concord
UNL Extension Educator &
Organic Project Coordinator
402-309-0944
www.esarno2@unl.edu

OCIA Research & Education, Inc.

Angela Tunink
EXECUTIVE DIRECTOR
1340 N. Cotner Blvd.
Lincoln, NE 68505
402-477-2323, Ext. 320
atunink@ocia.org
www.ocia.org/RE

By Liz Sarno, UNL Extension Educator

NSAS EVENT:

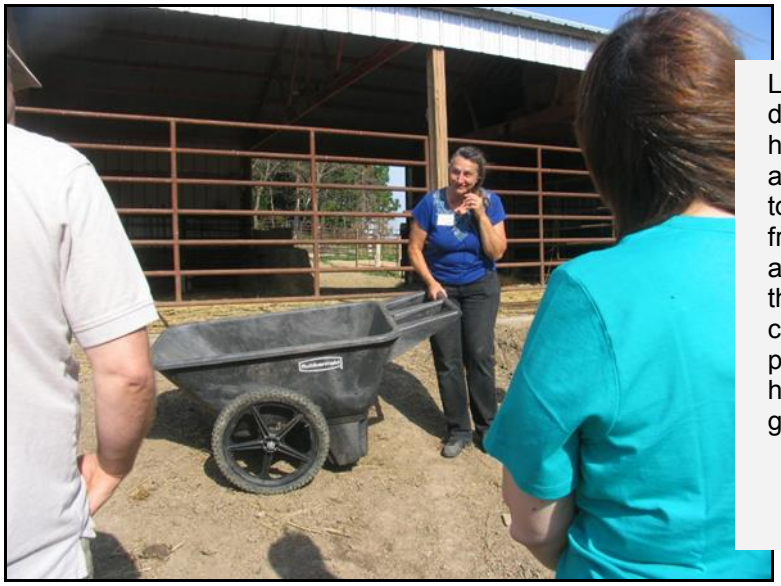
Mom, Apple Pie and Conservation

When I read about the "Mom, Apple Pie and Conservation: Women-Only Conservation Tour" in NSAS's weekly events and opportunities, I thought how could I resist not going to this farm tour? I looked up Palmer, Kansas, and it was only a three-hour drive; the tour was free and for women. Tour topics were on cost-share programs, soil health, cover crops, and a roundtable discussion, "From a Woman's Perspective."

Funding for the workshop came from a USDA-NRCS Conservation Innovation Grant to the Women Food and Agriculture Network and Center for Rural Affairs sub-contracted to the Kansas Rural Center, and from the Kansas Center for Sustainable Agriculture and Alternative Crops, and the Kansas Rural Center, River Valley Extension, District Kansas State University Research and Extension, and Tuttle Creek WRAPS.

Over the years, I have attended many sustainable agriculture meetings and have noticed that more women are attending, though usually with their husband or son. In all those years, I have never attended a meeting just for women and wondered what would make this special. Then I read that at one of the farm tour stops that we would view a maternity barn with special stalls, designed from a woman's perspective for ease of management. That's when I knew I had to go. I thought of how many nights have I sat up with a cow waiting for her to calf and wishing I had a better calving facility. So off I went at 5:30 a.m. to Palmer, Kansas, for the farm tour.

Why a "woman only" farm tour? Women tend to feel uncomfortable asking questions in a group with their male counterparts; often they feel intimidated or embarrassed. Ironically more women are the sole landowners. They need help to understand farming practices and conservation programs so they can make good management decisions for their land, family and tenants, explained Mary Fund, project director for KRC's Clean Water Farm-River Friendly Farm. Mary's project is to



Lucinda demonstrates how she uses a wheel barrel to carry a calf from the field and can keep the mother cow at bay, protecting herself from getting hurt

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provide planning assistance and limited cost-share to farmers and ranchers wanting to improve water quality on their farms.

Mary introduced our hosts Lucinda and Sheila Stuenkel. Lucinda Stuenkel led the farm tour and explained how their operation worked as we toured the farm on a hayrack ride. Get this—they covered the hay bales with blankets. What a treat!

Lucinda talked about their challenges on the farm and how they overcame them. Lucinda and her sister in-law Sheila unexpectedly had to take over the management of the farm due to the sudden deaths of their husbands in a vehicle accident. I can only imagine how devastating this was for them, but these women pulled together to manage their farm.

Thankfully before their husbands had passed, the couples were involved in completing the River Friendly Farm Environmental Assessment Tool: http://www.kansasruralcenter.org/publications/RFFP.pdf . The couples had to write down their short-term and long-term (1-15 years) management goals, so they could develop an environmental plan for their family and farm's natural resources.

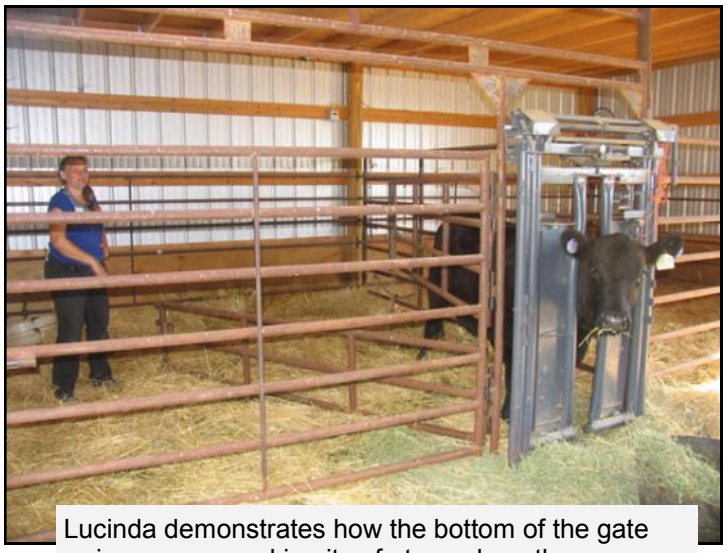
I asked Lucinda how long it took them to complete their plan. She said it took them a couple months as they completed it between planting and harvesting activities. The plan forced her to study FSA maps and understand the layout of her farm. That way, she was able to develop a field and natural resource inventory of their entire farm including cropland, pasture, hay fields, brome waterways, woodland, riparian areas, ponds and streams. The plan made them answer a series of questionnaires that rank various practices and conditions that exist on the farm and develop an action plan.

In the long run, she was grateful they had this plan, for it gave her a chance to ask her late husband if something would happen to him who he would want to help her with the farming. This plan also provided Lucinda and Shelia with goals and a timeline of what needed to be done and how they would accomplish them.

Later in the tour, someone asked Shelia if there was any other planning she should have done. She wishes they had done their estate planning sooner, which proved to be very expensive to put together after her husband's passing. Even in the winter when we should work on things such as estate planning, many of us (including me) never take time to do so.

Lucinda went on to show us all the projects around the farm they have accomplished in less time than their plan suggested—projects they felt needed to be done so the farm could run smoothly such as repairing the ends of waterways and ditches, cutting trees in pastures, fencing cattle out of gullies, filling low spots on terraces, measuring soil nutrients, relocating the winter-feeding site up out of the flood plain, cross-fencing pastures for rotational grazing and including access to a water-source for the cattle in each grazing paddock. They used geo-textile and stone

Lucinda holds up a rock from the rock check dam. Four check dams slow the water as it drops from this waterway into the stream. Rock armor was placed along the stream bank for stabilization and to prevent soil erosion.



Lucinda demonstrates how the bottom of the gate swings opens making it safe to work on the cow.

around feeding pads, cattle waterers, sides of stream banks, chutes where water drops from waterways down to the stream and other areas around the farm to prevent the soil from eroding.

I am always interested in why people make decisions to do certain practices on their farm, so I asked Lucinda why her husband's family had such strong support for conservation

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practices. She told me that her father-in-law Clarence's philosophy was "they are stewards of the land rather than owners and their mission is to leave the land better off than when they first acquired it." Clarence has left a strong legacy to conserve the natural resources of the land, which Lucinda, Sheila and their children are carrying on.

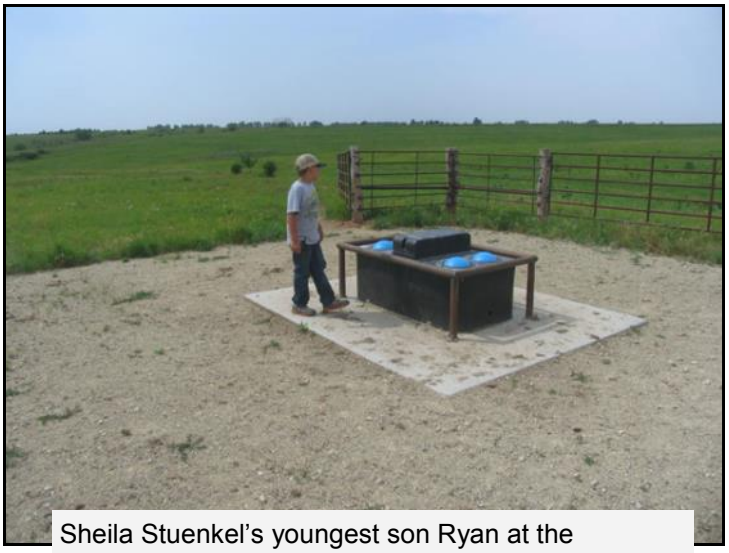
The Stuenkel's are conventional, dryland farmers that have exceptional farming practices. For example, five years ago, after wheat harvest her husband experimented with fall-planting oats on half of the field, the cattle did so well on grazing the oats he wished he had planted the entire field to oats. Lucinda has increased their use of cover crops by adding purple-top turnips and tillage radishes to the oats. She decided to use the tiller radishes to break up the hard pan and scavenge excess nitrogen and other nutrients. They have experimented with millet, cow peas, brassicas, sorghum Sudan grass, soybeans, birdsfoot trefoil, red clover, and lentils.

At first, the farmer planting her ground argued with her as to why she shouldn't plant a cover crop after wheat harvest. He told her that the next crop would have a hard time because the cover crop would take moisture away from the cash crop. However, those arguments quickly faded away when they got 10 bushels more per acre from the field with the cover crop. Now a cover crop is planted in August after wheat harvest as part of their management strategy. Rye is drilled into the corn stalks after the corn is harvested, and last year, even with the drought, they had high-moisture corn to sell, which they sold for premium while their neighbor's corn dried up. Lucinda explained that the fields with the cover crops are planted last, because the cover protects the ground from wind erosion and captures so much moisture over the winter.

I was curious if their use of cover crops has reduced their use of herbicide. Lucinda said yes, with cover crops the weeds have less of a chance to get established. This practice, along with the rotational grazing of cover crops, has helped them to manage weeds and reduce herbicides. She pointed out another benefit of cover crops is that they provide habitat for beneficial insects so she has been able to reduce their use of pesticides.

Lucinda has many great ideas that she has applied to her cattle barns and corrals for safe handling. She had Linn Post and Pipe Company (www.linnpost.com) build gates that swing around so the cow will move naturally into the maternity stall head gate. The bottom of the gate swings away so you can reach in and work on the cow or put a calf on to nurse.

Another interesting practice is that Lucinda plants crabgrass in the dry lots. Most people try to get rid of crabgrass, but crabgrass grows easily and has a deep-rooted system that takes up excess nutrients, and so, helps to reduce flies and improves traction for the cattle in the yard the next season after rains.



Sheila Stuenkel's youngest son Ryan at the alternative watering center—cattle can enter from four different paddocks, and the center can be closed off to separated or treat an animal.

Lucinda grew up on a dairy farm and recalls being annoyed at her father for making her get involved with the 4-H cattle showing and judging program. She remembers thinking, why do I need to do this because she thought she would never need to use this skill? Well, it sure has paid off for Lucinda as she has a keen eye for selecting cattle.

Their cattle are rotationally grazed, and the grass-finished steers are marketed directly to the consumer. They raise bull calves for Ohlde Cattle Company using Tim Ohlde's genetic stock and then Tim buys the bull calves back and sells them as breeding stock. These genetics have been selected for grass-finishing, and the cattle looked sleek and fat without being fed any grain.

In addition to the livestock, their cash crops are corn, soybeans, milo and alfalfa, brome and native grass hay. Lucinda told me because the cattle graze the cover crops and the rye in the corn stalks, they end up not needing all their hay and had excess to sell even during the drought these past two years.

The farm tour ended, and we went to lunch and, as promised, we had apple pie for dessert.

After lunch, Dale Strickler of Star Seed gave a talk on his use of cover crops and how to adapt green manures/cover crops in the farming operation.

Tom Meek, Clay County Conservation District Manager, went over the various state and federal cost-share and assistance programs.

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Lisa French of Cheney Lake Project demonstrated a tabletop rainfall simulator. It showed how water filters through different soil profiles: tilled ground, no-till and prairie ground. The tilled ground faired the worse, which made a strong case for planting cover crops.

We ended the day with a roundtable discussion of the challenges facing women in farming and the prejudices that still exist.

Lucinda and Sheila Stuenkel are true modern pioneers of the prairie. They are in the process of reducing their use of herbicides, increasing their use of cover crops, improving wildlife habitats, healing the land with conservation structures and having a profitable farm.

They are achieving their family's legacy. They are stewards of the land and are leaving the land better off than when they first acquired it, so the farm will be passed down with pride to the next generation.

If you want to find out more about their operation, Lucinda Stuenkel will be conducting a workshop at the February 2014 Healthy Farms Conference.

By Rita Brhel, NSAS member

Songbirds Provide Biocontrol for Crop Pests

Many farmers enjoy watching a robin or meadowlark or red-wing blackbird flit by when they're working the fields.

Songbirds are likely more appreciated than any other wildlife, not only for adding a bit of color and music, but also because they don't pose a danger to the crops or livestock. Turns out, research is showing that birds may not be as benign as thought—rather, they may be quite beneficial.

James Brandle, an UNL ecologist, has been coordinating several studies related to bird species biodiversity in Nebraska's agricultural landscape and has found some surprising links between environmental conservation and farm economics.

One study surveyed both the on-farm bird habitat as well as that of the property surrounding the farm. Alfalfa- or pasture-based farms tended to have more grassland bird species, whereas farms with a high diversity in vegetative types—pasture, alfalfa, crops, field borders, windbreaks, and so on—have more shrubland birds. It was also found that organic farms have double the bird biodiversity of conventional farms.

Another research project measured how much impact that environmental health has on a farm's economic well-being. Specific markers measured were crop yields, market opportunities, soil conservation, water conservation, and pasture or crop quality—all of which correlate with more bird biodiversity. One reason may be because of what an additional study found when wild birds were examined for the potential to be used as a biocontrol agent in insect pest control in crops.

The project determined to find out how far different species of birds, from the brown thrasher and gray catbird to the blue jay and others, will fly out of woody areas into crops to forage for insects. What Brandle found is that, even with shy birds, none of the species seemed to be limited on how far they would forage. Brandle was particularly impressed with the kingbird's predation on crop pests.

This new focus on bird conservation in terms of how it impacts the money side of agriculture is being called economic ornithology, according to Julie Jedlicka, a researcher with the University of California at Berkeley. Outside of the Midwest, studies have been conducted on vineyards, coffee, fruit and vegetable, and other food crops, finding the pest control impact as high as $120 an acre for some of these crops, if the right bird species can be matched with the target insect pest. Brandle says that most Nebraska bird species aren't picky about the insect pests their foraging for, so farmers only need to focus on increasing their songbird numbers on the farm.

So, how can producers encourage more songbirds to visit their crops? Anecdotal information collected from farmers in various states, through a number of research studies, suggests:

- Reduce pesticide use.
- Reduce tillage.
- Increase vegetative diversity on the farm.
- Provide bird houses, feeders, and water sources on the farm.
- Provide perch sites around and in the fields for foraging birds.
- Provide habitat in field borders.

By Rita Brhel, NSAS member

Mediating Climate Change's Effects on Crop Insect Pests

The jury is still out as to whether the extreme drought conditions that gripped more than half of the country in 2012 are the result of global climate change, but the majority of scientists do believe that a major shift in weather around the world is occurring.

Among the believed effects of this phenomenon will be increased stress on agricultural production.

Climate Change, Population Growth & Food Production

According to his research, Washington State University entomologist David Crowder finds that climate change is expected to contribute to both habitat and species loss globally. Although weather change should result in an increase in agricultural productivity in much of the upper half of the Northern Hemisphere, including Nebraska, the same can't be said for the rest of the world.

To compound the problem, due to both changing ecosystems and growing urbanization, arable land worldwide is decreasing.

At the same time, the demand on agricultural production will rise sharply as population growth continues, Crowder says. While the population in developed nations, like the United States and much of Eastern Europe, will remain steady, others will be gaining.

"A lot of human population growth that is accelerating climate change is in less developed countries in Asia and Africa," said Crowder, whose research centers on insect biodiversity of agricultural systems. This will not only stress agriculture by putting on more demand for food, but also by adding to greenhouse gas production and the climate change effect.

"Obviously, this presents a big problem for the human population as a whole," Crowder said.

Human survival isn't just a matter of increasing yields, as many of the technologies to do so—synthesized fertilizer application, for example—also contribute to climate change, he adds.

The Crop Ecosystem

Specifically, Crowder's research focuses on agricultural insect pests, and like other mostly conventional farming practices, chemical insecticides add to the climate change problem—both through fuel usage of the sprayer as well as changing the cropping ecosystem.

"Climate change is reducing biodiversity, and some farming practices can promote biodiversity," he said.

> "It may seem these little shifts of balance aren't important, but they can really move in your favor as far as improvement to your yield."

Ecosystems, and the species that live within them, have an intricate interaction with the climate. Easily forgotten is that the climate also reacts to long-term changes in the ecosystem. For example, 200 years ago, Nebraska was a prairie as far as the eye could see and the climate

was drier. Over the last century, as the landscape turned into row-crop cultivation, so has the climate changed. Al Dutcher, University of Nebraska state climatologist, said that the Great Plains was once referred to as a grassy desert and that, during the past 30 years, the Upper Midwest has been in an overly wet period.

As cultivation took hold in the Heartland, the overall ecosystem of the Great Plains changed and so did the species it contains as well as that species' behavior, Crowder says. He blames agricultural production on increasing insect pest outbreaks in the United States.

"If you're a bug, you might see a field of crops as an all-you-can-eat buffet," Crowder said.

Searching for the Conventional-Organic Middle Ground

Crowder's hope is to find farming practices that alter the behavior of insect pests accustomed to cultivation, that lead to decreased insecticide use. He considers both conventional and organic cropping systems in his research, seeking out an ecological-economic balance between the two.

Conventional farming practices consist of calendar-based sprays of broad-spectrum insecticides and soil fumigation that kills all insect species it comes in contact with. Organic farming practices consist of natural pesticides and bio-fumigation that targets specific insect pests but tries to leave insect biodiversity alone. In conventional farming systems, there is a 15% increase in yield over organic practices, but there is a definitely different environmental impact between the two.

Interestingly, in his research, Crowder finds that conventional pest control doesn't eliminate all insect pests. Rather, it disrupts the natural biodiversity so that while there are fewer insect pests, pathogen incidence rises instead. However, organic methods are not any more effective at protecting biodiversity balance: While organic farming's aim is to preserve predator insects, the result is also more insect pest numbers. However, to organic's credit, there is no negative effect on other forms of biodiversity balance that help to control pathogens as well as enhance natural pollination, soil nutrient cycling, and other natural processes that are harder to achieve in conventional systems.

"Organic increases the number of organisms but does not increase biodiversity more than conventional, but at the same time, there is a more equal proportion of species," Crowder said. "Conventional has the same biodiversity as organic, but the species have fewer numbers and some species are represented much more or much less than others."

> "Not all biodiversity is a good thing. You really have to understand the interaction of all the species."

The Biodiversity Mix Matters

Whether conventional or organic, whether using broad-spectrum insecticides or not, what makes insect pest control effective is not how many insects are killed or even certain species of pest insects targeted, but rather what balance of insect predators are achieved for the cropping system, Crowder says.

"Not all biodiversity is a good thing," he added. "You really have to understand the interaction of all the species."

Imagining a pie chart, Crowder says, the goal is for all predator insects to be present in equal abundance: Most cropping systems, whether conventional or organic, have disproportionately higher percentages of one predator insect than others—more than half of the pie chart; the goal is for all insect predators to have an equal piece of the pie.

"It is a more balanced community when everybody is doing their job," Crowder said. "If you have 100 people in a town and 99 are barbers, there are a lot of jobs not getting done."

Most predator insects don't have specific insect pest species that they prey on, he says, but they all have a part in an ecosystem in how the species interact. So, even if one predator insect species is present in large numbers, they interact with the ecosystem differently than if all predator insect species were present in equal numbers.

"In more balanced systems, we see greater numbers of natural enemies," Crowder said.

Furthermore, his research shows that equal proportions of all predator insect species not only increases insect pest mortality but also increases plant biomass, meaning that plants are larger and more productive.

Certain crops are more likely to see an advantage from this biodiversity "evenness," as Crowder defines it: Soybean yield would benefit more so than corn, he said. In addition, farms with more crop diversity will tend to achieve biodiversity evenness easier.

"It may seem these little shifts of balance aren't important," Crowder concluded, "but they can really move in your favor as far as improvement to your yield."

NSAS Member News

Share what's going on in your lives, your communities, and on your farms. We are especially interested in:

- Happenings on your farm or ranch, such as research/experiments you're trying, new practices, varieties or breeds you're putting into place, fields days, successes and lessons learned.
- Community or family events, such as marriages, graduations, births, community activities, and educational pursuits.

Send contributions to healthyfarms@gmail.com or by postal mail to: NSAS, 414 CR 15, Ceresco, NE 68017.

Opinion: Agriculture's Shame of Global Food Waste

Globally, agriculture produces about 4.5 billion tons of food each year. That should be more than enough for our world's population. So, why is there still hunger and famine? And why does food cost as much as it does?

Because an estimated 50% of that food goes to waste, according to the Institution of Mechanical Engineers.

Half of the food grown each year is lost in inefficient processes in harvesting, storage, and transportation before it even gets in front of the consumer. And then, think about how much food is wasted by us as consumers! I try to be very conscious in avoiding food waste, but there have been a few times when I cleaned out my fridge and found moldy leftovers forgotten in the back.

As a society, we are throwing out great amounts of food without a second thought. And when news comes in of higher food prices or famine in Africa, we start pointing fingers. But the fault actually lies with us. We have allowed this to continue on without informing ourselves of what really goes on in our food infrastructure.

A report by the Institution of Mechanical Engineers finds that while fully developed countries like the United States tend to have the most efficient farming practices and better transport, storage, and processing facilities to ensure less waste, there are certain characteristics of our domestic food industry that promote waste at the retail and consumer level that just aren't there in less developed, less affluent countries. For example, major supermarkets will reject entire crops of edible fruit and vegetables because they do not meet consumer expectations for physical standards. Globally, 1.75 billion tons of food waste is generated each year in this way. **And of the produce that does appear in the supermarket, 30 to 50% of what is purchased will end up wasted by the purchaser anyway.**

Food waste, in the reality of hunger and famine around the world, is one thing. Wasting inputs, like fertilizer and herbicide and fuel, is another. The Institution reports that nearly half of the arable land surface in the world is being used for agricultural production, but that any further increase in farming area will have a negative impact on the world's natural ecosystems. While technologies are able to expand crop yields without requiring additional land, the reality is that increases in animal-based production will require more land use. It just will. Just 2 1/2 acres of land can produce enough rice or potatoes to feed 20 people each year. However, the same area can only produce enough lamb or beef to feed one or two people annually.

Another huge waste is in water usage. Every year, 100 quadrillion (that's what comes after trillion) gallons of water is used by humans globally. About 70% of this water usage is used by agriculture, and 40% of the global food supply comes from irrigated land. **It's predicted that total water usage—agricultural and not—will triple by mid-century as our worldwide population climbs toward its estimated 2075 mark of 9 million**. No doubt that agricultural water waste will also climb, as overhead sprinkler-type systems prove not only to be significantly cheaper to install but also quite a bit more inefficient than drip or trickle irrigation that helps prevent evaporation during delivery. In addition, meat production uses 50 times more water than crops, mostly in processing.

Realistically, there can't be no food waste. Even in the most efficient systems, there is still waste at least part of the time. But, according to the Institution, better practices and more emphasis on technologies that increase efficiencies can reduce current annual food waste by at least 60%. That's almost 2 billion tons less food waste each year at the current rate. But as with anything, it would require a shifting of attention and funding and human resources, and as with anything, changing our society's focus takes time and maybe a crisis. Let's hope it doesn't get to that point.

Opinion piece by Rita Brhel