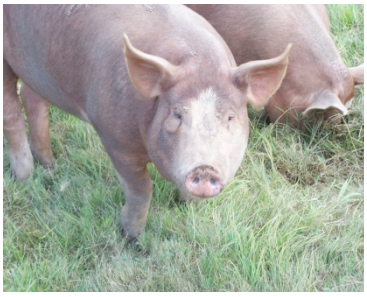
PROFILES IN SUSTAINABLE AGRICULTURE

Clover Valley Farms

Minnesota Institute for Sustainable Agriculture





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green text = author notes
blue text = questions for technical reviewers

Introduction

Cindy Hale and Jeff Hall have built Clover Valley Farms, just north of Duluth, Minnesota, into a classic case of "what's old is new again." Using a modern "homestead" model, they produce poultry, eggs, hogs, herbs, and fruit for themselves and for sale within their local community. At the same time, the greywater and composting systems and the passive solar greenhouse integrated with their home would score points in today's fast-growing "green building" industry, while their small-scale, diversified approach of makes advocates of sustainable agriculture stand up and take notice.

As you shall see, "integrated" is a key word in Jeff and Cindy's vocabulary. They use integrated pest management to grow apples in new and restored heritage orchards. Apple pulp from cider pressing is used to finish their pastured hogs each fall, and it keeps the diets of their free-range poultry interesting too. Jeff and Cindy are working toward having the hogs and poultry, in turn, prepare and maintain orchard sites. They also grow herbs for sale year-round in their greenhouse, plus other greens that keep their family healthy and their laying hens producing eggs that keep customers coming back for more. Jeff and Cindy's story shows how integration of efforts – along with goal setting, record keeping, financial management, networking, and gradual expansion – have set them on the path to success.

Assessing & Planning

Getting Started

The story of Clover Valley Farms begins in 1996, even before Cindy and Jeff met. That was the year Cindy purchased the land. She comes from a rural background and has always loved gardening and imagined farming in some way. When Cindy and Jeff met through the Duluth Community Gardening Program, they started off with a shared interest. Jeff joined Cindy on the farm in 1999, and they immediately set about putting in a big garden, renovating the old homestead orchard, and pondering what else they could do.

Jeff and Cindy started experimenting with raising poultry in 2004. They had only 6 chickens the first year, all for their own use. In 2005, their daughter May entered the picture and inspired them to explore options for summer work to complement their academic-year positions. They wanted a source of income that didn't require sending May off to day care every summer, and they found that poultry could be a great fit. As described under Assessing & Planning > Business Planning, they grew their flock each year, starting sales in 2007, and have been gradually adding ducks, turkeys, and hogs to their efforts since then. Trees already existing on the farm also made apples and other fruits a natural component of their enterprise.

Farmer's Perspective: On The Bookshelf

You Can Farm: The Entrepreneur's Guide to Start and Succeed in a Farming Enterprise

By Joel Salatin

Cindy and Jeff were inspired early on by this book geared toward farmer "wannabes." Published by Chelsea Green, it discusses myths and realities of turning farming dreams into viable family businesses. Cindy and Jeff now emulate many of Salatin's methods, include his "daily move pens" (see Resource Tip box under Production > Production Methods > Poultry).

Much of Cindy and Jeff's training to be farmers has been of the hands-on variety. They participated in the Land Stewardship Project's (LSP) Farm Beginnings program in 2008 and a Farmer-to-Farmer Mentoring Program in 2009 through the Midwest Organic and Sustainable Education Service (MOSES). They were mentored by Tom Galazen (of North Wind Organic Farm in Bayfield, Wisconsin), who runs a small operation (including a small inspected kitchen) with the help of interns. They learned about fruit tree grafting and northern varieties, managing interns, and about the "homestead model" of farming. Cindy and Jeff have also done extensive networking, and they work to create synergies between their farming activities and their off-farm careers wherever possible (see Farm Business > Professional Development).

Educator's Perspective: Resource Tip

Hands-on Learning

The Land Stewardship Project's Farm Beginnings is a farmer-led educational training and support program designed to help people who want to evaluate and plan their farm enterprise.[1]

The Beginning Farmers Web site from Michigan State University (MSU) provides a list of resources under Jobs and Internships and Training Programs.[1]

The Minnesota Institute for Sustainable Agriculture (MISA) maintains a list of internship opportunities with farms and related organizations in Minnesota and beyond.

ATTRA (the National Sustainable Agriculture Information Service) has a directory of on-the-job learning opportunities in sustainable and organic agriculture in the U.S. and Canada. Farmers and interns/apprentices can connect by searching for opportunities by state.

The MOSES Farmer-to-Farmer Mentoring Program pairs experienced organic farmers with transitioning organic farmers to promote the successful adoption of organic methods through one-on-one interaction.

Some training programs are designed to serve as "incubator programs" and may be targeted to specific audiences. The Minnesota Food Association, for example, provides small learning plots through its Immigrant Agriculture Training Program at Wilder Forest.

[1]The Farm Beginnings courses led by LSP are offered in the Upper Midwest. Links to Farm Beginnings programs in other regions are on the MSU Beginning Farmers Training Programs page.

Jeff and Cindy's educational backgrounds and professional experiences have clearly contributed to the technical know-how and philosophies that get applied to their farm. Jeff has a degree in Outdoor Education, which he has put to use by working with both children and adults and which reflects his interest in ecological systems. Cindy has degrees in Ecology and

Environmental Science and specialized in Forest Ecology for her Ph.D. She also has extensive experience with science education. As described throughout the case study, research and outreach have become inherent parts of Cindy and Jeff's approach to farming.

Jeff now works full-time in the Duluth school system during the academic year and is full-time on the farm during summer. Cindy has a 50%-time position with the Natural Resources Research Institute at the University of Minnesota – Duluth during the school year, while summer brings a combination of academic and farm work. They expect their ratio of on-farm to off-farm work to continue evolving as the farm does (see Farm Business > Human Resources).

Business Planning (The Chicken or The Egg?)

Cindy and Jeff's model has been one of gradual growth that is closely tied to available resources and lifestyle choices. As mentioned under Assessing & Planning > Getting Started, for Cindy and Jeff, it was a case of the chicken coming first – but eggs were close behind, and other products, such as herbs and fruit, were always in the works too because of the existing greenhouse and fruit trees.

As the business grew, customers asked for other products like pastured turkeys, lamb, and pork. Hogs were a good fit for Clover Valley Farms because they could be raised from feeders in the spring to finish weight by fall. As long as Jeff and Cindy both have off-farm jobs during the academic year, they expect to avoid producing animals that require year-round care (with the exception of the laying flock, which they find easy to manage). Another benefit they hope to realize by raising hogs is that rotating them with chickens will increase the quality and quantity of pasture forage without tilling, seeding, or soil amendments (see Production > Production Methods > On-Farm Research). With improved pasture quality, they hope to see the economic benefits of getting more marketable meat with less supplemental feed.

Jeff and Cindy's approach to growth is to try new products first on a small scale, where the emphasis is on learning and not making money, and then to increase production and work toward profitability as resources allow. (As mentioned above, customer requests also come into play.) For the first year of raising a new animal, they include it on the pre-order form that goes out to customers each spring as a "just-in-case" option (Appendix I). With broilers, for example, they didn't sell birds until the fourth year of production; with ducks, turkeys, and hogs, they sold small amounts in the first year (see Table 1).

Table 1. Summary of farm growth (round numbers)

Year	Hogs	Poultry (Meat)	Poultry (Eggs)	Fruit	Wholesale Herbs
2004		6 broilers			
2005		15 broilers			
2006		25 broilers			
2007		50 broilers*			Small quantities of 6 bulk herbs*
2008		150 broilers	25-hen laying flock*		Packages (¾ oz. clamshell) of 7 herbs, 1-2 times per year
2009	3*	300 broilers 15 ducks* 15 fryers and stewing hens[1]	35-50 hen laying flock	50 lbs of apples*[2]	Packages of 7 herbs, 2-3 times per year
2010	5	300 broilers 50 ducks 20 turkeys* 25 fryers and stewing hens	50-hen laying flock[3]		Packages of 8-9 herbs, 3-4 times per year; garlic and garlic braids

*first year of sales

[1]Fryers are males of laying breeds; stewing hens are retired laying hens (see Production > Production Methods > Poultry).

[2]No apples sold in 2010 while Cindy and Jeff focused on establishing a new orchard (see Production > Production Methods > Apple & Other Fruits) and also adding 20 currant bushes. Apple sales are expected to resume in 2011.

[3]Egg sales in 2010 are described under Production > Yields & Profitability > Poultry.

Cindy and Jeff manage this growth by having what they call "corporate meetings," where they discuss planning for each season, develop monthly

calendars, and review finances. They decide on the numbers and types of animals to raise each season by consulting their detailed inventories, which tell them how well they are tracking toward profitability (see also Production > Yields & Profitability), and by assessing how well the previous season went in terms of scheduling and quality of life.

Farmer's Perspective: Lessons Learned

Adaptive Management

Jeff and Cindy use the principles of adaptive management to make decisions about farm planning. In other words, they keep track of how well their past decisions played out, then use that information to make the next set of decisions, so that their choices continually build on the knowledge they've acquired. As an example, in 2010, they decided that all poultry processing in the future needed to be done by the end of August. Until then, processing of some birds had always occurred in September, when apple harvest comes into full swing and Jeff has gone back to work at his off-farm job. To accommodate this change in the processing schedule, they will need to adjust their production schedule and possibly the breeds of poultry they raise (because the birds will have less time to grow and reach processing weight).

Jeff and Cindy prepared a business plan in 2010 as part of the process of becoming a Limited Liability Corporation (LLC) (see also Farm Business > Business Structure). They expect to do annual updates that will help them track their progress. Their formal planning efforts actually started earlier, however. Jeff and Cindy feel the most important outcome of their participation in LSP's Farm Beginnings class was that it forced them to talk more about their goals and plans. Now, their detailed planning happens in the context of the overall vision statement they formulated in 2009:

Make a profit. This includes a starting wage for Cindy and Jeff's labor at $12/hour and growing that to $20/hour in 5 years.

Keep stress to a minimum. This means keeping a balance between work and the things that provide physical, mental, emotional, and spiritual renewal, such as:

- Time for regular exercise.
- Family time at home and away.
- Time for reflection and giving thanks.
- Mindfulness; being in the present.
- A schedule that is not overbooked at any given time.
- Sharing of record keeping and financial management tasks.
- Regular and open communication about farm tasks and plans.

Nurture community and quality of life. Cindy and Jeff's farming practices seek to:

- Improve the quality of their surrounding environment, including biodiversity and native habitats.
- Provide a rich array of food for family and friends.

Educator's Perspective: Resource Tip

Business Planning

A MISA publication called Building a Sustainable Business: A Guide to Developing a Business Plan for Farms and Rural Businesses assists with the creation of a holistic business plan rooted in personal, community, economic, and environmental values.

A free online course called Strategic Farm/Ranch Planning and Marketing, one of a series in SARE's[1] National Continuing Education Program in Sustainable Agriculture, covers goal setting, developing business and marketing plans, managing risk, meeting with lenders and alternative financing, transferring farms, and understanding retirement options.

A free online business planning tool called AgPlan, from the Center for Farm Financial Management, offers tips and resources for writing a plan and provides an option for getting it reviewed.

The U.S. Small Business Administration has Small Business Development Centers throughout the country that offer free consultations for business planning. Click here for an office locator.

[1]Sustainable Agriculture Research and Education, a program of the U.S. Department of Agriculture (USDA)

Farm Description

Clover Valley Farms sits about 20 miles north of Duluth and about 4 miles from Lake Superior. Cindy and Jeff own 25 acres, of which 8-10 acres are in production. Much of the property is forested, while the remainder is made up of old pastures, orchards, and the homestead. Cindy and Jeff can envision using most, if not all, of the property for farming purposes eventually, though they do not anticipate it would involve clearing the forest. The hogs, for example, could be sent to the forested areas to forage temporarily. Cindy and Jeff currently have about one acre of forest enrolled in the Wildlife Habitat Incentives Program (WHIP) and will be planting a cover crop and native fruit trees.

Educator's Perspective: Resource Tip

Working Lands Conservation

WHIP is just one of several federal cost-share programs that can help farmers implement conservation activities on their land. The Minnesota Department of Agriculture's Conservation Funding Guide provides information about opportunities in Minnesota, and many are relevant nationwide.

Until recently, U.S. conservation policy has focused on "land retirement" programs such as the well-known Conservation Reserve Program. Recent trends, however, indicate an increasing emphasis on "working lands" conservation through initiatives such as the Conservation Stewardship Program. By implementing conservation practices on land that is in agricultural production, more efficient and sustainable land use is possible.

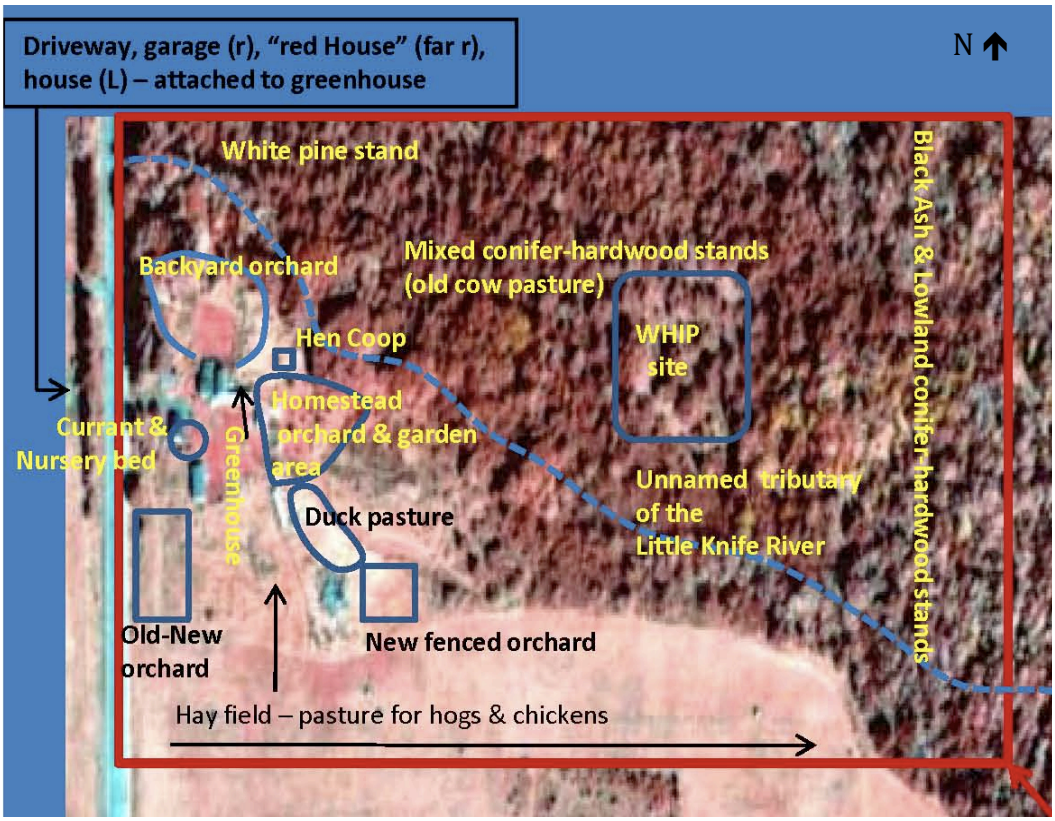

Figure 1. Aerial view of Clover Valley Farms.

Many farmers would balk at the idea of farming in Minnesota's northerly reaches, but Jeff and Cindy feel there are unique advantages. They both like the seasonal nature of farming there and the lulls provided by the region's climate. They also appreciate that the farm is located out of the range of two of the most destructive pests that plague other fruit tree growers in Minnesota (see Production > Production Methods > Apples & Other Fruits). The farm's latitude limits the varieties of fruit that can be planted there, but Jeff and Cindy have found that there are enough locally developed heritage varieties to meet their needs. The primary disadvantage of the farm's location is the heavy soil. They must deal with 40 feet of unstructured clay (a result of the region's glacial history), which requires working the soil for a year before planting apple trees.

Educator's Perspective: Resource Tip

Soils

Farmers seeking land need to know what kind of soil they'll be dealing with. To get a map of soil types for a specific property, contact the local Soil and Water Conservation District or USDA Natural Resources Conservation Service. Click here for an office locator. Soil data are also available through the Web Soil Survey.

Once farming is underway, SARE"s[1] Building Soil for Better Crops is an essential reference. This one-of-a-kind, practical guide to ecological soil management was updated in 2010.

Cindy and Jeff also value the thriving community of sustainable farmers and local food advocates in the Duluth area (see also Farm Business > Professional Development).

Equipment & Infrastructure

An important part of Jeff and Cindy's philosophy is about keeping their farm at a small scale. Nowhere is this philosophy more evident than in their intentional avoidance of large or expensive equipment. Of course, all farming operations depend on some kind of equipment, but in Jeff and Cindy's case it is generally small and specific to certain production practices (such as a cider press for apples, an incubator for chicks, pens for pastured poultry, or freezers for poultry sales).

"If we can't do it with a pick-up or a lawn tractor, we don't want to do it!"

Cindy and Jeff's infrastructure is also fairly simple. The house was already on the land when Cindy purchased it in 1996. The so-called "red house" and an attached Airstream trailer were also part of the land; the red house was eventually separated from the Airstream and moved to a different location. It contains intern housing, a small shop, storage areas, and freezers. The garage and hen house were purchased and moved to the farm from other properties, thanks to an acquaintance who moves buildings and gives them a good price.

The most significant investments that Jeff and Cindy have made to infrastructure involve the passive solar greenhouse that is attached to their home and which integrates household heating and water treatment with their herb-growing operation. Their "greywater" system, in turn, relates to their use of composting toilets. The components of the overall system are described below.

Composting Toilets

When Cindy purchased the property, there was a well but no septic system. The clay soil of the site would have required a mound septic system, at a cost of approximately $12,000-$15,000 in 1998. Cindy wanted a greenhouse anyway and knew that one could potentially be combined with a greywater system at a similar cost to a mound septic system.

The composting toilets now in use at Clover Valley Farms – one in the house and one outside – are one example of the ways in which Cindy and Jeff's lifestyle is intertwined with their farming business. Some of the composting process occurs within the holding tanks of the toilets; every few weeks, the material is then moved to secondary composting bins placed around the farm. After sufficient time has passed for the composting process to destroy human pathogens, the finished compost is applied to the orchards or pasture (but not to their gardens to minimize risks imposed by any surviving pathogens). With this approach, Cindy and Jeff reduce household water use while generating a useful fertilizer for their fruit trees and saving on the cost of commercial inputs.

Passive Solar Greenhouse & Greywater

The greenhouse was built in 1998 at a cost of around $12,000. Cindy received a $5,000 grant from the Minnesota Office of Environmental Assistance and worked with Roald Gundersen, a regionally known innovator of "biosystems," to design the greenhouse and its associated heating and water systems. Originally built as a stand-alone structure, the greenhouse is 36' x 10' with six 3' x 9' raised beds. Jeff and Cindy grow flowers, vegetables, and herbs in the greenhouse year-round, without supplemental heat or light and by relying on greywater (water from the household's sinks, shower, and washing machine) and rainwater.

Educator's Perspective: Resource Tip

Greenhouse Case Study

Clover Valley Farms' greenhouse is described further in a case study published by the Minnesota Sustainable Communities Network.

It also served as a prototype for a greenhouse built at a nearby elementary school, North Shore Community School. That greenhouse has developed to the point that students now use it to grow greens for their own school meals.

Sending greywater to the greenhouse instead of a septic system means it gets put to good use. Greywater is sent from the house to the greenhouse and stored in an underground 300-gallon tank, where it supplies water and certain nutrients to the raised beds. During the warm months, rainwater is collected and stored in two 3' x 9' above-ground, 400-gallon tanks. The rainwater is used to supplement irrigation by the greywater, and the above-ground tanks also provide thermal mass that helps to regulate the greenhouse's temperature during winter. Irrigation water is delivered to the raised beds through 4" perforated drain tile lines under the surface.

Heat and Moisture Exchange

The greenhouse was originally kept detached from the living quarters out of concerns over excessive moisture being introduced to the house. In 2003, however, when Jeff and Cindy added a second story to their home, they attached the greenhouse. It is now part of a three-tiered system for heating their house. First, a thermostatically controlled fan blows air from the greenhouse into the home if the temperature in the greenhouse exceeds a certain point. When this warm, moist air is inadequate, a wood stove and electric radiant heaters installed on the walls of the house provide back-up.

Other mechanisms are in place to keep greenhouse heating and air exchange largely passive. The ridge vents in the greenhouse, for example, open and close automatically because of a resin in the pistons that expands when hot

and contracts when cold. There is a reversible gable fan used for air exchange with the house and a solar-powered gable fan on the far side of the greenhouse to regulate summer temperatures.

This entire system was permitted under an experimental septic program and benefitted from a county health inspector who was open to the plans. Cindy and Jeff work with the inspector to provide periodic data that show the system still functions. They have been pleased to be able to demonstrate, using flow meters, that they typically discharge only 50 gallons per day – a figure that was initially hardly believed! Cindy and Jeff were told that septic systems are typically designed to accommodate 450 gallons of discharge per person per day.

In Their Words: Video Clip [to be inserted]

Greenhouse Construction and Operation

Cindy and Jeff's greenhouse was built with "knee walls" that support the A-frame structure. The walls are bermed on the outside, up to the bottom of the windows and the top of the raised beds, providing insulation. One end of the greenhouse is attached to the house and the other end is insulated, so that the primary heat loss is through the window glazing. The insulation is so effective that the greenhouse can reach 110ºF and need to be vented on a sunny day in January, when it's -20ºF and windy outside. The angle of the glazing is designed to capture maximum penetration by the sun in the middle of winter. It's actually easier to cool the greenhouse in the summer, when they can open the doors and have the fans going.

Night-time warmth is maintained during winter through the use of rainwater storage tanks and barrels, which provide thermal mass. The sun heats the water during the day, and the heat is stored overnight. Air temperature in the greenhouse may drop to a few degrees below freezing at night during the coldest part of winter, but the soil in the raised beds never freezes. Effectively, the greenhouse becomes a USDA Plant Hardiness Zone 6 or 7, compared to a Zone 3 outside.

Jeff and Cindy made a point to keep the greenhouse simple to operate, including "off-the-shelf" plumbing materials such as water lines and a water meter. They use a ball valve to control how much water gets to each raised bed, and drain tile is buried underneath. There are "microclimates" within the greenhouse, so that some beds are naturally drier or colder than others.

One of the "lessons learned" was about the "water wall" on the north side. It was added as an afterthought rather than being integrated into the original structure, and it worked well for about five years until the tubing started degrading. It functioned by pumping water from the holding tanks and running it down the wall when the air temperature exceeded 80º, then recapturing it in the tanks. The heat of the wall warmed the water, increasing the ability of the tanks to provide thermal mass. Cindy and Jeff eventually hope to restore the water wall's function.

Production

Production Methods

The diversity of Cindy and Jeff's enterprise means that many details are involved in their production methods. But what underlies and unifies these methods are four key words or phrases that come up repeatedly when you talk to Cindy and Jeff about their farming philosophy.

Farmer's Perspective: On The Bookshelf

Storey Guides

Storey Publishing has produced guides to production of various animals, such as chickens, turkeys, ducks, and pigs. Cindy and Jeff have found the series to be a useful source of information.

- Small-scale: As discussed under Assessing & Planning > Equipment & Infrastructure, Jeff and Cindy intentionally limit their acquisition of heavy equipment. They believe their key to profitability is diversity rather than scale.
- Integrated: The integrated nature of their farm (and home) is touched on throughout the case study. The ways they combine their production of plants and animals and intertwine their farming practices with their lifestyle are described in more detail below.
- Subsistence: As discussed under Assessing & Planning > Getting Started, Cindy and Jeff adhere to a "homestead model" of farming, in which they combine food production for themselves – or family subsistence – with community subsistence. In other words, they model their farm after what was often done historically – producing for themselves plus extra for sale within the local community.
- No waste: Jeff and Cindy are proud of the fact that no organic waste has left the farm in 10 years – whether it's the way that hog and poultry manure get worked into the pastures, composted deep bedding from the hen coop is applied to the orchards, or any of a myriad of other synergies that result from their emphasis on integration.

Poultry

Species: Because the composition of Jeff and Cindy's poultry flocks has been evolving as the farm business grows, a description of the numbers and types of birds they produce is necessarily a snapshot in time. For 2010, their production of laying hens (and males) is summarized in Table 2. Jeff and Cindy like Barred Rocks before they forage well and lay well. Barred Rocks lay large brown eggs., as do Buff Orpingtons (Figure 2). Jeff and Cindy have found the Buff Orpingtons to be more broody than the Barred Rocks, but both breeds are good for cold climates. Ameraucanas are also hardy in winter; they lay blue, medium-sized eggs (Figure 2).

Table 2. Laying hen production in 2010

Chickens (Breed/Sex)	# Birds	How Acquired	Status at End of Season
Ameraucana hens	22	carried over from 2009[1]	processed 9/27/10
	20	hatched on farm 9/28/10[1]	carried over to 2011
Buff Orpington hens	35	carried over from 2009	processed 9/27/10
Buff Orpington males (for breeding)	5	purchased as day old chicks on 4/9/10	
Barred Rock hens	50		carried over to 2011

[1]For Ameraucana chicks hatched on the farm in 2010, the breeding male was carried over from 2009 along with the hens.

Figure 2. One Buff Orpington and two Barred Rocks foraging in apple pulp (top left). Ameraucana rooster in hen coop (top right). Smaller bluish eggs of Ameraucanas (bottom right) compared to larger brown eggs of other breeds (bottom left).

Production of broilers and other poultry is summarized in Table 3. Cindy and Jeff raise Cornish Broilers for their fast growth rates and Red Broilers for their pasture foraging abilities and consequent flavor. Like Cornish Broilers, Pekin ducks are the industry standard breed and grow quickly. Cindy and Jeff experimented with heritage turkey breeds in 2010 (Figure 3).

Table 3. Meat poultry production in 2010

Species (Breed)	# Birds	How Acquired	Processing Date
Chickens (Cornish Broilers[1])	155	day old chicks on 6/11/10	8/6/10
Chickens (Red Broilers)	165		9/17/10
Ducks (Giant White Pekin)	47		7/30/10
Turkeys (mixed heritage breeds)	20	day old chicks on 7/23/10	10/30/10

[1]In 2009, Jeff and Cindy began raising only pullets of this breed, because of the higher mortality rates of males as they get older. In 2011, they will try raising males again and processing them at 6 weeks instead of 8 weeks, as they do for pullets.

Figure 3. Clockwise from top left: Cornish Broilers, Red Broilers, Pekin ducks, heritage turkeys.

Feed: Cindy and Jeff feed all their poultry species an organic ration designed for chickens (Table 4). Their research and consultation with others indicated that with a full complement of minerals, flax oil, and other key ingredients, the same feed meant for chickens could work as well for turkeys and ducks. In 2009, they processed their Pekin ducks at 7 weeks and averaged 4 lbs per bird – the size people want, and suggesting that the feed worked well.

Jeff and Cindy use organic feed, though they don't anticipate pursuing organic certification themselves. They would consider it if they sold more to wholesale outlets where customers didn't know them. Currently, however, their emphasis is on direct sales through word of mouth (see Marketing > Models > Direct Sales), which involves frequent visits to the farm by customers who can see Jeff and Cindy's practices firsthand.

Educator's Perspective: Resource Tip

Organic Certification

Cindy and Jeff use organic feed and like being able to communicate to others that they use sustainable practices, but they must be careful about using the word "organic" on labels or in promotional materials due to strict regulations relating to organic certification. The following resources provide good baseline information on organic certification:

What is Organic Farming?

Minnesota Guide to Organic Certification

MOSES Organic Certification Guidebook[1]

Minnesota Department of Agriculture Organic Division

University of Minnesota Southwest Research and Outreach Center

eXtension

ATTRA Organic Farming

[1]MOSES also has a Farmer Transition hotline at 1-888-551-GROW (4769) for questions about soil building, weed and pest control, livestock, and certification paperwork.

The amount of feed that Jeff and Cindy use varies by species and stage of growth (Table 4). They fill feeders for broilers in the evening, which helps the birds retain body heat on cooler nights and prevents overheating on warm days. They add enough feed to ensure that some is left in the morning, then remove any uneaten feed during the day to encourage foraging on pasture (see also On-Farm Research). Jeff and Cindy also feed layers enough so that it is finished each day, and they monitor feed amounts by manually checking keels to ensure hens are neither too skinny nor too fat (both of which would drive down egg production).

Table 4. Average daily poultry rations

Feed Type[1]	Laying Hens (and males)	Broilers	Ducks	Turkeys
21% certified organic chick starter ration	0.25 lb per bird (2 weeks)	0.3 lb per bird (2 weeks)	0.6 lb per bird (2 weeks)	0.5 lb per bird (4 weeks)
19% certified organic chick grower ration	0.5 lb per bird until 4 months old	0.4 lb per bird	0.6 lb per bird	0.5 lb per bird
17% certified organic layer ration[2]	0.75 lb per bird after 4 months old	n/a	n/a	n/a

[1]Percentage refers to crude protein content.
[2]The calcium content in the layer ration provides for egg shells but can be damaging to younger birds, so a layer ration is used only after they start laying eggs.

Breeding: Cindy and Jeff acquired chicks from a variety of hatcheries. They anticipate continuing to order chicks of meat birds (which are hybrids) from hatcheries, but they started raising their own layers in 2010.

Farmer's Perspective: On The Bookshelf

A Guide to Better Hatching

By Janet Stromberg

Cindy and Jeff like this small but useful guide to breeding and hatching your own chicks, published by Stromberg Hatchery of Pine River, Minnesota.

In Their Words: Video Clip [to be inserted]

Hatching Chicks

Cindy and Jeff's goal is to breed 50 hens every 6 months for year-round egg production. They isolate breeding birds from the rest of the flock by placing about 12 hens and a rooster in a separate, portable hen coop. They start collecting fertilized eggs after 3-4 days, store them at 48-50ºF (with egg turning) in a small tabletop incubator inside the house for up to a week, and then increase the temperature to stimulate development. The incubator cost around $40. Although it is not meant for many years' use, Cindy and Jeff have used it for three incubations so far. They clean the internal parts (including a tray used for holding water for humidity control and the egg-turner) with bleach solution to control bacterial growth. The egg-turner rocks the eggs back and forth about every 5-10 minutes, and the target temperature is about 100ºF. When the chicks start to pip at about 21 days, Cindy and Jeff take the egg-turner out and allow eggs to hatch and dry on a wire mesh. Over a 48-hour period, batches of chicks are then moved each morning and evening to a brooder in one of their outbuildings. Of the 36 eggs they incubated in fall 2010, 3 were unfertilized and 5 failed to hatch (due to temperature, humidity, storage, or natural reasons).

Farmer's Perspective: Lessons Learned

Know Your Breeder

Jeff and Cindy have found that it's important to do your homework about hatcheries to find out where a given breed is actually hatched (and, if possible, to learn how the genetics are managed). They prefer to buy chicks from hatcheries that rear their own birds or contract locally. Many hatcheries raise only one or two breeds themselves but offer other breeds through contracted breeders, which can be located far away. For example, hatcheries in Iowa and Minnesota often get stock from Texas or New Mexico. Birds from local hatcheries spend less time in transit and tend to arrive healthier. This approach also supports local or regional growers.

Layer Husbandry (Figure 4): Chicks of laying breeds spend 3-4 weeks in the brooder and are then kept in a 6' x 12' portable coop, which is moved semi-daily until the birds are about 4 months old. They are then integrated with the main flock in a 22' x 24' hen coop, to which two hoop houses and two paddocks for rotational grazing are attached. Laying hens are generally processed and sold as stewing hens at 1½ years of age (after 6 months of growth followed by 1 year of laying). Males (those not kept as roosters) are typically processed at around 6 months of age.

Figure 4. Layer breeding and husbandry: chicks in brooder (top left); portable hen coop used for isolation breeding or birds in transition from brooder (top right); paddocks attached to hen coop (middle); inside of hen coop (bottom left); hoop house attached to hen coop and under construction (bottom right).

In Their Words: Video Clip [to be inserted]

Layer Husbandry

Jeff and Cindy use the portable hen coop to hold young birds until they are ready for laying and integration with the main flock. The main flock is housed in a re-purposed garage. The hen coop includes steps and other perches, nest boxes, isolation cages (where broody hens are kept for 4-5 days to break the cycle), and feeders and founts suspended from the ceiling. They have had one predation event, where a mink got into the coop and took seven hens.

The hen coop has a large door that Cindy and Jeff close in inclement weather or open to let the chickens forage around the homestead (though they don't do that often, or the hens would start laying outside of their nest boxes). Mostly the chickens forage in two paddocks attached to the hen coop. The vegetation is thick and tall, which encourages them to wander and forage (though sometimes they lay eggs where they shouldn't)! Jeff and Cindy try to rotate use of the paddocks so that one can recover while the other is in use. They plant greens in the attached hoop house in the fall so the chickens can get sunlight and forage during the winter. They also provide kitchen scraps in the winter, offer "habitat enhancements" (apples on nails, twigs of balsam fir, and even the retired Christmas tree), and may start sprouting rye and oats in five-gallon buckets as an additional cold-weather supplement.

Jeff and Cindy provide supplemental lighting to keep hens laying year-round. When there is a lull in laying (such as in the fall, when natural day length tapers off), it's their cue to start using artificial lighting. They increase light by one minute per day until February, when natural day length is increasing noticeably again, and keep it at 14 hours per day. They use compact fluorescents because they just need light and not heat from the bulbs.

The only heat provided in the hen coop is that generated by the deep bedding system, which consists mostly of hay (round bales in winter) or grass (bagged lawn clippings in summer). The composting process generates enough heat that Cindy and Jeff have seen it steaming in January! Manure from the chickens helps keep composting underway. The chickens also dig in the bedding for kitchen scraps, which helps to turn the compost over. Jeff and Cindy turn the bedding themselves occasionally and clean it out annually.

Pastured Poultry Husbandry: Ducklings spend 2 weeks in the brooder, while broiler chicks stay for 3 weeks and turkey chicks for 3-4 weeks. Ducklings grow to processing weight (about 7 weeks) in a 165'-perimeter paddock with shade shelter. Broiler and turkey chicks grow to processing weight in 8' x 10' Salatin-style pens that are moved daily. Pens contain 5-gallon galvanized water founts that are filled twice daily (morning and evening), and feed is provided using two 22-lb capacity hoppers per pen (see also Feed, above, and On-Farm Research). In 2010, Cornish Broilers were processed at 8 weeks, Red Broilers at 14 weeks, and turkeys at 14 weeks (see Production > Harvest & Processing > Poultry for "lessons learned" on timing of processing).

In Their Words: Video Clip [to be inserted]

Pastured Poultry Husbandry

Jeff and Cindy spend about $150 to construct each Salatin-style pen. They are "sold" on this design. They know colleagues that are turned off by the idea of moving the pens every day, but Jeff and Cindy find that it takes only a few extra minutes in addition to feeding and watering the birds. They purposely use construction materials that make the pens light enough for both of them to move by hand. They've found that after just a few times the birds get used to the idea of the pen shifting, and they move ahead in anticipation (even the Cornish Broilers, who don't move much at all!).

Cindy and Jeff have found that the Salatin-style pens are effective at preventing predation and distributing the manure well with daily moves. The manure breaks down in about two weeks, and the grass that comes up afterward is bright and luscious. They know others swear by "day-range" systems (which consist of a paddock and a coop in which the birds get closed up for the night), but they feel this wouldn't work well for Cornish Broilers (add notes about feeding behavior to main text). Some people take a combined approach, where they move the day-range system every few weeks after a certain percentage of the vegetation is covered in manure.

Jeff and Cindy could keep their ducks in Salatin-style pens as they do with chickens and turkeys, but so far have used a paddock system. One of the key differences between chickens or turkeys and ducks is the amount of water the ducks go through. Although the ducks don't consume all the water, their tendency to splash around in it requires frequent changes. Jeff and Cindy provide about 15 gallons in the morning and 15 in the evening and say the ducks would happily take more!

Farmer's Perspective: On The Bookshelf

Raising Poultry on Pasture: Ten Years of Success

By Jody Padgham

This book is a compilation of articles published by the American Pastured Poultry Producers Association. It has fourteen comprehensive chapters and covers a wide range of viewpoints and techniques. In general, Cindy and Jeff have found the APPPA to be a useful source for technical information. The organization publishes a simple monthly newsletter called "Grit!" Cindy and Jeff always seem to learn something new from it.

Poultry Your Way: A Guide to Management Alternatives for the Upper Midwest

This publication was a joint effort between MISA and MDA, through which free digital and print copies are available. It includes chapters on management, processing, marketing, and planning.

Educator's Perspective: Resource Tip

Salatin-Style Pens

Farmer Joel Salatin of Polyface Farms popularized the "daily move pen" in his book, *Pastured Poultry Profits*. ATTRA discussed these pens in an article called Range Poultry Housing. Cindy and Jeff have made two modifications to the original design – increasing the height from 2' to 2.5' to accommodate turkeys, and adding PVC pipe to the bottom to facilitate sliding the pens across the pasture.

Hogs

Jeff and Cindy raised three hogs in 2009 and five in 2010 (though two of those were lost to vandalism in August). In 2010, they purchased the five hogs (crosses between two heritage breeds, Tamworth and Hereford) as 40-lb "feeders" in late April. They use a 16% organic swine starter ration until the hogs reach about 100 lbs, then use a 14% organic swine finish ration (see Production > Yields & Profitability for amounts of feed). Hog diets are supplemented with apple pulp from Jeff and Cindy's cider press (see Production > Harvest & Processing). Hogs are kept in a 165'-perimeter, portable paddock with electric fencing. The paddock contains a two-hopper, 300-lb capacity feeder, an 80-gallon tank with 2 founts, and a 6' x 14' Port-a-Hut shelter. The paddock is moved every 1-2 weeks across pasture (see On-Farm Research). Jeff and Cindy anticipate keeping a maximum of eight hogs in this size of enclosure.

Farmer's Perspective: On The Bookshelf

Dirt Hog: A Hands-on Guide to Raising Pigs Outdoors ... Naturally

By Kelly Klober

This book, published by Acres USA, addresses raising hogs on pasture with sections including housing, fencing, breeding, herd maintenance, feed, and marketing.

How to Raise Pigs

by Philip Hasheider

This book, published by Voyageur Press, covers housing, feeding, and other aspects of care, plus breeding, showing, and marketing. It also includes a glossary, resources, and information about pork organizations, regulations, and ordinances.

On-Farm Research: Integration of Poultry and Hog Production

Cindy and Jeff received two 3-year grants from the Minnesota Department of Agriculture (MDA)'s Sustainable Agriculture Demonstration Grant Program and the USDA's Sustainable Agriculture Research & Education program to conduct on-farm research. This research allows them to tailor their production methods to site conditions while increasing general knowledge about animal-based pasture rejuvenation and the productivity of pastured poultry. [turn into "Spotlight on: Research" box]

Background: When Jeff and Cindy started up their poultry operation using Salatin-style pens in an old pasture, they noticed that the paths along which the pens moved throughout the season were not only greener and more productive the following year; they also appeared to contain more desirable plants (such as clovers) than did the unaffected pasture only a few feet away. Recommendations for pasture rejuvenation in their region generally include raking or tilling of the field, addition of soil amendments (such as lime, phosphorus, potassium, or manure), and re-seeding, but they had not taken any of these steps. This led them to wonder if broilers could do the work of pasture restoration for them, while increasing productivity of the broilers themselves through enhanced foraging opportunities in subsequent seasons. They also wondered about the potential for the hogs' rooting behavior and the additional manure to help with pasture rejuvenation.

Project Design: Cindy and Jeff set up an experimental block in their pasture, an old hayfield (Figure 5). The experimental area contained strips along which the hog paddock and broiler pens were moved throughout the 2010 season (the first year of the 3-year study). Some strips experienced no hog or broiler grazing, thus acting as controls. Alternate plots were seeded with a 50:50 white and red clover mix or left unseeded. This design allows them to test the pasture rejuvenation potential of hogs and two different breeds of broilers alone and in combination. They can also test whether seeding is required to enhance foraging after the grazing treatments. They will measure pasture rejuvenation (by collecting plant samples to analyze for species composition and productivity) and broiler productivity (by tracking amounts of feed used and bird weights at processing time).

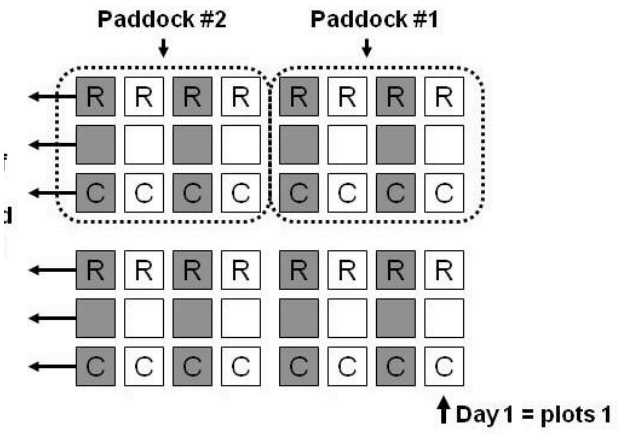

Figure 5. Hogs were placed on pasture in the northeast corner of the experimental field block on April 25, 2010, and moved westward every 7-15 days (based on the level of rooting and sod break-up that had been achieved). The area covered by the 30' x 40' hog paddock (dotted lines) eventually encompassed twelve broiler plots. Chickens were placed on pasture on June 28, using 8' x 10' Salatin-style pens (in one strip for combination with hog treatment and in another strip for the no-hog, control treatment) that were moved westward daily. "R" indicates pens containing 50 Red Broilers, "C" indicates pens containing 50 Cornish Broilers, and the blank boxes indicate the "no bird" controls. White boxes indicate seeded plots; gray boxes indicate non-seeded plots.

Preliminary Results: Because 2010 was the first of the 3-year study, Cindy and Jeff did not expect to find meaningful differences in feed consumption rates or processing weights. The first year's data will provide a baseline for measuring whether feed consumption rates and/or processing weights are affected by changes in the abundance or composition of pasture plants over time. They did observe striking differences in pasture appearance whether chickens had grazed in a strip or not (Figure 6). They also found that Cornish Broilers had much lower feed costs per bird than did Red Broilers, largely because it took 14 weeks to grow out the Red Broilers versus 8 weeks for the Cornish. Overall, the average feed cost per finished pound of bird was $0.94-$0.97 for Cornish and $1.60-$2.23 for Red Broilers. Although Red Broilers forage better on pasture, it was not enough to reduce feed costs compared to the Cornish (though in 2011 they'll be trying a different variety of Red Broiler; see Production > Harvest & Processing > Poultry). There was no significant difference in feed costs for a given breed whether they grazed behind the hogs or grazed alone, but Cindy and Jeff hope that with increased pasture quality they will see better growth at a lower feed cost for Red Broilers. They would like to figure out an economical way to raise Red Broilers, because their customers have been pleased with their flavor.

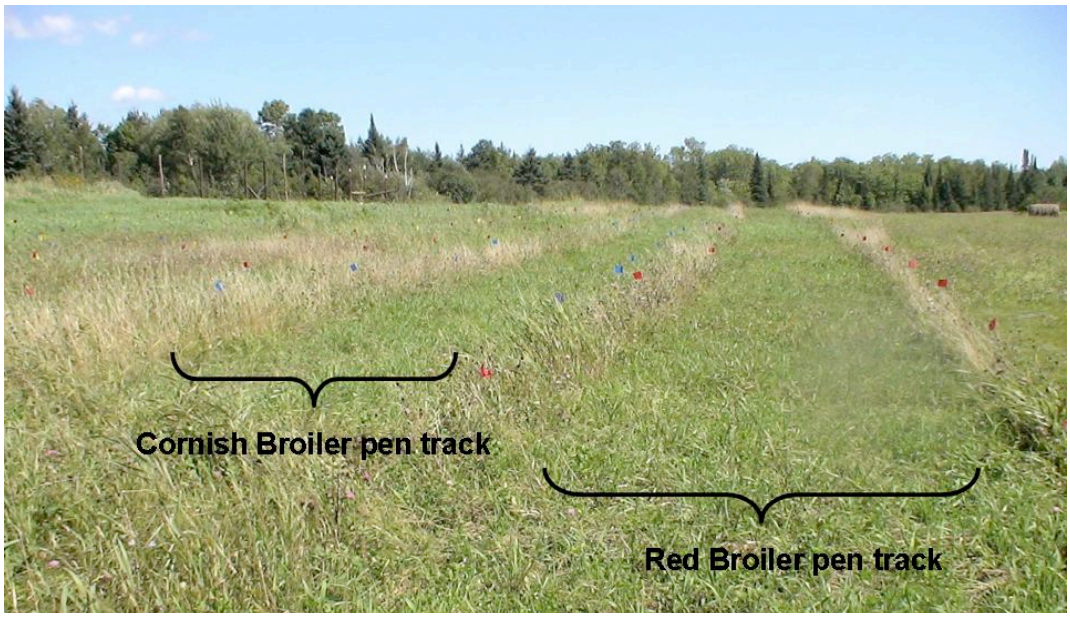

Figure 6. The strip on the right (large bracket) is the path followed by the Red Broiler pen; the strip on the left (small bracket) is the path followed by the Cornish Broiler pen. The narrow margin between the strips and the area to the far left in the picture show areas ungrazed by the chickens.

Farmer's Perspective: On The Bookshelf

In managing paddock and pasture vegetation for poultry and hog grazing, Jeff and Cindy have found these two publications to be useful:

Invasive Plants of the Upper Midwest: An Illustrated Guide to Their Identification and Control

By Elizabeth Czarapata, published by University of Wisconsin Press.

Identifying Pasture Grasses

By Dan Undersander, Michael Casler, and Dennis Cosgrove, available free in digital form from University of Wisconsin Extension.

Apples & Other Fruits

Species: Cindy and Jeff focus on apples and other tree fruits, but they grow some small fruits as well. Their fruit inventory in 2010, involving about 120 plants, included apples, cherries, pears, and plums, plus currants and juneberries. Eight apples trees were already on the farm in 1996. Cindy and Jeff planted small numbers of fruit trees or bushes during most years from 1999 to 2009, then did a large planting in 2010. The large planting involved 45 new or transplanted apple trees in a newly established, fenced orchard, plus 17 other trees or bushes planted elsewhere around the farm.

Farmer's Perspective: On The Bookshelf

The Apple Grower: A Guide for the Organic Orchardist

By Michael Phillips

Jeff and Cindy rate this book, published by Chelsea Green, very highly. It explores topics such as the use and limitations of kaolin clay, techniques of understory management, and making small orchards viable through heritage and regional varieties, value-added products, and the "community orchard" model.

Ecological Fruit Production in the North

By Bart and Jean Richard Hall-Beyer

Cindy and Jeff had to write to the authors directly to get this book, but they have found it an excellent resource and well worth the effort (RR#3, Scotstown, Quebec J0B 3J0).

Table 5a shows the varieties of each type of tree fruit in the their 2010 inventory, and Table 5b shows small fruits. Some apple varieties are unknown because the trees preceded Jeff and Cindy's time on the farm; other varieties are unknown because they are antique or heritage varieties or because of inadequate record keeping early on (an important lesson learned!). Cindy and Jeff have one or two trees or bushes per variety for most of their varieties, up to 5 or 6 plants per variety as of 2010. Initially Jeff and Cindy obtained most of their fruit trees and bushes from a variety of nurseries and the Duluth Community Garden Program. Recently they have been developing their own trees by grafting desirable fruit varieties (from scion exchanges through MOSES and the Sustainable Farming Association of Minnesota (SFA)) onto a range of cold-hardy rootstocks (see below).

[resources on which fruit species can self-pollinate and which can't/info on why multiple varieties may be needed in an orchard?]

Table 5a. Varieties of tree fruits in 2010

Apples	Cherries
1628 Ashton Bitter Clover Valley Antique[1] Beacon Belle de Boskop Blue Moon Esopus Spitzenburg Famuse Snow Fireside Goodland Heritage Crabs[1] Honeygold Kingstone Black Liberty Minjon Newton Pippin Norland Red NW Greening Red Baron Red Free Snowsweet unknown WestField Seek-No-Further Wolf River Wolly Polly Woody's Russett Yellow Transparent Zestar	Evan's Ball Nanking Native Pin Native other
	Pears
	Bosc Magness Nova Shinseiki (Asian) Staceyville Stinett Heritage[1] Summer Crisp unknown Ure
	Plums
	Black Ice Compass Toka Waneta

[1]Cindy and Jeff have been unable to identify some varieties and have named and described them themselves for record keeping purposes. The Clover Valley Antique, for example, produces mid- to late-season very nice, firm, red fruits that have white flesh and are great for drying, baking, and cidering.

Table 5b. Varieties of small fruits in 2010

Currants	Juneberries
Black Russian Primus (white) Red Lake	Regent Saskatoon Serviceberry

[resources about restrictions on growing currants until recently (recently lifted ban on import of *Ribes* spp. due to white pine blister rust) / how currant production hasn't been very well developed but has good potential?]

Propagation: Jeff and Cindy use a variety of cold-hardy rootstocks (Table 6). They are testing the strengths and weaknesses of each rootstock for their site and soils by matching different rootstocks to different fruit varieties. A strongly dwarfing rootstock such as "Bud9," for example, keeps the tree small and allows for higher density plantings and earlier fruiting at 2-3 years, but it leads to fewer fruits per tree (about 2 bushels' worth) and needs to be trellised because of a weak root system that is not self supporting. Other rootstocks, such as "Antonovka," are self-supporting, result in larger trees, and produce larger crops, but take longer to start producing (generally 5-7 years). Aside from cold-hardiness and disease resistance, Jeff and Cindy are considering which combinations work best for their objectives. High-density plantings on dwarfing stock may be the best for growers focusing strictly on fruit production, but large, self-supporting trees may be a better choice for grazing poultry through the orchard as an integrated pest management strategy (see below).

[resources on rootstocks and grafting?]

Table 6. Rootstocks in use as of 2010

Apples	Cherries & Plums	Pears
Antonovka B118 Bud9 Fedco Apple M7 M111 unknown or volunteer	Antonovic Cherry Krymsk-5 Cherry Native (*Prunus* spp.) unknown	Fedco Pear Old Home unknown

Cindy and Jeff have their fruit trees and bushes distributed among various areas on the farm. Following is a list of these areas as of 2010 (Appendix II).

- The "Homestead Orchard" is located south of the hen coop (Figure 1). It contains heritage apple trees that were already growing on the farm in 1996, plus new apple, pear, and plum trees planted between 1999 and 2009. The site is adjacent to woods on the north but open on the other sides for full sun and good air circulation.
- The "Backyard Orchard," to the north of the house (Figure 1), contains heritage crab apple trees and a combination of native and cultivated varieties of plum and cherry trees planted between 2001 and 2008. This is a relatively low area, in which some species have done well and others have not.
- From 2005 to 2007, Cindy and Jeff planted pear and apple trees in the "Old-New Orchard" located along Homestead Road (Figure 1). Many of the trees died due to inadequate drainage, and others were moved to the new Fenced Orchard in 2010. Two pears and an apple tree, individually fenced for protection against deer, remain in this area. Cindy and Jeff may use the area again in the future, by improving site preparation and drainage.
- Jeff and Cindy established the "Fenced Orchard," in the south-central portion of the property (Figure 1), in 2010. The orchard is a mix of pear and apple trees. They transplanted 6 trees from the Old-New Orchard, and the remaining 39 trees were planted as grafted whips. They prepared the site in 2009 by grazing hogs in the area, which "tilled" the soil and added nutrients. In spring 2010, they tilled strips where the trees were to be planted and added more compost. By 2011, mowing between rows had led to a nice thatch, which they expect to help

Farmer's Perspective: On The Bookshelf

Fences for Pasture & Garden

By Gail Damerow

Published by Storey Publishing, this book is a guide to selecting, planning, and building fences intended to keep livestock in or wildlife predators out. It covers various types of fencing, provides illustrations, and addresses related topics such as alarm systems and zoning laws.

with weed control and addition of nutrients through slow decomposition of organic matter. Jeff and Cindy fenced the orchard using trees harvested from their own and a neighbor's property. With the help of a couple of friends, they installed all the posts in a day (after water-sealing them and using a 5' concrete base for each). They then used inexpensive, easy-to-install plastic fencing to achieve an enclosure good enough to keep poultry in and deer out, at a cost of less than a thousand dollars in equipment rental and supplies.

- Cindy and Jeff established the "Currant and Nursery Beds" in 2010. The beds, located southwest of the house (Figure 1), contain all their currant bushes, blueberry plants (for personal use), two cherry trees, and a plum tree. They plan to convert part of this area to nursery beds for their orchards; other nursery beds are currently located within their personal garden to the southeast of the greenhouse.

Spotlight on: Outreach

Orchard Establishment

Cindy has been working to restore abandoned trees with neighbors who have heritage orchards and at a historic seedling trial orchard at the old University of Minnesota - Duluth agricultural field station (part of the newly formed Sustainable Agriculture Project). It has been a great opportunity for her to learn the skills of orchard restoration and about heritage fruits in the region. These projects dovetail with her personal interests and were instrumental in giving her the courage to try planting her own orchard using her own trees! She has begun offering a course to help others in the region to learn the skills she has found so valuable on the farm.

Farmer's Perspective: Lessons Learned

Orchard Establishment

In addition to losing some information on early fruit plantings (which Cindy and Jeff have rectified with improved record keeping and the use of tree tags), they have learned important lessons about preparing sites for plantings, especially considering they have to deal with poorly drained soils on their site. So far they feel that the combination of grazing hogs through an orchard site in the year preceding a planting, plus their own tilling efforts and soil amendments, has produced good results and will help them revitalize other planting sites in the future.

Maintenance: The fruit tree operation has its own calendar, different though generally compatible with poultry and hog production. Outside of fall harvest, and once trees are established, the season starts in February with winter pruning, which keeps trees productive and in good condition. During spring and summer, Jeff and Cindy monitor blooms, fruit set and development, and pests.

[resources on pruning and other maintenance tasks?]

Integrated Pest Management: Jeff and Cindy use integrated pest management (IPM) to manage pests in their fruit operation. As mentioned earlier, their farm's location puts them out of range for two of the most destructive pests that plague other Minnesota growers: the plum curculio (a weevil that pierces and damages the fruit, causing it to be misshapen) and the codling moth (whose larvae burrow inside and eat their way out, leaving a hollow rotten core to the fruit). Both pests render the fruit unmarketable.

Cindy and Jeff helped to demonstrate that they were out of range of these pests by participating in the MDA's IPM Program. They do weekly monitoring of pest traps (Figure 7a) during the growing season and report to the MDA, which publishes data in the weekly Fruit IPM Update. Clover Valley Farms is one of two monitoring sites in St. Louis County.

The primary pest for which Jeff and Cindy have needed to take action is the apple maggot, a mid- to late-summer fly that lays its eggs in the developing fruit. A combination of trapping (Figure 7b) and spraying with kaolin clay (a naturally occurring mineral that forms a white film that suppresses pests and can be removed before eating) can keep them in check. Using orchard management techniques, they have been able to control apple scab, a fungal disease that can damage both fruit and leaves.

Educator's Perspective: Resource Tip

Integrated Pest Management

According to the Minnesota Department of Agriculture's IPM Program, the goal of IPM is to mitigate pest damage while protecting human health, the environment, and economic viability. IPM is a stepwise approach involving proactive planning, setting thresholds for management actions, conducting ongoing monitoring for pests, properly identifying pests, implementing control actions, and evaluating effectiveness. Actions may include biological control (releasing or promoting beneficial organisms), cultural control (such as mowing, trapping, or destruction of pest habitat), chemical control (such as insect pheromones), and genetic control (use of resistant varieties).

Figure 7a (left): MDA IPM trap; Figure 7b (right): apple maggot trap.

Farmer's Perspective: Lessons Learned

Program Participation

Cindy feels that participation in programs like the MDA's IPM program is important for beginners. Even with her scientific background, she confesses that she would be likely to let weekly orchard monitoring slip if she hadn't committed to the program. They now have two years of useful data from monitoring their own orchard, plus a neighbor's orchard and the orchard at the University of Minnesota – Duluth.

Cindy also feels that the process of writing proposals for (and carrying out) on-farm research has been very valuable to them. It has given them access to helpful contacts and forced them to think through questions and issues on the farm that they might not otherwise address. She encourages other beginners to explore similar opportunities, even without previous grant writing experience.

Greenhouse

Cindy and Jeff grow a wide variety of annual and perennial flowers and vegetables in their greenhouse (Table 7). Although the greenhouse looks small at first glance, careful rotation planning allows them to have diverse products throughout the year.

Table 7. Greenhouse inventory (2010)

Herbs grown for sale at Whole Foods Co-op	Vegetables and herbs grown for personal consumption	Flowers grown for personal use
garlic herb fennel lavender oregano rosemary sage thyme	beets (incl. greens) broccoli cabbage carrots cilantro garlic greens (arugula, Asian greens, collards, mustard, spinach, Swiss chard) peas sweet & hot peppers turnips (incl. greens) wax beans	*Amaryllis* *Anemone* Aztec lily Calla lily crocus daffodil hen & chicks hyacinth *Iphoena* iris *Nasturtium* pansy paper white parlor maple petunia rain lily snow drop stock sweet pea

It has taken several years of trial and error to determine which plants work best and when to grow them in this particular setting. Table 8 shows Jeff and Cindy's greenhouse crop rotations.

Table 8. Greenhouse crop rotations

Rotation name (planting time)	Representative plants	Keys to success
Winter (August)	cole crops (e.g., cabbage, broccoli) root crops (e.g., beets, carrots, turnips) peas & beans (late crop) greens	These crops can tolerate low air temperatures. Planting them in August gives them time to grow to maturity before light levels get low. They then spend the winter holding their own, acting as a "living root cellar" until harvest.
Summer (May)	annual herbs (e.g., basil) melons peas & beans (early crop) peppers squash tomatoes	These heat-loving crops can tolerate the higher temperatures of the summer greenhouse. Raising them in the greenhouse provides a "jump-start" on the outdoor garden.



Harvest & Processing

Poultry

In 2010, Jeff and Cindy purchased a mobile poultry processing unit. Prior to that, they rented the "chicken bus" from SFA's Lake Superior Chapter. While access to a mobile unit for rent was helpful during their first years of poultry operation, they found its availability became limiting as their operation expanded. With their own unit, for example, they could plan early-season processing of ducks and late-season processing of turkeys. Their customers had been asking them to produce turkeys for years, but they were unable to do so until they had their own equipment. The capital cost was high (at around $14,000), but they mounted the equipment on a trailer and are making plans to rent out the equipment, thereby creating another revenue stream for their farm.

Spotlight on: Outreach

Jeff and Cindy would like their mobile poultry processing unit to become a community resource. They are working on a rental protocol and accompanying manual. In 2010, they lent the unit to two other farmers as a way of learning what issues arise when others use the equipment. Renters would be required to spend at least one day processing with Jeff and Cindy before being allowed to rent the unit, and they may offer an option where their services could be provided along with the unit.

Now, with their own processing equipment, plus the knowledge gained from several years of production, they can plan out a staggered schedule for the growing season that maximizes efficiency. Ducks, for example, can be put out on pasture as early as April; with only 7 weeks' growth until processing, Cindy and Jeff can be mostly finished with duck production before broiler production ramps up. Besides spreading out the labor involved in processing, this staggered approach allows them to cycle different species through the brooder at different times (keeping equipment needs to a minimum) and distributes husbandry tasks throughout the season. Cindy and Jeff kept their 2010 schedule similar to previous years while they adjusted to having their own mobile processing unit, but now plan to solidify

a duck/early broiler/late broiler/turkey rotation through their production and processing regime.

In Their Words: Video Clip [to be inserted]

Mobile Poultry Processing

[add clip showing and describing standard procedure: use of killing cabinet, scalder, plucker, de-legging/de-necking station, evisceration, chill tanks, QA/QC and packaging]

[may also an evisceration tutorial - an in-depth look at all the steps involved]

Jeff and Cindy have learned that, like so many aspects of farming, many of the choices they need to make come down to personal preference. The SFA mobile unit was equipped with killing "cones," while the unit they purchased has a killing "cabinet." They haven't seen a significant difference in wing breakage (to which Cornish Broilers are especially prone) between the two types of equipment, and they are working to minimize wing breakage in other ways. Two suggestions they are exploring are the use of large rubber bands (like broccoli bands), to keep the birds' wings close to their bodies, and the use of rubber highway cones, which are softer and have more "give" than steel cones. They do still prefer the killing cabinet over the killing cones, because it involves fewer steps in moving birds to the scalder and thus saves time. They also feel it contains blood better and facilitates clean-up.

[resources on processing equipment and procedures?]

Cindy and Jeff have also found there are important differences among species in terms of processing. It seems every year they tweak something about their production plans based on what they learn during processing. Some differences are obvious (for instance, you can fit fewer turkeys into the plucker than chickens, affecting overall processing time). Other lessons are more iterative. In 2009, for example, they processed Red Broilers (for which they have always raised both males and females) at 11 weeks. They ended up with a lot of 2-lb birds, whereas most customers prefer birds around 4½ lbs. In 2010, they let Red Broilers grow until 14 weeks, and then saw a lot of aggression between males starting around 12 weeks. In the future, they may raise only male Red Broilers (because they grow larger than females) and go back to processing them at 11 weeks, to achieve the goal of a more consistent-sized bird with limited intra-flock aggression. In addition, in 2011 they plan to try a new variety of Red Broiler, which another farmer's study showed to have a better growth rate than the variety they used in 2010, while maintaining good foraging behavior on pasture.

Besides all the lessons learned about broilers, they have learned that when it comes to processing, ducks are a whole other story. Their pin feathers can be difficult and time-consuming to remove, requiring extra soap in the scalder and ensuring that the birds are not processed at a day over 7 weeks.

Because Cindy and Jeff's use of on-farm processing relates to their focus on direct sales, the relevant poultry processing and regulatory details are provided under Marketing > Models > Direct Sales.

Hogs

In 2010, Cindy and Jeff's hogs were sent to a custom processor on October 8. Because the processing regulations relate to Cindy and Jeff's use of direct sales, regulatory details are provided under Management & Marketing > Marketing Models > Direct Sales.

Apples & Other Fruits

Apple harvest begins in the fall and can span two months (from August through September) because of the number of varieties Jeff and Cindy have. They sell marketable (aesthetically pleasing) apples through the fall and start using unmarketable fruits to press cider and preserve products for family use in October. Jeff and Cindy are working on strategies for harvesting and packing (so they can improve fresh fruit sales) and for developing value-added products (such as jams, sauces, and cider) for sale. While their own apple production is still ramping up, they're working with friends and neighbors to glean apples, pears, and plums from other trees in the area. This allows Jeff and Cindy to sell more of their own production while still having enough fruit for personal use and for finishing poultry and hogs in the fall.

Spotlight on: Outreach

Community Fruit Gleaning

Jeff and Cindy's gleaning efforts inspired them to explore how they can integrate tree fruit gleaning into their operation as a way of helping provide jobs, training, and access to nutritious local foods for low-income members of the Duluth community (see Farm Business > Professional Development).

Currants start producing in mid-summer. As Cindy & Jeff's hedgerows expand, they expect to start sales in 2011, either direct to customers or wholesale to the local food cooperative.

In Their Words: Video Clip [to be inserted]

Cider Pressing

[add clip showing standard procedure (trimming bruises, loading grinder, grinding, small press, large press, bottling) while describing how their fruit enterprise has evolved]

Cindy and Jeff started out with a small wooden "backyard" cider press, which is built for about 30 gallons per year. They pushed it to its limits in 2009, using it to produce 110 gallons of cider that year. With increasing production, they got motivated to improve their pressing capabilities. They found few options between small backyard presses and large, unaffordable commercial presses, so they designed their own metal hydraulic press. This press allows them to press more apples at one time and also to get more cider out of the apples (about 5 gallons per 100 lbs, versus 4 gallons with the backyard press). They like its simple design, using a small off-the-shelf hydraulic pump. As with the absence of tractors on the farm, Cindy notes that this press illustrates their focus on avoiding mechanization and working toward a goal of providing food for themselves and the local community but not growing larger than that. They also like that cider pressing can be a community event itself, with friends and neighbors joining in the effort to get their own apples pressed and to create tasty combinations of cider using different varieties.

Yields & Profitability

Poultry

Cindy and Jeff sold 608 dozen eggs at $3.00 per dozen in 2010, for gross egg sales of $1,824.00. Because they process retired laying hens and males for meat, they calculate profitability of their laying enterprise based on both egg sales and meat sales. The calculations are complicated by the fact that hens live more than one year, so costs and sales are carried across years. Cindy and Jeff are still working out their methods for breeding and raising their own chicks and their approach to flock rotations so that they'll have more consistent laying and egg sales throughout the year. Table 9 shows that they experienced a net income of $660.11 from their laying enterprise in 2010. This was the first year they showed a profit, though importantly, they have not yet started accounting for labor costs in their profit calculations.

Table 9. Laying hen processing income, egg sales, and costs in 2010

Breed/ Sex	Cost per Bird[1]	Chick Ration Cost[2]	Layer Ration Cost[2]	# Birds Processed[1]	Sale Price (per lb)	Average Processed Weight (lbs)	Gross Income	Total Costs[3]
Ameraucana hens	n/a	$0.00	$233.64	15	$2.50	3.0	$112.50	$233.64
	n/a	$7.38	$212.40	0	n/a	n/a	$0.00	$219.78
Buff Orp. hens	n/a	$0.00	$371.70	25	$2.50	3.4	$212.50	$371.70*
Buff Orp. males	$1.53	$1.47	$35.40	4	$2.50	3.5	$35.00	$44.52
Barred Rock hens	$2.17	$14.75	$531.00	0	n/a	n/a	$0.00	$654.25
						Egg Sales	**$1,824.00**	
						Totals	**$2,184.00**	**$1,523.89**

[1]Number of birds raised shown in Table 2. Number of birds processed is generally lower than the number raised because of some mortality, because some stewing hens and fryers are kept for their own use, and because some males are kept as roosters for breeding.

[2]Average cost of both rations was $14.75 per 50 lbs in 2010. Ration sizes given in Table 4. See Lessons Learned box about feed costs under Management & Marketing > Marketing Models > Direct Sales.

[3]Total costs include chick purchases and feed but not labor.

As discussed under Assessing & Planning > Business Planning, 2010 was Jeff and Cindy's fourth year selling broilers, their second year selling ducks, and their first year selling turkeys. Table 10 shows that they experienced a net income of $1,433.67 from their meat poultry enterprise in 2010. They expect profitability to continue, though again, it is important to note they have not started accounting for labor costs.

Table 10. Meat poultry income and costs in 2010

Species/ Breed	Cost per Bird[1]	Chick Starter Ration Cost[2]	Chick Grower Ration Cost[2]	# Birds Processed[1]	Sale Price (per lb)	Average Processed Weight (lbs)	Gross Income	Total Costs[3]
Cornish Broilers	$1.13	$29.50	$619.50	150	$3.00	4.2	$1,890.00	$824.15
Red Broilers	$1.65	$29.50	$1,371.75	163	$3.00	4.1	$2,004.90	$1,648.75[4]
Ducks	$3.94	$17.70	$309.75	46	$4.25	3.5	$684.25	$512.63
Turkeys	$6.71	$14.75	$206.50	17	$2.50[5]	4.6	$195.50	$355.45
						Totals	**$4,774.65**	**$3,340.98**

[1]Number of birds raised shown in Table 3. Number of birds processed is slightly lower than the number raised due to pre-processing mortality. Two Red Broilers and one duck died on pasture in 2010, while three turkey chicks and five Cornish broilers were lost in the brooder. With changes in brooder and pasture management, they have reduced their mortality rate well below 10% (often considered an expected level of mortality for broilers).

[2]Average cost of both rations was $14.75 per 50 lbs in 2010. Ration sizes given in Table 4. See Lessons Learned box about feed costs under Management & Marketing > Marketing Models > Direct Sales.

[3]Total costs include chick/duckling purchases and feed but not labor.

[4]Received 165 Red Broiler chicks but only ordered (and paid) for 150.

[5]Charged low sale price because unhappy with size of birds, though customers reported very good flavor; plan to try Broad-breasted Whites in 2011.

Hogs

As discussed under Assessing & Planning > Business Planning, 2010 was Jeff and Cindy's second year selling hogs. Table 11 shows that they experienced a net income of $171 from their hog enterprise in 2010, though as with poultry, the calculations do not account for labor costs. The table assumes that all five hogs made it to processing, for a net income of $34.20 per hog, though two were lost to vandalism (see Production > Production Methods > Hogs). Jeff and Cindy will try raising five hogs again in 2011 and hope to increase to eight hogs by 2013. They are also exploring options for farrowing their own feeders as a way to increase profitability.

Table 11. Hog income and costs in 2010

Cost per Feeder Hog[1]	Starter Ration Cost[2]	Finish Ration Cost[2]	# Hogs Processed[1]	Sale Price (per lb)	Average Processed Weight (lbs)	Gross Income	Total Costs[3]
$60.00	$582.00	$2,192.00	5	$2.95	220	$3,245.00	$3,074.00

[1] Calculations assume all five hogs survived until processing time, though two were lost to vandalism in August (see Production > Hogs).

[2] Average cost of starter ration was $14.55 per 50 lbs and $11.85 per 50 lbs in 2010. Cindy and Jeff used an average of 40 lbs per week per animal of the starter ration for 10 weeks, then an average of 132 lbs per week per animal of the finish ration for 14 weeks. They were able to purchase finish ration by the ton and achieve substantial savings.

[3] Total costs include hog purchase and feed but not processing costs (paid by customer) or labor.

Greenhouse

To date, Cindy and Jeff have not tracked greenhouse production in a way that allows them to calculate personal and business yields separately. With 1-2 plants of each herb species, they had total sales of wholesale herbs of $276.20 in 2010. They are working to expand the number of herb plants so they can increase sales, and as noted in Table 1, they started growing garlic in 2010 to add to their wholesale enterprise.

Marketing

Models

Jeff and Cindy sell products directly to customers and have a wholesale account. Initially they sold at a farmers' market; sales went well, and they felt it was a good experience for making initial customer contacts. Some of their farmers' market customers, for example, became ongoing egg customers. They switched to a focus on direct sales, however, because they felt the logistics of packing things up and devoting Saturdays to being away from the farm were not a good match for

their lifestyle. The farmers' market was also not a good fit for their approach to meat sales.

Although Cindy and Jeff have customers coming to the farm for product pick-ups, they don't anticipate setting up an on-farm store in the near future, as they like their privacy. They considered offering Community Supported Agriculture (CSA) subscriptions for meat and eggs, but shied away from this idea after conducting a customer survey (see Direct Sales). They may use a CSA marketing model for apples in the future. Apples have good storage ability, and Cindy and Jeff see good potential for value-added apple products that could be marketed on an ongoing basis.

Direct Sales

Jeff and Cindy sell eggs, meat from poultry, and half or whole hogs directly to customers either through on-farm pick-ups or deliveries. They get most of their customers through word-of-mouth; many customers are co-workers, for example, or met Jeff and Cindy through involvement in different organizations (see Farm Business > Professional Development). Their emphasis on a direct-sales model is partly due to personal preferences, as described above, but it also relates to the regulations surrounding meat sales (described below).

Eggs are Cindy and Jeff's most consistently offered product throughout the year. They sold 608 dozen eggs in 2010 and still can't meet the demand they have from co-workers. Cindy and Jeff feel the eggs are a classic case of a product that sells itself, which they credit to their hens' free-ranging diets and supplemental winter greens. One customer reported back that her teenage son (not the demographic one would expect of a discriminating egg connoisseur!) went to make himself some eggs. He didn't know they were different than any others he'd encountered in their refrigerator, and he ran to his mom demanding to know where they'd come from, as they were the best eggs he'd ever had!

Under xxx regulations, Jeff and Cindy are allowed to process poultry on the farm and sell fresh whole birds (no cuts or labels) directly to consumers, up to 1,000 birds per year. This approach to poultry meat sales works better for them than a farmers' market or wholesale, because the distance and cost of USDA-inspected processing would significantly reduce profitability at their scale. Another strong advantage of a direct-sales approach is that they can decide the number of

birds to raise each season based on customer demand. Each year, in late March or early April, Jeff and Cindy send out a pre-order form (Appendix I) to their customers before ordering chicks and finalizing production plans.

[resources for poultry processing regs? explain Minnesota regs in some depth, then refer to other sources applicable elsewhere? include http://www.nichemeatprocessing.org/?]

Cindy and Jeff sell pork by the half or whole hog because producing individual cuts and/or selling at retail or wholesale outlets is prohibited under federal law unless the hogs are butchered at a USDA-inspected processing plant (the closest one to Clover Valley Farms is near Minneapolis-St. Paul, not a feasible distance for them). As with poultry, Cindy and Jeff have found sufficient direct-sales demand that they are not motivated to pursue wholesale or other markets that would be less profitable at their scale. They are allowed to sell pork directly to consumers by the half or whole animal. As a courtesy to their customers, they can and do arrange for "custom" processing of the meat. They also help match up customers who want to share their half with others, though they can't divide or deliver any part of the order to anyone but the primary customer. By law they are required to charge customers a price per pound of "hanging weight" and the processing costs.

Farmer's Perspective: Lessons Learned

Customer Communications

Cindy and Jeff believe that ongoing communications with customers and honest explanations about pricing have helped them establish a loyal customer base. In 2010, for example, they explained what they had learned about the extra labor involved in processing ducks in 2009 (see Production > Harvest & Processing > Poultry) and how they needed to increase duck prices as a result, and they still sold out. In 2011, organic feed costs jumped up by 30%. Cindy and Jeff used an online survey to ask customers if they'd prefer to see a change in practices (such as the use of non-organic or transitional feed instead of certified organic feed) in order to keep costs down. The overwhelming response was that customers wanted their practices stay the same and would pay more for the products. Cindy and Jeff adjusted their egg and meat prices according to feed costs, and 2011 orders have been strong.

[resources for hog processing regs? explain Minnesota regs in some depth, then refer to other sources applicable elsewhere? include http://www.nichemeatprocessing.org/? include Iowa State University pub on what to expect when buying beef or pork by the half or whole animal?]

Jeff and Cindy took advantage of their customer base to get feedback on their idea of offering a meat CSA (along with feedback on other ideas and on customer satisfaction). They used the online tool Zoomerang (and print

copies for customers without email) to conduct a customer survey in 2009 (Appendix III). They received 58 responses out of a customer base of around 100. Jeff and Cindy were interested to learn that their customers liked the concept of a meat CSA but not the details. Few people said they'd actually subscribe, generally because of widely varying preferences in the amounts and types of meats that they like to eat. Although Jeff and Cindy have heard success stories about meat CSA models from other producers (largely beef) and may explore the option again in the future, they felt they could not offer a good fit for their customers at this time.

Wholesale

Cindy and Jeff approached Whole Foods Co-op in Duluth (an independent grocery store, not to be confused with the national chain) in 2008. The co-op is very accommodating for local growers and is flexible in terms of product availability. No other truly local producer was providing the co-op with local herbs or other produce (such as garlic) out of season. Cindy and Jeff deliver products to the co-op about five times a year throughout the year.

Farmer's Perspective: Lessons Learned

How much information is too much?

Cindy and Jeff have found that their customers appreciate the transparency of their operation, and some even want to contribute – for example by volunteering on poultry processing day (see Farm Business > Human Resources). Cindy and Jeff have learned, however, that there is a fine line between what most customers want to *know* and what they want to *see*. Based on feedback from 2010, for example, they're moving their mobile unit to a different location on processing days. Customers generally liked seeing where the processing was done, but many balked at having to walk right by the mobile unit when they came to the farm to pick up their birds. Cindy and Jeff agree with others (like Chris Duke of Pastured Perfect Poultry, who speaks on this topic) that, to a degree, farmers like themselves are selling certain ideas of what small diversified farms look like. Cindy and Jeff strive for the right balance, by not hiding anything or "whitewashing" their customers, but by taking reasonable steps to make patrons feel comfortable.

The Farm Business

Human Resources

Jeff and Cindy do not formally track their time spent on the farming business. It generally takes two hours in the morning and two hours in the afternoon

to do chores when the season is in full swing. They're working toward setting aside at least an hour per day to handle emails and other office work during the summer. There are pulses of activity (generally involving whole weekends) surrounding poultry processing, fruit harvesting, and cider pressing. They also try to plan one big project, such as developing a new brooder or planting a new orchard, per month, to move various initiatives forward.

As described under Assessing & Planning > Getting Started, Jeff works on the farm full-time during the summer while Cindy continues working close to 50%-time at her academic appointment. They are 1½ years into a 3-5 year plan, in which the goal is for Cindy to increase the percent of time she is on the farm (both during the school year and in the summer). Eventually they expect Cindy to be full-time on the farm year-round. If they could figure out how to get affordable health insurance while being self-employed, they might consider having Jeff work full-time on the farm too; they have never expected the farm to support both of them, but they realize the future is uncertain and are open to the possibilities! Both Jeff and Cindy already work to integrate their off-farm careers with Clover Valley Farms, and Cindy sees good potential for research or teaching opportunities to present themselves as the sustainable agriculture movement continues to grow (see Professional Development).

"As far as May knows, there's no difference between work and play."

Cindy manages most of the communications, record keeping, and other administrative work. Jeff manages most of the greenhouse production. They divide responsibilities for planning, scheduling, poultry and hog care, orchard establishment and maintenance, fruit harvest, poultry processing, cider pressing, and equipment maintenance. Cindy and Jeff feel that ideally each of them would be able to perform all tasks, and they work toward this goal. Jeff, for example, is learning QuickBooks and helping more with bookkeeping so he feels more connected to that part of the business. In reality, they recognize each of them has different strengths. They get help with farm tasks from daughter May, who likes to collect eggs, feed chickens, and work in the garden. She is also a huge help at cider pressing time, and Cindy and Jeff think it won't be too much longer before she's moving poultry pens across the pasture!

Jeff and Cindy had an intern for the first time in 2010. Until then, they had called on neighbors to cover chores if they had to be off-farm for a few days, but in 2010 they needed to be absent from the farm for a longer period of time. Their first intern, who lived nearby, was paid and worked an intermittent schedule, helping with chores when they were gone and with projects as needed. Jeff and Cindy quickly saw the value of additional labor on the farm, and they like being able to contribute to the growth of future farmers. They envision a more structured approach in the future, where interns have designated areas of responsibility that are tailored to their goals and abilities. In 2011, they hired two interns who live on the farm. This extra help allows them to explore new revenue streams and expand their current enterprises further.

Educator's Perspective: Resource Tip

Being an Employer

Small farmers often underestimate the responsibilities involved in being an employer. Although most farmer-employee relationships go well, the rare cases in which an intern or seasonal employee is injured or feels mistreated can cause big problems. For the protection of themselves as well as those they are intending to help through employment, it is strongly recommended that small farmers understand the rules and regulations of hiring. Jennifer Jambor-Delgado with the Farmers' Legal Action Group held a session, called "Know the Law," on this subject at the SFA conference in 2011.

In Their Words: Video Clip [to be inserted]

Intern's Perspective

Matt worked with Cindy and Jeff in 2010. He has a background in horticulture and liked learning about not only the details of Cindy and Jeff's fruit production but also helping with their on-farm research. Matt lives nearby and is experimenting with starting his own orchard on family land. He is especially interested in cider production, because the management focus doesn't have to be on producing aesthetically pleasing apples – just healthy apples that can be used in a variety of value-added products. One of the lessons Matt takes away from the intern experience is seeing firsthand how everyone does things a little differently; he didn't learn this in his textbooks, but when it comes to farming, there is often more than one way to do something and get it right.

Volunteers have always played an important role at Clover Valley Farms. They are especially crucial on poultry processing day, when the right number of people is key to avoiding bottlenecks. Four people is considered the minimum, but six to eight is ideal. With more people to help at the processing table, the initial steps don't get as backed up. [add pull-quote about 8 people making it go more than twice as fast as 4] Cindy and Jeff recruit volunteers from a variety of acquaintances – friends, colleagues, neighbors, and customers. They've found that on-farm processing attracts considerable interest from customers who want to learn more about where their food comes from and who are willing to help in exchange for reduced price or free birds. Cindy and Jeff feel volunteers offer a win-win situation, where they get the quality help they need at peak times and the volunteers get a positive experience plus a break on poultry costs. [refer back to poultry processing regs, re: training requirements etc.?]

Business Structure

Jeff and Cindy initially structured Clover Valley Farms as a sole proprietorship. They incorporated as a Limited Liability Corporation (LLC) in 2010 as a way to protect their personal assets from farm liability (see also Farm Business > Risk Management). They were also motivated by the record keeping requirements that would be reinforced by being an LLC (see also Farm Business > Finances).

[resources about what is involved in becoming an LLC?]

Educator's Perspective: Resource Tip

Business Structures

The decision about whether to incorporate a farm or use another business structure tends to be very specific to each farmer's set of circumstances. Professional advice is highly recommended, but the resources below provide a starting point for understanding the different options.

MSU's Beginning Farmers Web site has a useful post about Farm Incorporation.

The University of Wisconsin Center for Cooperatives has a comprehensive comparison chart of business structure types that is tailored to farming.

Risk Management

As described under Farm Business > Business Structure, risk management was one of the factors that motivated Cindy and Jeff to establish Clover Valley Farms as an LLC. Other aspects of their farming approach that they feel reduce their risks include selling to friends and acquaintances and having a small-scale, simple infrastructure (which means losses, such as those due to severe weather, would be relatively minor).

They anticipate that Jeff will keep his job (if or when Cindy moves to working full-time on the farm) in part to maintain their health insurance, though he finds his off-farm work rewarding and would be staying for other reasons as

well. Cindy and Jeff do not carry commercial liability insurance; they have found the cost to be prohibitive for poultry.

[resources for liability insurance? other risk management planning?]

Finances

To cover start-up and capital costs, Cindy and Jeff have generally invested personal funds. They did take out an AgStar loan to help with the purchase of their mobile poultry processing unit.

Jeff and Cindy also provided the initial capital required when forming the LLC in 2010, to cover expected costs through the first year in combination with projected income. Their 2010 Balance Sheet (Appendix IV) shows their Total Assets and Total Liabilities and Equity as $20,941.72.

Although Cindy and Jeff have started seeing profitability in certain enterprises (see Production > Yields & Profitability, and keep in mind that those calculations do not account for labor costs), the business as a whole is not yet profitable. Clover Valley Farms' Profit and Loss Statement from 2010 (Appendix V) shows Ordinary Income of $8,244.93 and Other Income of $7,867.00, for a total income of just over $16,000. With their Cost of Goods Sold ($9,795.00) and other Expenses ($11,640.24), their net income in 2010 was -$5,323.31. [address discrepancies with tables in Production section]

Educator's Perspective: Resource Tip

Managing Farm Finances

The Center for Farm Financial Management (CFFM) at the University of Minnesota provides educational programs and software tools, such as Interpreting Financial Statements and Measures, an online video workshop that helps producers understand and use the 4 major financial statements and the 21 financial measures recommended by the Farm Financial Standards Council.

CFFM works with other groups to manage FINBIN, a farm financial database that provides benchmark financial information to farm producers, educators, lenders, and other agricultural professionals.

Use the USDA Service Center Locator to find a local office with information on FSA loans.

Cindy and Jeff don't consider themselves very "tech-savvy" but have become fans of QuickBooks software, which helps them streamline their accounting.

Jeff and Cindy's off-farm income has allowed them to invest in the farm business and grow gradually while working part-time on the farm. Although they are anxious to realize a profit (and one that includes labor costs, to be true to their vision {see Assessing & Planning > Business Planning], they have preferred to follow a gradual growth model and avoid significant debt.

Professional Development

Jeff and Cindy's current professional memberships include SFA's Lake Superior Chapter, Land Stewardship Project, and the American Pastured Poultry Producers Association. Cindy has several memberships that stem from her off-farm career but that also relate to the farming business (the Minnesota Academy of Science, the Minnesota and North American Associations of Environmental Education, and the Ecological Society of America), especially given the level of research and outreach with which their farm is involved.

As described under Assessing & Planning > Getting Started and Business Planning, Cindy and Jeff used a Farm Beginnings program and a mentoring program to strengthen their knowledge base. In addition to the planning tools they acquired from Farm Beginnings, an important insight gleaned from the wide range of speaker experiences was where they fit into the realm of financial situations. Cindy and Jeff also regularly attend conferences, such as the MOSES Organic Farming Conference, the Minnesota Organic Conference and Trade Show, and workshops held by other organizations such as SFA, the Organic Tree Fruit Association, and the University of Wisconsin Center for Integrated Agricultural Systems. They credit many of their "lessons learned" to conference attendance, such as adding carbon to their chicken compost to keep the ammonia down, or feeding broilers at night (when they need energy for warmth) instead of in the morning.

Farmer's Perspective: On The Bookshelf

In addition to reading the newsletters published by various groups to which they belong, Cindy and Jeff stay up to date with resources, events, and methods through two electronic mailing lists: MISA's Sustag listserve and the University of Minnesota's Poultry listserve.

Jeff and Cindy devote considerable time to networking and to creating synergies between the farm and their off-farm careers. Their contacts have played various roles in their farming efforts, such as encouraging them to try raising hogs, inspiring the design for their custom-made cider press, or providing feedback on use of the mobile poultry processing unit so Jeff and Cindy could develop a manual and a rental protocol. Jeff works with the school district's food-to-farm program and provides farm tours for school groups. Cindy is on the steering committee for a Seeds of Success Urban Agriculture program with Community Action Duluth to help develop a fruit gleaning project and a USDA proposal for a community food systems project (see also Production > Harvest & Processing > Apples & Other Fruits). She also serves as Orchard Manager for the University of Minnesota – Duluth Sustainable Agriculture Project.

Conclusion

Cindy and Jeff are five years into poultry sales, which marked their formal entry into farming as a business. They've been on the path for much longer, however, and are excited to be realizing their vision statement (see Assessing & Planning > Business Planning). As Jeff likes to say, "It's about progress, not perfection – and we're making progress!" They are on the way to showing profitability with poultry sales, they are pleased with how they've been managing communications and minimizing stress, and they are definitely seeing results in the health of the environment on their farm.

Ideas for the future include adding a commercial kitchen. They would be able to rent one in a church in Duluth first at very low cost to start evaluating the logistics and profitability of value-added fruit products (such as applesauce, jams, and jellies). They're also always thinking about adding different plants and animals to their collection. They like exploring different fruit tree varieties and grafting options. They would like to explore expansion of different aspects of production for animals they already raise (such as breeding their own laying flock, as described under Production > Production Methods > Poultry, or farrowing hogs). Customers ask for other products such as beef and lamb, which may have good income potential down the road but which need more of a year-round time commitment, thus requiring at least one of them to have a different balance with off-farm work.

Jeff and Cindy have learned their share of lessons and now hope that their experience offers tips or useful models to other beginning farmers. Jeff's "favorite mistake" was the day the pigs got out; he describes how they ran and ran through the fields and woods, looking so happy (he even swears they were giggling)! (His initial concern subsided when they steered clear of the road.) When they were done playing about 30 minutes later, they simply came back to their pen. On a more serious level, Cindy learned that when the books say, "Site selection is the most important part of any orchard" – they're not kidding! And they both felt that raising Red Broilers in 2010 was an important example of how adjustments to their production system will be an ongoing challenge (see Production > Harvest & Processing). Whether it's establishing a now-thriving orchard or watching broiler productivity improve, they both look forward to further improvement on all fronts.