

SUMMER 2014

SMALL FARM QUARTERLY

Good Living and Good Farming – Connecting People, Land, and Communities



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SEED STORIES

Cultivating the Heirlooms of Tomorrow

Whether you plant seeds or not!

by Petra Page-Mann

Do you breed new vegetable varieties? Do you save seed? Do you wear clothes and eat food?

If you answered 'yes' to any of these questions, you impact our food system at the seed level profoundly. Every day we make decisions that influence what seeds will — and will not — be sown by future generations.

Few people are plant breeders by profession. But if you've saved seed, you are a plant breeder: decisions you've made (consciously and sub-consciously) have changed the seeds available 10, 100 and 10,000 years from now. And every time you buy clothes and eat food you are influencing the decisions of professional seed breeders who determine what seeds are being planted around the world.

Like a seed, you have more power to change the world than perhaps you'll ever know.

How do heirlooms matter? There are many definitions of an 'heirloom' variety; I think of an heirloom as a plant whose seeds have been saved in a general region for more than 40 years. Heirlooms have become popular for many reasons and have much to offer us: phenomenal flavor, regional adaptation and cultural acuity. Recently bred varieties tend to focus on productivity and transportability, often leaving flavor out of the equation. So of course we are turning to heirlooms for flavor and connection to our seed heritage.

But consider: each 'heirloom' variety originally began as a brand new variety. Only after generations of people selecting, saving and sharing these seeds did they become the beloved heirlooms of today. Selected well over generations, these varieties will continue to become more delicious and resilient for future generations.

Who is selecting our heirlooms to be more delicious, more resilient? You can.

Who is breeding the new varieties that our Grandchildren will know as 'heirloom'? You can.

Our modern food crops were developed originally by amateurs, by grandparents and their grandparents before them for thousands of years. Professional seed breeders have only been around for a fraction of the time we've been saving seeds as a species. Though modern professional plant breeders are often highly educated, don't underestimate the significance of your observation and selection in your garden.

You can select heirlooms to be more delicious and more resilient; simply choose which plants' seeds you'll save on a basis of simple observation. Do some tomatoes not get blight? Save those. Do some heads of lettuce bolt after most of the others? Save those. Do some winter squash keep longer than others? Save those. It's all a matter of personal preference and genetic diversity offers us the range of possibilities. Only our imaginations are the limit.



Every heirloom begins as a new introduction; "Gardener's Sweetheart" Cherry Tomato has just been developed and future generations will know it as an heirloom.

Photo by Petra Page-Mann

heirlooms more delicious, productive and resilient than ever.

You can breed the new varieties that your grandchildren will know as heirloom. "If you're already saving seeds," writes Carol Deppe in her book *Breed Your Own Vegetable Varieties*, "you're just a few short steps away from deliberately breeding plants. Why limit yourself to preserving the achievements of the amateurs of the past?"

See Cultivating page 3



This "Red Russian" Kale has been selected for countless generations and will continue to be selected for countless to come. What qualities would you select kale for now that future generations will thank you for?

Photo by Petra Page-Mann

For example, Caroline Hunt and her family have been saving Amish Butter Popcorn for just over a decade. "You'll be surprised how quickly you can work with a population and see measurable change," she notes. At Italy Hill Farm in the Finger Lakes of New York, Caroline selects for excellent popping, long conical ears with a small butt (easier to shell), drought tolerance and corn earworm resistance. Over the years, her seed has dramatically improved and as these qualities have stabilized, further refinements are made. It is a testament to the power of observation, selection, dedication and vision of amateur seed savers who are making



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Cornell Small Farms Program Update

Winter and Spring was a busy season of hosting some excellent webinar presentations! Now that you are all out in your fields and gardens, we don't expect that you'll be tuning in to our webinar archive any time soon, but should you be resting indoors to escape the hottest part of the afternoon, we've listed some archived presentations below with links.

Valuing Time and Muscle - Working with Beginning Farmers in Labor Record Keeping

Chris Blanchard, farmer, consultant, and educator, explored ways to track and calculate labor inputs that translate into meaning-

ful records. This training focused on what activities to monitor, if and how to extrapolate from a snapshot, when to lump activities together or get picky, and what forms and formats may work better or worse. If you missed this webinar, you can access the archived version by visiting www.nebeginningfarmers.org and clicking on Trainer's Toolbox.

Diversifying Beyond Direct - Supporting Beginning Farmers in Exploring Wholesale

Participants learned through the experience of Deep Root Cooperative and their work with organic vegetable farmers in the



Four Winds Farm's earth cooled barn with attached greenhouse was one of several designs featured in the sustainable farm energy webinar series.

Message from the Editor

It happens every year, and always surprises me. Last summer, just after the first long, soaking rain of summer, I walked out to the garden to see a carpet of slugs feasting on a tattered array of succulent green stems that were once peppers, basil and hearty greens. I went straight to the local farm supply store to purchase another round of starts and added a large bag of organic slug killer to my cart. A little sun and the slug killer worked wonders and the new plants were soon looking delicious and hearty enough that they attracted a midnight visit from some local deer who browsed them to the ground. I half-heartedly replanted, mostly surrendering to the fact that I was likely sticking charitable snacks in the ground for an infinite number of hungry fauna patrolling the great backyard.

Several months later, despite the stresses of weather and herbivory, I bent down to see modest fruits forming on most of the garden veggies. The resilience and abundance of nature always surprises me. I know I'm not the only one whose fruits and vegetables are suffering early heat or late frosts, drought or excessive rains, and damage from any number of creatures with wings and legs and hoofs. And yet, as the days grow shorter, the farm stands and stalls grow fuller with bountiful displays of the harvest. It certainly is hard work to tend a farm or garden, but we can be thankful that nature does a miraculous job with its part.

During this busiest time of the year, don't forget to find a shady spot, rest your head, and be amazed by nature's work!

Best wishes,

Violet
Managing Editor



Violet Stone

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Northeast. The webinar discussed the nature of wholesale relationships, terms of pricing and payment, and expectations for quality and packaging. Exploring the structure of wholesale markets will help educators design outreach and education programs that prepare beginning farmers to consider these channels as their enterprises grow. You can access this archived webinar by visiting www.nebeginningfarmers.org and clicking on Trainer's Toolbox.

Sustainable Farm Energy Series Focused on Solar, Geothermal, Biodiesel & More

Are you looking to stabilize rising fuel and energy costs on your farm or homestead?

Are you seeking more sustainable sources of energy? In this four-part webinar series hosted by the Small Farms Program in April with support from NE SARE, participants learned from an organic vegetable farmer, grape grower & winemaker, sunflower & biodiesel producer, and pastured livestock farmer who led virtual tours of their sustainable farm energy systems and ecological production techniques. If you missed any of these, the archived webinars are free and open to the public. To view the archived version of the webinar, visit <http://smallfarms.cornell.edu/resources/farm-energy/>

Cultivating from page 2

They didn't. You can both preserve the fine old heirloom varieties and use them to create new varieties of your own."

For example, Will Bonsall has long stewarded and bred phenomenal varieties of all kinds of plants on his homestead in Maine. Several years ago he crossed two heirloom tomatoes, Gardener's Delight (cherry) and Royal Chico (paste), discovering a gem in the progeny: vigorous plants covered in bright red, heart-shaped tomatoes, early to fruit and delectable as they were endearing. After five seasons of selection, "Gardener's Sweetheart" was just introduced in 2014. A new variety, by the time our children's children have their children, Gardener's Sweetheart will be a beloved heirloom alongside any classic heirloom tomato we now know and love.

In addition to our access the the widest selection of genetic diversity in history, we also have immense resources at our fingertips to both save and breed new varieties of seed. Two fantastic books on seed saving are *The Organic Seed Grower* by John Navazio and *Seed to Seed* by Suzanne Ashworth. If you're interested in seed breeding, I recommend exploring *Breeding your own Vegetable Varieties* by Carol Deppe as well as *Breeding Organic Vegetables: A Step by Step Guide for Growers* by Rowen White and Bryan Connolly.

Every day we make decisions that influence what seeds will — and will not — be sown by

future generations. Heirloom varieties are ours to select, save, share and improve, season after season. Each seed has the potential to change the world — and so do you.

Petra Page-Mann improves the heirlooms of yesterday and cultivates the heirlooms of tomorrow every day at Fruition Seeds, customizing organic seed to thrive in the Northeast. She can be reached at petra@fruitionseeds.com or 585-300-0699. She'd love to hear about your seed saving and breeding projects and help in any way she can!



The heirloom "Amish Butter" Popcorn has been greatly improved after a decade of vigilant selection.

Photo by Matthew Goldfarb

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SMALL FARM QUARTERLY

Good Farming and Good Living —
Connecting People, Land, and Communities

Small Farm Quarterly is for farmers and farm families — including spouses and children - who value the quality of life that smaller farms provide.

OUR GOALS ARE TO:

- Celebrate the Northeast region's smaller farms;
- Inspire and inform farm families and their supporters;
- Help farmers share expertise and opinions with each other;
- Increase awareness of the benefits that small farms contribute to society and the environment;
- Share important research, extension, and other resources.

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NEW AND BEGINNING FARMERS**Greasing the Farm Wheels: Tips From a Former First-Year Farmer**

The day-to-days of farm life are decorated with strings of lessons, just waiting to be pulled to see the mystery that lies on the other end.

by Alicia Anderson

To me, farming is about leaving the security of the 9-5 structure, the comfort of specialized tasks, completed over and over again, to push limits, to put to use all information ever learned in order to try and understand the best way to work with the land. New challenges arise daily, presenting opportunities to craftily figure out a way to overcome, a renewal of the life of ancestors where work and gratification went hand-in-hand.

I didn't grow up on a farm. I grew up in an old General Motors manufacturing city in Michigan. I was the kid who changed what they wanted to be every other week, which was consistent through grad school comple-

tion. An internship in Northeastern Pennsylvania drastically altered my worldview and kept me at that same farm for another season, then, running my own operation through a land-lease in the same county this past year.

It was incredible; the freedom that it presented for expression through work while learning from many fields of thought, which enabled a deeper relationship with the land and people. It was a moment-to-moment journey requiring self-application, pulling from where I'd been in order to move forward. The result: beautiful vegetables to share with new and old friends and a wheelbarrow full of lessons to help guide in the future.

My business background prior to farming kept me open minded to comparing the suit-and-heel structures with the overalls-and-barefoot ones. This brought to mind the similarity of a corporation's needs with those of a small farm, with corporate back-of-the-house operations placing emphasis on having the right thing, at the right time, and at the right place. This mantra, along with continual improvement and flexibility leads the way to ensuring supply meets demand. The processes in their operations can be applied and put to good use on a small scale, where seeds, soil, and labor all need to connect.

A procedure that I uphold highly is that of regular review. It ensures that self-reflection occurs on a regular basis. Keeping up with the fast pace of nature in the spring and summer months can set-in place a forward thinking mindset where the time isn't taken to truly learn from past decisions. Having scheduled review, at least once a year, can keep a truthful and holistic understanding of the operation's current state. An exercise to help includes writing out on paper where you are, including the strengths and weaknesses of the different functions of your operation. This can lead into where you want to improve, broken down in different areas, and simple improvement steps that can be taken each day.

Farm life is laced with fast decision-making: whether to plant before the rain since it's forecasted to continue for the next week, to transplant a week later or to follow the biodynamic calendar, or even how you will start your seedlings. All of these questions need to be answered by you, working in an overarching direction towards your goal. It helps to have what you're working towards viewable every day. Fortune 500 companies do this by displaying their mission statement and objectives. There is power in being reminded every day the reasons behind what you are doing. That top of mind awareness can ease the stress of quick adjustments in routines, staying firm in the roots of the farm.

Then there's the matter of balance. Long nights and early mornings in the late spring and summer, plus a continually refreshing list of to-do's that, even if you never took a break to sleep, would still multiply, create a combination of juggling and tight rope walking that would make even a senior acrobat do a double-take. This challenge, recognized by a wise woman who was raised in the lifestyle, advised me, "break or be broken". It's so important to take care of your body, to do what you can and then step away, and to ask for help when needed. Your body is your tool, the best one that can be applied to the fields, which requires physical, mental, and emotional health. Working the land offers renewal of all three of these states in return.

After the season and some cold winter nights to review, I've picked out some advice I'd like to offer for those just getting involved, a few tools to ease stress plus general tips.



The beginning of the seed starting operation

Some Toolbox Essentials

The Wave accounting app is great. Their basic free service makes it easy to track the money coming in and leaving your operation. You can create invoices from a standard template and send professional looking receipts through email.

Johnny's seed starting date calendar, available on their website in the Interactive Tools section, gives you a customizable spreadsheet. You can put your last frost date in and it automatically calculates when you should start different seedlings.

Dr. Andrew Weil's 4-7-8 breathing technique, it's a way, through deep breathing, to calm your nervous system. Say it's pouring and you didn't get the carrots directed seeded, 4-7-8, you'll figure out a way to make it work.

Some Farming Tips....

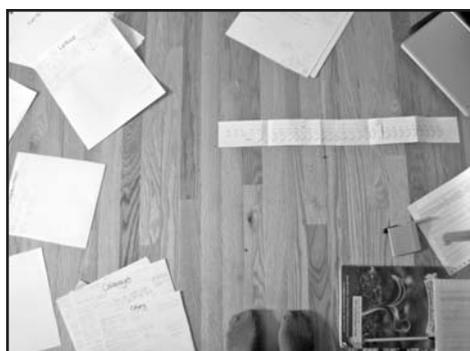
It really helps if you make it as easy as possible to stay organized. This might mean creating a system to separate papers as you pile them up in the "to-be-dealt-with-later" section.

Energy output is also required for hiring help. It's one of the hats to be worn that needs your attention.

Slow growth. Slow growth. Slow growth. I've heard this from so many farmers and only now am starting to get it. You're working towards your goals a little bit everyday.

Through reading this, I hope you were able to grab some information that will help spring your operation forward. This season I'm actually taking a step back. I realized that the farmers that I look up to, the Jerry Brunetti's and the Arden Anderson's, have steadily learned and grown over time. That slow continuous growth presents a pace that is sustainable to achieve life goals, it doesn't all have to happen over night. I'm taking what I learned and applying it on a smaller scale to connect with the soil, the plants, and the people in my community.

Alicia Anderson has an M.B.A. from Eastern Michigan University and ran a 25-person CSA at Journey's End Farm in Sterling, PA. She is now working on community gardening initiatives. Alicia can be contacted at Aander49@gmail.com



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Appreciating the growth together
Photos by Alicia Anderson

FARM TECH**Fishing for a New Way to Farm**

Aquaponics — a combination of hydroponics and aquaculture — is becoming a world-wide phenomenon.

by Edward Duquette

About 8 years ago, my wife, daughter and I made the 2500 mile trek across the United States from our East coast home that's been in our family for almost 100 years, to the great State of Utah. Our new home was located in a rapidly growing community called Eagle Mountain. Growing up in Connecticut, we always had a family garden, green grass, fruit trees, flowers and plenty of water and birds. Our new home was in stark contrast to New England living. We now lived at over 5000 feet above sea level. Green grass was replaced with brown clay - no spontaneously growing trees, flowers, or soft grass, and very few songbirds. The annual rainfall in Utah is 8" per year as compared to Connecticut's 50" per year and we have water shares here. We actually arrived in Utah just as a 5 year drought ended.

It took us several years of relearning how to grow everything utilizing hard water and dealing with 100+ degree summers coupled with very low humidity and high altitude. Now the big killer of this garden party here is the soil. When people living in Eagle Mountain talk about the soil we have to smile because it's mostly clay with a high mineral content. Do you know what happens when water hits clay? Well, it turns to glue. The kind of glue that pulls your shoe off when you step in it. And it doesn't smell like dirt. Due to the high mineral content it has a unique smell. I never thought I would actually miss the smell of dirt.



Commercial green house with Zip Grow vertical growing system

The Stage is Set

I first learned about aquaculture and hydroponics over 20-years ago. I dabbled with it from time to time, but with no serious interest. In Connecticut, growing was not an issue, and 20-years ago, modern aquaculture and hydroponics were still in their infancy and would have been merely a hobby for most people there. When we relocated to our new home in the Rockies, we began to examine alternative growing methods. We wanted to grow vegetables, fruit trees, and flowers. We looked at hydroponics and the possibility of greenhouse growing. Hydroponics would overcome the issue of having poor soil and we could start planting earlier to help with our shorter growing season. Also we have temperature drops of 10-30 degrees at night so a greenhouse could stabilize the temperature of our growing

environment nicely. When looking into aquaculture and hydroponics after all these years, I was impressed with the rate of symbiotic development in the field and the extent of its evolution. These two proven sciences have been transformed into a technology currently known as Aquaponics. Today, this new soil-less, urban garden growing hobby is now one of the most discussed and sought after subjects. It is in the news everywhere, in magazines, local newspapers, and across the internet. There are new business models, products, and techniques being developed weekly. Its growth is exponential WORLDWIDE.

Looking Deeper

Aquaculture is the science of growing fish in a controlled environment; this controlled environment becomes growing tanks, netted ponds or lakes and even the ocean. The problem that arises in commercial production is that heavily controlled stocking densities are the norm, and so the problems of diseases and the use of strong antibiotics and poor filtered water systems help create less than acceptable quality fish as a food source.

Hydroponics is the science of growing vegetables in a soilless medium and using synthetic chemical nutrients to feed the plants. Hydroponics is far from being "organic". So the birth of Aquaponics was quickly heralded as our new super hero. By definition aquaponics is a combination of hydroponics and aquaculture, utilizing the very best of both technologies.

Fish are grown in a controlled healthy environment. Their waste water is processed through vegetable produce beds. The produce is not grown in dirt but in a medium of expanded clay pellets or some other inert material. No pesticides or synthetic chemicals are used. This method gives us the ability to grow much more organically where organic soils or organic farming are not available. The vegetables assimilate the nutrients and filter the waste. The water returns, cleaned

and filtered, back to the fish tank for the fish to thrive. The process uses aerobic and nitrosomonas/ sp and nitrobacter/ sp (autotrophic) bacteria found in the waste water to achieve this effect. This process creates a kind of an organic waste treatment plant, mimicking nature. Aquaponically grown vegetables and fish typically carry a 100% organic classification.

Sweeping the World

Why aren't we using aquaponics as a growing system more you might ask? Well, you would be surprised to find out that we are. Aquaponics is truly sweeping the world right now. There are thousands of aquaponic garden systems in operation, from apartment roof tops in New York City, to large commercial greenhouse systems in Florida. There are large Airports around the world, in

places like the US, China, Japan, and England that are piloting aquaponic gardens within their buildings for travelers to see and enjoy. The food is grown and harvested for use in the restaurants located on the premises. This worldwide growing phenomenon is feeding thousands and may one day help to feed millions of people.

Several years ago, I started buying books and reading everything I could on aquaponics. I fervently watched videos, paid attention to YouTube aquaponic "guru's", and studied internet online courses. A large portion of the information out there is marketing hype, written by people that are trying to take advantage of this current frenzy. Once I realized this, I decided to offer the community what I had learned from reliable reading sources and from my combined experiences in this field.

I began teaching an Aquaponic class at several colleges here in Utah through their extension programs. The response has been tremendous, my classes being filled a month before their start dates. I'm receiving emails from people throughout Utah with DIY systems growing both fish and vegetables for their families. There are even some commercial growers with large greenhouses that are looking to convert over to an aquaponics system. There is some interest from green home builders to add greenhouses with aquaponics systems as part of a new home feature. I'm also working with several software engineer friends to develop smart phone applications so an aquaponics system can be controlled from anywhere.

Moving Forward

Aquaponics can be a very profitable means to a sustainable agricultural business model. Where is aquaponics heading? It's the future! We're seeing the increase in organics products purchased by consumers not just here in the US but worldwide. People understand the relationship between organic food and good health. Aquaponics is one way to supply this need to consumers, and it can quickly become a profitable commercial farm endeavor.

Aquaponics conserves natural resources; we use 70% less water with aquaponics than soil-based systems.



Close up of Zip Grow towers used for vertical growing

The water in the system is re-circulated; a plant's take-up and evaporation are the only use of the water. Vegetable production is conservable 4-6 times more productive than soil based systems and grows between 2-3 times faster. No more weeds, composting, fertilizing, and watering. The systems can be as small or as large as needed. That's the nice thing about aquaponics; it's easily scalable.

There are many articles, books, videos, and chat groups on the subject of Aquaponics. Get your feet wet by starting with a small system, something easily manageable. Look for my next article in Small Farm Quarterly Fall, 2014 for a detailed overview of how to get started and suggested best practices.

Edward Duquette has an engineering background and is currently teaching at several colleges offering aquaponics classes in their extension programs. He also offers consulting services for the aquaponic systems enthusiast and can be contacted by e-mail at eduquetteut@gmail.com.

Additional sources of information on aquaponics:

- aquaponicsusa.com
- backyardaquaponics.com
- futurefoodfarms.com
- [channel.nationalgeographic.com/endless food](http://channel.nationalgeographic.com/endlessfood)
- aquaponicworld.com

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A visit with Chris Simons reveals how crop insurance can protect your farm not only from big disasters, but also from small losses over time

by Elizabeth Burrichter

One young farmer who has benefited from crop insurance is Chris Simons in Oneida County, New York. He began farming on his family's dairy growing up, and has since begun his own grain enterprise. When the dairy transitioned to organic, the Simons decided to begin growing their own grains instead of purchasing organic corn from off the farm. Chris showed an interest in growing field crops, and applied for a first time farmer loan from FSA to get started on his own. His banker recommended crop insurance, so he contacted his local agent to begin the process.

Chris said, "My area in Remsen, NY was devastated last year. From May until mid-June we got 40 inches of rain, and I planted one field three times before it got established because of the rain. If it wasn't for the crop insurance, I would have had to just cut my losses and give up. When all was said and done, it was probably the best investment I've made."

All farms take on the risk of failure due to unexpected weather events and natural disasters, and farmers have an interest in managing their risk in any way possible. They can diversify their farm enterprises or modes of income, and plan for the most resilient cropping systems, but crop insurance is another available layer of protection. Farms can increase their resilience with crop insurance not only in the rare disaster year when there is total yield loss, but also on small losses that occur more frequently.

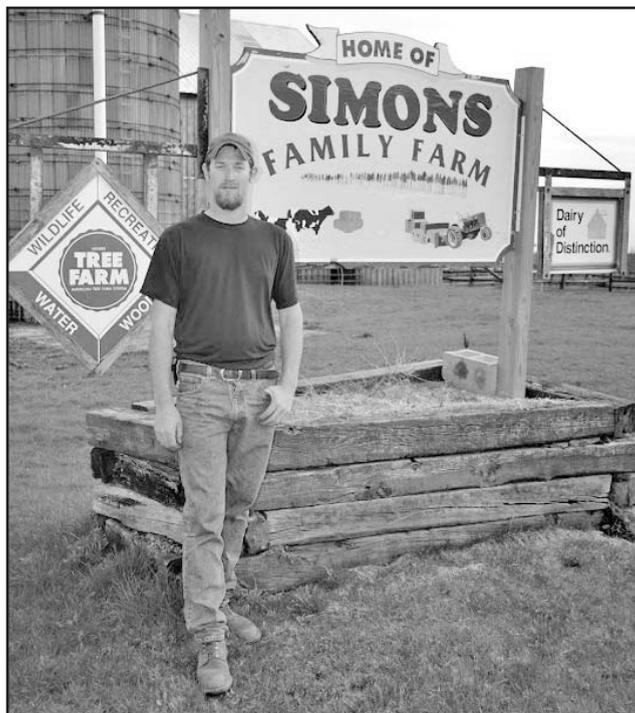


Crop insurance policies are risk management tools that many agricultural producers can purchase from private insurance companies. The Risk Management Agency (RMA), part of the USDA, works with these private insurance agencies to create and subsidize the programs for American farmers. They offer several different types of policies for over 100 crops, including different types of insurance coverage for specific commodities, as well as increased options for organic and transitional acreage.

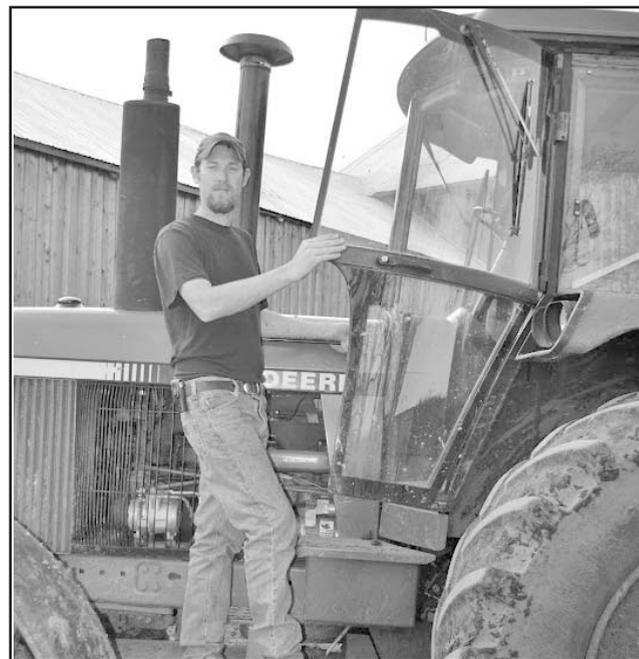
Producers can be protected from yield loss due to natural causes such as drought, excessive moisture, hail, wind, frost, insects, and disease under most policies. The producer selects a percent of a predicted price/yield to insure (50-85%), and if the return on the harvested crop is less than what was insured, then the producer will receive an indemnity payment based on the difference. Other plans insure historical revenues instead of yields, or revenues of the whole farm instead of an individual crop. The producer works with an agent from a private insurance company to decide what policy will work best for their farm. The key to positive outcomes from your insurance is good communication with your agent.

Help for New and Beginning Farmers

The 2014 farm bill has provisions that will help new and



Crop insurance has helped Chris Simon mitigate risks of production loss on his family's organic grain and dairy farm.



The 2014 farm bill has provisions that will help new and beginning farmers purchase crop insurance.

beginning farmers purchase crop insurance and enhance the crop insurance that beginning farmers already have. A beginning farmer will be exempt from paying the \$300 administrative fee for catastrophic coverage policies, and receive premium subsidy assistance for certain coverage policies. When establishing the Actual Production History (APH), beginning farmers can use the county base yields at higher rates than other farmers. Additionally, in certain instances, a beginning farmer may use the production history of another farm operation they were previously involved with for his/her own policy, if their involvement was substantial.

Chris Simons had the advantage of being able to base his policy on the county yield average for organic soybeans, which was 40 bushels/acre. Organic farmers often experience lower yields when they first transition from conventional forms of weed control and fertilization. The opportunity to use conventional yields to create his Actual Production History (APH) increased Simon's chance for indemnity payments. This is likely to change, as there will likely be separate T-yields (transition yields) for organic crops starting in 2015. Organic corn, soy, wheat, and some other vegetables can now be insured at actual organic pricing.

Although there is a lot of paper work, Chris worked with his agent and found the process easier than he expected. For established grain farmers that have track records from past seasons, RMA will take your yield record average from the past three seasons as your APH. From there, you can buy coverage for whatever percentage you and your agent figure will be appropriate for your farm. Chris has more fallow land he plans on cropping and insuring, and his APH will now be based on not only county averages but also his own production history. "As I plan for the future, I will definitely cover my yields with crop insurance."

Elizabeth Burrichter works for Cornell Cooperative Extension of Cortland County as the Program Assistant for the Organic Dairy Initiative. She can be reached by email at eab239@cornell.edu.



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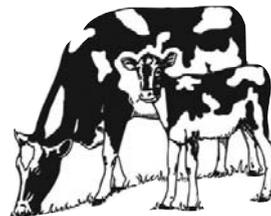
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- For more information about crop insurance in general, visit www.agriculture.ny.gov/AP/CropInsuranceBasics.html

ENERGY ON THE FARM

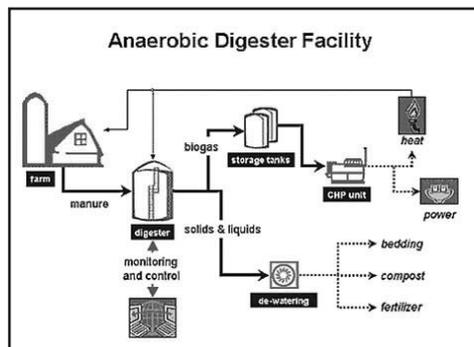
Anaerobic Digesters: Up and Coming for Small Farms?

by Abigail Woughter

Making energy from food waste and reducing the odor of manure with one device might sound like science fiction, but research in engineering technology is making it a possibility with a structure called an anaerobic digester. An anaerobic digester is a gas-tight vessel inside which microbes convert organic matter – manure and food waste, for example – into biogas that can be turned into electrical energy. For small dairy farmers, anaerobic digesters could be the sustainable energy technology to revolutionize manure management while cutting down farm energy expenditures.

What is Anaerobic Digestion?

Anaerobic digestion is a controlled process that takes place in an oxygen-free environment, where microbe species decompose the organic matter in manure, food waste, or plant matter into a nutrient-rich liquid (which is called *effluent*) and a mix of gases called biogas. The resulting liquid effluent can be used as a less odorous soil amendment than manure, while still providing the same nutrients as manure to the soil; the resulting biogas is a mixture of carbon dioxide, methane, and trace gases. The composition of the biogas differs based on the particular microbial species used in the digester, as well as the substrate the microbes are feeding on. Different levels of different gasses would be produced by a dairy farm's anaerobic digester inputting mostly manure than a composting facility's anaerobic digester inputting mostly food waste. The digester, the air-tight vessel that contains the anaerobic digestion process, can be thought of like a concrete rumen that ferments and 'digests' organic matter into a more useful form.



The simplified anaerobic digestion process Photo by Elizabeth Newbold



Construction of a dairy farm's anaerobic digester. Photo by Cornell PRO-DAIRY

Anaerobic Digestion in New York State

There are two types of anaerobic digesters well-suited for small farmers in New York and the Northeast. The first is called a plug-flow system, which is the simpler of the two, and the other is a mixed system. In a plug-flow set-up, there are no moving parts. The digester tank is divided into sections that get filled with manure, always added from the same end. Each addition pushes material through the system, where it eventually comes out on the opposite side as effluent. The plug flow system is relatively inexpensive in terms of equipment, maintenance, and operation, but it is well suited for raw manure only. A mixed system, on the other hand, has moving parts for stirring and mixing influent as it is digested and can process a wider variety of substrates, even plant material, into biogas for electrical energy. A farmer could feed a mixed system with post-harvest plant material or leftover compost, as well as manure and food waste.

The target temperature for anaerobic digestion for most New York State facilities is 100 degrees Fahrenheit, and there are a few ways to achieve this heating. One way is to design the digester tank with a series of stainless steel vessels throughout. Warm water is pumped through the vessels to heat the material in the digester and facilitate the work of the microbes. Other common heating mechanisms include exterior heat exchangers and hot water boilers that heat the material before it enters the mixing compartment of the digester. How efficient a digester is at producing biogas is dependent on the ability of the system to maintain a consistent temperature. In New York, this poses the issue of heating costs in the winter and ventilation costs in the summer.

How long does biogas production take? The anaerobic digester Hydraulic Retention

Time, or HRT, refers to how long the digested material remains in the vessel. For a plug flow system operating at 100 degrees Fahrenheit, the HRT is 21 days. The HRT tends to be lower for mixed systems.

Vernon Hoover, an electrical engineer near Penn Yan, New York, partnered with his neighbor, a dairy farmer with a 60-head herd, to create a unique small-scale anaerobic digester 100% manure-fed. The plug-flow digester is heated by tubing in the floor, or bottom, of the tub-shaped vessel, instead of the walls, and is insulated with Styrofoam-like material. After experiencing some issues with pipes freezing in the winter, Hoover now submerges some pipes in 5-gallon buckets of warm water to prevent such freezing. Insulated water pipes run throughout the inside of the digester to heat the material. The conversion to electrical energy takes place through a modified propane carburetor engine.

It takes 3-4 weeks to fill the digester, then it has a subsequent 23-25 day HRT. Three mechanical agitators in the digester's belly keep the solids from collecting. At the system's peak run-time in 2013, Hoover was able to use the digester to generate 58% of his home's energy usage at 74% run-time of the digester, the anaerobic digester-powered engine averaging production of about 6kW per hour.



Digested liquid fraction for land application. Photo by Cornell PRO-DAIRY

The Future of Anaerobic Digesters: Increasing Efficiency and Cooperative Efforts

Adding food waste to raw manure increases the biogas production of an anaerobic digester, as does adding plant matter. You get 8 times more biogas from a system digesting silage than manure because manure has been stripped of some of its organic matter energy potential by the cow that produced it. Baking wastes, waste grease, food waste, and brewer's grain silage are among the substances whose processing yields some of the highest potential biogas yields. While on-farm co-digestion of manure and food waste together is currently allowed with the proper permits in New York State, human waste processing is not.

How much electrical energy a digester system produces is highly dependent on the efficiency of the system's engine. An electrical generator is the final piece of the anaerobic digester system puzzle, and represents the biggest challenge for small farmers because big generators are more efficient than small ones. Managing the conversion of biogas to electrical energy efficiently on small farms is currently a topic of research at Cornell University's Dairy Environmental Management Program.



Organic matter in manure can be 'digested' by microbes and converted into biogas. Photo by William Cain

Since anaerobic digesters work best on a large scale, one creative solution to this challenge for small farms is an integrated, cooperative model in which one or a few anaerobic digesters could be utilized by a group of small farmers, thus allowing the farmers to pool their capital resources to build a large enough digester that engine generator efficiency would not be an issue. The community energy model has been successfully implemented in parts of Europe, reducing the amount of time it takes to fill the digester and eliminating the need for a small, custom-made electrical generator.

Norman Scott, a Professor Emeritus at Cornell University who has been involved in bioengineering research for several years, has seen the equipment for anaerobic digestion take many forms. In Brazil, farmers constructed a swimming pool-like structure out of slate stone as the digestion vessel. The University of Minnesota bioengineers created digester tubing that contains the microbes and digestate.

Scott is of the mind that creativity is the key to the success of small-scale anaerobic digesters: "One of the things I keep thinking about for small farms is taking something off the shelf, modifying it, and using it: septic tanks, grain bins. Maybe you can even convert an existing silo into a digester!"

There is also a need to draw more public attention to the benefits of anaerobic digesters, particularly for dairy farmers, who could enjoy less odorous manure amendments, decreased energy and bedding costs, all while reducing greenhouse gasses.

"Anaerobic digestion is a scalable technology," Scott assured. "Future opportunities are in the incorporation into integrated energy systems, both small and large."

Abigail Woughter served as Cornell Small Farms Program summer intern in 2013. She is an undergraduate student studying agricultural sciences.

Anaerobic Digesters Resources:

- Cornell Manure Management: www.manuremanagement.cornell.edu/
- USDA Small Farm Anaerobic Digestion White Paper: www.manuremanagement.cornell.edu/Pages/General_Docs/Reports/Small_Farm_AD_report_final_12_11_12.pdf
- Anaerobic Digester Workforce Development Program: www.manuremanagement.cornell.edu/Pages/Funded_Projects/AD_Workforce_Development_Project.html
- Small Business Finance Tools for Anaerobic Digesters: <http://agfinance.dyson.cornell.edu/ad-systems.html>



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LOCAL FOODS AND MARKETING

Small Livestock Farm Reaches Big Markets

Lucki 7 Farms in Rodman, NY

by Rachel Whiteheart



The Winklers sell 35 head of beef per year

With its rich loamy soil, plentiful water, and flat basin land, it's unsurprising that Stephen Winkler and his family settled down in Jefferson County, New York. The Winklers purchased the original 100 acres, house, and barn of what would soon become Lucki 7 Farms in 1997, becoming the third family to farm the land. Their primary predecessor, the Gates family, was well known for their generosity with land and resources and their dedication to employing local farmers. Each



This timeline shows that transitioning to wholesale markets has enabled the Winklers to expand production and increase revenue.

Gates property had beautiful rustic farm-houses, several of which the Winklers have refurbished since purchasing the land.



One of the refurbished Gates family barns

The Winkler family started off from much humbler beginnings than their forebearers. The Winklers began with a single flock of laying hens to sustain the homestead, but in the years to come they would build the foundation for a multi-species livestock farm, adding pigs, chickens, turkeys, and beef cows.

enabled Lucki 7 Farms to start selling to white tablecloth distributors in 2007. Soon after, they expanded their market channels to include direct marketing to retailers. They sold their first livestock to Whole Foods in 2008 and began selling to Wegmans just two years later.

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The farm now sells 800-1000 hogs/year

In 2000, Lucki 7 Farms began selling to neighbors and through local farmers markets, grossing a little over \$20,000 annually. The Winkler family purchased another farm the same year, adding 220 acres to their property and enabling them to keep up with the heightened demand for their products.

Today Lucki 7 Farms is a full-time enterprise that grosses over \$1.5 million. The Winkler family currently owns 320 acres and hopes to purchase another 280 acres, effectively doubling the size of their farm. Annually, the farm now sells 800-1000 hogs, 35 head of beef, 700 meat chickens, and 7000 dozen eggs a year and Stephen now has plans to expand into high tunnels for vegetable production. To accommodate these livestock additions, the Winklers have built 2 sustainable hog farms and a laying farm for hens. The family aims to build their own beef facility in the near future. Although the Winkler family has shifted from using local chop shops to USDA processors for the majority of their meat cutting needs, they still use local feed dealers, local equipment dealers, and even a local trucking service based out of Ithaca, NY called Regional Access. See the sidebar for a full list of Stephen's local expenditures.

Then, in the mid-2000s, Stephen Winkler says consumers began to desire "farm products with a story and closer to their home." The rising demand for locally produced food

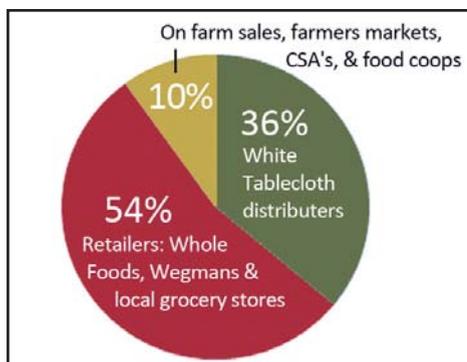
Stephen Winkler would still consider Lucki 7 Farms a small livestock farm because, in his words, "if we use only dollar amounts to define the size of farms it is misleading." Lucki 7 Farms, despite the huge success that it has seen, is still owned and primarily operated by Stephen, his wife Lisa, and their five children. Lucki 7 Farms is a family farm that uses local inputs to feed a regional community which, to Stephen, is what really defines a small farm.

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- NYS Flower Industries
- Farmers' Market Federation of NY



Graph reflects current marketing channel mix

Breakdown of the Winkler's Expenditures

- Feed purchases - \$85,000
- Seed/Fert - \$55,000
- Machinery upgrades - \$36,000
- Building Supplies (new barn) - \$120,000
- Livestock purchases (cows, sows, feeder pigs) - \$210,000
- Hired labor - \$285,000
- Processing - \$73,000
- Trucking - \$54,000

For information on Lucki 7 Farms, visit their website: www.lucki7livestock.com/

Rachel Whiteheart was a student intern with the Cornell Small Farms Program from 2012 - 2014. She recently graduated with an environmental engineering degree.



Dinner time for chickens

LOCAL FOODS AND MARKETING

A Spirited Discussion with Hudson Valley Distillers

Longtime friends Chris Moyer and Tom Yozzo open Hudson Valley distillery featuring spirits made with local ingredients.

by Stephen E. Hadcock

This Spring, I visited with Tom and Jen Yozzo and Chris Moyer of Hudson Valley Distillers — the newest distillery to open in the Hudson Valley region of New York State. The tasting room doors of Hudson Valley Distillers opened for business in March, 2014, but much work had taken place prior to the successful public launch of the company.

From Dreams to Brick and Mortar

The process to start the distillery was a long one. Tom and Chris had talked about partnering on various business ventures for many years. Once they agreed to pursue the idea of starting a distillery, they began the research to learn what is entailed to operate a farm distillery. The two families searched a fairly large geographic area looking for a good place to start the business. The Hudson Valley ranked near the top because of all the states and locations they were interested in, they felt there was “room to grow” in New York State. In their estimation, competition is higher in some other states, since those states have a more developed locally produced spirits and alcohol business.

The two families settled upon purchasing a farm consisting of almost 12 acres in Clermont, NY. They already had in mind the mix of spirits they would like to produce and sell, and this property met their needs. One of the products they intended to produce

(and have started selling) is vodka made from apples. One of the appealing features of the property they purchased was that there was already an established orchard of approximately 4 1/2 acres there. The orchard had been let go, but Tom and Chris have been working slowly to do what is needed to bring the orchard back.

Although not subscribing completely to the concept of terroir, the parties involved do take very seriously either growing as much of the raw ingredients to make spirits themselves or purchasing them from local sources. Tom used the term “dirt to glass” as the philosophy he has in producing the spirits the distillery makes and sells. The apple orchard is one example of this, but Tom stated that this summer they are going to be growing heritage corn in another section of the property to use in making whiskey. They are planning to use the greenhouses already located on the property to grow sugar cane in order to make rum. The greenhouses will also be used to grow botanicals



Eleven acre farm in Clermont, NY

needed for producing gin and other spirits. The partners even want to obtain barrels made from New York white oak. It is currently difficult to source barrels crafted in New York, so right now, they are sourcing barrels from the Midwest.

One of the limiting ingredients for them is barley. Right now, malting barley is in short supply in the Hudson Valley. However, the potential to produce the right type of barley here is promising. Cornell Cooperative Extension and other organizations are exploring how to successfully grow malting barley once again in New York State. The other constraint is a facility to malt barley and other grains. These facilities are called “malting houses” and are rare in New York State. However, other entrepreneurs are interested in investing and starting malting houses. Therefore, it is hoped in the next few years more malting grains will be available as an ingredient for beer and spirits.

Chris and Tom mentioned it is not easy to start a distillery in New York State. A farm distillery is a capital intensive business. Not only do you need land and buildings for a farm, but also need all of the capital items (still, wooden barrels, fermenting tanks, supplies, etc.) for making the spirits. All of this equipment needs to be in place prior to applying for the necessary permits and licenses from New York State and the federal government. Significant investments have been made to develop the business over 1



Thomas Yozzo and Chris Moyer met in 1990 as fraternity brothers at Bloomsburg University

Photo by Dave Ashby

1/2 years without any income. They have developed a plan to start and grow the business. To start with, their distillery is smaller than some others. They sized the business to what they felt they could successfully invest in and not become too heavily leveraged.

One word of advice that the partners have

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Chris and Katie Cashen
of the Farm at Miller's Crossing

CSA Experiences Growth in Challenging Economy

What started as just a three-acre CSA in Hudson, N.Y., has grown to 300 acres over the past decade, including 50 acres of veggies rotated with small grains and forage on 100 acres and 200 acres of pasture and hay. Chris and Katie Cashen, owners of the Farm at Miller's Crossing, have expanded their business to include CSA summer and winter shares. Their products are being shipped as far as New York City markets — and they're still growing.

A small-business success story? Indeed. However, the impressive trajectory of the Cashen's business hasn't happened by chance. Early on, Chris and Katie built a strong relationship with Farm Credit East that has served them well during years of growth.

Initially, the Cashens worked with Farm Credit East for tax preparation, but as the need to invest in their business became obvious, their relationship expanded to include lending services. "When we need to spend money up front to make more money later, Farm Credit East has been able to lend us what we need to stay an efficient operation," said Chris.

Despite their consistent growth, the Cashens face many challenges specific to the cycles of a CSA. "In the spring, our CSA payments haven't come in yet, so we rely on our line of credit with Farm Credit East to see us through," said Chris. "They understand the risk and seasonality of our business better than other lenders do — and when you factor in their competitive rates it makes for a great long-term relationship for us."



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for those who are considering starting a distillery is that unexpected issues will arise. As with many value added agricultural businesses, there is a variety of machinery that is needed to process spirits. The most important piece of machinery is the still. Once installed, there have been "glitches" in proper operation of the still and other machinery. The glitches have been mostly resolved but Chris and Tom continue to proceed with production.

To better appreciate what is entailed in producing a spirit, here is a brief overview of the process. One key component of making spirits or any other alcoholic product is yeast. A critical nutrient that yeast need to grow is sugar or starch. A wide variety of different agricultural products can be used to provide starch and sugar for the yeast. If grains are used, some types of grain are allowed to sprout and then dried. This is the malting process. Whole malted grains, or other food products for the yeast, are added to a tub along with water. The mixture is heated to release the sugars and starches and the grains are removed. Yeast is added to the mixture and the magic begins. Two byproducts produced from the yeast eating and growing in this liquid are carbon dioxide and alcohol. Once the process is completed, the fermented liquid is transferred to a kettle and is heated. Since the boiling point of alcohol is different than water, a distillation process (still) is used to capture the alcohol. Depending on what spirit is made, it may be distilled actually several times to obtain the desired qualities. Tom mentions that this is where the art of making a spirit comes in. It is knowing when the good part of the distillation process starts and how much of it to capture. Aged spirits are then placed in oak barrels and aged until ready for sale. Tom emphasizes it takes a trained pallet to recognize when a spirit is ready and can be bottled.

All involved in the distillery have given thought to their marketing plan. The partners are relying on social and print media to let consumers know about the business. Chris and Tom have joined the Hudson Berkshire Beverage Trail and are also pro-



The (almost) Finished Product.

moting the business by participating in festivals. The partners continue to look for new marketing opportunities. Tom and Chris acknowledge that they and their wives bring a variety of skill sets that will help the business be successful. Tom has produced his own wine and beer and is focusing on the production of the spirit. Chris has talent and experience in financial and business management. They are not only focused on establishing the business but are also thinking strategically on how to grow the business. Plans are already in place to use larger barrels for aging and possibly upgrading the still.

With careful planning the right mix of products and good marketing, the future looks bright for these two longtime friends in the Hudson Valley to produce and sell a variety spirits produced from locally grown crops.

Stephen Hadcock is a Senior Resource Educator with Cornell Cooperative Extension Capital Area Agricultural and Horticultural Program. He can be reached at 518-380-1497 or seh11@cornell.edu



A complete picture of the still at Hudson Valley Distillers. The still separates the alcohol from water and other components in the fermented product.



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For those interested in learning more about what it takes to establish a farm distillery, brewery or winery in NYS, here is information from NYS: <http://esd.ny.gov/NYSBeverageBiz/faq.html>

To learn more about Hudson Valley Distillers, visit their website at www.hudsonvalleydistillers.com

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Investigating the Profitability of the Paper Pot Transplanter on a Small Scale Vegetable Farm

by Liz Martin

The spring of 2011 was extremely wet in New York State. Local farmers shared stories of being delayed by five weeks in getting out to prepare the soil for planting. A sense of desperation filled the air - don't try to keep farmer's from their fields when the normally appointed time for planting arrives! The first plantings of many of our early spring crops such as beets, spinach or lettuce got skipped because of the constant rain. As we start to realize the effects of climate change, extreme weather patterns like this are anticipated to become more common. As the rain was falling and falling, we were busily seeding crops into trays in the greenhouse and wishing that we could be planting our early crops in there, as well. General knowledge says that it is not cost effective to fill many trays with those crops and then spend hours transplanting them. If a simple cost effective way could be found to do it, there would be many benefits to starting traditionally direct seeded crops in pots and then planting them out as small plants, rather than as seeds.

Having seen videos of this cool tool called the Japanese paperpot transplanter that puts plants in the ground jaw droppingly fast, we wondered if a tool like that could have saved spring 2011 for us. We wrote a SARE farmer grant to study if the paper pot transplanter (lets call it the PPT, for brevity's sake) could be a profitable way to transplant traditionally direct seeded crops while also mitigating

the risks of wet weather that makes working the soil impossible. We anticipated that there also could be a reduction in labor and cultivation associated with these crops as the transplanted seedlings will have a head start on the weeds. As an added bonus, the PPT is used standing up, so wear and tear could be reduced on the transplanter's body.

Who We Are

Muddy Fingers Farm is a two-person small-scale vegetable farm. The farmers are Liz Martin and Matthew Glenn. We raise over 100 different varieties of vegetables on our 3 acre farm. We focus on fertility by creating

a healthy soil ecosystem through crop rotation, cover cropping, the use of compost, and a reduced tillage system that uses permanent growing beds and permanent sod paths between them. While we are not certi-

fied organic, we do not use any herbicides. On the rare occasion when we have needed to use a pesticide, we only use products approved for use by certified organic growers. All of this helps us to grow healthy,



Poorly planted greens that did not "seat" well into the soil



Well planted lettuce mix, properly seated into the soil, spacing of six inches



Germination of PPT trays rear with perlite covering, front with potting mix

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vibrant crops. Produce is marketed through an 80 member Community Supported Agriculture (CSA) program, three weekly farmers' markets and sales to fine local restaurants. 2014 will be our twelfth season growing vegetables. We are glad that our small farm provides full time employment for both of us.

Our farm is well suited to doing research on the profitability of different cropping methods because we have spent the last four seasons tracking the relative profitability of our forty-some crops. We have developed an efficient system for recording labor and harvest data for separate crops and analyzing that data when we have time in the fall and winter. (Our record keeping system was covered in an article in *Growing for Market* in February 2011.)

How did the study work?

Our farm is small and land-limited, so we carefully consider which crops will return us a certain minimum amount per bed of growing space (\$400 per 100 foot bed) while also balancing a diverse crop base to satisfy our CSA members. In our studies of crop profitability, we have noticed a trend that crops that are direct-seeded tend to take more labor to keep them weed free than transplanted crops, and thus direct-seeded crops on average have been less profitable for us than crops that we transplant. (Because of this, we try to transplant as many crops as possible and we hoped the PPT would allow us to expand our transplantable crop list.)

We regularly direct seed 12 crops on our farm: beets, carrots, cilantro, radishes, turnips, lettuce mix, parsnips, arugula, spicy greens mix, spinach, rutabagas, and beans. We transplant head lettuce, but we thought it would be a candidate for use with the paper pot transplanter. The paper pots come in linked chains at 2, 4, or 6 inch spacing which makes them suited only for fairly closely spaced crops. Head lettuce is normally transplanted at one foot spacing, but for the study we used the PPT 6 inch spacing. Our plan was to harvest every other one as small heads.

For ease of record-keeping, we chose 5 crops that were representative of the types of direct-seeded crops based on the spacing and harvest patterns. They were: beets, spinach, lettuce heads, lettuce mix, and beans. Because the majority of farms are not already transplanting beets, spinach and other greens using the PPT for them is actually creating more work - the PPT must give some big advantages to earn its keep.

One flaw in our study is that we did not study the profitability of onions, scallions or leeks with the PPT. These are the vegetables most commonly associated with the PPT as people are already transplanting them at a close spacing, so the PPT could reduce transplanting labor on these. We have found that we are not good at tractor cultivation on our farm, and therefore use a lot of mulch (hay, weed mat, and biodegradable). In trying to avoid growing on bare soil, we found a method of growing alliums - transplanted into weed mat, that gets reused- that has worked very well for us. Hand weeding is needed once or twice just in the holes around the onions. Since we are very happy with this method, we did not include any alliums as study crops.

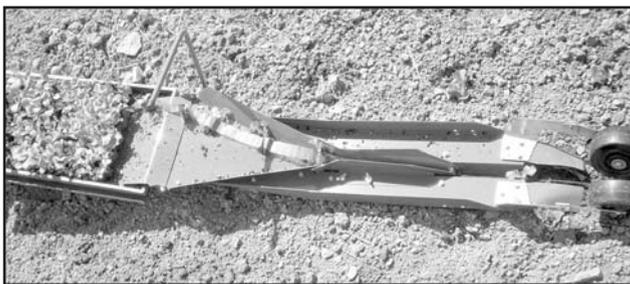
We chose not to do any tap rooted crops such as parsnips, carrots and daikon radishes which have been reported to be unsaleable as they have too many forked roots as a result of being started in the small paper pots. Cilantro was also not chosen, as it resents being transplanted, and so is not a good candidate.

We did three planting times for each crop that we studied. With the exception of head lettuce which we already transplant, for each planting we compared the direct seeded bed to PPT bed. We recorded how much we earned and how much time spent on producing each crop. In the first planting of the year, we also compared earliness - would the PPT allow for earlier harvest?

How did the PPT do at giving earlier spring harvests?

By transplanting 2-3 week old plants as soon as the ground can be worked could we harvest earlier in the spring?

The only problem with this is that we are still guessing when it is 2-3 weeks before the ground can be worked! This seems like it would be the biggest help in a late, wet spring,



Transplanter in use

because it would allow seeds to be started even while the ground is wet. Then 2-3 week old plants will be ready to be transplanted when the soil dries.

Neither 2012 or 2013 was a wet spring. In fact 2012 was an extremely early, dry spring, with plants going in the ground 5 weeks earlier than we might have expected! It was hard to realize that we needed to start our earliest plants, because it is not a time we normally would be getting ready for field work!

The results from these two springs showed beans were one week earlier, but due to the plants lacking vigor, we did get less yield overall. (We have had excellent success transplanting our first beans from 50s.)

Spinach was also earlier - 1 week earlier the first year and 12 days earlier the second year. Beets were not earlier in these two trial years, though in 2012, due to not being soothsayers, we did not start plants early enough to beat the outside planting window which was extremely early! And in 2013 the earliest planting failed to germinate well and was unusable. We believe earlier harvests should be attainable with the PPT, especially in a wet spring.

Lettuce heads were not earlier, as both were transplanted. Lettuce mix was not earlier, but we strongly suspect it could be! The earliest plantings both years failed, showing how dicey it can be to get early plantings just right! One year the trays didn't germinate; one year the direct seeded comparison bed was lost to weeds, but looked like it would have been ready several days later.

On the side, we tried several other crops with the PPT. While records were not kept for the trial for these crops, we had good success with the following: Parsley, Spicy Greens mix, Arugula, Chard (harvested for baby leaves), Rutabagas, and Mustard Greens.

This study showed that despite the initial cost of the PPT and the on going cost of buying paper pots each year, it is possible that on certain small farms the PPT would be a worthwhile tool. Farms that could exploit the PPT best are businesses that grow lots of cut and come again greens, have finely textured, non-rocky soil, grow greens in hoop-houses, and/or already transplant beets, spinach, lettuce mix or other greens.

Drawbacks to the PPT

Consider carefully before deciding to buy one. Here are

some that we found problematic.

- Soil conditions are key. The PPT does not work well in rocky or "trashy" soil. Soil must be well prepared, dry, with no "trash" and minimal rocks. This was our biggest problem!
- We found in-row cultivation to be impossible due to the close spacing and the paper chains between the plants.
- There are small bits of paper left in the field which take a while to decompose.
- If trays germinate poorly, there is money wasted. Trays cost between \$2.40-\$3.80 each; losing a ten tray planting is a loss of \$24-\$38. Excellent potting mix is essential. The trays take up valuable greenhouse space in the spring.
- Because good quality potting mix is needed, either time to mix or money to buy is needed to have a good supply of finely screened potting mix.
- There can be a re-establishment period for after transplanting with the PPT. Direct-seeded crops may actually grow faster, depending on the weather, since they do not experience a transplant set back.
- PPT trays are not a standard 10x20 size. They are a standard rice tray size (12 by 24 inches) so greenhouse tables must be sized to fit a true two foot tray.
- The PPT does not work well when plants are overgrown in the cells, and roots are growing together at the bottom of the tray. Also if plants are too top-heavy (bean plants were too tall and tipped over as they were planted), they do not plant out nicely with the PPT. After about 3 weeks, paper chains begin to decompose in the trays. The small cell size means that the plants can begin to start to run out of nutrients after a few weeks.
- Another drawback is that there are not many crops on our farm currently that are already being transplanted at 2, 4, or 6 inch spacing. This limits the usefulness of the tool. (Again alliums are the exception and where this tool seems likely to most quickly pay for its keep.)
- In hot, dry weather PPT plants need to be watered every day after transplant until their roots are well established. This is especially true of any plants that are poorly seated in the soil.

Benefits to the PPT

- The ability to get a head start on weeds by cultivating just prior to planting the small plants, not having to stoop or bend to transplant, and ability to closely schedule plantings.

Q&A

Here are the questions we wanted to have answered:

Does the tool pay for itself? It depends on the crops that it is used for, on the growing conditions, and the soil type and cleanliness. In our study, we found its most likely to pay for itself in growing cut and come again greens.

Does it save cultivating/weeding time and labor? If bed is empty for several weeks before planting, it provides more time for stale seed-bedding. It is easier to hoe or tractor cultivate an empty bed than to work around small plants.

Does the PPT increase earliness? Timing is tricky. It can provide earlier harvests, but there is a guessing element to when the earliest planting date will be for the year.

Did it allow us to grow more in the same space? This can also be tricky to accomplish. Beds must be very tightly managed. Farms that already do this well should find that the

See SARE page 15

So what did we learn?		
<p>Lettuce: Earned the same \$/bed, same \$/min PPT - \$355/bed, \$1.44/min Hand-transplant - \$352/bed, \$1.39/min Conclusion: no significant difference, though it was a difficult to measure because there was a fair amount of bolting. PPT lettuce had more bolting.</p>	<p>Spinach: Produced more lbs per bed with PPT Less time spent harvesting on PPT beds (perhaps bigger plants due to the wider spacing) PPT: \$230/bed, \$1.43/min DS: \$234/bed, \$1.37/min Conclusion: PPT spinach faster to harvest, and in 2013 more productive (102 vs 77 lbs) so it seems worthwhile for spinach</p>	<p>roots coming off the bulb, were aesthetically less pleasing Conclusion: PPT beets slightly faster to harvest, and in 2013 more productive (204 bunches vs 167 bunches) so it seems worthwhile for beets</p>
<p>Lettuce Mix: Produced more lbs/bed with PPT Took more mins/bed for the PPT, so earned less per minute PPT: \$631/bed, \$1.93/min DS: \$308/bed, \$2.64/min Conclusion: PPT worthwhile for lettuce mix due to increased yield, even though it was less efficient to produce.</p>	<p>Beets: Produced more lbs per bed with PPT Each bed grew more in the space with PPT PPT: \$338/bed, \$1.23/min DS: \$176/bed, \$1.43/min PPT Beets had more tapered tap</p>	<p>Beans: Performed poorly with PPT, cells too small - poor plant vigor. Tall plants did not seat into soil well with PPT. The PPT plants were poorly rooted and not as productive. PPT: \$154/bed, \$.52/min DS: \$196/bed, \$.53/min Conclusion: PPT beans were slightly faster to harvest, but less productive (154 lbs vs 196 lbs). The PPT is not worthwhile for beans.</p>

LOCAL FOODS AND MARKETING

First Food Justice Certified Farm and Food Stores in New York

Long overdue, Food Justice Certified “measures what matters,” ensuring that workers on farms and the farmers who hire them are fairly treated and paid.

by Elizabeth Henderson

Food Justice Certification is the first social justice labeling program to launch in the U.S. and Canada. So far, a cooperative of organic grain growers in Canada and a family farm in Florida have been certified. In January 2014, Swanton Berry Farm and Pie Ranch became the first farms to be Food Justice certified in California. And in May, the Agricultural Justice Project (AJP) announced the first three certifications in New York State – West Haven Farm, Green Star Coop and The Piggery Eatery and Butcher Shop, all in Ithaca. Leah Cohen, AJP Program Director, confirms that the farm and both stores meet the rigorous AJP standards for respectful treatment of farm and store employees, living wages, safe working conditions, and commitment to continual improvement, and have earned the right to display the Food Justice Certified label.



Joe Romano, Marketing Manager at Green Star Coop, greets inspection team, including 10 trainees.

AJP is a program jointly sponsored by four not-for-profits that work on behalf of farmers and farm workers. Since 1999, the Northeast Organic Farming Association (NOFA), CATA (the Farmworker Support Committee, *Comite de apoyo a los trabajadores agricolas*), Florida Organic Growers (FOG) and Rural Advancement Foundation International (RAFI-USA), have been engaged in a stakeholder process to write standards for fairness in the food system. The program is designed for all agricultural production systems, fiber, and cosmetics, as well as food. Candidates must meet high bar standards that have been negotiated among food system stakeholders including both farmers and farm workers. The standards (which can apply to farms, buyers, distributors, processors and retailers – every link in the supply chain from farm to table) include:

- Fair pricing for farmers
- Fair wages and treatment of workers

- Safe working conditions
- Fair and equitable contracts for farmers and buyers
- Workers' and farmers' right to freedom of association and collective bargaining
- Clear conflict resolution policies for all throughout the food chain
- Clean and safe farmworker housing
- Learning contracts for Interns and apprentices
- A ban on full-time child labor together with full protection for children on farms
- Environmental stewardship through organic certification

West Haven Farm, Green Star Coop and The Piggery Eatery and Butcher Shop will be carrying this new label – Food Justice Certified. They filled out applications in late summer and inspections took place in early November as part of an AJP training for certifiers and worker inspectors held in Binghamton and Ithaca. To qualify as an AJP certifier or inspector, a staff member of an organic certification program or a member of a worker organization must study AJP standards and policies, participate in 3 inspections, observing the first, helping with the second and doing the third under the watchful eye of a trainer, and then pass an exam. Among fair trade market claims, including an inspector from a farm worker organization is unique to AJP.

West Haven Farm which rents 10 acres from the Eco-Village in Ithaca, NY, has been providing certified organic vegetables, herbs and fruit to the Ithaca area for over 20 years through a CSA and a popular stand at the Ithaca Farmers' Market. Farmer John Bokaer-Smith employs 5 workers but has also made the farm a center for new farmer training as part of the Groundswell Program. John

says, “The success of West Haven Farm depends on the hard work of the terrific, dedicated people who help make it run.”

Green Star Coop, one of NYS's outstanding retail stores, has been a pioneer in food justice, initiating an array of programs to provide access to high quality food for low income people and to diversify staff. Operating two stores and a warehouse/community center, Green Star has over 200 employees. The store is committed to cooperative principles and to management by a team that makes



Heather Sanford, one of the owners of The Piggery, answers questions surrounded by trainees Lou Battalen, Marion McBride and Michael Monahan, and certification inspector/trainer Denise Aguero.

Photos by Elizabeth Henderson

decisions by consensus and welcomes the creative contributions of all staff members and owner-volunteers. “Providing fair and supportive treatment of our own employees, and being sensitive to the working and living conditions of those whose labor produces the goods we sell,” are top priorities for Green Star.

Joe Romano, Marketing Manager, says: “Green Star is thrilled to partner with the Agricultural Justice Program by receiving their Food Justice Certification. We are pleased not only to receive Food Justice Certification ourselves, but to promote the fair business prac-

tices it represents to our members, shoppers and to our community as a whole. Having a standard that “measures what matters” ensures that workers and producers are fairly treated. This type of certification is long overdue, and we are happy to be one of the first of what will hopefully be many businesses committed to this kind of objective evaluation, so that “Food Justice for All” becomes the standard for businesses, communities, and individuals.

The Piggery Eatery and Butcher Shop in Ithaca sells meat from its own farm's heritage breeds of pasture raised pork as well as providing an outlet for other area livestock farms that adhere to its rigorous standards for humane treatment of the animals and sustainable growing practices. Guided by owners Heather Sanford and Brad Marshall, the staff of seven makes gourmet charcuterie and sausages as well as butchery, and is expanding into wholesale markets. Heather Sanford, co-owner and manager explains their decision to apply for AJP certification: “The Piggery has long been interested in supporting and recognizing the faces behind agricultural work. There have been many wonderful discussions and actions centered around the treatment of our lands and livestock, but we strongly feel that more needs to be done to honor the people behind agriculture. Food Justice Certification has been integral in helping us work toward that goal.”

Growing numbers of the customers in NY who are enthusiastic shoppers for local foods want to know how the people who grow, wash, process and serve that food



Denise Aguero from Quality Certification Services and Jessica Culley from the Farmworker Support Committee (CATA) interview farmer Jon Bokaer-Smith during the audit of West Haven Farm for Food Justice Certification.

are treated. By adopting AJP standards, West Haven Farm, Green Star and the Piggery are providing this kind of transparency with the assurance that a third party has verified compliance.

If the local food movement begins demanding that farmers, farm workers and all food workers make living wages with full benefits, (health care, compensation for injuries and unemployment, and retirement) from a 40 hour week, we may start moving towards an agriculture that will sustain us into a future worth living. And that is what the Agricultural Justice Project is all about – a set of tools to help build value chains, changing relationships to bring into practical everyday life the Principle of Fairness that is basic to organic agriculture all over the world.

For the full standards in English and Spanish, and more information about the Agricultural Justice Project and Food Justice Certification, visit www.agriculturaljusticeproject.org

Elizabeth Henderson, an organic farmer and member of the Board of NOFA-NY, is the representative of NOFA to the Board of the Agricultural Justice Project. She can be reached at 585-764-8471, elizabethhenderson13@gmail.com

Confused about the labels you see on food?

In recent years there has been a proliferation of social justice and fair trade market claims leading to consumer confusion. Consumers are bombarded with claims, many of which are not applied consistently, lack relevant meaning, or do not tell the whole story of a product or program. At the same time, many organizations and companies are making tremendous progress in setting standards for fair trade and social justice or implementing fair business practices. There is a danger that these legitimate programs and practices will become indistinguishable from false or misleading claims without a more objective consumer education and outreach campaign.

To address the need, the Domestic Fair Trade Association created an evaluation program using its own principles as criteria for distinguishing between claims. Thus far the DFTA has evaluated six prominent fair trade and social justice certification programs to help consumers identify programs that reflect the DFTA's vision of just, healthy, and sustainable food system. Food Justice Certified received high ratings. To view the evaluations please visit www.fairfacts.thedfta.org

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LIVESTOCK AND POULTRY

Colostrum

by Ulf Kintzel

Colostrum is the first milk that sheep (as well as other mammals) produce when they give birth. This first milk is very high in nutrients. However, the most important factor is that it contains numerous antibodies, which protect the new born lambs from diseases. Without these antibodies rather minor diseases can weaken a lamb, make it sick or let it die, even later on and not just immediately after birth.

This colostrum must be consumed by the lamb ideally within the first 12 to 18 hours but no later than 24 hours after it was born. There are two reasons for this time limit. Firstly, the ewe stops producing colostrum after about 24 hours, give or take. That means the amount of antibodies in the milk declines rapidly after that time period. Secondly, the lamb is, physiologically speaking, only able to absorb these antibodies for a little more than a day. Antibodies are large proteins. The building blocks of a protein are the amino acids. When proteins are consumed and end up in the stomach, enzymes break down these proteins into these amino acids, which are then absorbed. These enzymes, which also would digest antibodies, are notably absent during the first day of a lamb's life and therefore the antibodies can be absorbed as a whole. While antibodies also have protective mechanisms that hinder enzymes to digest them, they are mostly still not getting into the blood stream after the stomach starts digesting proteins. What

is the practical relevance of this? You can't delay giving a lamb colostrum if the mother doesn't have any by another day or two. It must happen on day one.

Why would a lamb not get its share of colostrum? The cause could be the ewe. Perhaps she doesn't have any milk or she has too little for two lambs, perhaps because she is too young or perhaps she had mastitis and one side of the udder is not producing any milk. The other cause could be the lamb itself. It could be too weak to nurse or it could get lost and because of cold weather it may have hypothermia by the time you find it and can no longer nurse. If the ewe is the problem, a substitute should be given. If the lamb is weak or cold, make sure you warm it up first with a heat pad or heat lamp before you give any milk. Cold and weak lambs do not have their physiological functions operating properly and therefore don't have a fully functioning digestive system. Giving it milk in this condition would kill it.

If you raise sheep on a somewhat larger scale, a helpful and in my view necessary tool for feeding lambs that have problems when born is the tube feeder. This is the easiest way to make sure that the lamb gets its share of colostrum. It also requires little time and little patience compared to bottle feeding. When you use the tube feeder, make sure that you indeed insert the tube into the stomach and not into the lungs. The lamb will not survive when you drain the milk into the lungs. Also, each feeding should be reduced to about five ounces, less if the lamb is very small. If you give too much colostrum, say upward of eight ounces, at any one feeding with a stomach that doesn't have the

capacity for that much yet, the remainder of the milk will stay in the rumen which has the high probability of killing the lamb.

Where do you get your colostrum? If you are lucky you will have another ewe that has lambed at the same time and has plentiful milk that you can milk out five ounces for your problem lamb. You can also milk out some colostrum if you feel there is extra and freeze it. A second option would be to buy a container of colostrum at a farm store to mix with milk replacer when you need it. A third option and the one I want to share with you in detail is the colostrum from cows. A cow's colostrum can be used as a substitute and I have done so successfully for years. I am lucky to have an organic dairy farmer as a neighbor for a few years now. A few months before lambing I put him on alert that I need a gallon of colostrum. Very often, a dairy cow produces it in excess of what is needed for her own calf. Since the remainder doesn't go in the bulk tank anyway, I am able to purchase some, usually a gallon. At home I fill the milk in eight-ounce water bottles, leaving a little room for the milk to expand when frozen. I get these small empty bottles from my dentist who offers that size of drink to his customers. I then freeze the colostrum. Each bottle provides me about two feedings for a single lamb or one feeding for a set of twins. When the need arises, I take a bottle and put it in a pot with very warm water. You want to remember that you can't boil or microwave the milk to defrost it. So a warm water bath will need to do the trick.

In addition to my frozen colostrum I have a container of powdered colostrum in the freezer in the event I run out of the one I gleaned from a cow. Also in addition I always have some milk replacer around, which is needed to mix in the powdered colostrum or



Colostrum given via tube feeder
Photos by Ulf Kintzel

which is needed if the lamb needs some supplemental feeding beyond day one of its life.

While you may have finished lambing this season, you may want to start thinking about where to get some cows' colostrum for the next season, so that you are ready for the first lambs that need it without having to worry about diseases killing your lamb later on. And if you haven't done so already, get that tube feeder, will ya?

Ulf owns and operates White Clover Sheep Farm and breeds and raises grass-fed White Dorper Sheep without any grain feeding and offers breeding stock suitable for grazing. He is a native of Germany and lives in the U.S. since 1995. He farms in the Finger Lakes area in upstate New York. His website address is www.whitecloversheepfarm.com. He can be reached by e-mail at ulf@whitecloversheepfarm.com or by phone at 585-554-3313.



Portion-sized frozen cows' colostrum

SARE from page 13

PPT helps do it better.

Does it reduce labor for transplanting? Well, not really. It takes time (not a lot, but some) to fill the trays, then seed them with the greens and beets. Then it takes time to transplant the trays. If the same crop was just direct seeded, it would take less time to put the seed in the ground. That said, the tool does seem like it could pay for itself on the following types of small-scale vegetable farms:

- An "Elliot Coleman style" farm where every inch is always tightly managed.
- Any farm that is already paying people to transplant closely spaced crops (beets, spinach).
- A farm that has soil that is neither "trashy" or very rocky.
- A farm that grows greens in hoophouses.

Even after two seasons of using the system, it still feels like there is lots of tweaking that could be done to make it an even more useful tool on our small vegetable farm. Farms who choose to try this tool should be prepared to experiment with different spacing, seed sizes, and planting timeframes before they feel that the PPT has been mastered.

Here are a few tips and techniques we picked up in using the system.

- For head lettuce use pelleted seed, but for lettuce mix use non-pelleted seed with several seeds/cell.

- Cover small seeds with perlite for better germination.
- By running the wheel in the wheel track from the previous row, we were able to get rows spaced six inches apart. This was the closest we found we were able to transplant.
- Small brassicas seeds can get stuck between the two layers of plexiglass due to static electricity especially in the spring when cold air can be dry. Assembly instructions are in Japanese, follow pictures carefully!
- Teeny plants need well prepared soil and very shallow planting.
- Quality of potting media makes a big difference. Use good quality, finely sifted mix!
- Good germination is key. If a tray is only half full of plants, it is a poor filler of greenhouse space, and will be a waste of field space, too!

Funding for this project was provided by NE SARE. A full write up of the report is at the website. www.sare.org project number is FNE12-758

Liz Martin and her husband Matthew Glenn own and operate Muddy Fingers Farm a two person vegetable farm in Hector NY. They can be reached at 607-546-4535 or martin25@juno.com.

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Videos of the PPT at work on Muddy Fingers Farm can be seen at :

- Tray filling video: www.youtube.com/watch?v=31IF6liHNC8
- Seeding video: www.youtube.com/watch?v=lnOEJWrQM44
- Transplanting: www.youtube.com/watch?v=D25uR_wVVw4
- A great overview of transplanting with some of the troubles with seating of the plants visible: www.youtube.com/watch?v=ydG_xJ7DQ70

STEWARDSHIP AND NATURE**Keeping Farming Practices in Sync with Natural Systems Will Always Keep You in the Green**

by Kimberly Hagen

Sharing is almost always a good practice. It's just not cool to take the last cookie on the plate, or the last beer in the six-pack (especially after a day of haying) without offering to share it with others. The generosity of the gesture will often return tenfold. And that is the general rule of those systems in place outside the door of the house and the barn too. Ignore the rules of those systems and you will pay – someday, somehow, somewhere.

Far too many folks have the mindset of taking all that nature has to offer in how they manage their farm, without a thought about sharing. And then it comes back to bite them.

It's such a simple rule, yet so difficult a concept to accept, and so absolutely necessary to keep a farm successful. So, on a practical level, what do we mean when we say farming needs to be in sync with natural systems and mindful of sharing the bounty? Here are two great examples of how and why it works to the betterment of both the farm, and the world outside the farm.

Example One: Grazing

I wish I had a nickel for every time a farmer told me the animals were staying out on the pasture until it was "all cleaned up" meaning, of course, that it was all eaten down to a uniform 2 or 3 inches. Most likely many of the plants in that pasture were munched, not just once, or twice, but three, or even more times. It's a mindset of taking it all, because it's what's needed in the immediate. Instead, ideally what should happen is, the plant is grazed once, and more than half of it left remaining there on the pasture floor, the residue left to photosynthesize and feed the plant roots for it to regrow, and then slowly decompose, and add organic matter to the soil.

"But I can't do that. It's too expensive I have to get all the feed I can off that ground," is what I typically hear. Overgrazing leaves the plant with no option for regrowth, but to draw on reserves in its roots, for the energy it needs to get going again. There is a cost to that and it is expensive. Once the reserves are all used up, there isn't anything to draw from, and the plant pulls into itself and literally shrinks.

Walk into an overgrazed pasture and you find miniature versions of plants, and not much available for a mouthful. With consistent over-grazing, the bounce back and regrowth become more and more feeble, turning the pasture into nothing more than a holding pen or exercise yard. The animals find a nibble here and there, but for all practical purposes, the pasture is not a viable functioning food source and continues to decline. Even worse, the soil becomes a compacted, impermeable piece of adobe hardpan, directing all rain and nutrients elsewhere, starving the plants on top of overgrazing them. The costs grow exponentially, to the soil, the water, the air, the animal health, the financial health and the whole farm and its community. And the expense to renovate grows exponentially as well.

The greater the natural fertility in your soil, the longer you can continue with this disregard for the natural systems on your farm, but eventually the plants will give up and, lacking the energy or reserves to replenish, remain stunted in their growth. Eventually the only viable grazing period is May and

June, the first flush of the year. You could bring in purchased feed – for a price. Or pasture can be rented at another farm – for a price. Plus the inconvenience of transporting the animals either by walking, or trucking them.

Pushing to the edge and taking all there is, will only leave less and less for the farm's future wealth. With incremental additions, i.e., leaving plenty of residue for feeding the plant and the soil, the general health and wealth of the farm grows too, with soil that can feed the forage, and forage that can feed the livestock, and livestock that can feed us. Farm management really is all about sharing – taking only just enough to keep the farm healthy and productive, and leaving the rest for replenishing the systems that supply the farm. But it also means feeding – which is a form of giving back or sharing the nutrients. Like all living things, soil and plants need food if they are to grow. Animals can provide these nutrients in the form of their manure when they graze in the pastures, but they can also provide this manure to hayfields, if those are worked into the grazing management system, to be grazed at some point after a hay crop has been removed.

**Multi levels of species for brief grazing**

In nature, everything strives for equilibrium, so that within an ecosystem, somebody's junk is treasure for another – the waste product from one species is the food of another, and everyone shares. When something moves out of balance, a correctional shift will evolve. Here in the northeast, we need only think of the inter-related boom and bust cycles of pine cones, squirrels and coyotes. The pines have a boom production in cone production, and in the following year, the squirrel population explodes with the plentiful supply of good food. The year after that, the coyote population explodes with the plentiful supply of a furry hot breakfast every day. And all of the scat and urine dropped on the ground feeds the roots of the pine trees. There's a lot of sharing going on



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Overgrazing of plants leads to unhealthy plants, poor productivity and a degraded ecosystem.



"No golf course here! Just thick lush pasture forage - the goal."

as the system fluctuates, stretches out, and pulls back in to keep it healthy and functioning.

All of this requires lots and lots of observation, and getting to know your farm's ecosystem in the deepest sense, from the soil and microbes therein, to the animals and their yields in terms of milk production, or pounds of weight, and what it takes from the farm to get that yield. The rules are the same, but because the variables of soil, temperature, water supply, etc. can be so radically different, every farmer really must find his/her own way and every farm will be different.

Example Two: Internal Parasites

They aren't going away. In the world of small ruminants, internal parasites tend to play a role larger than the Abominable Snowman or even the Cookie Monster. After several decades of rigorous, full-on attack with chemical dewormers, we are back to square one, or even further back in some cases, since many animals now have little, if any, resistance, and our pockets are empty. It's been an expensive effort.

The first step in this issue is to admit the internal parasites are here to stay. Eradication through chemical dewormers is not going to happen. We can't beat the natural ecological systems, and as in the case with grazing, working with the natural systems might get us ahead. So how does this look on a practical level? Good management practices.

See Keeping *page 17*

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SMALL FARM SPOTLIGHT**Barn Foundation Problems?***Invest in a lasting repair for your architectural treasure*

by David Aman

Are you the owner of an old empty dairy barn? Have you noticed some deterioration on the hill side of the foundation? It turns out that the heat from the long-time bovine residents prevented the water from freezing between the ramp and the foundation for the previous 100 years. With the cows gone, freeze-thaw cycles started working magic on your once sturdy building. It probably started with the rot in the sill beam that goes across the entrance to the upper floor which made the roof droop a little over where the doors used to be. This caused the gutter to drain in the same spot. The water worked its way between the foundation and your ramp and now you have a problem.

Don't Panic! Don't be tempted into making a form and pouring a concrete face against the crumbling part of the foundation. This would look good for a while until the concrete gets pushed also. This will either end up with your repair crumbling apart or the entire slab of heavy concrete falling inwards breaking pipes and posts and maybe your toes.

First, you should solve the problem. Stop the water from destroying your barn. You can fix the sill and raise the barn

in this area to try to get the gutter to drain properly or you could take the gutter right off. Usually the gutter is no longer functioning anyway. Taking it off or having it replaced by a professional gutter company will take away the problem of the old gutter dumping all of the water from the roof right onto the area where your foundation is crumbling.

You could go a step further and install a drain tile across the area at the top of the ramp so that the water goes left and right instead of against your foundation. You could also dig the top of the ramp away and make a bridge going up into your barn.

One way to repair the foundation is to rebuild the damaged area with the same rocks. A second option is to form and pour a one foot thick concrete foundation or a third possibility is to build a block wall which you can then fill with concrete and rebar.

Since all three methods usually cost the same, rebuilding the damaged area with the same rocks makes a better looking repair. Remove the old, loose rocks until only the good and strong part of the foundation remains. Then, rebuild the wall in the same style and strength as the original. The original foundations were usually about two feet thick and very rugged. Often the wall was built upon giant boulders which can be used to build off of. The object is to have a stable, strong repair that will last another 100 years.



Don't be tempted into making a form and pouring a concrete face against the crumbling part of the foundation
Photograph by Victoria Aman



Dairy barn in Waterloo, NY originally built around 1881

There are people out there that see barns in this condition every day and are experts at fixing this exact problem. There are also people who build brand new house foundations daily and are not used to this type of repair. Don't allow a mason to talk you into just having a block wall put in to solve the problem. A block wall that has not been filled with rebar and concrete has a lot of vertical strength but almost no strength to hold back the pressure from the dirt ramp. The repair will look great to begin with but it almost certainly will buckle if there is any pressure against it.

You may also be tempted to just place lumber under the floor joists and against the crumbling wall. This, you think, will have the double effect of holding up the floor joists so you can continue to drive in upstairs and it would hold the crumbling wall in place. This would be a temporary fix at best and will not hold back the pressure from the dirt ramp.

If you end up having a good repair done and stop the water from doing any more damage then you should be able to get another 100 years out of your barn.

Boy, they sure don't make barns like they used to! You may not know it but you are the owner of an architectural treasure. Do you think a brand new pole barn will still be around 100 years from now?

David Aman owns Stone Works and has been repairing foundations and framing in old barns for 30 years. He works in western New York and can be reached at 585-905-0998 or stoneworks14@yahoo.com.

Looking to Restore Your Historic Barn?

The Barn Restoration program was created in 2000 to help preserve historic barns and protect agricultural landscapes throughout New York. In order to qualify for an income tax credit equal to 25% of the cost of rehabilitating historic barns the following rules apply:

- it must be a barn (defined as being built to house farm equipment, livestock or agricultural products). Buildings built for or converted to residential use are not eligible. the barn must meet the tax definition of income-producing (farming, rental, office, commercial).
 - it must have been built or placed in agricultural service before 1936. Please note that Register-listed barns built after 1936 do not qualify for the New York State Historic Barns Tax Credit, even though they are officially designated as historic.
 - the rehabilitation cannot "materially alter the historic appearance" of the barn. That is it cannot change or destroy the important characteristics that make the building identifiable as a historic barn.
 - only costs incurred after January 1, 1997 are eligible.
- Learn more at: <http://nysparks.com/shpo/technical-assistance/historic-barns/default.aspx#sthash.g5NIWmkT.dpuf>

Keeping from page 16

At one time these animals were always on the move, and early shepherds kept a nomadic existence, following their food and fiber on the hoof. By confining them to the same ground/pasture, we've brought on these parasite issues and the animals can't get away from them. Instead we should move them - they need intensive rotational grazing since the larval stage of these internal parasites live in the water droplets close to the ground - so moving the animals once they have grazed the top few inches, keeps them from the likelihood of ingesting these larvae.

Ruminants also need forage variety, and not a monoculture pasture. Different plants have a variety of nutrients and minerals. When these animals had a nomadic existence, they nibbled on all kinds of green living tissue, acquiring what they needed through the different plants. Some of these plants contain substances that are toxic and naturally repel these internal parasites - most noticeably higher levels of tannins. By giving the grazing animal periodic access to plants that have these high levels of tannins,

research has shown that these parasites tend to not stick around and exit fairly quickly - right out the back end.

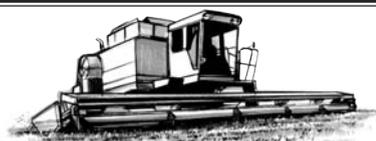
Spending hours and hours running mechanical equipment, and using fuel to eradicate pastures of "undesirable" forage species, makes very little sense - nutritionally, economically or for the environment. By taking the time to observe the interactions of the plants and animals on your farm, and the response of the local environment to them, and then changing management practices to work within and/or complementary to those systems, everything comes out ahead. The farmer spends less time "in battle" using fuel and labor to beat "back the jungle" that will most likely reappear as it wants, the animals graze and balance out the plants' needs for being pruned for healthy regrowth, and the animals acquire the nutrients and energy they need to grow and produce.

So, make a plan of action. For example, schedule a time - perhaps one or two mornings a week - when you visit the pasture with your animals, or walk your

fields, hedgerows and woods and really spend the time to observe. What do the animals eat, and how do they eat? Do they take one bite and move on, or do they stay in one place and eat everything around them? Do they concentrate on one plant species, or nibble a mixture? What plants are growing on your farm? What keeps coming back and seems to like it there? Is there a good mixture of plants in your pasture? How do the plants respond to being grazed? Is that response different in the early part of the season versus mid-season or late in the season? What insects are flying around or scuttling along in the forage? Do their numbers change with the grazing regimen?

You get the idea, pay attention to what systems are already in place and working on your farm, and work with them the best you can. It is probably the wisest investment you can make.

Kimberly Hagen is the Grazing Outreach Specialist at UVM Extension. She can be reached at kimberly.hagen@uvm.edu.



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BUSINESS MANAGEMENT**Switch the Boots, Wash the Hands, and Keep Farm Records****Food safety planning tips from Vermont for new farmers and a refresher for all.**

by Rachel Carter

Water supply, soil quality, harvesting procedures, and adding livestock are early stage considerations in developing a small farm. Often some of the most appealing in agricultural planning due to the concrete nature of their applications can cause food contamination and other health hazards when met with the lack of incorporating food safety into these and other areas of farming - even at a small scale.

Food safety refers to preventing foodborne illness through a set of procedures to handle, prepare, and store food. Safe preparation of food for market and from market to consumer are both included in food safety practices, and small farmers also must consider farm to consumer direct.

Food contamination can happen when disease producing pathogens spread from people, animals, and insects. Bacteria found in raw food can contaminate cooked foods and other surfaces and can remain active if not cooked or prepared properly. Storage temperature, water, soil, and materials can also be causes for contaminating food.

Hand washing may be one of the simplest yet most important facets of good food safety protocol. "Have a separate place to wash hands that is not the same sink or tank where you wash produce, but where you and workers will remember to use it. Preferably in the washing and packing area and if not, where you will pass by it frequently while working. The farmhouse bathroom is too far away!" shares Ginger Nickerson, GAPs (USDA Good Agricultural Practices) outreach coordinator at the University of Vermont Center for Sustainable Agriculture, part of UVM Extension.



An assortment of spicy greens are Foggy Brook Farm's specialty, grown in their greenhouse in Fairfield, Vermont.

Christine Kubacz, a new farmer/owner of Foggy Brook Farm in Fairfield, Vermont found the abundance of information regarding food safety to be overwhelming at first. "Take your time with decisions, work with a mentor, ask questions, and do your research," she advises other new farmers. "Be prepared to make mistakes and that is part of learning. I found having the support of other farmers and working with a larger, more experienced farm to be crucial. Rolling with what Mother Nature hands us is a humbling experience."

Foggy Brook Farm grows greens through an extended growing season, raises eggs, and supports a growing assortment of value-added products for market-direct sales. Kubacz found the logistics around washing produce and solely preparing one value-added product at a time to be first areas of research and learning to implement on her farm.

"I also didn't think about all of the different reasoning behind proper labeling - for safety, allergies, tracking and being able to think about the whole picture - from farm to plate in essence - has allowed me to understand how to implement," shares Kubacz.

Like many new farmers, the to-do list requirements and reality of finances tug on the purse strings and can be inhibiting to growth. "Learning I needed different boots for the greenhouse from the chicken coop - now that was a quick fix!"

State Extension offices like those at the University of Vermont, provide the resources, details, and support as well

Learn more and connect

UVM Extension - www.uvm.edu/extension/
 Foggy Brook Farm - www.facebook.com/foggybrookfarm
 Vermont Farm to Plate - www.vtfoodatlas.com/

as training and practical education for farmers at many stages. Online resources like those on food safety are available for download and are some of the materials farmers like Christine Kubacz can use to conduct research as a new farmer. Staying current with food safety procedures is also important, as changes are made as new research and laws come into effect.

The Food Safety Modernization Act (FSMA) is a federal food safety law that currently has two sets of proposed rules that authorize new regulations for produce production and food safety measures for facilities that process food for human consumption. "FSMA grants the Food and Drug Administration (FDA) broad new power to enforce food safety standards on farms. The draft proposed rules lacked flexibility and scale- and supply- appropriate regulations, and could negatively impact produce growers, farms that aggregate product with other farms, and farms that even minimally process what they produce," comments Erica Campbell, program director of Vermont's Farm to Plate Initiative. We are hoping that FDA's final rules will be more flexible to small and medium sized farmers so it won't financially overburden them."

Farm to Plate is Vermont's statewide initiative to increase economic development and jobs in Vermont's farm and food sector and improve access to healthy local food for all Vermonters. Dozens of UVM Extension and other University professionals and researchers as well as Vermont farmers are actively engaged in Farm to Plate's work to strengthen the working landscape, build the resilience of farms and food enterprises, improve environmental quality, and increase local food access for all Vermonters.

Rachel Carter is the communications director at the Vermont Sustainable Jobs Fund, a non-profit organization created by the State of Vermont to help develop Vermont's sustainable agriculture, renewable energy, and forest product businesses. She can be reached at 802-318-5527 or rachel@vsjf.org.



Foggy Brook Farm began as a small chicken farm producing farm fresh eggs.



Bagged greens from Foggy Brook Farm are sold at the local farmers' market, at area stores and restaurants, and at the farmstand.



Hoop house grows greens at Foggy Brook Farm in Fairfield, VT.

According to the UVM Practical Produce Safety Model, the following are key considerations when it comes to preparing for food safety on the farm.

- Conduct a risk assessment of your farm's land history to identify potential sources of contamination.
- Take proper precautions when using manure and compost to avoid produce contamination. A four month rotation is suggested between raw manure or livestock and produce fields/harvest. If making your own compost, keep at 131 degrees for at least 3 days as well as turning. The FDA is considering revisions to this, so stay informed.
- Mitigate the potential for pathogens in your water supply by planning out the irrigation system, beginning with water quality testing, which should be done before the start of each season. Use drip irrigation if pulling from surface water to reduce potential for microbial contamination - especially on leafy greens.

- Plan for reducing potential field contamination such as wild animals, flooding, farm equipment spills, domestic animals and livestock.
- Develop policies for sick and injured workers as well as protocol for hygiene. Convenient hand washing stations are a must!
- Consider precautions when harvesting produce as activity can stir up pathogens.
- Implement good hygiene and cleaning produce practices which can improve quality and shelf life, as well as safety. Triple wash those greens!
- Keep storage surfaces and facilities clean, organized, and use proper temperatures for storage procedures.
- Label produce so it can be tracked backwards in cases of recalls and prepare invoices and harvest logs.
- If engaging in agritourism, or on-farm visits, additional precautions are needed to reduce pathogens spread between animals and humans.

LIVESTOCK AND POULTRY

Profitable Broiler Enterprises in New England

by Sam Anderson

It has been many decades since broilers (chickens bred and raised specifically for meat) were a big business in New England. Broiler enterprises have started making a comeback in the region in recent years, but they tend to look very different from the standard broiler operations you'd find in Maryland or Georgia. Scale is the most obvious difference: A typical broiler producer in New England might market somewhere between 500 and 5,000 chickens per year, whereas a middle-of-the-road Southern broiler operation may grow upwards of half a million birds. Large-scale Southern and Midwestern operations raise batches of thousands of broilers in long metal broiler houses, while in the Northeast you're more likely to find farmers moving groups of 50 to 100 broilers across fields in open-bottomed mobile coops or "chicken tractors."

Despite these differences – or, perhaps more accurately, because of them – it is possible for a Massachusetts farmer to make more money raising 1,000 broilers on pasture than what a conventional broiler grower nets for 50,000 broilers. There is a strong market in New England for locally raised meat, and pasture-raised broilers commonly demand \$4 to \$7 per pound at farmers markets. While very few producers are able to grow and market enough pasture-raised broilers to make a full-time living at it, with niche marketing and smart management, a few pens of broilers can be a profitable enterprise with minimal startup cost as part of a diversified farm operation or as a supplement for off-farm income.

So, why isn't everyone already doing this? With support from a Northeast SARE Partnership Grant, we worked with sev-

eral small-scale poultry growers to track best practices and build enterprise budgets for alternative poultry enterprises in New England. Compiled from producer experiences, here are some of the common challenges for small-scale broiler enterprises in New England:

Processing

This could be a whole article in itself, but in short, the recommendation is: Before you start sinking too much money and time into starting a small-scale broiler enterprise, figure out how you're going to get the birds processed. Legal, affordable slaughter and processing options are limited for many New England producers. There are a few USDA-inspected poultry processors in the region, and for those living within driving distance of one of these, it is probably the simplest option: Schedule with the slaughterhouse, drop off the birds, and pick up bagged, ready-to-sell product. However, the cost of processing can be an issue – the going rate is around \$5 per chicken, not including the cost of making two trips to the slaughterhouse – and for some growers, hauling live birds to the nearest USDA-inspected facility just isn't feasible. For those growers, and for those looking to reduce processing expenses and to have more control over the quality of their final product, there are special USDA exemptions that allow farmers to process their own poultry using a mobile poultry processing unit or by building their own licensed on-farm facility. This can save the producer a significant amount of money, and can even be a great marketing tool, but it can also open a regulatory can of worms (depending in large part on your state's laws). It also means quite a bit of additional work, especially in the first year. Understanding the available processing options and which one is the best fit for you is an essential part – according to some of the producers we spoke with, the most essential part – of running a successful small-scale broiler enterprise in New England.

Managing Production Risks

The process of actually raising the birds isn't a cakewalk, but the learning curve isn't particularly steep – at least in terms of keeping most of the birds alive and bringing them to market at a reasonable size in a reasonable amount of time (depending on genetics, preferences, and production approach, usually somewhere between 4 to 7 pounds in 6 to 11 weeks). The most-cited production challenges relate to preventing catastrophe, particularly in the form of predators and disease losses. For non-vaccinated birds, coccidiosis was the most noticeable disease problem. Growers also observed a general tendency for fast-growing "Cornish Cross" broilers to have health problems as they approached



Slow and fast-growing varieties of broilers raised together in a mobile coop.

a market weight of 7 pounds – or, especially, if they surpassed it – including a higher rate of mortality compared to slower-growing broiler varieties (e.g. "Freedom Rangers"). However, all growers agreed that the Cornish Cross birds lived up to their billing as efficient converters of feed to meat, dwarfing other varieties (literally, in some cases). Which brings us to the next challenge...

Feed Costs

For all of the broiler enterprises in this project, feed was the biggest cost. For those buying organic grain, feed costs are especially steep. Depending on a wide range of factors, producers purchased 3 to 6 lbs of feed for every 1 lb of meat marketed. Some feed was lost to spillage around feeders, and nutritional value can be lost when feed is kept for too long or not stored properly, but a large part of reducing feed costs appears to revolve around improving feed conversion rates – that is, the efficiency at which the birds convert feed into meat. Genetics plays a large role in feed efficiency; for example, a Cornish Cross and a slower-growing broiler can both be raised to produce a 5 lb roasting bird, but the slower-growing broiler will probably need an additional 1-4 weeks – and, in the process, several more pounds of feed – to get there. Management factors also play an important role; for example, in cold temperatures, feed efficiency may be reduced because more feed is being used for body heat rather than growth.

These certainly aren't the only challenges, of course, just the ones we heard most often. Keep an eye out later in June for a guide which will cover the results of this Northeast SARE grant, including more keys to small-scale poultry profitability. The guide will be published, among other places, on New Entry Sustainable Farming Project's website (www.nesfp.org).

Sam Anderson is the Livestock Program Coordinator and Outreach Coordinator at New Entry Sustainable Farming Project in Lowell, Massachusetts.



Two types of "chicken tractor" for pasture-raised poultry, part of a pilot project at New Entry Sustainable Farming Project's training farms.

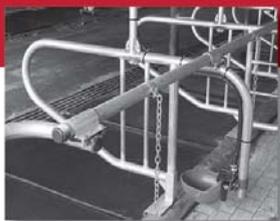


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GRAZING**Ovines in the Vines?****A New Idea for the Finger Lakes Region of New York**

by Nancy Glazier

Grazing sheep in vineyards has been an idea we have tossed around for a while. This spring Hans Walter-Peterson and Mike Colizzi with the Finger Lakes Grape Program and I sat down to actually talk about it. This practice is done on the West Coast with baby doll sheep, but none of us has ever heard of it in the Finger Lakes region or New York. We had an interesting discussion mingling grape and grass lingo.

Since this was a new idea to the region, we needed a guinea pig vineyard to test the idea. It needed to be someone that had their vineyard fenced in, or partially fenced and lots of temporary fencing. The next step was locating someone that had sheep, ideally with no lambs, to keep it simple.

Mike volunteered his own vineyard, Kashong Glen Vineyards in Bellona, Yates County. He has energized deer fence on three

sides with temporary fence along the road. The sheep came from some of his wife's aunt flock. They were a group of ten ewes that had lambed early for Easter. Water tubs were set out on the headlands near the road for easy filling.

The ideal time to start spring grazing of sheep in the vineyards is prior to bud break. We had concerns about the sheep biting off the tender buds and leaves, especially after the hard winter we had just finished. The vines couldn't withstand any further damage from bud loss. I had estimated there was plenty of 'pasture' available for the ewes for more than a month on the small acreage. We were hesitant to get too many sheep since we didn't know if they would destroy the vines.

The sheep were delivered to the vineyard on Mother's Day. The ewes hit the ground running since it was their first opportunity to get out on pasture this spring. Pastures had gotten off to a slow start so moving them to the vineyard was a great opportunity. Mike was hoping the ewes would graze in some targeted areas – the areas at the base of the vines, and the grassy rows in between the

rows of vines, thus reducing the need for mowing. Plant growth at the vine bases can compete for water in dry years. There were some weeds but since they were flush with spring growth it was very palatable. Mike spent quite a bit of time watching the sheep that first day making sure they weren't destructive.

Some work has been done to train sheep to graze vineyard floors and not grape leaves. To deter sheep from grazing the grape leaves, they were fed grape leaves then administered a small dose of lithium chloride. The sheep got a bit of an upset stomach and associated the discomfort with the grape leaves. We couldn't start with that practice since the vines hadn't yet leafed out and the sheep might possibly be used for leaf pull later in the season. This practice removes a few leaves in the grape zone to allow for more air circulation. This can help reduce disease risk.

The sheep had a short stay within the vines. Bud break occurred quickly with the warm temperatures in mid-May. They were moved to the headlands where there was plenty of grazing for a



Sheep grazing weeds at the bases of the grape vines.

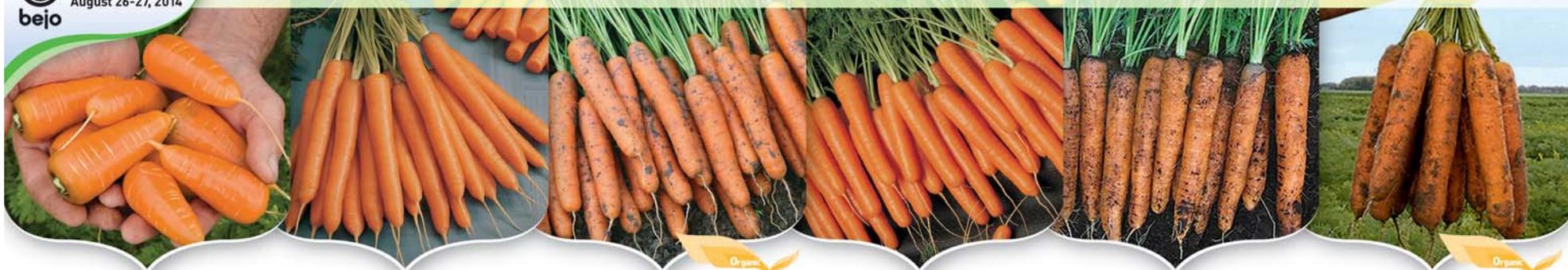
Photos by Mike Colizzi



Sheep grazing in the vineyard.

few weeks. The goal is to put them back in the vineyard possibly after harvest to graze the grassy areas down before winter.

Nancy Glazier is the Small Farms Specialist with Cornell Cooperative Extension's Northwest New York Dairy, Livestock and Field Crops Team. Her office is in Penn Yan and can be reached at 585.536.5123 and nig3@cornell.edu.

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