

WINTER 2015

SMALL FARM QUARTERLY

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



Feature Articles

Considerations for Winter Grazing Your Sheep	Page 3
A Hop Forward for NY-Grown Brewing Grains	Page 6
Turning Milk to Gold (Butter).....	Page 9
Mushrooms Turning a Profit	Page 19



NEW AND BEGINNING FARMERS**Military Veterans Turn to Farming**

Organizations in New York State and beyond are building capacity to help military veterans put their skills to work growing and producing food.

by Sarah Nechamen

Tom Bryant grew up visiting his grandparents' farm every weekend, taking care of the chickens as a part time job. After serving four years in the United States Air Force and four more in the Navy Reserve, he started eyeing the farming lifestyle once again, anticipating that the calming effect of caring for plants and animals would help him cope with his post-traumatic stress disorder.

Tom started out by taking a beginning farmers class hosted by Cornell Cooperative Extension to fill in any gaps in his agricultural knowledge that weren't covered by his childhood farming experiences and his life-long passion for gardening. Soon after, Onondaga farmers donated five acres of land near Syracuse and Tom was able to officially embark on his new career as a farmer.

Tom's story is surprisingly common for American veterans; nearly half of military recruits come from rural farming communities. As one farmer-veteran put it, "When I was being shot at in Afghanistan, I kept thinking to myself how peaceful it would be to work on a farm!"

It is for this reason that a number of programs have been launched recently to support veterans interested in pursuing careers in agriculture. One of these programs is VetFarms, founded by Tom Bryant himself soon after he took that first beginning farmers class.

When asked why he, as a farmer veteran, decided to go a step farther and help bring other veterans into farming as well, Tom laughed, "Well, I didn't want to farm alone!"

Tom went on to explain that he was already experienced placing veterans in welding jobs as a BOCES instructor, so it was an easy jump for him to start placing those same people on a farm instead. Plus, he needed labor on his new five acre farm.

Soon enough veterans were working Tom's fields in Onondaga County, growing everything from turnips to pumpkins. Tom enlisted the help of several other farms, including Schader Farms in Williamstown and Grindstone Farms in



Vetfarm participants Josh and Janell Pitcher have goats, chickens and fruit on their farm in Pulaski, NY.

Pulaski, so that farmer veterans could get experience farming with a variety of land and crops. The crops harvested from this collection of farms were then sold at Syracuse's Regional Market.

By the time they graduate from the VetFarms program, participants have learned when and how to plant and harvest, how to market their product, and proper machinery practices so they can stay safe through the process. Tom has veterans of his program from the Finger Lakes region to North Lawrence on the border of Canada. "Pretty much all of them," he said, have gone on to start a farm.

An influx of new farmer veterans is especially desirable given the statistics: 50 percent of farmers today are at retirement age, and there are more farmers over 65 years old than under 45. The USDA is calling for a million new farmers in the next decade to replace the ones that are on the verge of retirement, and military veterans have the potential to help fill that gap.

"Every day there's a new farmer veteran success story on Facebook," says Tom, "and the types of farming you can get into really are unlimited."

Veterans have certain skills from their military experience that make them especially competent farmers. Tom identifies these as the ability to work long hours, stay committed to a goal, and have a backup plan in case the goal needs to be changed.

A number of organizations are now committed to helping veterans complement these skills with more practical farming skills. Cornell Cooperative Extension offers various farmer and farmer-veteran classes, including the "Beginning Farmers" class mentioned above and a "Different Shade of Green" farmer-veteran training program which Tom encouraged many of the VetFarms veterans to take. Trainings like these offer practical information as well as valuable networking opportunities. Tom met a number of other farmer-veterans at the "Different Shade of Green" training who now manage a wide variety of farming ventures across the state, from a beekeeper in Elbridge to a hot sauce manufacturer in Baldwinsville.

Other organizations that have connected to VetFarms include the USDA, which finds funding for the veterans' farming ventures and looks for ways to decrease their tax burdens, and the Farmer Veteran

Coalition for which Tom is now the regional director. The FVC works to "mobilize veterans to feed America" through farming fellowships, weekly job postings, and assistance in developing business plans.

The Department of Veterans Affairs has the potential to be a huge resource for veterans looking to get into agriculture, but unfortunately the vocational and educational funds that VA supplies usually cannot be used for farm trainings.

Now the Cornell Small Farms Program is poised to join the ranks of these organizations that are supporting farmer veterans. Starting in 2015, the SFP will launch a statewide network to train and support farmer-veterans by connecting to state agencies and training veteran counselors on farming as a viable career path. A network between the farmer-veterans themselves is also being developed based upon the 130 farmer-veteran survey respondents who have expressed interest in peer support and collaboration. In November 2014, the SFP hosted the first Veterans in Agriculture Summit to connect current and aspiring farmer veterans with organizations serving farmer veterans.

The Small Farms Program is also planning to co-host an "Agricultural Enterprise Boot Camp," a week-long, intensive training on agricultural business planning and entrepreneurship. The boot camp will represent a collaboration between the Cornell SFP, Cornell's School of Hotel Management, and Syracuse University's Institute for Veterans and Military Families, and will attract veterans interested in not just agriculture but also in restaurant and hotel management.

Other components of this project include a more general New York agricultural training for veterans, built upon regional discussion groups, farmer mentors who will provide on-the-job trainings, video profiles on veterans farming in New York, and farmer-veteran classes.

Sarah Nechamen is an undergraduate Plant Science major at Cornell and a student intern for the Small Farms Program. She can be reached at sdn27@cornell.edu.

For more information about the VetFarms program, visit <http://patriotresourcesandvetfarms.webs.com/> or contact Tom Bryant at tombryant315@yahoo.com.

If you are a veteran who is currently farming or would like to farm, or if you represent an organization interested in serving farmer-veterans, please enter your contact information at <http://bit.ly/1oZs4C8> and the Cornell Small Farms Program will contact you with more information about how to become a partner in our project.



Vetfarms produce at Syracuse Regional Market.



Greenhouse owned by Jamie Critelli, a Vetfarms graduate.

Cornell Small Farm Program Update

Small Farms Program Director Transitions to New Position

The Small Farms Program's director, Anu Rangarajan, is transitioning out of her position at Cornell to assume a new role as the Director of the Hudson Valley Farm Hub, which is sponsored by the Local Economies Project and The New World Foundation. Anu was drawn to this position because it represents an opportunity to execute a vision for local farm and food systems that she has worked toward for the last 25 years. She will be working with the Small Farm Program's Leadership Team to hire a new Director for the SFP in the next few months

New York Veterans in Agriculture Summit

On November 6th, we hosted a summit for military veterans in agriculture and service organizations interested in supporting them. Nearly 100 veterans and service providers joined us at the NYS Fairgrounds to meet others interested in supporting veterans getting into agriculture and design programs and pathways to help veterans enter agriculture. Featured speaker Jamie Critelli touched on the unique skill sets of veterans that compliment farming, highlighted the challenges of reintegration into communities and outlined basic strategies to

improve support of veterans who want to start farming. For more information on the gathering or to get involved in future programs, visit <http://smallfarms.cornell.edu/projects/veterans/>

Professional Development Training for NE Beginning Farmer Service Providers

This year's conference, Re-Strategizing with Advanced BF's: Supporting Scale-up and Farm Investment Decision Making, was held in Albany, NY from October 27-29th, 2014. This train-the-trainer conference brought together over 50 service providers from extension programs, non-profit organizations,

and government agencies across the NE to help improve service provider teaching skills and foster a growing BF service provider network. We offered intensive workshops on Credit Readiness, Farm Financial Analysis, Labor and Equipment Decision-Making, Marketing through Wholesale Channels, Whole Farm Decision-Making, and Reaching Out to Underserved BF Audiences. To learn more about the workshops offered or to join the Northeast Beginning Farmer Service Provider Network, visit <http://nebeginningfarmers.org/trainers/>



Anu Rangarajan

Message from the Editor

Happy New Year! As I write this message, delicate ice formations decorate the window and the pines outside are swaying gracefully in a swirl of snowflakes. As I checked the weather report this morning to find out how much snow this storm is expected to bring, I was not surprised to learn that the media is once again vilifying the storm, with language like "Storm to Invade Northeast with Unrelenting Snow". Meanwhile, those of us that farm and garden know that winter plays a balancing role in the cycles of nature. Cold temperatures knock back pest pressure and snow insulates the ground and provides needed moisture in the Spring thaw. And without winter, we wouldn't get to curl up inside and get some much needed rest for a few months (or ski!).

That said, erratic temperatures and climate instability are certainly a concern for the future of farming. I am pleased that this issue of SFQ offers two articles on converting to renewable energy, an important step toward making our farms and homesteads more stable and sustainable. If you're thinking about how to become more energy efficient or install renewable energy on your farm, check out our archived webinar series and other resources at <http://smallfarms.cornell.edu/resources/farm-energy/>

Wishing you rest and warmth,
Violet



Violet Stone, Managing Editor

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GRAZING

Considerations for Winter Grazing Your Sheep

by Ulf Kintzel

Winter is here once again. In this article I would like to share what I have learned over the years when it comes to grazing in cold and freezing conditions and with snow on the ground.

Snow on the ground does not necessarily mean that the grazing season ends. Sheep have the ability to dig through the snow to get to the grass. It matters, though, what kind of snow it is. Light and fluffy snow can be as deep or deeper than a foot and there will be no problems for the sheep to dig through. In fact, they will do so with relatively little effort. Wet snow takes more of an effort. Drifted snow is even harder and at times impossible for the sheep to dig through even when there is less than a foot of snow on the ground. Ice on top changes everything, again for the worse. Sheep don't have the weight and force of cattle. No matter how little snow there is on the ground, it will be impossible for the sheep to get to any forage when there is a solid sheet of ice on top.

The length of the forage underneath matters as well. The longer the grass, the more it will stick out and entice the sheep to make an effort to dig. Secondly, for each time the sheep dig they get to more forage when the grass is long versus short. How does that matter? Digging causes the sheep to burn some extra energy. It must be worth the effort. Also, ice will have a harder time forming a coherent sheet when there are bunches of grass sticking out. The ice breaks at these bunches and gives the sheep a starting point to dig.

How can one assess if there is enough forage for the sheep to meet their needs? Whenever I am not sure I simply put a couple feeders with round bales of good first-cutting hay out for my sheep. If the grass is good and fairly easily accessible, they will hardly eat any hay. If they need it, they will eat it. Just be careful, don't put the fanciest hay or good baleage out. The sheep might choose convenience over grazing when the stored forage is of the best quality.

I still work with my electric nettings during the winter, at least until late December or early January when I run out of hay or when the snow gets too deep. A common comment I get from other producers is that they



The more grass underneath the snow, the more it is worth grazing in the winter.

Photo by Ulf Kintzel

can't do that since their ground is frozen and they cannot work with electric nettings anymore. In pastures with short grass the ground indeed freezes up early on. Tall grass will keep the frost off of the ground much longer than short grass. The difference is indeed stunning. Short pasture may be solidly frozen while pasture with long grass will have very little frost on the ground. A snow blanket not only keeps the ground from freezing, but it also takes moderate frost back out of the ground. Also, I never step the double-spiked posts fully into the ground when I expect frost or have some already. That makes the removal easier. The occasional post that is frozen solidly into the ground can be removed by using a metal stake (i.e. a three-foot piece of a ground rod) as a lever underneath the double spike.

Water is a major concern when we have heavy frost and no snow on the ground. Bringing water to the sheep to let them drink can become a cumbersome daily chore. That all changes when there is snow on the ground. A field trial conducted in Wisconsin examined if snow, as the only source of water, is sufficient for sheep to maintain themselves (the results were published in "The Shepherd" magazine). A group of ewes and yearlings had snow as their only water source while a comparison group received water throughout the winter. In the following spring, there was no difference in weight among adult ewes, while the yearlings that received only snow didn't gain as much as those receiving water.

See Considerations page 5

SMALL FARM QUARTERLY - WINTER 2015

TABLE OF CONTENTS

SMALL FARM PROGRAM UPDATE

Cornell Small Farm Program UpdatePage 3

ENERGY ON THE FARM

On-Farm Heating with Biomass, by Chris Callahan..Page 19

Solar Powering your Farm Just Became Easier,
by Edward Duquette.....Page 17

FARM SAFETY

How to Stay Safe on the Farm This Winter,
by Marybeth Vargha.....Page 5

FARM TECH

Selecting a Used Tractor for Your Farm, Part II:
Locating a Tractor, by Rich Taber.....Page 18

FOOD SECURITY

Less Waste in the Landfills, More Food on People's
Plates, by Rachel Carter.....Page 16

GRAZING

Considerations for Winter Grazing Your Sheep,
by Ulf Kintzel.....Page 3

Grazing Our Way to Health, by Marvin Moyer.....Page 7

HORTICULTURE

Mushrooms Turning a Profit for Forest Farmers in the
Northeast, by Steve Gabriel.....Page 12

LOCAL FOODS & MARKETING

A Hop Forward for NY-Grown Brewing Grains,
by Sarah Nechamen.....Page 6

Turning Milk to Gold (Butter), by Abigail Woughter.....Page 9

NEW AND BEGINNING FARMERS

Growing the Next Generation of Farmers in the Hudson
Valley, by Rachel Schneider.....Page 10

Military Veterans Turn to Farming,
by Sarah Nechamen.....Page 2

The Seed Farm Grows Next Generation of Farmers,
by Lindsey Parks.....Page 19

Young Farmers Work Together in the Community
School's Young Farmer Transition Program,
by John Welton.....Page 11

RESOURCE SPOTLIGHT

Farming in the Woods:New book for Enthusiasts of
Agroforestry, Forest Gardening, and Specialty
CropsPage 8

Grant Funds Available to Support the Newest Farmers in
New York State, by Daniel Rivera.....Page 8

SEED STORIES

Seed, Story & Citizen: An Interview with Scott Chaskey,
by Petra Page-Mann.....Page 15

URBAN AGRICULTURE

From Vacant Spaces to Vibrant Places,
by Sean Cummings.....Page 14

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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Cover: A Dorper Sheep poses for the camera at White Clover Sheep Farm.
Photo by Ulf Kintzel

FARM SAFETY

How to Stay Safe on the Farm This Winter

by Marybeth Vargha

The crops are in, the last harvest finished, and you're heading into your hibernation phase, enjoying some relaxation with the guitar and hanging out more with the kids. But even in this slower season, farmers are injured and accidents happen. When you think about it, the cold creates many hazards to be aware of.

Firstly, pay attention to safe heating in all of your farm buildings. One January, a friend and I were at the local gym with the kids when he got the call from his wife at home. A neighbor saw smoke coming from the barn and the fire department was in full swing fighting a fire they couldn't quite see. He knew right away exactly what it was - a very attentive sow liked to build up hay for her piglets and it must have gotten too close to the heat lamp he had set up. When he got there, the animals were all safe and the firemen were hosing down the barn. He took them in directly to where the fire was and they got it out quickly. Not too much damage was done to the barn, but he lost all of his feed and spring seed from all the water. Even this small fire was very costly.

It's always a good idea to make sure everyone on the farm knows what to do in case of fire. Not just for the house, but make plans for all your buildings - where to evacuate any animals, what resources are available for the firefighters, and are there any hazards in the buildings or around the property. It's great to share information with a neighboring farmer. Exchange your fire response plans and phone numbers in case you're not around when something happens. Fire departments are always very open to getting your plans as well.

If a small fire does break out, before trying to fight it make sure everyone gets to safety and you call for help. You may be able to put it out with a fire extinguisher if you know how to use it and act quickly. Remember to PASS: Pull, Aim, Squeeze and Sweep.

Pull: Pull the pin at the top of the extinguisher. This lets you squeeze the handle to discharge it. Aim: Don't aim for the flames near the top of the fire. You must aim for the base of the fire. Squeeze: Squeeze the handle to release the extinguishing agent. When you let go of the handle the discharge will stop. Sweep: Using a sweeping motion, move the extinguisher back and forth from side to side to put the fire out.



When working in the cold, be careful about exposing yourself to frostbite.

Always stay at a safe distance and don't ever turn your back on a fire. If the fire starts to spread and get out of control, evacuate the area immediately. Remember, fire can spread quickly!

When it's cold, it may be your instinct to finish your farm chores quickly so you can get back to the woodstove. But speed under these conditions can be disastrous. Equipment freezes right when you need to run it. Why shut it off when you can just reach in and thaw something or grab the frozen piece of chop? As one farmer said, "You can do it a hundred times without any problem, but there could always be that last time you'll never be able to do it again." Even when you turn off the power, there will still be stored energy in machinery that can catch a hand or foot so stay away from any moving parts until you know it's safe.

Sometimes you're just not prepared for what the cold can do. Like the farmer spreading manure who was knocked out by a frozen flying chunk. He came to just as the tractor was about to go onto the road. He's lucky he stayed in his seat. If the winter is colder than usual, there could be ice where you've never had it before. Last winter was one such deep freeze that a farmer was carefully crossing a stream in a small tractor when he realized he wasn't on the shore but on ice, which suddenly gave way on one side and the tractor ended up in the stream. Another lucky guy, he was able to jump off his

seat quickly before being trapped in the freezing water.

And don't forget that you can freeze pretty easily under the right conditions. It may be too subtle to notice until you get back into the house. I've heard several stories of pitch forks going through a foot in a rubber boot without the farmer feeling a thing. By the time the injury was noticed, there was a lot of bleeding and plenty of time for an infection to take hold.

Be mindful of the first signs of trouble. Red and swollen skin on the hands, feet, ear and nose is a sign of frostnip, a precursor to frostbite. Skin that looks white, waxy or grayish yellow is a first sign of frozen tissue, or frostbite. Superficial frostbite is when the skin feels cold, numb and stiff but the underlying tissue is soft when pressed; deep frostbite is when the skin is cold, hard, and cannot be depressed. These conditions can lead to gangrene and possibly amputations. Take due diligence to cover your exposed skin when you need to.

Don't skimp on good footwear in the winter - you need to keep your skin dry and warm. Warm for obvious reasons, but dry to prevent trench foot (or immersion foot). Trench foot is redness, swelling, numbness and blisters in the feet, a condition caused by lengthy exposure to wet, cold conditions. It doesn't need to be freezing; trench foot can occur at air temperatures as high as 60 degrees if your feet are wet. To prevent this condition, try winter boots that are a little big to allow for extra layers of socks. Pac-type boots with removable felt liners are good for farm work. Just make sure to change any wet socks or liners as soon as possible.

Staying dry is essential in the winter. Wet clothing will draw heat out of your body through evaporation, increasing your risk of hypothermia. Layers are a great idea, especially if you start with material next to your skin that will wick away moisture, like polypropylene thermal underwear.

Enjoy the winter season. Stay safe and healthy to keep your farm going!

Marybeth Vargha works for the New York Center for Agricultural Medicine and Health in Fly Creek, NY and with her family at Big Sky Farms. She can be reached at 607-57-6023 or marybeth.vargha@bassett.org.

NYCAMH is always available to help you with your safety efforts. Visit the website WWW.NYCAMH.ORG for information about our free programs and additional resources. Contact NYCAMH at 800-343-7527 or e-mail info@nycamh.org if you are interested in on-farm safety consultations and trainings or the Farm Emergency Response Program, which offers trainings in fire safety, emergency preparedness, and first aid/CPR trainings. Trainings are available in English and Spanish. NYCAMH is a program of Bassett Healthcare Network, enhancing agricultural and rural health by preventing and treating occupational injury and illness.

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Considerations from page 3

In essence, snow can be a fine water but here are some helpful tips: The snow should be clean and soft. It should not be solidly frozen, covered with ice, or dirty. I do not advise having snow as the only water source for lactating ewes. However, ewes with young lambs are likely to be in the barn at that time of the year anyway where water can be given and can be kept ice-free. Lastly, if it is convenient and an open water source can be provided even though there is snow on the ground, you will find that the sheep prefer drinking water over eating snow. However, that in itself does not mean that the sheep cannot meet their

water needs by eating snow.

Snow also changes the eating behavior of sheep. They usually eat very selectively. With snow on the ground, they eat whatever they can get.

A word of caution when grazing sheep in the winter: While cold temperatures generally do not bother well-fed sheep in full fleece, cold winds do. One must be prepared to provide shelter on a moment's notice if the weather changes. Check the weather report frequently. When it is cold and the wind starts hauling, I want to make sure that my sheep have the appropriate shelter. This does not necessarily mean that they need to be locked up in the barn. A thick hedgerow that breaks the wind can be used to provide the necessary animal comfort.

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 at ulf@whitecloversheepfarm.com or by phone at 585-554-3313.

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LOCAL FOODS AND MARKETING**A Hop Forward for NY-Grown Brewing Grains**

Thanks to the 'Farm to Glass' classroom, New York State farmers and brewers now have access to in-depth training for producing and malting home-grown grains.

by Sarah Nechamen

A hundred and fifty years ago, New York State was producing 90 percent of the country's hops. Just about every farm had two or three acres of hops planted, drying the grain in "hop houses" which likewise were a standard feature on the New York farm. But one price collapse, two blights, and a bout with Prohibition later, the state's hops industry had disappeared almost entirely.

Fast forward to 2012, when Governor Andrew Cuomo passed the Farm Brewery Law and created an incentive for New York breweries to buy their hops and malt grains locally. Breweries that buy 20 percent of their hops and other ingredients from within the state are eligible for a farm brewery license, in addition to multiple tax breaks and other benefits.

But according to Sarah Gordon of the Carey Institute for Global Good, "A single microbrewery, the size of Saranac brewery in Utica, NY, could consume all the barley that's being grown in New York State right now."

Hop production in New York State stands at just 130 acres, or about .3 percent of hop production for the whole country. So Sarah and the Carey Institute decided to uncover some of the forgotten knowledge of hops and malt grain production, and hold workshops for farmers interested in growing them. In this way, Sarah hoped to not only increase farmers' knowledge of how to grow these very profitable crops (with so much unmet demand from breweries, hops and malt grain growers face essentially zero competition) but also to stimulate New York's local beer industry, "the same way that had been done with the New York wine industry."

The workshop series, dubbed the 'Farm to Glass Classroom,' launched in February 2013 with a farm-brewery workshop on New York State barley.

"That one was just a real can of worms," laughed Sarah. One hundred people turned up, and they spent the day discussing barley growing, barley processing, and the general potential of barley as a New York crop.

After the success of the first meeting, the Carey Institute went on to hold seven more workshops, discussions, and networking sessions for New York farmers interested in growing hops and malting grains and for brewers interested in turning them into local beer. And they are not stopping there: with the help of a one year On-Farm Research / Partnership SARE grant, the institute will continue to fund the large amount of research that goes into preparing the workshops, and the outreach conducted both before and after the events.

Ask an Expert

The Farm to Glass workshops always feature a panel of specialists and authorities from every side of the industry.

"We pull in typically one scientific expert," Sarah said, "and then one policy expert who helps to explain the behind-the-

scenes rationale and why laws are structured and regulated in the ways they are."

The Carey Institute also tries to bring in more on-the-ground specialists: a processor such as a malt house operator, an experienced farmer, and a beginning farmer typically join the panel. The experienced farmer shares his/her many experiences with growing hops or malting grains, and discusses any tricks of the trade that he has learned along the way. But the beginning farmer can be just as instructive.

"New farmers have experienced a lot more challenges in the past year or so because they're really figuring it out," Sarah explains, "and they can provide a more fresh level of detail about the immediate risks and investments."

The panels are always informative, but the Carey Institute is careful to ensure that the attendees also get to actually connect with each other. After the first hour or so of panelist presentations, everyone takes a 45 minute networking break to "mix and mingle and exchange business cards." The audiences tend to be a diverse mix of farmers, brewers, investors and beer enthusiasts, so the networking sessions are an important time for these different groups to meet each other and, perhaps, to start discussing business deals.

The logo of the Helderberg Brewshed, an umbrella initiative which covers the Farm-To-Glass Classroom.

**Do the Workshops Work?**

The Farm to Glass Classroom essentially has two objectives: to increase New York farmers' knowledge about growing and processing hops and malt grains, and to increase the amount of hops and malt grains being grown in New York State. This means that the Carey Institute needs not only the workshops designed to further these goals, but also some way to know if the goals have actually been met. They created surveys for workshop attendees to take before the workshop, after the workshop, and six months after the workshop.

"That way we can see whether or not they took the information and went home and planted some barley," says Sarah.

And for the most part, workshop attendees are going home and planting some barley, or hops, or other malting grain. The surveys have shown the workshops to be very successful in giving people the information they need to start growing these crops; and once the know-how was there, an increase in actual hops and barley acreage followed close behind.

Sarah says they don't know exactly how many acres of hops

The Carey Institute

The Carey Institute for Global Good is the force behind the Farm to Glass Classroom. The institute and the Mohawk Valley in which it lies are historically a community of farmers, and there is still a very vibrant agricultural industry in the area. The institute is working to strengthen that industry by encouraging the production of hops and small grains. Learn more at <http://careyinstitute.org/>

Online Workshops

Potential hops and malting grain growers who don't live a stone's throw from Rennselaerville can still access the Farm to Glass workshops online. Every workshop is videotaped and full videos are made available at most two weeks later, when they are posted on the Carey Institute's "Brewshed Blog" and YouTube channel.



Dietrich Gehring, a participant of the Transitioning To Small Grains program.

and barley were planted due to the Farm to Glass Classroom in particular but in New York as a whole, barley acreage has tripled since the Farm Brewery bill was passed two years ago — from 500 acres to 1500 acres.

"However, malting barley still accounts for less than 1 percent of all the grain grown in New York State," Sarah admits. There is still a long way to go.

Future Plans

To complement the Farm to Glass workshops, which are directed primarily toward the grower, the Carey Institute also has a "Farm Brewery Incubator" in the works, directed toward brewers and focusing on brewing beer with New York grown ingredients.

The incubator will act in part as a research brewery, both to find ways to increase energy efficiency and to develop flavor profiles for New York ingredients which brewers can use during their recipe making. The incubator's other major project will be a mentorship program: beginning brewers will have the chance to learn under a more experienced brewer so that they can pick up practices that work best without having to go through the messy trial and error process.

"It's really a pilot system," says Sarah. Combine that pilot system with the Farm to Glass Classroom workshops, and New York might soon find itself heading back to the days of beer made from local ingredients and a hop house on every farm.

Sarah Nechamen is an undergraduate Plant Science major at Cornell and a student intern for the Small Farms Program. She can be reached at sdn27@cornell.edu.



Casey Holzworth reporting on his experiences growing hops for the first year in the Farm-To-Glass Classroom.

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GRAZING

Grazing Our Way to Health

A farmer's journey to raising grass-fed beef.

by Marvin Moyer

"How do you raise your beef? Do you use growth hormones? Do you feed your animals GMO grain and what about antibiotics and herbicides?" These are questions I hear again and again. Consumers are showing an interest in how their food is produced. Ever since the late 1990s, when my family was young and growing, I have been concerned with producing healthy food. I began attending grazing seminars, and one speaker in particular, Dr. Bauman from Cornell, stood out to me. He listed the health benefits of raising grass fed beef: a healthy ratio of omega 3 and omega 6 fatty acids, the value of CLA (conjugated linoleic acid) and others. I must admit that the first time I heard Dr. Bauman speak, I was not able to grasp what he was saying but after the second time I left the meeting thinking, "This is what I want my family to eat."

Since the late 90's, I have continued to read and attend seminars, learning everything possible about grass fed beef. I learned that cattle and other ruminants have the ability to turn grass into high quality protein and that when we leave our beef on the same pasture for weeks, they gain very little and put on very little finish. I had been using corn and oats to help my cows put on weight and finish quickly and was naive when I thought this was a better, faster and more lucrative way to raise beef. Thanks to those who went back to the old ways of grazing (with modest

variations), I learned that what I believed was a success was actually a source of some of cattle's biggest health problems.

When a calf is born, it stays with the mama cow for about 10 months. It needs that time to fully develop. After, it can easily grow and gain weight on grass, hay, and balage. Since most calves are born in the spring, they are weaned in March and fed good quality hay or balage until the beginning of May when they are put out on pasture. A good grazing plan must include a daily or very short term rotation. On my farm, I move my beef every day, and they gain 1 1/2 to 2+ lbs. per day. A cow with a pound or more gain per day will usually produce a tender meat. With this type of program, calves are finished beef in



Two cows relaxing

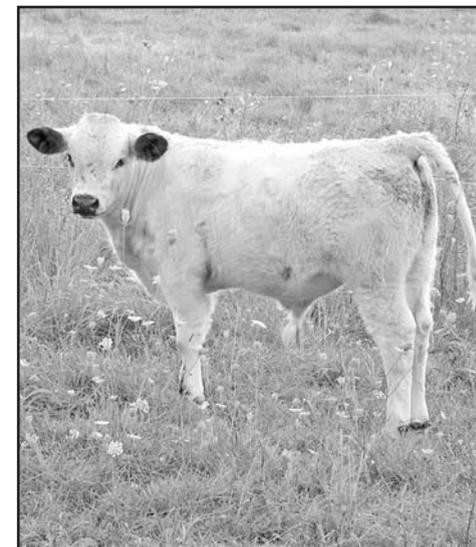
about 24 months. Feed lot beef are finished in 12 to 15 months. There is a premium for quality beef.

What are the benefits of all grass fed beef? For me there are many, from the environmental benefit to bettering the health of both the cattle and humans. Firstly, grass farmers produce grass. We plow very little. We don't need to use herbicides, pesticides or dry fertilizers. The sod catches the rain and a lot of run off and there is minimal erosion. When cattle are rotated often there are many cattle on a small area for a short time. This means they tramp down grass, which becomes worm food and of course they leave lots of fertility when they change paddocks. This, along with a rest period for the plants to recover, produces a lush and thick sod. With no herbicides and no dry fertilizer the soil biology can thrive and work 24/7, spring, summer, and autumn. Talk about getting something for free. How can I top that with my own inputs? If we follow nature, we will prosper.

The health benefits are also remarkable. I already mentioned that grass fed beef has a good omega 3 to omega 6 ratio. Doctors tell us when we have heart problems that we can eat venison but not beef - meaning grain fed beef. Jo Robinson, a beef expert, tells us that eating grass fed beef is like eating a skinless chicken breast. E.coli likes the acidic environment of the rumen of grain fed beef, and we are told that we can avoid E.coli by not feeding grain two weeks before slaughter. Then there is CLA (conjugated linoleic acid), which research tell us reduces tumors, the risk of obesity and diabetes, and helps to keep the arteries clean.

Another benefit is to allow a cow to be a cow. My beef are not confined to a building and they harvest their own feed. Each of them gets fresh grass, water, sunshine and exercise. In the cool of the evening, I enjoy watching the young calves run around the fields. Occasionally the older ones will join and what a show that is. It makes my day, and I know I am doing the right thing.

It can be very fulfilling to raise animals but if we don't have a market for our products we can't pay the bills. We producers are grateful for the local interest we see for healthy and



Grazing in pasture

Photos by Marvin Moyer

quality food, and we have discovered that we get a better return for our products if we sell directly rather than selling on the commodity market. Therefore as our farms develop, we need to seek innovative ways to market what we produce. The methods are as wide open as your imagination. A few that fit my personality are: selling from a small shop on the farm, selling at a day care (it's great to get healthy meat into growing children), and establishing buying groups at places of work, like schools and hospitals.

The demand for quality beef is growing and I, as a small producer, will soon be maxing out. I can produce only so much beef. I finish 25-30 cattle per year, and I can't get much bigger. In order to meet the demand for quality meat, we must get more people involved. There is a lot of vacant land in upstate New York, and I encourage people with land and interest to think about getting involved. Start slow, buy a few beef cattle and get your feet wet.

I continue to learn every day and meet many people who are grateful that they can purchase healthy meat. Producing grass fed beef fits me, my farm, family and community like a glove, and I will never go back to conventional farming.

Marvin Moyer is a farmer at Twin Brook Farm. He can be reached at 607-687-4053.

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RESOURCE SPOTLIGHT**Grant Funds Available to Support the Newest Farmers in New York State**

by Daniel Rivera

The world needs more small farmers, and I'm happy to say that New York State is investing in the future of local and regional agriculture.

New York State's Empire States Development (ESD) President, CEO & Commissioner Kenneth Adams said, "The New York State New Farmers Grant Fund was created to invest in the future of our agriculture industry and will provide the support many of our farmers need to establish an agriculture operation or grow their business. With funding available for costs ranging from the lease or purchase of farm machinery and equipment to the purchase of supplies, the grant fund will help meet the needs of our next generation of farmers in New York."

In the past, many farmer grants and funding opportunities have been targeted more towards existing operations with established histories. This grant however is specifically for beginning farmers.

New Farmer Grant Program Purpose

The stated purpose of the New Farmers Grant Fund is "to provide assistance to new and early stage farmers and encourage farming as a career path to sustain and grow agribusiness across New York State." A total of \$614,000 makes up the fund. Grants will be available in the range of \$15,000 to \$50,000.

Who is Eligible?

Here's a basic overview:

- You own or lease 150 acres or less, all within New York State
- You have spent 10 years or less producing an agricultural product
- You actively participate in the production of an agricultural product grown or raised on your farm
- You use or plan to use "innovative agricultural techniques," such as organic farming, specialty crops, environmental stewardship or new technology
- Your farm operation is a legally formed business in New York State

Be sure to read all of the finer details on eligibility in the New Farmers Grant Fund Guidelines.

How Do You Apply?

First off I've always heard that grants can be tough to win and that there is a lot of competition. So if you're a newbie to this, like I am, there are lots of resources online to consider first.

My first stop was to read up on "How to write an application that wins grants," in the book *Grant Writing for Dummies*.

More advice I've found on Inc.com is "make sure your mission and purpose fits closely with the funding entity's mission and purpose."

So as you go through the process, it's important to keep checking that what you write in the grant application does not stray from the mission of the New Farmers Grant Fund

Thinking more about the mission, the one eligibility requirement that stands out above the rest for me is "demonstrating innovation." I think this is the key to a successful grant application.

Many of us can talk about being innovative, but demonstrating it can be another task altogether. I think it will be worthwhile to spend the most time and effort in this section of the application.

Breaking Down the Application

Because this whole process can seem overwhelming, it's best to break it down into smaller parts and work on it over a period of time. If you rush and try to complete too many parts at once, you might not feel so confident that you've completed each part to the best of your ability.

Start with the first part of the application: the due date. All apps need to be in the mail to Albany, NY by January 28th, 2015. So we have a date to be completed by and we



Applications are due January 28th.

Photo by Daniel Rivera

probably want this completed a few weeks earlier, right?

Just to make sure I get mine in by the due date, I'm going to try to make my personal due date December 31st, 2014. If I can do that, then I have plenty of time for tweaks and editing.

The Checklist

A few pages into the application is the Attachment Checklist. It lists a total of 17 items. Not all of these items may apply to you, but if they do, they have to be included with the application.

A big one for my application is the "matching funds commitment letter" and this needs to be started ASAP in order to make the deadline. I need to talk to my credit union soon to see if they will sponsor my farm (via a loan) for matching funds in the event that we are awarded by the program.

By the time the Attachment Checklist is completed, you'll probably have a large stack of scanned and photocopied papers ready to be shipped to Albany.

The Application

After the checklist is reviewed and sorted out, we can then jump into the application itself.

Section 1 is all about your farm's operation. This includes routine details that you should have easily at hand or at least know where to get, like tax ID numbers, etc. Then, just as I referred to earlier, in Section 1 Part D Question 3, the "innovation" inquiry begins:

"Does the farm operation currently employ the use of innovative agricultural techniques or is the farm operation seeking to employ the use of innovative agricultural techniques as a result of this project? If yes, provide details."

Now I'm not saying your application will get rejected for not

being innovative and leaving this section blank, but because it is so prominent in the eligibility requirements and the application itself, I assume it is to your benefit to provide as much detail as possible here.

In Section 2 begins the fun part. Here you will fill in your project title and include an executive summary. You'll also fill in the amount of grant money you're requesting to make your innovative agricultural dream a reality.

In Section 3 you are promptly brought back down to Earth in the form of a business plan.

You'll need to include details of the proposed project, such as:

- A description of your current business
- The scope of the new project activities
- Innovative agricultural techniques to be employed
- Economic and environmental impacts and benefits
- Management and personnel
- Budget
- Work plan

In Section 4 you will specify the dollar amount of the Estimated Total Project Budget, and fill in a sub-section for estimated machinery and equipment costs, estimated construction costs and supplies costs, if applicable for your project.

For Section 5 you will attest that you are a law-abiding citizen in good standing or you will state otherwise and provide an explanation.

Section 6 is probably the easiest part. It's where you sign away on the dotted line.

What's Next

Now it's your turn! I've given you a quick overview on what the program is all about and what's to be expected in the checklist and application.

It does seem like a lot of work to fit into your already busy schedule, but if you "chunkify" it into small pieces of info, I think you'll find it is not that hard.

Other Funding Opportunities

The New Farmers Grant Fund is a New York State only program, but there are many other sources of funding available nationwide.

Visit the Cornell Small Farms Program website for information on grants and other funding opportunities for farmers across the Northeast.

Daniel Rivera chronicles the journey of bringing a small farm back to life in Willsboro, NY on his blog, ADKFarmerDan.com. He can be reached at adkfarmerdan@gmail.com or 518-302-1828.

Farming the Woods***New Book for Enthusiasts of Agroforestry, Forest Gardening, and Specialty Crops***

In 2009, co-authors Ken Mudge and Steve Gabriel met in the MacDaniels Nut Grove, Steve a student in Ken's Practicum in Forest Farming class at Cornell University. As they began to work together, the two found that at the intersection of forest farming and permaculture was a new way to see the forest as more than just trees. Ken and Steve began researching and writing together, and in the fall of 2014, finished a new book for Chelsea Green Publishing called *Farming the Woods*.

The book combines Ken's decades of research and international agroforestry experience with Steve's permaculture and farming knowledge to offer readers a plethora of concepts and ideas for growing a range of non-timber crops in their woods.

Farming the Woods covers in detail how to cultivate, harvest, and market high-value non-timber forest crops such as American ginseng, shiitake mushrooms, ramps (wild leeks), maple syrup, fruit and nut trees, ornamentals, and

more. Readers are provided comprehensive information on:

- Historical perspectives of forest farming
- Mimicking the forest in a changing climate
- Cultivation of medicinal, food, and mushroom crops
- Creating a forest nursery
- Harvesting and utilizing wood products
- The role of animals in the forest farm
- How to design a forest farm and manage it once it's established

In addition to a wide breadth of content, the book offers case studies of real-world forest farmers engaged in mushroom cultivation, nursery operations, animal systems, and nut breeding. The book has been called "a must-read for anyone interested in agroforestry, forest gardening, or utilizing forests for specialty crops" by Martin Grawford, author of *Creating a Forest Garden*.

For more information and to order, visit www.FarmingTheWoods.com.

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Farm Credit East Congratulates Thriving CSA From the Ground Up



Ryan and Sarah Voiland of Red Fire Farm with their son, Wally

Ryan Voiland, owner of Red Fire Farm, got started farming while still in high school. Shortly after college graduation, he purchased his first farm and his business has been growing, from the ground up, ever since.

Originally focused on supplying organic produce for local retail markets, Ryan Voiland and his wife, Sarah, recognized early on that a growing public interest in CSAs could spell greater profitability for their farm.

To accomplish their expansion goals and provide adequate shares to a growing client base, the Voilands turned to Farm Credit East to help purchase land of their own and expand the business. "I talked with other banks, but Farm Credit East has a much deeper understanding of agriculture," said Ryan.

In addition to financing assistance for several expansions, the Voilands discovered that Farm Credit East could also be a key resource in preparing their payroll. "When we first started our business, we hired someone to do our payroll who wasn't familiar with agriculture and made a number of mistakes," said Ryan. "That person just didn't understand the rules and regulations specific to agriculture, so we turned to Farm Credit East."

With key financing opportunities and the added protection of payroll support, Red Fire Farm has grown to be one of the largest CSAs in Western Massachusetts. Serving more than 1,500 CSA summer shares, plus 2,000 fruit, egg, flower and winter shares, they're once again preparing their thriving business for growth.



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LOCAL FOODS AND MARKETING

Turning Milk to Gold (Butter)

Wholesale marketing helps Danforth Jersey Farm expand its product offerings and reach new markets.

by Abigail Woughter

Since 1817, Shannon Mason's family has operated Danforth Jersey Farm in the Catskills region of upstate NY. Mason, the sixth generation to grow up on the farm, returned to the family business in 2006 and launched Cowbella yogurt and butter products in 2010.



Danforth Jersey Farm

Photos by Shannon Mason

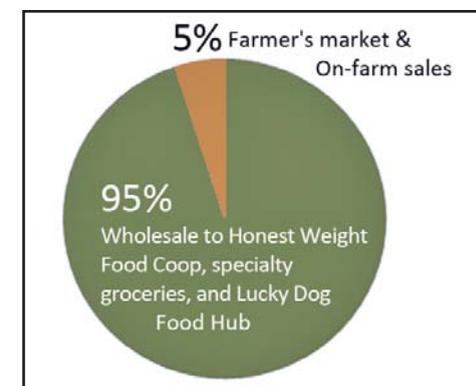
Historically, Danforth Jersey Farm sold all of their liquid milk for shipping on the milk truck, but Mason is working to diversify that model. In 2013, 15 percent of the farm's milk was diverted from the milk truck to Cowbella products, all of which are processed on-farm, and Mason's long-term goal is to use the entire dairy for value-added Cowbella products. When Cowbella got its start in 2010, its products were sold primarily in specialty grocery stores in upstate NY, at Farmer's Markets, and on-farm. Cowbella's market mix began to shift in early 2011 by wholesaling to Honest Weight Food Cooperative in Albany, Freshtown grocery in Margaretville, the Carrot Barn in Schoharie, and in 2012 local Price Chopper groceries. Today, Cowbella products can be found in 35 different locations in upstate NY, including seven Price Choppers, six Tops Markets, and four Shop-Rites.

Mason's most recent wholesale market is Lucky Dog Local Food Hub based in Hamden, NY. Lucky Dog connects NYC buyers to upstate NY products and specifically works with small-to-mid size farms. Lucky Dog Farm is an organic vegetable farm begun in 2000 by two farmers who transported their vegetables to regional markets in a refrigerated truck that had more room than their own vegetables could fill - so they opened up the space to fellow upstate NY farmers wanting to reach new markets. Lucky Dog Local Food Hub works in partnership with the Center for Agricultural Development and Entrepreneurship (CADE) to connect with last-mile distributors and buyers in the NYC area. The charge for their delivery service is 15 percent of gross product value.

A wholesale-dominant market mix - now representing about 95 percent of Cowbella's sales - has allowed Mason to expand Cowbella product offerings to include a kefir drinkable yogurt, as well as justifying the purchase of a filling machine that speeds up the packaging of fluid milk and yogurt. Additionally, the farm is now producing enough volume that she is able to purchase pre-printed yogurt containers, eliminating the time consuming task of adding stickers to yogurt containers by hand.

In the past year, Mason has implemented a rotational grazing program across the farm's 310 acres (some of which is corn for hay as well as forested area), replacing the free range open-pasture model the farm previously used. In addition to improving pasture health, rotational grazing allows

See Turning page 14



Current Marketing Channels



Danforth Jersey Farm

NEW AND BEGINNING FARMERS**Growing the Next Generation of Farmers in the Hudson Valley**

by Rachel Schneider

"The dirty secret of the food movement is that the much-celebrated small-scale farmer isn't making a living. After the tools are put away, we head out to second and third jobs to keep our farms afloat. Ninety-one percent of all farm households rely on multiple sources of income... health care, paying for our kids' college, preparing for retirement? Not happening..." ~ Sunday Review, NY Times: "Don't Let Your Children Grow Up to Be Farmers"

"Let your children grow up to be farmers..let them know what it is like to be free from fluorescent lights and laser pointer meetings. Let them challenge themselves to be forever resourceful and endlessly clever. Let them whistle and sing loud as they like without getting called into an office for "disturbing the workforce." Let them commute down a winding path with birdsong instead of a freeway's constant growl. Let them be bold..... Let them learn what real work is. Let them find happiness in the understanding that success and wealth are not the same thing. Let them skip the fancy wedding. Let them forget four years of unused college. Let them go. Let them go home." ~ The Huffington Post: "Let Your Children Grow Up to Be Farmers"

We do live in extraordinary times - so many challenges - so many chances to dig deep, to discover our core values and to try to live by them. As the above quotes suggest, it is not always easy to reconcile many of our strongly held beliefs in small to mid-scale sustainable agriculture with the hard core financial facts. As someone who works daily with aspiring, idealistic young farmers, these two quotes are frustrating, invigorating, and hit the nail right on its economic head. At the Institute for Mindful Agriculture we have been observing what we are calling the "emerging real food economy" for the past 20 years. It continues to grow and thrive in the Hudson Valley and yet, paradoxically, many small farmers also continue to struggle to survive. The need to grow the next generation of farmers into a strong supportive network that will evolve a "Hudson Valley food shed" requires us to have a long hard look at the economic challenges and farming values presented above.

Some History

Family farms have existed along the Hudson for the past 300 years. Dairying and beef cattle, fruit and vegetable farming, haymaking, grain production, sheep farming, have all had their time and place, county by county within the ecological reality of our beautiful river valley. And those farms helped to



Hawthorne Valley Farm apprentices harvesting Swiss Chard for the weekly CSA.
Photo by Michele Kowalski

shape and support a vibrant rural culture that included writers, painters and musicians, where both economic and cultural activity related itself right back to the endpoint of the Hudson River in New York City. The urban-rural connection is not a dream or a myth, but has been a long standing reality for us. But the advent of post World War II industrial agriculture caused a steady decline in the number of family farms in the Hudson Valley and some of our major agricultural products moved to other parts of the country - dairying to the mid-west, apple production to California, etc.



Harvesting vegetables at Hawthorne Valley Farm. Photo by Michele Kowalski

From the mid 1970's to the mid 1990's the rise of small organic farms, the food co-op movement, and a renewed interest in local farmers' markets signaled the beginning of something new and a little different for the Hudson Valley. Many of the up and coming farmers, retailers and food entrepreneurs were former urban dwellers, sometimes college grads taking refuge from the increasingly destructive political times. Many of us were idealistic, ambitious and given to working collaboratively. Hawthorne Valley Farm was at the vanguard of this early history. We were one of the first farms at the Union Square market with our products; we started training interns on our farm in 1974 and also began our farm based education programs for children during that time. CSA's took hold in the United States during these years as well. By the late 1990's this "phenomenon" had grown into an "organic food movement" including biodynamic farms as well. As farmers and farmer educators we found ourselves in a strong supportive network that included peer-to-peer learning, sharing of knowledge, skills, equipment, and sometimes even our products as we grew our marketing capabilities. The CRAFT network (Collaborative Regional Alliance for Farmer Training) was born as an attempt by Columbia County organic and BD farmers to offer our apprentices more complete and robust learning opportunities as the next generation of growers and livestock farmers began to populate the Hudson Valley.

We were helped in our efforts by an ever more aware population of "eaters". Mothers concerned for food safety for their children, individuals who responded to health needs and those with ecological and environmental awareness, were some of the consumers, who all helped to grow this movement.

In 2006 a watershed moment occurred. "The Omnivore's Dilemma" by Michael Pollan was published and after it many other books and films highlighted the perils of industrial farming. An ever greater awakened public began to be interested in farms and food. Consumers started to demand better foods in their restaurants. Diet and health were

finally clearly linked. Organic growers were already delivering to restaurants up and down the Hudson Valley when the the farm to table movement emerged and opened many new markets. Once the restaurants got involved an "agri-tourism scene" developed. At the same time, the next generation of young people became interested in food - and in contributing to what was clearly becoming a Hudson Valley "food shed." And that is where we find ourselves today.

A Maturing Food Movement and a Long Way To Go

"This all sounds great"... you will say... "so what's the problem?" Well, the problem is that indeed - as the NY Times op ed piece suggests - with all this wonderful growth and positive contributions from all parts of the food "value chain" - many small scale sustainable farmers still find themselves struggling financially. They often work long hours in the field and then move on to work long hours directly marketing their food with little personal security. And yet they continue to want to farm, to be part of this growing "food movement" because their deepest held values spur them on. Where are the "stuck" points, the "gaps" in our current efforts to provide wholesome and nutritious food locally and regionally and to participate in a cultural "renaissance" with food and farming at its foundation for the Hudson Valley food shed?

- Our farmers are lacking the business skills to scale up their businesses.
- They are often carrying tremendous debt from their university experiences and are afraid of taking financial risks
- They lack capital to grow their businesses
- They lack access to land
- They are concerned about markets



A Hawthorne Valley Farm livestock apprentice in the pasture with the dairy herd.
Photo by Michele Kowalski

These challenges are real and are being addressed by those of us who consider ourselves service providers to aspiring farmers. Programs such as the Grow NYC "Farm Roots" Program, Cornell University's "Small Farms Program", Hawthorne Valley's "Farm Beginnings Program", Stone Barns' Young Farmer Conference, the yearly NOFA NY conferences, Glynwood's Incubator Program, (among many others) are all working collaboratively to help young farmers gain skills to grow their farms and become successful entrepreneurs.

Other service providers such as Northeast Farm Access, Columbia Land Conservancy and American Farmland Trust's land link programs, Dirt Capital Partners, The Carrot Project, Slow Money, and the USDA Farm Service Agency are dealing with land access and questions of capitalization for new farmers.



Hawthorne Valley Farm Compost Manager Spencer Fenniman working in the loafing barn.

Photo by Laurie Rhodes

At this point I would like to focus on one particular "gap" or "stuck place" in our food system that poses an increasing challenge to the next generation of small to mid scale farmers:

- How does our food get to us?
- What distribution systems are currently in place?
- Do those systems need to evolve and develop in the same way as our small to mid-size farms have been re-shaping themselves over the past 20 years?

How can solving questions of distribution help the needs of the next generation of small farmers?

Food Hubs Throughout the Hudson Valley

Most small scale farmers like to direct market. CSA's offer a chance to build community and the farmer receives the full share price without having to first sell his/her produce through an intermediary. Farmers like markets for the same reasons. However, driving a truck for hours upon hours to deliver shares, or needing to attend 10 markets a week in order to bring in an adequate income is a grueling proposition. Such challenges greatly interfere with a farmer's quality of life when added to the 60-70 hours per week spent in actual farm production. In addition, new farmers are often not allowed into existing markets if they are offering product already present in the marketplace and CSA shareholders are becoming harder to find. As the "emerging real food economy" continues to grow, we are will certainly be offered the possibility for continuing consumer education and community building. Hopefully this will translate into continued growth of farmer's markets and CSAs.

There still remains the unexplored area of wholesaling for many small farmers. The Local Economies Project in Ulster County is pioneering a Farm Hub/Food Hub project that includes a training program for farmers interested in learning how to farm for the wholesale markets and aggregating food for the larger institutions such as hospitals and schools. For this kind of effort, larger amounts of acreage need to be in production and a scaling up of all systems from planting to post harvest handling of crops are being looked at.

This doesn't solve the problem of price for the small grower. Wholesale prices are just that - a price that will go to the farmer that is lower than a retail price because the food will need to be marked up by a distributor and then by a retailer before it reaches the consumer. On a farm enterprise with diverse marketing venues, it would be very possible

See Growing page 11

NEW AND BEGINNING FARMERS**Young Farmers Work Together in the Community School's Young Farmer Transition Program**

by John Welton

For years now, aspiring young farmers have found a patch of land in the foothills of New Hampshire's White Mountains where they can deepen their farming experience. The Community School provides two-and-a-half acres of cultivated garden space for the motivated individual to grow produce for sale through a small (30-40) member CSA program, a thriving farmers market in the town of Tamworth, and any wholesale accounts he or she chooses to develop. As a salaried staff member, this position offers a unique opportunity to gain knowledge, save a little money, and contribute meaningfully to the organization in its role as an alternative educator and local foods provider.

Despite all these positives, the farm manager's position has seen a consistent turnover every two seasons for at least the last eight years. In a small community built on long-term, reliable commitment, having farmers passing through like this risks leaving a void in the social and financial fabric of the school. Such a void limits the farm's ability to achieve high visibility during the summer months marketing produce and serve as a source of income to the school in the months it is not receiving tuition payments



Even though the outgoing manager was just a few weeks from ending his tenure, the incoming farm manager would be able to market the fall carrots into winter.

Photo by John Welton

from students. In addition to many other benefits, these, if gone, would affect significant financial stress on the school and negative social change within the community. This situation has generated plenty of discussion as to why farmers aren't sticking around. Perhaps the pay is not competitive enough; the stress load is simply too much; the inexperienced farmers don't like farming as much as they thought; or, farming at the school is nice, but they would rather farm on their own. Although each idea is valid, experience shows that they-and various other reasons, too-are all interrelated. The solving of one will not create the perfect conditions for a permanent farm manager, nor is solving them all a realistic project.

The 2014 season marked the first attempts to address these concerns through a transitional leadership program designed to have the outgoing and incoming farm managers work alongside one another for the entire season. Overlapping the tenure of each manager like this is crucial to the success of the transition. The pattern over the last eight years has shown us that each new farmer pursues his or her own projects, based on his or her unique interests, and therefore takes the farm in a different direction from the previous farmer, whether that is through

constructing a greenhouse, planting an orchard, or diversifying farm income with a new business idea. While these efforts all represent dynamic and stimulating change, the abrupt shift in leadership every other season can stall or even prevent momentum from building over time. The limited transfer of knowledge and experience between managers that results has repeated itself as spring begins, the pace of life quickens, and our individual lives get busy. In response to this reality, one of the main

motivations underlying the idea of a farmer transition was to enable the effective sharing of site-specific knowledge as well as the rationale behind broader organizational decisions that would continue to affect future farm managers. Through the transitional process, the incoming farmer's understanding of his or her work environment and all its complexities will have the filter of an experienced peer. If done successfully, the teamwork will enhance each successive farmer's ability to manage farm productively, extending the school's success in building local agriculture over time.

By establishing this transitional model, the Community School has deliberately embraced the reality of regular farmer turnover. It is an attempt to practice a conceptual model of shared leadership, grounded in the belief that by working together two individuals can more effectively manage what a single farmer would otherwise find overwhelming. It demonstrates a proactive approach to the less-than-ideal situation of farm managers coming and going frequently, as well as sound business planning: co-leadership on the farm serves as a form of long-term risk management for an organization that is practicing the inherently risky business of farming. For example, the critical step of annual farm planning will now have the insight of an incoming manager who has had an entire season's worth of experience before assuming head manager responsibilities, not to mention the countless opportunities to discuss preparation and methodology as both farmers work in the field. Incoming farmers will add their own layers of effort and ideas to an established pattern, rather than having to invent their own patterns over an existing, but incoherent, mix of past actions.

For successful farming to happen at the Community School, the building of a new farmer's confidence is just as important as the building of the soil. The transitional model



School allows farm managers to follow their own interests. In 2013 and 2014, they grew ginger for sale.

Photo by John Welton



The Community School's booth at the Tamworth, NH, farmer's market. June 2014.

Photo by Hannah Fleischmann

facilitates the planning and decision-making process through farmer collaboration. First-year managers have always had and will continue to have the responsibility of understanding the current systems and nuances of the farm; while second-year, outgoing managers will now have the responsibility of passing on their records, practices, and any knowledge gleaned from their tenure to their co-worker. It is a way to institutionalize accountability, to make one aware that their actions do not take place in a vacuum, and to recognize that cooperation over time will yield countless benefits not only for the school and the farm itself, but also for the farmers who have been, are, and will become the stewards of that piece of land.

The Community School has become a training ground for young, energetic people trying to see whether or not farming is the path they should follow in life. Creating a sense of place, rooted in the shared goal of supporting the next generation of small farmers, would enhance the school's ability to continue attracting future farm managers while improving their chances of success when working here.

On the practical side of things, to have a program that formally organizes the reality of transient or transitional farmers will enable stability and long-term planning for both the farm and school. Regardless of any formalities, however, farm managers gain incredible experience while working at the Community School. The welcoming community, consistent customer base, and stunning landscape impart a real sense of purpose and pleasure to those lucky enough to work there. Sustaining such a project requires the ability to see not only what works, but also what could be improved. The school's effort in 2014 to initiate a farm manager transition program began with looking inward and recognizing the need for perpetuating success over many seasons - the need for stability. Having farm managers work alongside one another has had a positive initial season. May there be many more to come.

For more information, contact the Community School: info@communityschoolnh.org, farm@communityschoolnh.org, or 603-323-7000.

John Welton and Emma Schroeder managed the Community School Farm in 2013 and 2014. They now live in Old Town, Maine. They can be reached at 207-581-8942 or contact the author at jcwelt@hotmail.com.

Growing from page 10

to spare some acres out for crops or livestock enterprises if the price were right. How to guarantee a fair price for the farmer and a reasonable price for the consumer when you are in the wholesale market?

Enter two independent and fascinating projects. The first is the Corbin Hill Food Project initiated by social justice food activist Dennis Derryk. The second is "Farmers To You" - developed by food entrepreneurs Greg Georgaklis and his wife Eva Cahill. Each of these food entrepreneurs has developed farmer networks - Dennis in the upper Hudson Valley and Greg and Eva in Vermont and connecting them with either NYC or Boston families. They aggregate product in their warehouses and send it off to pre-determined pick-up sites with an option for home delivery in the case of "Farmers To You." They DO NOT buy and sell product. They are not distributors. They are facilitators. They take a set fee to run their businesses. They are committed to making sure that farmers get the best prices possible for their products while also

making sure that families can afford the food. And they work to insure that farmers and families connect to build strong farmer/consumer networks and a sense of community. Dennis, Greg and Eva are building food hubs. We need more of such food hubs and the Institute for Mindful Agriculture will continue to do its best to promote such projects as part of the emerging, real food economy.

Rachel Schneider is co-director of the Institute for Mindful Agriculture and Director of the Hawthorne Valley Farm Place Based Learning Center which focuses on farm based educational programming for children and families and professional training in the vocation of agriculture. She can be reached at rachel@hawthornevalleyfarm.org or by phone at 518-672-7500 x 236.

For more information on how the Institute for Mindful Agriculture is working to reshape agricultural theory and practice, visit www.instituteformindfulagriculture.org

HORTICULTURE

Mushrooms Turning a Profit for Forest Farmers in the Northeast

Research shows woodland-cultivated shiitake mushrooms to be a leader in profitable agroforestry crops.

by Steve Gabriel

One long held assumption about many agroforestry practices is that while they promote positive land stewardship, the economics just aren't there. Often farmers only adopt practices if there are financial incentives (NRCS programs, for example) or if the practices peak a side-interest from the more "serious" aspects of the farm. While university research from around the nation has demonstrated that agroforestry makes sense for the environment, adoption lags because it has not fully shown that there is also money to be made.

The lack of positive economics of different agroforestry systems is not due to the fact that these systems are inherently unprofitable, but rather due to the fact that the necessary research and development by researchers, extension educators, and farmers for many crops just hasn't been done. There are also cultural and social factors, as agroforestry inherently implies "stacked" systems where multiple crops, the timing of management, and other factors force farmers to look at their landscape in a different way.

Yet, this perspective is in fact the virtue of agroforestry - that complex farm ecologies based in tree crops can better support healthy farms. And while all agroforestry crops may not be ready for "prime time" in the global food system, we are seeing the beginnings of enterprises and systems that are proving to pay the bills. One of these, at the forefront, is woodland-cultivated mushrooms, most notably shiitake (*Lentinula edodes*).

Research based at Cornell University in partnership with University of Vermont, Chatham University, county cooperative extension agents, and farmers has led to a significant increase in demand and interest for forest mushrooms over the last five years. This effort was boosted by almost a decade of research by recently retired Cornell professor Dr. Ken Mudge on the specifics of shiitake and lions mane production including species selection, harvesting protocols, and management logistics that have greatly improved understanding of cultivation.

This base research fed into a three-year SARE sponsored project Cultivation of shiitake mushrooms as an agroforestry crop for New England where over 250 farmers were educated in the basics of cultivation and forest management. Of these, 55 completed a 5-year enterprise plan for a shiitake operation, of these 27 were selected to inoculate 100 logs and keep data records on time, expenses, and sales of product. 15 farmers actually followed through on log inoculation and provided complete datasets. Of these, 10 of the 15 reported net profit after expenses.

Labor & Expenses in Shiitake Cultivation

One aspect of the study focused on the breakdown of labor (Figure 1.1), where it is notable that 53 percent of labor was spent felling trees for inoculating bolts, 32 percent for maintenance tasks and harvesting, and 15 percent for marketing and distribution related work. This snapshot provides some good characteristics for shiitake cultivation; much of the labor is accomplished in the colder months of the year as

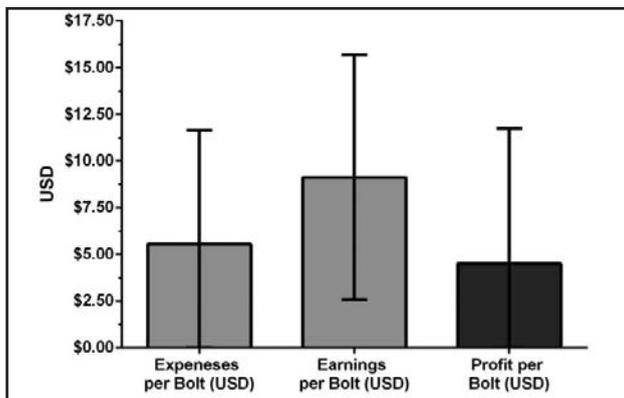
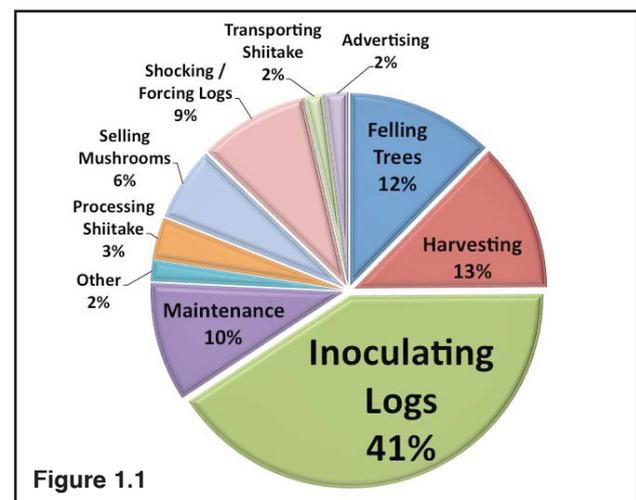


Figure 1.2

forest management is least cumbersome in winter months and inoculation can happen at any time after harvesting, though there is some evidence that the sooner, the better. This means that farmers can put the bulk of the work into the enterprise in a time of year where other farm activities are at a minimum. A well-designed laying yard means that maintenance and harvesting tasks can be efficient and equate to a morning chore rather than eating up precious parcels of time during the growing season. All told, growers spend just over 1 hour per bolt throughout the entire process, a useful measure to think of when deciding on a scale of operation. Also notable is that much of this time is an upfront "investment," as felling trees and inoculation take the majority of time. This process occurs only once in the lifetime of a log, and a good log can continue to fruit for 4 or more seasons.

Another dataset summarizes expenses and earnings, which were quite variable. The average cost per bolt was around

	Year 1	Year 2	Year 3	Year 4	Year 5
Logs Inoculated	100	100	100	100	100
Logs in Laying Yard	100	197 ¹	291 ¹	382 ¹	471 ¹
Logs Fruited	0	97	191	282	371
Shiitake Production (total lbs.)	0	101	199	294	386
Shiitake Production (average lbs. per log per year)		1.04	1.04 ²	1.04 ²	1.04 ²
Price per pound (average)		\$12.26	\$12.26	\$12.26	\$12.26
Total Income	\$0.00	\$1,237	\$2,436	\$3,600	\$4,729

Figure 1.3

	Year 1	Year 2	Year 3	Year 4	Year 5
Total Enterprise Expenses	\$1,041	\$490	\$490	\$490	\$490
Annual Income	\$0	\$1,237	\$2,436	\$3,600	\$4,729
Annual Net Profit or Loss	\$1,041	\$746	\$1,946	\$3,110	\$4,239
Net Profit or Loss to Date	\$1,041	\$295	\$1,651	\$4,761	\$9,000

Figure 1.4

\$4.74, although approximately half of participant's expenses went toward "durable goods," equipment and supplies that are often a one-time purchase. This means that after some initial investment, the cost per log could go down as much as 50 percent. One element that skewed the data, for instance, was that 22 percent of costs were for tree cutting equipment (chainsaws, safety gear, etc) which may be something a farmer already has or may not be necessary if logs are purchased from an outside source. Actual supplies essential to inoculation, harvesting, and sales are around 75 percent, or less of the total above.

See Mushrooms page 13

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Mushrooms from page 12

Equally important is data where log-grown mushrooms are sold successfully, and for how much. Whereas conventional, indoor grown shiitake sells for \$4-8, log-grown shiitake has commanded a much higher price, ranging from \$10-\$16 per pound. Most mushrooms (46 percent) were sold to restaurants, followed by direct sales (19 percent), farmers markets (15 percent), groceries (15 percent), and other (5 percent). Most growers report that in their local markets the demand far exceeds the supply, indicating ample room to expand operations as well as support additional growers.

The bottom line of the economic analysis is that farmers can make income from shiitake cultivation. Of the 15 participants who submitted full datasets, 10 made a profit in just the second year of production. The profits ranged from \$1.39 - \$11.88 per log, depending on the expenditures the farmer chose to take (Figure 1.2). This means an average profit of \$5/log per season, or \$15 - \$20 per log over its productive lifespan. Along with this data, extension specialists crafted some sample budgets for a small operation where 100 logs are inoculated each year, until a total of 500 logs is reached. As shown in Figures 1.3 and 1.4, one could expect to produce a profit in year two, and over \$4,000 in profit in year five. Total profit over the five years is estimated to be around \$9,000. 500 logs is considered a small operation; most commercial growers manage between 1,000 and 3,000 logs.

It's important to note that while we were able to establish some trends in the economics, there is high variability in the choices farmers make, how efficient they are with their time, and other constraints of location and farm particulars. Those interested in commercial shiitake cultivation should keep records on income and expenses and track their own progress in relation to the above data.

Excellent	Very Good	Variable	Not Suitable
Oak (<i>Quercus</i>):	American Hophornbeam / Ironwood (<i>Ostrya virginiana</i>):	Sweet Birch / Black Birch / Yellow Birch (<i>Betula lenta</i> and <i>Betula lutea</i>):	White Ash Elm Poplar Evergreen Species: Do not use wood from any coniferous evergreen tree (pine, spruce, hemlock, etc.).
Sugar maple (<i>Acer saccharum</i>):	American Hornbeam / Musclemwood (<i>Carpinus caroliniana</i>):	Bitternut Hickory (<i>Carya</i>):	
	American Beech (<i>Fagus grandifolia</i>):	Red Maple (<i>Acer Rubrum</i>):	

Table 1.6

Management Factors

In addition to the above economic factors, there are several management factors that affect timing, forest ecology, and choices each farmer must make. Some of these variables include:

Date on which a living tree was felled (cut down) to produce bolts for inoculation. In an experiment at the Arnot Forest, we cut and inoculated red oak and American beech trees at 3 month intervals for a year. Winter and spring-harvested logs performed similarly (in terms of mushroom yield) and substantially better than trees cut in fall or summer, both of which performed about the same (Figure 1.5).

Date of inoculation. Our research from the SARE project indicates that bolts inoculated earlier in April produce more mushrooms versus those done later in spring. There is also a significant relationship for production between the number of days elapsed between felling and inoculation. In summary, the earlier the log is inoculated after felling, the better.

Tree species has always been considered an important factor when producing shiitake mushrooms as a forest crop. Conventional wisdom has it that oaks are best, other hardwoods like hop hornbeam (*Ostrya virginiana*), musclemwood (*Carpinus betulafolia*), sugar maple, and American beech are acceptable, and red maple is a less acceptable substrate for growing shiitake mushrooms. These are recommendations based on input from many growers and our own research, but it is important to realize that they are not absolutes (Table 1.6). The performance of one tree species will depend on the shade and other aspects of the laying yard's microclimate, as well as the time of year, so that the preferred tree species for one grower is not necessarily the same for another grower. Even though the generalized table shows oak and sugar maple in the top tier and iron wood in the next lower tier, our results from one experiment at Cornell's Arnot Forest showed that iron wood performed significantly better than oak, sugar maple, and hop horn bean. That does not mean that the table is wrong; just that actual performance of any tree species is influence by other factors

that the grower may have little or no control over. So, it is important that any new grower should not depend on any one tree species, but rather, try several until it is clear which is best for your site.

Mushrooms and Forest Management

A number of "unintended consequences" emerged from our work over the last eight years. In addition to an emerging grower network (see sidebar), our biggest discovery was the positive link between mushroom cultivation and forest health. Obviously there is value in forest preservation, which provides optimal shading conditions for the fruiting mushrooms, but beyond that a larger link between forest thinning and stand improvement emerged.

Often woodlot owners are incentivized to cut trees by the economics; whether it be timber harvesting, firewood for sale or personal use, or use rights like a hunting lease. For small diameter stands (4-10" trees), the main product is firewood, which has limited use and value-at 6" diameter, roughly 20 trees make a cord of wood, which equates to \$10-\$15 of revenue generated per tree (whether selling it or for personal use). If the same tree is harvested for shiitake mushrooms, one might yield 5-10 three-foot logs per tree. Mushroom cultivation could yield \$25-\$50 per stem; a much improved margin if one is willing to put in the time and work over several years. In reality, timber stand improvement thinning can yield both mushroom logs and firewood, which means that both efficiency and productivity are maximized.

There are further implications to forest ecology, as harvesting mushroom logs can focus on thinning some of the species that will support the long term, positive ecology of the woods. One example is thinning beech trees for mushroom logs, which are often in decline from beech bark disease, and further aren't considered a high value timber species. Instead of seeing beech resprout as a "weedy" problem, farmers could manage young shoots or thin older, diseased trees for mushroom logs, finding value where previously there was none. The bottom line is that farmers should work on a stand management plan, thinning for forest health, with the byproduct of that thinning being mushroom logs and other products.

Steve Gabriel is agroforestry extension specialist for the Cornell Small Farms Program, and in addition runs a farm with his wife in Mecklenburg, NY, where they grow and sell mushrooms, duck eggs, lamb, and more. He can be reached at sfg53@cornell.edu.

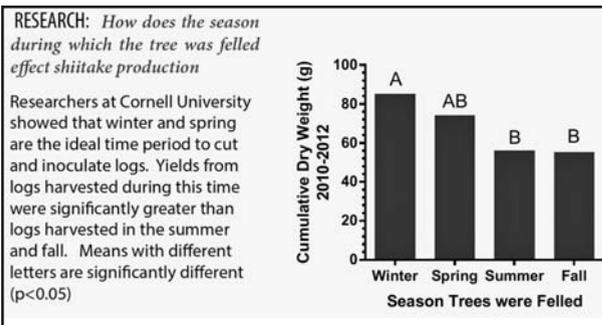


Figure 1.5

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URBAN AGRICULTURE**From Vacant Spaces to Vibrant Places**

by Sean Cummings

The Binghamton Urban Farm is a small market garden located on the east side of Binghamton's downtown, managed by Volunteers Improving Neighborhood Environments (VINES) a small not-for-profit in the City of Binghamton. Our goal at the urban farm has always been to create access to fresh affordable food where there once was none. I am happy to say that with each new season, the urban farm has been able to grow and distribute more food than the last. The main fruit and vegetable garden is about five thousand square feet and produces food for the Downtown Binghamton Farmers Market and Binghamton Farm Share, a food box subscription program. There is a high tunnel for seedlings and, when we have the energy, an extended season. This spring, we will plant a small ecological orchard with plums, pears, berries and lots of perennial herbs. Each season, we work with youth from the City of Binghamton to teach them gardening skills and educate them about the food system.

Binghamton, like many other cities across the country, struggles to find a way to address the issue of food insecurity in some of its less well-off neighborhoods. There are different definitions of food insecurity. In Binghamton what seems to be the major issue is that too many people do not have easy enough access to the kinds of foods that support a healthy lifestyle. There are too many barriers both physical and economic to accessing healthy foods, and people resort to eating the processed foods available at gas stations and convenient stores. These foods are cheap and easily accessible. But these foods also play a major role in the rise of chronic diet related diseases and are produced in an unsustainable way.

Growing more food directly in cities helps, but it is only one piece of the puzzle. Urban food insecurity is the result of the intersection of cultural, physical and economic factors. Thinking about these complexities reminds me of an interesting conversation I had with a friend when work first began to launch the Binghamton Urban Farm. I was describing our plan to him. We would find some vacant lots in the city, lease them, bring in soil and compost, grow food and make it available to the community. My friend's response to this plan was very straightforward. "That sounds weird," he said. "Why not find land outside the city where you can grow lots of food, where there is already soil and just bring the food into the city?" Initially, his response made the idea of an urban farm seem convoluted. Why convert city lots into sites of food production when there is plenty of room to grow food outside of our urban areas? My friend's response was a reasonable one especially given that the four city parcels that have become the urban farm at the time were occupied by four burned out houses, piles of trash and overgrown weeds. However my friend's response overlooked one of the main goals of urban agriculture: reconnecting urban people to the practice of growing food in hopes of one day changing the broader food culture.

Changing the broader food culture starts and ends with changing our relationship to food; what we know about where it comes from, how it is grown, and the way we eat and obtain it. Urban agriculture is one point of leverage to begin fostering this broader



Binghamton Urban Farm mid-summer, perennials, pole beans, onions and collards
Photos by Isaiah Barker

change, while dealing with the very real issue of urban food insecurity. The way urban agriculture deals with both the broader cultural issue and the particular issue of food insecurity is by reclaiming urban spaces so that food can be grown directly in urban communities. It is also important to engage community members, as best as possible, in the practice of growing food. Making land and food available goes a long way to solving the accessibility problem. Food is grown in neighborhoods. It comes straight out of the ground and into the hands of people. This is as direct as access gets, and it reconnects people in urban communities to food and agriculture in such a way that will eventually lead to broader social change. We need to begin to look at our urban communities as not just a place where food gets consumed, but also as a place where food gets produced. In order to create these changes we need to overcome two major obstacles: urban soils need to be reclaimed from the harmful effects of urban development, and urban communities need to relearn and reinvent specific agricultural practices.

When you work in urban agriculture you often work with people, especially young people, who have never realized that food comes



Binghamton Urban Farm Tudor Street Garden mid-summer

from soil. Although the process by which nutrients in the soil is converted by plants and other organisms into nutrients for people is extremely complex at the biological, chemical and physical level it can nevertheless be understood very simply. The realization can be had merely by experiencing the journey from seed to table, or even more simply by seeing a broccoli plant standing in a garden in early summer. "Is that broccoli?" I remember one young person asking with a tone of surprise on their first visit to the Binghamton Urban Farm. As if to say, "What is it doing here sticking out of the ground like that?"

There was a time (it seems that there had to be) when people were not in the position to have this kind of realization, not even young people. That food came from soil was common knowledge. It was knowledge ingrained in us since childhood. It was cultural knowledge. That so many of us now, especially in urban areas, are in the position to have this realization when we are first exposed to agriculture is telling of our culture's relationship to food. There is a disconnect between the most basic resource that sustains us all and the way we tend to think about urban development.

The disconnect is a physical one. There just

is not much soil left uncovered or undisturbed in urban areas. If there is a bit of topsoil, it tends to be shallow, infertile or utilized as an ornamental lawn. This makes growing food in urban areas very challenging, but not impossible. For those members of urban communities that have been marginalized by the industrial food system having a soil resource in their neighborhood could make all the difference. There is, however, also a knowledge disconnect. It is not enough to simply make gardening space available. People also have to relearn how to utilize such spaces in productive and healthful ways. Education about the food system, including but not limited to how to grow food, is perhaps the most important role urban agriculture plays in bringing about a more fair and just food system. The hope is that as the relationship between soil, food and health becomes clearer, community members will demand sovereignty over their food choices, and demand the kind of food system that can legitimately offer people such sovereignty.

The most pressing challenge of urban food insecurity is finding a way to make healthy fresh foods affordable and available in an immediate way. Projects like the Binghamton Urban Farm seek to do this by growing food directly in urban neighborhoods. Although this is the most immediate challenge, in the sense that it affects people's lives on a daily basis, the ultimate challenge is to pursue a food system model that is built on participation and collective ownership rather than disconnection and consumerism. But to move in this direction we have to be more willing to put our hands in the soil and reconnect with our food. We have to live where food is grown.

Sean Cummings is the Binghamton Urban Farm Manager. For more information on VINES, he can be reached at 607-232-3582, or visit vinesgardens.org.

Turning from page 9

Mason's 40 milking head herd to enjoy a longer grazing season and more nutritious grasses. She said the change in feed quality is visible in the butter produced. When her Jersey cows are eating high quality grass, the butter made from their milk is "a very rich, bright, sunflower yellow."

Mason is a member of a group of value-added dairy producers in the Delaware and Schoharie County areas called Catskills Family Creamery. The producer group has provided Mason with an important network of local farmers from whom she can source specialty produce, such as fruit or nuts, for use in yogurt and other Cowbella products. The 8 value-added dairy producers meet once a month to discuss issues and plan events. Last year, they hosted a field day called "Travel the Milky Way," establishing their farms as a "dairy trail" open to the public for visiting and learning about how NY dairy products are made.

With three generations of family living on the bustling Danforth Jersey Farm, everyone has their roles. Mason's father handles deliveries and sales calls, while her mother and uncle help out in the barn and in the processing plant. Mason's husband, who is also a teacher, acts as the processing plant manager, while Shannon oversees the entire Cowbella operation and takes care of the cows. She does almost all the milking herself, occasionally hosting SUNY Cobleskill dairy students who help out with barn chores. Mason also has two daughters: Beth is 8 and Daisy is 4. Currently, the family is able to keep up with Cowbella production by processing two days a week and have not needed to hire any off-farm labor. Mason acknowledges that the time and labor commitment has grown more challenging as she takes on more wholesale markets, requiring a higher volume of Cowbella products, and she foresees needing to hire some off-farm labor to work in the processing plant in the near future.

**Marketing Timeline**

One downfall of living in the beautiful hills of the Catskills is the challenge of proximity to markets. "We do a lot of driving at this point," Mason admitted; two major days of delivery per week, in fact, covering the Capital District all the way to Delaware County, about an hour and a half radius from their farm. A centralized drop-off location is one of the major advantages of food hub and co-op systems in particular and wholesaling in general, allowing farmers to spend more time on the farm producing products than in the car delivering them.

Finding ways to streamline processes is an important part of any business manager's job, and Mason has found over the years that consumers really respond to simplicity. "We thought we needed to have all these flavors and varieties," she said, "but we noticed that people put more importance on quality, and plain yogurt is still our best seller." Wholesale marketing has allowed Mason to capitalize on efficiencies of production, while staying true to family and quality.

Abigail is a senior studying Agricultural Sciences and served as student intern to the Cornell Small Farms Program in 2014. She can be reached at arw225@cornell.edu. For more information on Danforth Jersey Farm and Cowbella products, please visit www.cowbella.com.

SEED STORIES

Seed, Story & Citizen: An Interview with Scott Chaskey

by Petra Page-Mann

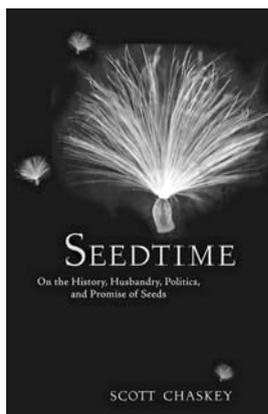
Scott Chaskey has been well described as a working farmer, poet, and spiritual father of the community farming movement. Twenty five years ago he began Quail Hill Farm, one of the original CSAs in the country, as an innovative stewardship project with the Peconic Land Trust on Long Island. Currently serving 250 CSA members, local restaurants, food pantries and farmers markets, Scott has also nourished the world through the thoughtful training of well over one hundred apprentices.

I first heard Scott speak as NOFA-NY's Farmer of the Year at the 2013 Winter Conference. The room was silent and electric, all attention rapt as the farmer-poet-sage brought us on a journey of soil and spirit, simultaneously grounding and uplifting us, renewing our passion for the good work and good world we call home.

As a seed farmer, breeder and founder of Fruition Seeds, I am particularly inspired by Scott's rich, articulate commitment to sharing the significance of the seeds that form the foundation of our food system.

Scott's recent book *Seedtime* celebrates the seed through story and scholarship, calling us to "renew our role as citizens of

Scott's recent book *Seedtime* weaves botany and memoir, history and mythology.



nature," as Aldo Leopold implored, "not as conquerors of it." We shared a conversation this fall and here are a few highlights.

Petra: Scott, what is a seed?

Scott: Each seed is a story, a story held in a state of rest. To grasp the whole story, we will have to look at the structure of a flower, how plants have evolved to attract pollinators, and how a flowering plant produces seed. Our entire food supply is a gift of the angiosperm revolution - the magnificent event that introduced flowering plants to the world 140 million years ago - and our health and food futures are entwined with the way in which we choose to nurture or manipulate the seeds of that natural revolution.

Petra: How has our relationship with seed developed over time?

Scott: Throughout most of the history of agriculture, each farmer was by definition a seedsman. In the fields, the strongest plants were selected, collected and saved the seeds to ensure another harvest. Seed companies eventually replaced farmers in the field as the keepers and purveyors of seed. As seed production became more centralized, on-farm breeding and seed selection diminished, and the indigenous wisdom of generations began to fade. How many of us can name the difference between an open-pollinated plant and a hybrid, let alone understand the implications of our present industrial systems for our food supply? If we retrace the story of seeds to the waters and soil of origin we will glimpse a shared identity. We are, after all, fellow travelers on this earth and dependent on each other.

Petra: How has your relationship with seed developed over time?

Scott: I was first welcomed to the world of plants by a garden in England in my late 20s, studying plants and poetry. I learned to turn the earth and to cultivate crops in the dark, fertile soil of the cliff meadows perched just above Merlin's rock, where the interconnection between mineral, flowering plants and man - far from abstraction - could be immediately felt. Twenty five years ago we began Quail Hill Farm on Long Island, planting many thousands of seeds each year. Fifteen years ago we began to save seed from our fields and immediately noticed the signature of farmer-saved seed: better performance. Finally, I was inspired to write *Seedtime* in reverence to the miracle of creation as well as the need to communicate the story of seed with more people.

Petra: It's a beautiful book Scott, thank you for writing it. What specific qualities do you see changing in the seed you've saved on your farm?



Our culture, our habitation in this time on Earth, is in need of transformation; transformation comes from within, and seeds have mastered the art.

Scott: The first seeds we saved at Quail Hill were tomatoes. Increased productivity and earliness were notable, but perhaps the most significant experience came in 2009, the first year we experienced Late Blight. Though we eventually lost our entire crop, four varieties specifically stood out as resilient, producing fruit weeks after the rest. These four were each crops we had been saving seed of, adapting them to our conditions, to our needs. Some were varieties widely known for this resistance, such as Matt's Wild Cherry. Others had no known resistance, such as Jaune Flamme. This resilience defies characterization and we continue to value seed selected on our farm as a result.

Petra: How does the term "citizen" relate to seeds and seed saving?

Scott: Functional societies cultivate citizens who find themselves and find their place, learn throughout their lives and contribute to the health of the whole. Of course, this is how seeds function. For us often 'thinking' gets in the way. I love a statement about the effectiveness of plants by Zen teacher Robert Aitken. It goes something like this: "Clover does not think about responsibility...its response to altered circumstances is to give nourishment." When I first learned about the Community Supported Agriculture (CSA) model I thought, "now here is a way contribute to our culture in a way that deepens my relationship with the Earth and serves needs greater than my own."

Petra: So true! Scott, where do you find hope these days?

Scott: In the passion of young people! The change of age and interest in farming is dramatic and invigorating. The NOFA-NY Winter Conference used to be about 200 people, many in their 40s and 50s; now it's about 1500 people, 75% are in their 20s. Quail Hill was one of the first CSAs in the country; now there are more than 6000. We are ready to get back to our roots!

Petra: And what would you like us all to remember?

Scott: The health of our fields, the health of our plant communities and the future of our food supply will depend on whether, as a global culture, we can learn to respect the whole of the biological community and to accept our role as citizens of it. Our culture, our habitation in this time on Earth, is in need of transformation, some say in the shape of a new story. Transformation comes from within, and seeds have mastered the art.

Petra Page-Mann co-founded Fruition Seeds, customizing organic seed to thrive in the Northeast. Growing, developing, sharing and inspiring regionally adapted seed networks is her passion! Find over 200 organic, regionally-adapted varieties on her website, fruitionseeds.com or contact her at petra@fruitionseeds.com

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FOOD SECURITY**Less Waste in the Landfills, More Food on People's Plates****Farmers in Vermont incorporate food rescue and composting to benefit their community and farm viability.**

by Rachel Carter

Vermont is taking recycling and waste reduction to a whole new level with the Universal Recycling Law, passed unanimously by the legislature in 2012. Universal Recycling bans disposal of recyclables (metal, glass, plastics #1 & #2, and paper/cardboard) beginning July 1, 2015; yard and wood debris beginning July 1, 2016; and food scraps (in phases) beginning July 1, 2014 with the largest generators (resorts and institutions), and culminating in a full ban July 1, 2020. Simultaneously, solid waste haulers and facilities are required to provide collection services as materials are banned from landfill disposals.

"Complying with Vermont's Universal Recycling Law, Act 148, is becoming more than about meeting mandates," says Pat Sagui, director of the Composting Association of Vermont. "The legislation has spurred organizations to connect with one another and communities to leverage opportunities for food rescue. Farmers partner with charitable food security organizations which is a win-win. Food is gleaned post commercial harvest and moved into food production for Vermonters. Getting crops out of the fields reduces the risk of overwintering disease and fungus and lessens the attractiveness to unwanted wildlife." Sagui is also the chair of the Food Cycle Coalition, a task force of the statewide Vermont Farm to Plate Initiative to increase economic development and jobs in the farm and food sector and improve access to healthy local food for all Vermonters.

Vermont's Universal Recycling Law is being implemented by the Vermont Agency of Natural Resources and aligns with the state's Farm to Plate nutrient management goal to divert food scraps away from landfills and back into the food system. The Farm to Plate Food Cycle Coalition is a diverse group of stakeholders including the Composting Association of Vermont, the Vermont Agency of Natural Resources, solid waste districts, food rescue groups, and composting companies who are working to increase organics diversion in response to

Farm to Plate and Universal Recycling. The Coalition is working to divert food and organic materials that would otherwise be wasted and redirect them to support Vermont's local food system through a hierarchy that places source reduction in the top tier followed by food rescue, and then onto animal feed utilization, composting and anaerobic digestion, and energy recovery.



Potatoes not suitable for market are still perfectly edible and are gleaned as a part of food rescue instead of all being tossed in the compost.

Photo by Cedar Circle Farm

"Farmers are very resourceful and are quick to put un-marketed crops to work for the farm as animal feed or to add fertility to the soil. However, when crops are left on the farm it represents a lost food resource to humans. When a farm makes excess crops available to its community the benefits not only provide food, but unique educational opportunities for community members to engage with the farm and learn about the local food system. Farmers can provide for more of the community while still retaining a large amount of organic matter for animals and soil," shares Theresa Snow, director of Salvation Farms, a non-profit that coordinates agricultural surplus management or "gleaning" with Vermont farmers.

Cedar Circle Farm in East Thetford, Vermont is in their second season working with Salvation Farms and provides product to the Vermont Commodity Program work at the Southeast State Correctional Facility. Farmer Luke Joanis shares, "Last year's fall potato harvest left us with quite a high incidence of 'hollow heart' among our russet potatoes. From the outside these were perfectly normal looking tubers, but on the inside they were hollow! One regrettable side of this business is the market demand

for unblemished produce, which can sometimes create a glut of perfectly edible yet unsaleable product. The compost bin can often be an unsatisfying end of a long road to fruition. Food rescue organizations, such as Salvation Farms, help us to further fulfill one fundamental purpose of our farm, getting healthy food to those that need it."

Food insecurity in Vermont is on the rise with 13% of households being food insecure (compared to 9.1% in 2000). Another Vermont Farm to Plate goal is to increase the percentage of Vermonters who will have access to fresh, nutritionally balanced food they can afford.

The Vermont Foodbank distributes 400,000 pounds of donated and gleaned food to 270 food shelves, meal sites and senior centers across Vermont annually. Farmers can work with Vermont Foodbank volunteers to harvest and gather excess produce or "seconds" from farms. The produce might have small blemishes or an irregular shape, but otherwise is of good quality. Food rescue allows the Vermont Foodbank to provide healthy food to Vermonters who might not otherwise have access to local produce.

From antiquity to present day, gleaning has been a method of providing food to vulnerable populations by collecting leftover crops from farmers' fields after the harvest.

"Salvation Farms has witnessed the impact of increasing access to local foods by those engaged in the process of gleaning and receiving. People begin to see local farms as a vital part of their community, something not separate from their lives, not something



Volunteers work on local farms to glean products like sweet corn in the fall.

Photo by Salvation Farms

just viewed from the road," Snow continues. "This effects purchasing choices, the belief that local, wholesome food is for everyone, and the realization that food going to waste on our farms doesn't have to be a reality. This builds our agricultural economy and future."

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.



Vermont's Universal Recycling Law is moving organic matter out of landfills and back into the food and nutrient cycle.

Photo by VT Agency of Natural Resources



Gleaned potatoes are a local food source for Southeast State Correctional Facility in Windsor, VT.

Photo by Salvation Farms



Produce like sweet corn is gleaned post-commercial harvest from farms in Vermont, processed locally, and distributed back into Vermont's food shed.

Photo by Salvation Farms

Connect with Resources:

- The Agency of Natural Resources Universal Recycling provides a host of information at <http://recycle.vermont.gov>, or contact the ANR Solid Waste Program team at 802-828-1138 for more information. You can also follow the latest news on recycling, composting, and the innovative world of materials management on Twitter @VTrecycles
- Learn more about Vermont Farm to Plate, the Food Cycle Coalition, and the Nutrient Management goal of the Farm to Plate Strategic Plan at www.VTFarmtoPlate.com or on Twitter @VTFarm2Plate
- Learn more about Salvation Farms' work distributing Vermont's farm surplus through the engagement and utilization of available resources, skills and knowledge at www.salvationfarms.org
- Connect with Vermont's largest hunger-relief organization, the Vermont Foodbank at www.vermontfoodbank.com
- Cedar Circle Farm operates a farmstand, café, and education center in East Thetford, Vermont. Learn more at www.cedarcirclefarm.org

ENERGY ON THE FARM

Solar Powering your Farm Just Became Easier

Off-the-grid farming can be very affordable thanks to federal and state tax credits and incentives.

by Edward DuQuette

If you have ever considered solar powering your farm and home, now is the perfect time to do it. Between federal tax incentives, state and town credits, federal grants, and the decreasing cost of solar equipment, you could install a system for very little out of pocket expense-and in some cases, for free or close to it.



A basic solar panel. Size varies with wattage design.

Where to Start

First you need to consider your electrical needs; the place to start is your utility bill. You'll need to find on your bill your kilowatt usage. The system will be designed around your kilowatt needs. If you want complete off-the-grid independence, it could get pricey even after rebates. If you start smaller you can always up grade as needed. Let look at some of a small farm's electrical needs:

- Lighting
- Pumps (water and for milking machines)
- Refrigeration (for milk, meats, food)
- Electric fencing for livestock
- Fans
- Electronic or electrical controllers
- Rechargeable equipment (drills, etc.)
- Security system

With increasing electric needs on the farm and increasing electric cost, reducing cost is an important factor when trying to stay in business and make a livable profit. Solar power could help support your farm's bottom line.

Solar is a clean, renewable source of free energy, after (on average) a 10-year payback operational cost. This means that about 10 years after installation, your system will be paid off and you can start meeting your electrical needs by means of solar for free.

Off-the-Grid Living

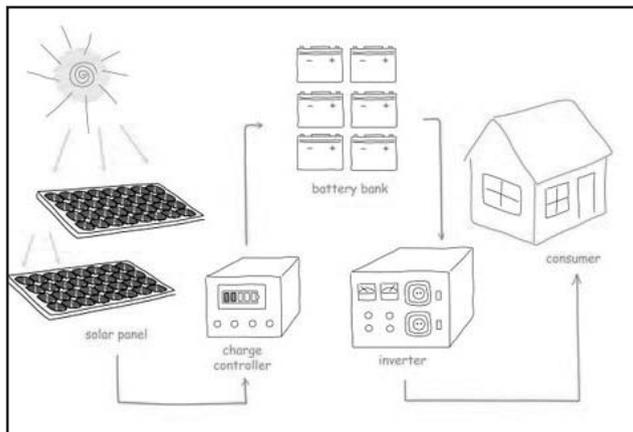
People often think that "off-the-grid" means being alone and isolated from society. In fact, far from that, "off-the-grid" means independence, conservation, a frugal response to high utilities cost, and a peaceful sense of freedom and security. On average, off-the-grid farms and homes use less electricity and their owners are more aware of their energy use. They understand the importance of independence from our aging power grid and increasing use of electricity.

The Operating Components of a Solar Power System

The first, most important factor is the efficiency of your system. When designing your system always double your energy requirements to achieve your needs with solar. For example, if you need 10kW for your operation without solar power, design a solar power system for 20kW. Solar power generating equipment losses on average are between 30-50%.

The most expensive part of your system is the installation cost; half of your system cost goes to the installer. This is why most systems are being designed for DIY. There are many companies that will offer design services for free. Let's look at what you'll need.

There are four major components to a solar power system: solar panels, power controller, inverter, and batteries. There are more suppliers offering quality components than ever before and with competition comes lower prices. System components are 20-50% less expensive than just several years ago.



Simplified wiring diagram of a solar power system.

Solar panels are also becoming more efficient and costing less. Currently solar panels (PV) come in 3-types. When choosing which to buy, cost shouldn't be the determining factor, efficiency rating should your top priority.

Monocrystalline: these panels are the most efficient and



A New England farm house operating off-the-grid with full roof installation.

the most expensive panels currently available. **Polycrystalline:** are the most commonly used panel almost as efficient as Monocrystalline but less expensive. **Amorphous Silicon:** (also called "Thin Film") these can be built to be flexible but are not very efficient. Not recommended for solar power (off-the-grid) installation.

Power Controller

The power controller is simply an electronic device that that maintains the proper charging voltage on the batteries.

Inverter

The inverter simply takes the low DC (direct current) voltage generated by the solar panels and converts it into 115 volts AC (alternating current). This device is the real work horse of the group. It basically takes the power of a car battery and converts it electronically to the same power you have coming out of your wall outlet.

Batteries

The batteries used in a solar power system are the type used in golf carts and boats but not your car. They are called deep cycle batteries. They can be discharged and recharged many times without damage.

Putting it All Together: Installation

The website www.freesunpower.com is a great resource for getting you started. This site will answer all your questions with easy to understand tutorials and interactive design tools. Additionally, a small company called Blue Pacific Solar (www.bluepacificsolar.com) sells all the components needed from solar panels and inverters to wind generators. They also have pre-built systems and design services and are very helpful and friendly. If you are not interested in doing it yourself, check out www.purepointenergy.blogspot.com This company, based in Norwalk, CT, offers consultation and installation of solar and wind systems.

Yes, You Can Afford Solar Today

Here are some of the programs to help you get started. Check with local and federal agencies for other updated programs that are being created to help businesses and homes be able to obtain solar power inexpensively.

Federal (Residential Energy Efficient Property Credit) Currently New York grants \$.90 per watt for systems up to 50kW and an additional \$.60 per watt for greater than 50kW.

State (NY-Sun Incentive Program) The current grant is \$.90 per watt. (Residential State Income Tax Credit) A personal income tax credit equal to 25% of your total cost up to \$5,000 is available.

Local (NY-Sun Incentive Program on Long Island) PSEG of Long Island customer's incentive program is \$.40 per watt.

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 at eduquetteut@gmail.com.

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FARM TECH**Selecting a Used Tractor for Your Farm, Part II: Locating a Tractor**

by Rich Taber

In the first installment of this series on selecting a farm tractor, I covered the tractor features that might be needed for you to accomplish your goals on the typical farm. In this second installment, I cover some of the different ways you might locate and purchase a tractor that suits your purposes. A tractor can accomplish a lot of work on your farm but can be quite expensive to purchase and maintain; you want to get the best value for your effort and investment.

In the previous article, I made some assumptions, one being that for a new farmer you would most likely be trying to locate a good used tractor, as compared to purchasing a new one. If you can afford a brand new tractor, by all means go ahead. However, a new machine suitable for the small farm will be a serious investment and can easily come with a several thousand dollar price tag-hence my assumption that you might be looking for a good used machine. If you can afford a new tractor, I would recommend that you stay with known brands and dealerships that have a good history of use and service in the area you live.

I will begin my suggestions with an oft quoted phrase: "caveat emptor," or "let the buyer beware." Purchasing a used tractor can be fraught with many of the same pitfalls as buying a used car. The worst case scenario would be for you to have to borrow money for your purchase, and then end up with a tractor that is little more than scrap iron leaving you with a lot of expensive repairs. Additionally, if you have some mechanical skills, and like to "tinker" on machines, you might be in a better position to buy an older machine. The old saying "you get what you pay for" generally applies to used tractors as well. However, there are some notable differences in the sources of tractors that are for sale.

Another factor to consider is the brand of the tractor. I prefer to own tractors that have locally available parts and service centers, as compared to obsolete lines that are periodically imported into the United States and then vanish after a number of years. Which brands do I prefer? I prefer a name brand that runs and operates, and that local mechanics have a base of experience of working with. If you don't have much tractor or mechanical experience, it might be worth paying a mechanic to evaluate a machine prior to purchasing it.

Regardless of the place that you purchase your tractor, one compelling question to ask yourself is how much recourse do you have in resolving disputes with the seller after you've taken your tractor home? What sort of warranty does this used tractor come with?

Several places to locate used tractors are

- Tractor and farm machinery dealerships
- Farm dispersal auctions
- Consignment auctions
- Classified ads
- Word of mouth
- Internet sites

Each of these methods has certain advantages and disadvantages.

Dealerships can sometimes be the most expensive place to purchase a used tractor. Typically the dealership has taken a used tractor in on trade for a new machine. Did



On the left is a two wheel drive 65 horsepower tractor that is a good size for a small farm. On the right is a 75 horsepower tractor with four wheel drive and a front end loader, which is even more useful for many applications.

they improve this tractor in any way? Did they overhaul the engine, or transmission, or put new tires on it? Or did they just take the machine in and slap a big markup on it? With a dealership, sometimes you can get a short warranty for a used tractor. If you don't have good machinery repair skills, a good dealership is worth its weight in gold. They may be more expensive initially, but if they offer good service, and come out to your farm late on a Saturday afternoon to help you get up and running again, it may well be worth it. This is the best kind of dealer to deal with.

Another type of dealer is called a "tractor jockey," who simply buys used tractors from all over, typically from one type of auction or another, for resale, and typically with few or no warranties. Oftentimes little or no information is available on the history of the machine in this scenario. Again, beware!

The consignment auction is probably the most perilous of places that you can purchase a tractor. A consignment auction is a central location where all kinds of machinery are auctioned off to the highest bidder. Typically machines with issues are "dumped" at consignment auctions, and unless you personally know the reason the tractor was consigned, or the history of the machine, you can easily end up buying a "pig in a poke." Consignment auctions are "what you see is what you get." That is, if you buy a tractor, take it home and discover issues with it, there is no recourse whatsoever. Additionally, beware of the fresh paint job! People can be easily swayed when they see a bright new coat of paint on what is really an old worn out machine, just waiting to saddle you with expensive repairs when you get it home!

A farm dispersal occurs when a given farm is going out of business, and they are selling all of their farm possessions. You know the tractors being offered are for sale simply for the reason that the farmer is going out of business. These types of auctions can be a good place to purchase a machine, but again, there are no warranties. You buy it, you own it.

Classified ads in local or farm papers, or

Word of mouth, or personally knowing the person from which you purchase a tractor, is one of the better ways of locating a tractor. The best tractors on my home farm have been purchased from friends and neighbors, and I know the sellers personally and the history of the machines.

Internet sites, such as Craig's List and Ebay can be good sources for finding available tractors. Two other good sites are www.TractorHouse.com and www.Fastline.com. Both of these sites have printed editions of tractors for sale.

In conclusion, finding and buying a good used tractor can be fraught with frustrations and pitfalls-but when you do find a good one, it can end up being a machine that gives you years of good service and helps you get your work accomplished on your farm. Used tractors have recently been selling for very high prices, and you must be as prepared and vigilant as you can be in purchasing one of these very necessary machines. Good luck!

Rich Taber is Grazing and Ag Economic Development Specialist for CCE Chenango. He lives with his motley collection of tractors on a 165 acre grazing farm in Southern Madison County which includes beef cattle, sheep, pastured poultry, heritage turkeys, a coonhound kennel, and a 100 acre woodlot. He can be reached at 607-334-5841 ext. 21 or email: rbt44@cornell.edu.

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NEW AND BEGINNING FARMERS**The Seed Farm Grows Next Generation of Farmers**

by Lindsey Parks

Each year, a new crop of farmers and sustainable farms is cultivated in the Lehigh Valley of Pennsylvania, thanks to the work of the Seed Farm. Through a unique combination of hands-on farm training, classroom learning, and an agricultural incubator located on site, the Seed Farm helps new farmers to overcome obstacles that might otherwise prevent them from pursuing careers in farming. And as the 2014 season wraps up, we are seeking interested new farmers to take part in our 2015 training season.

The Seed Farm's nine-month, intensive training program consists of over 600 hours of training on the farm and in the classroom. During the training program, participants build skills in greenhouse production, seeding, transplanting, irrigation, soils, cover crops, pest management, weed management, season extension, and post-harvest handling. Each apprentice is responsible for developing a comprehensive plan for a particular crop family and managing it throughout the season. Trainees are given frequent opportunities to make key decisions for the farm and delegate tasks with the support of the Farm Manager.

Farm ownership requires many skills not always covered in



Farm Manager/Educator Becca Munro addresses a crowd of new farmers at annual Equipment Demonstration Field Day, August 2014.

Photo by Lindsey Parks

a typical on-farm learning experience, such as how to piece together a marketing plan, manage crop plantings and rotations, and plan ahead for looming pest and disease problems. "[After completing a pre-season assessment] I was surprised at how little I knew, despite four years of previous

farming experience," said Emma Cunniff, who graduated from the Seed Farm's training program in 2013 and now owns Kneehigh Farm, a 1.5-acre diversified vegetable farm.

The Seed Farm training program helps build a bridge from farm worker to farm owner by providing experience in key areas including management, tractor/equipment use, business planning, and marketing. Equipment training is emphasized, and a wide range of seeding, transplanting, cultivation, and soil tillage tools are demonstrated and used at the farm.

On-farm training is complemented by classroom activities throughout the season, including three formal courses organized by Penn State Extension. In addition, apprentices conduct farm visits, allowing them to experience different types of agriculture and form connections in the local farming community. The Seed Farm participates in Tri-State CRAFT (Collaborate Alliance for New Farmer Training) program and is a member of PASA (Pennsylvania Association for Sustainable Agriculture).

Sarah Edmonds, a 2010 graduate who now manages

See Seed Farm page 20

ENERGY ON THE FARM**On-Farm Heating with Biomass**

by Chris Callahan

David and Jane Marchant of River Berry Farm—an organic vegetable and fruit producer in Fairfax, VT—were early adopters of biomass heating when they installed a corn and pellet furnace in one of their greenhouses in 2008. The furnace required manual lighting and, whenever a strong wind blew, the fire could be snuffed out, making it a real labor burden. Although it was rated for 165,000 BTU/hr input and had a relatively low initial installation cost of \$5,200, the furnace never seemed to actually produce a reasonable amount of heat. The Marchants also had a variable load in the greenhouse that peaked at night and was non-existent during the middle of a sunny day inside the greenhouse. This made for a frustrating relationship with the appliance. "I kept thinking, there has got to be a better option," recalls David, "It was a real labor burden, and you couldn't count on it."

This biomass heating demonstration was part of a UVM Extension project aimed at trialing several furnaces in agricultural heating applications with funding support provided by the High Meadows Fund. According to Chris Callahan, Ag Engineer with UVM Extension who assisted with some of the design and performance assessment, "The main lessons learned from these early installations were to buy high quality fuel, seek improved automatic ignition controls, invest in a good chimney and install it well, and know the actual heat output rating of the unit." Modern biomass heating appliances generally include a fuel storage bin, an auger for feeding fuel to the appliance, the appliance itself (boiler or furnace) with an ignition system, a combustion chamber, a heat exchanger, and a heat distribution system. They also

incorporate some means of controlling combustion, fuel feed rate, and air flow and often include emissions control measures and automated ash removal.

Boilers Can Provide Advantages Since Hot Water Can be Used in Many Applications

Based on their early experiences and bolstered by a commitment to long-term sustainability and reduced fossil fuel dependence, the Marchants hosted another demonstration project on their farm. This time, they opted for a higher-rated boiler rather than a furnace. Boilers produce hot water, rather than hot air, which allows more options for distributing the heat. The new system also had an automated propane ignition system. The selected boiler was a Central Boiler Maxim 250 with a 250,000 BTU/hr input rating, efficiency of 87.8%, and EPA Phase II Hydronic Heater qualification. "The boiler makes hot water which we can use in multiple greenhouses by plumbing it to them in insulated PEX piping. Once in the greenhouse, we convert to hot air with a hot water fan coil, put it in the ground for root-zone heating or on the benches in our mat-heating system for starts," says David, "I like it. I keep trying to find something wrong with it, but I can't. The payback period is a bit longer due to higher initial costs, but you have to expect that."

The basic system cost was approximately \$13,000 for the boiler, bin, pad, and plumbing to a hot water fan coil. The other heat distribution systems included in-ground PEX, heat exchange, and plumbing for a bench heat system and added approximately another \$5,000. The system is more automated and reliable than the earlier furnace was, but the higher initial costs and the fact that the system is only used 3 months out of the year do prolong the payback period to about 12 years when compared with a propane furnace. If the system was used for 6 (space heating) or even 12 months (wash water, pasteurization) of the year the payback would be halved or quartered, respectively.

"In addition to the financial payback, the carbon emissions avoidance is also of interest to many people," says Callahan, "In River Berry Farm's case, the Maxim is helping them avoid 5,910 pounds of net CO₂ emissions per year which is about equivalent to 5,000 miles car travel or the CO₂ sequestered by half an acre of pine forest." The EPA Phase II qualification of the unit refers to the emissions of criteria pollutants (e.g., sulfur oxide and nitric oxide).

The same analysis that shows the net CO₂ emissions reduction also suggests the net criteria pollutant emissions are also reduced when using the biomass boiler compared to propane.



The Central Boiler Maxim 250 boiler installed at River Berry Farm in Fairfax, VT.

Photo by Chris Callahan

Biomass heating is being used in other greenhouses as well. Paul Betz was interested in using his woodlands to fuel his greenhouses at High Ledge Farm in Woodbury. With the installation of a Central Boiler eClassic 2300 cord wood boiler he is doing just that. "Despite what the sales people will tell you, they are finicky to get lit, and require some babysitting for longer, reliable burn times," cautions Paul, "Once it is going, it does what it's supposed to do, which is burn clean and make hot water." The system cost about \$21,226 and saves about \$1,500 per year resulting in a payback period of about 14 years.

Paul also has two other pointers that will help anyone using a biomass boiler. "Don't skimp on the insulated piping. While I was shocked at the \$13.00 a foot price, I should have gone for it. I got some for \$6.95, and the insulation is not adequate, and since it's not a filled pipe, if the outer sleeve gets nicked, it will fill with water and defeat the insulation" Regarding heat distribution, Paul notes "When buying the exchangers, be sure to check the BTU ratings carefully. When they are listed they give the ratings for steam, not hot water. The end result is the exchangers can be a little under-sized when connected to a hot water boiler."

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This article originally appeared on the Vermont Food Atlas website. To learn more about the Vermont Food Atlas, visit <http://www.vtfoodatlas.com>



A less expensive underground insulated PEX tubing option (left) is wrapped in foiled bubble wrap and has space between the insulation on the pipe as well as the outer wall. The solid EPS insulated PEX tube (right) is more expensive but has demonstrated reduced heat loss and pipe to pipe heat transfer. Water infiltration is a concern on the foil wrapped version on the left.

Seed Farm from page 19

LaFarm, the community garden and working farm at Lafayette College in Easton, PA, said that the Seed Farm exposed her to "all the intricacies of whole farm planning." "Daily I use knowledge about small farm tools, sustainable growing practices, and management systems that I learned while farming at the Seed Farm. If I did not have the production planning experience I gained at the Seed Farm, my farm today would not be a success."

Making the leap from farm worker to farm owner is difficult - or seemingly impossible - without the land, equipment and capital to get started. Graduates of the training program may apply to join the Seed Farm's agricultural incubator, where they can launch their farm businesses with access to land, equipment, infrastructure, and continued mentorship. This program allows participants to start their businesses immediately, building credit, a customer base and skills, while



Jason Slipp, 2012 graduate, launched Spring Hill Farm in 2014.

Photo by Tianna DuPont

receiving continued support from a community of farmers.

Anton Shannon completed training in 2010 and proceeded to launch Good Work Farm in the incubator. While farming in the incubator, Anton benefited from access to a "living laboratory" where he could "test [his] production and sales techniques with scalable resource access."

"Our farm made a net profit in a year that included a drought, a hurricane, prolonged flooding and October snowfall," he remarked. "That very well may have finished off a new farm, [were it] not for the Seed Farm."

The Seed Farm's training program also provides new farmers with the skills that they need to climb the agricultural career ladder. The higher-level skills of planning and equipment use are valued by farm owners who are seeking qualified farm managers.

John Place, owner of Profeta Farms, said, "I am looking for a farm manager who is able to put together and stick to a budget, forecast yield and revenue, set up and run tractors and equipment such as plastic layers and transplanter. Take the time to become proficient in all these skills before you expect to be a farm manager."

To date, 25 new farmers have participated in the Seed Farm's training program. In 2014 alone, six past participants launched new farm businesses. It is a thrill to see the paths that our graduates have taken with the skills that they learned in our training program. Whether they go on to start or manage farms, grow produce for use in their restaurants, work with other farmers as consultants, or even grow medicinal herbs for use in clinical practice, we are proud to have provided the training and support that helped them achieve their dreams.

In our quest to make high-quality training accessible to all new farmers, regardless of financial ability, the Seed Farm is offering three fellowships for our 2015 training season, which will provide scholarships to applicants with at least



Sarah Edmonds, 2010 graduate, now manages LaFarm at Lafayette College, Easton, PA.

Photo by John Woodward

one year of commercial farming experience. A work-study option is available to applicants who need additional farming experience, giving them the opportunity to work extra hours on the farm and earn back the amount that they paid in tuition. Need-based financial aid is also available.

More information about the Seed Farm's programs, as well as application materials, can be found at www.TheSeedFarm.org.

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