

SMALL FARM QUARTERLY

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



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WINTER 2017

Supplement to Country Folks

STEWARDSHIP AND NATURE**From the Burbs to the Curds****Artisan Cheese Makers Embrace Voluntary Conservation at Award-Winning Vermont Dairy**

By Amy Overstreet

The story behind Vermont's Consider Bardwell could be the plot for a really great movie. The lead characters are Russell and Angela, two New York City executives who decide in their fifties they want to buy a farm, raise goats, and be artisan cheesemakers. The setting is a 300-acre dairy farm and cheese operation in West Pawlet, Vermont. And the best part of the story? They had no previous farming experience. What could have been a comedy is an inspiring story of dedication and perseverance. This is the true tale of an architect and a literary agent who pursue a dream to farm sustainably through a voluntary conservation approach, and create a unique farm-to-plate product. And their partnership with the USDA-Natural Resources Conservation Service (NRCS) is helping to ensure the health of the natural resources on their farm.

The story begins in 2000, when the couple visited friends in Dorset, Vermont. They were inspired to search for their own farmstead, and discovered a beautiful property straddling Vermont and their home state of New York. They made an offer and closed on the property in 2001. But, Angela admits they knew little about managing land and nothing about farming. "I was scared to go back in the woods when we were looking at the property!" she remembers. Soon after purchase, they connected with local NRCS soil conservationist, Sally Eugair, to improve the farm through participation in two Farm Bill programs.

They secured Vermont's first Grassland Reserve Program (GRP) easement in 2011. This program was rolled into the new Agricultural Conservation Easement Program (ACEP) in the 2014 Farm Bill. The GRP easement permanently protects 195-acres of healthy grazing lands for their herd of Oberhasli goats and enabled them to convert all the continuously cropped cornfields to lush, healthy grasslands. They learned that converting the cropland to grass provided a healthy and sustainable forage source for their goats and also protected water quality. "The grasslands also provide a valuable nesting and breeding area for many bird species," explained Eugair. They also

installed vegetative filter strips along the riverbank to prevent harmful runoff from entering the waterbody.

The Environmental Quality Incentives Program (EQIP) enabled the couple to provide a high quality forage source for the goat herd. Their EQIP plan helped them in many ways including installing fences to restrict animal access to waterbodies, implementing prescribed grazing, pasture and hayland planting, tree planting, and transitioning their pastures to an organic seed mix. Well-managed grazing systems improve the health and vigor of plants, enhance water quality, and reduce soil erosion. Their prescribed grazing plan allows the grass to recover while paddocks are resting, and encourages the animals to uniformly graze the land.

The dairy has a rich history that began in 1864, when Consider Stebbins Bardwell started the first cheesemaking cooperative in Vermont. Russell and Angela started from scratch when they made the decision to revive the farm, and embarked on a quest to teach themselves everything they could about the art of cheesemaking. They took courses and consulted with experts in the field. They received their Vermont creamery license in 2004, and started making and selling cheese commercially. Today, they have a full-time staff of 20, including three cheesemakers who produce small batches of cheese from unpasteurized milk that is antibiotic and hormone free. Last year, they made over 97,000 pounds of cheese from the milk of 150 goats and 65 cows, without the use of pesticides or fertilizers. Their cheeses have been winning national and international awards for the past ten years, and their product is served in some of the nation's finest restaurants.

There are many keys to their success, but Russell's skills as an architect were a "secret weapon" in the design of their operation. He was the architect of the special caves where the cheese is aged. They also learned they needed cow's milk because goats only produce eight months of the year. So, they worked with local dairy farmers to secure a steady source of high quality cow's



With technical and financial assistance from USDA-NRCS, 195-acres of cornfields were planted to grass to provide a healthy and sustainable forage source for the health of the goats which provide milk for the cheese.

milk. Their other secret weapon is Leslie Goff, who started helping out at the dairy in 2005 at age fifteen, milking goats. Eleven years later, Goff is the Creamery Manager and Head Cheesemaker, overseeing all production and supervising a staff of five. "I fell in love with the cheese making process and the satisfaction of continuously improving and developing a great product," she explains.

A typical day for a cheesemaker includes washing vats and equipment, turning the cheeses from the previous day, and lots of cleaning. "In a creamery, cleaning is about 80% of the job," says Goff. A typical part of the work also includes milking the goats and

managing the delivery of cow milk that arrives from three partner farms. The cheese then sits on wire racks to dry for a few days, and when absolutely dry, it goes into the cave to age. "The thing I love most about being a cheesemaker is being able to work with local farmers and help support them. I'm proud to work with some of the best quality milk producers in Vermont, and because cheese starts with the milk, it is very important to have the purest raw ingredient available to make the best cheese in the country." They use only microbial (non-animal) rennet in their cheese making (used in the production of most cheeses) and their non-animal alternative is suitable for consumption by vegetarians. The rennet is what starts the coagulation of the milk or the formation of the curds.

When asked about the future of the business, Angela and Russell hope to expand. "We are not the kind to retire," they explain. Both still maintain their full-time jobs as an architect and literary agent. Russell says he believes part of their success is due to their 'vertically integrated business' approach. "We raise the animals, make the cheese with milk that we produce, and personally take our product all the way to the consumers." They believe this is important to their audience who are more aware of how their food is produced.

And, their dedication to voluntary conservation

See Curds page 3



Russell's skills as an architect were useful in the design of Consider Bardwell's special caves, where cheese is aged to perfection.

Photos by Amy Overstreet, USDA NRCS

THINKING SMALL ISN'T ALWAYS A BAD THING!

By definition, a small farm generates less than \$250,000/yr in revenue. In New York state alone, 33,000 of the 36,000 farms are small farms. Small farms make up 90% of all farms in the US; nearly 2 million!

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Cornell Small Farms Program Update

Announcing New Grant to Enhance Mushroom Farming Viability in NY

The Cornell Small Farms Program announces a new two-year project funded through the USDA Specialty Crop Block Grant to support the development of a new niche crop in New York State; log-grown shiitake mushrooms. Anyone who is a resident of New York and growing commercially, starting up, or considering commercial production is welcome to participate.

Interested farmers and service providers can learn more and sign up for updates at: <http://blogs.cornell.edu/mushrooms/viability/>

In 2017 & 2018, the grant will focus on developing the following opportunities for farmers in New York:

- **A printed planning tool** will be published in early 2017 to support enterprise development by farmers. It will include enterprise budget worksheets, timelines for implementations, yield projection planning tools, an outline of safety and sanitation require-

ments, and procedures for value-added products utilizing mushrooms.

- **Self-directed online training modules** on advanced topics for mushroom cultivation including mushroom identification, forest management, production safety & sanitation measures, and strategic marketing will be released in 2017.

- In 2017 and 2018, Small Farms will host **5 trainings at regional Cooperative Extension offices in Wyoming, Schuyler, Franklin, Putnam, and Greene Counties.** The trainings will be two days, offering enterprise planning sessions on the first day, and individual farm consultations on day two. (see dates below)

- The program will **solicit applications from farms for customized one-on-one support** developing enterprise plans for their farm. Ongoing guidance and support will enable farms to develop robust and resilient plans for log-grown shiitake growing operations.

Sunday, January 29 - Franklin County CCE (Consultations on Jan 30)
 Sunday, February 5 - Wyoming County CCE (Consultations on Feb 6)
 Sunday, February 26 - Schuyler County CCE (Consultations on Feb 27)
 Friday, March 3 - Greene County CCE (Consultations on March 4)
 Friday, March 10 - Putnam County CCE (Consultations on March 11)

Cost: \$30/person

For more information: www.CornellMushrooms.org/Viability or contact Steve Gabriel at sfg53@cornell.edu

Upcoming Online Courses

We offer over twenty courses to help farmers improve their technical and business skills. Students connect with other farmers, work on farm plans, and gain practical tips without leaving their home. Course content can be accessed anywhere with a high-speed internet connection.

Most courses are six weeks long. Each week features an evening webinar and follow-up readings, videos, and activities. Students and their instructors connect through online forums and live chat. If you aren't able to attend the webinars in real-time, they are always recorded for later viewing.

Classes starting the Week of January 16 include:

BF 107: Climate Smart Farming
 BF 120: Veggie Farming 1 – From Planning to Planting
 BF 152: Introduction to Maple Syrup Production
 BF 203: Holistic Financial Planning
 BF 223: Tree Fruit Production
 BF 232: Commercial Sheep Production

Each course is \$250, which entitles two people from a farm to attend. Discounts for early sign up and multiple course sign ups are available.

Check out the listings at <http://www.nebeginningfarmers.org/online-courses/> for more information on a particular course and the instructors.

Upcoming Baskets to Pallets Trainings

The Baskets to Pallets Project is pleased to announce a calendar of 2016-17 training opportunities. The project seeks to prepare small and mid-scale farmers - who have been primarily direct marketing - to successfully enter new wholesale markets such as groceries, food hubs, restaurants and cooperatives. Farmers that complete a wholesale readiness training this Fall or Winter will be invited to attend a farmer-buyer Mixer on March 6th, 2017 in Troy, NY to start building new sales relationships. Visit the calendar at smallfarms.cornell.edu/projects/wholesale/

First Farm in New York Approved for On-the-Job Training for Veterans

In October, Kreher's Poultry Farm became the first farm in New York State approved by the Division of Veterans' Affairs to provide formal on-the-job training for military service members transitioning to agricultural careers.

The OJT program, administered by the Division of Veterans' Affairs, supports programs spanning six months to two years that follow an approved training outline. Employers pay participating veterans at a rate equal to that of any other trainee, while the Division of Veterans' Affairs pay the veterans a portion of their military housing allowance. Using this benefit, veterans can offset their cost of living and thus afford to work for a training-level wage.

FARM OPS staff, working with the New York State Division of Veterans' Affairs, will help each participating farm create a simple training outline—or modify an existing curriculum—that details what veterans are expected to learn while employed at the farm as trainees. Farms hiring through OJT should be in a position to offer full-time employment to the veteran at the end of the training term.

Employment at the end of the training program is, of course, contingent on the relationship having proven mutually beneficial, with the farm gaining a valuable, well-trained employee.

For more information: <http://www.nebeginningfarmers.org/projects/farmer-veterans/on-the-job-training/>

From the Editor:

Regardless of your social, political, and religious views, as a farmer you belong to a group that is a small minority of the U.S. workforce. And as we all know, farming is not a job, but a lifestyle. When there is not a clock-in and clock-out time, and when the farm needs to rise and fall with the seasons, weather, and market demands, we must always be on our toes.

In a line of work and life that can be stressful and debilitating at times, there is strength in numbers. We must remember that our fellow farmers and neighbors have similar struggles, and that there is likely more that unites us than divides us. Sometimes it's easy to forget, or to see only the values and viewpoints that make us seem different: Organic vs. Conventional, Small vs. Big, Old vs. Young.

In reality, we need every farmer to work more together, so that this way of life and line of work can continue to prosper. In the New Year, let's strive to make those connections, and reach across the fence and say hello to another farmer.

Steve Gabriel

How can I get Small Farm Quarterly?

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is ensuring that the natural resources at Consider Bardwell will be healthy and vibrant for generations to come. This real-life city slicker-turned-farmer success story, which unfolds much like a movie script, is nowhere near its conclusion. With the couple's dedication and passion for what they do, the story of Consider Bardwell is just beginning.

Amy Overstreet is the Public Information Officer for the USDA Natural Resources Conservation Service in Vermont. She can be reached at 802-951-6796 or amy.overstreet@vt.usda.gov.

For more information, visit <http://www.considerbardwellfarm.com>.

Creamery Manager and Head Cheesemaker Leslie Goff (center) with Consider Bardwell owner Angela Miller (right) and cheesemaker Anastasia Barrett.



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Cover photo:
The Cornell Small Farms program announces a new grant to promote the farm viability of log-grown shiitake mushrooms.
Credit Steve Gabriel

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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Anyone is welcome to submit articles for consideration. See our guidelines at smallfarms.cornell.edu/quarterly/writers/ and contact Steve Gabriel with inquiries. Articles should be 1,000 - 1,600 words in length with 2 - 3 high-resolution pictures.

Topics should be appropriate for a farmer audience, and not promote a single organization or business. We focus on articles with relevant information that helps to improve the practice of farming and agriculture in New York and the Northeast.

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EXTENSION NEWS**Soil Health Trailer Extends Cornell Reach**

By R.J. Anderson

Cornell Cooperative Extension's (CCE) Fay Benson and his colleagues in the Cornell College of Agriculture and Life Sciences (CALS) can talk all day with farmers about why healthy, properly managed soil is vital to field and land sustainability.

But recently, they've found it more effective to actually show people why practices such as cover cropping and no-till farming are so effective at preventing runoff, controlling erosion and locking in important nutrients to stimulate important biological and chemical reactions in soil.



Cornell Cooperative Extension's Janice Degni evaluates a field sample as part of a recent soil health demonstration for Ithaca-area farmers.

This summer, Benson, a member of CCE's South Central New York Dairy and Field Crops team, traveled throughout New York state hauling the New York Grazinglands Coalition Soil Health Trailer, a rolling lab equipped to provide demonstrations about the value of healthy soil while illustrating the dangers that can lurk both above and beneath.

Accompanying Benson on several trips – which included farm visits as well as large-scale farming and community events – were various members of the CALS Cornell Soil Health Team. "We presented at 25 events and reached over 1,000 participants," says Benson. "As events were held and articles appeared online and in local newspapers about the trailer, I began receiving request after request from all different types of sources. I knew interest in this topic would be pretty good, but I did not anticipate this type of response – the original grant only required taking the trailer to three events per year."

Funded by a grant from the Natural Resources Conservation Service of the U.S. Department of Agriculture, the solar-

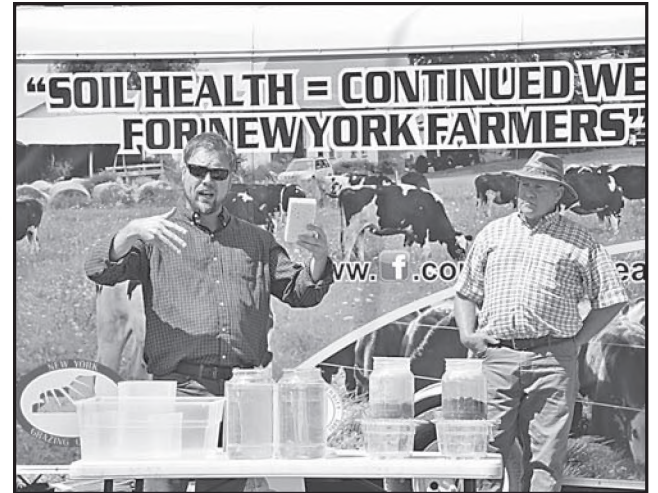
powered trailer has a self-contained water supply and is equipped to conduct a number of demonstrations, testing elements that impact and traits that comprise healthy and unhealthy soils. Highlighting the offerings is a six-foot-tall rain simulator that illustrates how rainfall affects various types of soil, from a bare medium to one that is sowed with cover crops. Beneath each soil section sits a pan that captures runoff, revealing how well or how poorly the soils retain rainwater. Other tests look at the ability of different soil types to maintain structure and resist erosion.

"Through these exercises, it becomes pretty evident pretty quickly that runoff and infiltration rates are much more favorable with a covered soil," says Benson. "These bird's-eye comparisons provide an important tool for revealing a soil's water-holding capacities and how sound soil management can improve crop yield and a farmer's bottom line."

Showing the impacts of soil practices instead of just talking about them, Benson said, makes the educational content much more accessible. Whether demonstrating for a gathering of crop farmers or a group of 4-H sixth-graders, the educational delivery system is neither too complex nor too simple.

"I received a lot of post-event feedback commenting that farmers are familiar with terms like aggregate stability of soil, biological cycling and water infiltration, but that seeing those concepts in action adds a different level of learning," Benson said. "As hands-on people, farmers tend to be more visual learners and they were completely engaged during our sessions."

"One workshop we did for the Hudson Valley Farm Hub was attended by a large number of Hispanic workers," Benson continues. "Afterward, the Farm Hub manager emailed me saying he and his workers appreciated the way the information was presented since it was so straightforward and didn't require much translation."



Cornell Soil Health Program Coordinator Aaron Ristow (left) recently joined CCE's Fay Benson (right) in an interactive demonstration teaching Ithaca-area farmers about value of properly managed soil.

Augmenting the visual demonstrations are the Cornell Soil Health experts, who provided expertise at the events. Soil Health Lab Manager Robert Schindelbeck and Aaron Ristow, the soil health program coordinator, attended a handful of on-farm workshops.

"They followed along with the physical demonstrations and provided expert commentary on soil fundamentals and the chemistry taking place," Benson said. "In addition, I had other CCE educators presenting alongside me at more than half of my events. They were able to add real-world expertise to the discussions."

With another year of funding left, Benson is excited about the future of the Soil Health Trailer. He's pursuing more grants and is in the process of training other CCE educators to conduct the demonstrations.

"My hope is that the trailer will become a resource that can be passed around and used by extension all over the state," he said. "From what I've seen, there's a definite need for this type of educational tool. Today's farmers and landowners are sharp folks who want to learn more about soil health and what management practices they can pursue to protect their land and environment."

R.J. Anderson is a staff writer/communications specialist for Cornell Cooperative Extension.



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LIVESTOCK AND POULTRY**Odor is More than a Nuisance*****Affordable biofilters can keep your farmyard odor in check***

By Jason P. Oliver

The importance of good neighbor relations and the issue of odor

Foul odors can lead to criticism of a livestock farm and impede the good neighbor relations that are essential to sustainable production. Due to changes in farm practice and manure handling, and to the encroachment of urban areas into regions traditionally dominated by agriculture, foul odor complaints are on the rise for farms of all sizes. Odor issues are complex due to their subjective nature, dependency on air dispersion patterns, and the complexity of odor itself. Many different odorous compounds acting independently and together can trigger a human response when detected by the nose. Farm odors are typically mixtures of many odorous compounds at various concentrations. For example, a single dairy may emit more than 100 odorous compounds, while a swine farm may generate up to 500. Farm odors are not simply a nuisance or cause of complaint either since they contain hydrogen sulfide and ammonia gases. These gases are hazardous to farmers, their workers, and livestock at elevated levels, and can create acid deposition and eutrophication problems in the local environment.

Livestock farms of all scales produce odor

Foul farm odors can be directly emitted by any farm animal, though most are from the microbial breakdown of organic matter, particularly under anaerobic (lack of oxygen) conditions. Thus, farm odor generation is typically associated with barns, poorly managed composts and feed storages, silage mounds, and manure storage and treatment facilities. While land application of manure can generate significant odor, emission rates decrease rapidly after spreading, with immediate incorporation of manure into the soil mitigating most foul smells. So though manure spreading is highly visible to the public, the more persistent farmyard sources of odor typically create the greatest potential for issues.

Biofilters offer a low cost way to mitigate many farmstead odors

Biofilters (Figure 1) are simple odor mitigation technologies that use a pile of mulch, wood chips, compost, or other porous, organic media as an air filter. As an odorous air is forced through the biofilter, microbes living on the media breakdown the odorous chemicals to harmless products, essentially de-odorizing the air stream. Biofilters are not a new technology. Developed for wastewater treatment plant odor in the 1920s, they were used on German farms in the

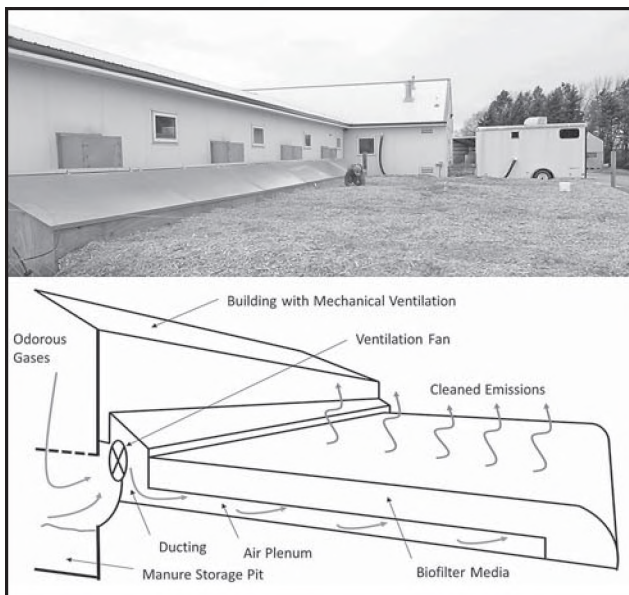


Photo and generalized schematic of a biofilter designed to simultaneously treat barn ventilation fans and manure pit emissions from a pig nursery barn in MN. The performance of this biofilter was continuously monitored by the author (seen on the biofilter) using the instrument trailer in the background.
Courtesy of J. P. Oliver, Cornell

1960s, and have been applied to U.S. livestock operations since the 1990s. When properly designed, constructed, operated and maintained, biofilters are capable of removing more than 90% of odor, hydrogen sulfide, and ammonia, even at the very large swine facilities found in the upper mid-western states. While the adoption of biofilters by small farms has been slow, similar benefits are achievable.

How do biofilters work?

Biofilters are applicable to many different style farms and farm effluents due to the flexibility and adaptability of the microbes that underpin their function. Bacteria and fungi (and other microbes) in a biofilter assemble on biofilter media surfaces in growths called biofilms (Figure 2). By growing into airspaces in the media, biofilms increase surface area and improve capture of odorous gases as they are forced past. Once captured, competent bacteria and fungi breakdown the odorous gases for energy and nutrients. The media provides the microbes with carbon, and over time microbial growth will degrade the media into enriched compost that can be land applied. High microbial diversity present in these biofilms enables biofilters to treat hundreds of different odorous compounds at the same time and be adaptable to different farm effluents.

For an odorous air to be treatable, it first must be contained so blowers/fans can push it through a biofilter. Therefore, biofilters are best suited for the odorous air from barn ventilation fans, manure collection pits and treatment buildings, the shed where your manure chute loads your spreader wagon, buildings used for composting, or even the exhaust fans of a food processing room. There are guidelines on how to select and size blowers/fans and media beds to ensure a biofilter will properly treat your farm's odor – see the Resource Spotlight.

Simple biofilters can be con-

structed easily and at low-cost by farmers. Once you have selected your blower/fan and have calculated the size biofilter you need, all that is left is to build the ducting and air plenum to get your odorous air to and through the biofilter media, and install the media. I've seen working farmer-designs constructed using readily available materials such as pallets, plywood, bird netting, cement blocks, or wire mesh with free piles of wood chips and mulch used as media (Figure 3).

Once constructed, the key to operating a biofilter is preventing compaction and managing moisture content of the media bed. If biofilter media is too compact or degraded, the blower/fan will not be able to move air through the media, and the media will need to be replenished. Well-managed woodchip and mulch media can last over 3 years. Over-watering can also lead to air flow issues and create the same anaerobic conditions that generate odor rather than mitigate it. Watering too little, however, will desiccate media and reduce microbial activity. Ideally, water content should be kept at 40-60% wet basis, and with a little trial and error can be maintained easily with a sprinkler. Some designs use roofs and cement sides for easier management of moisture content and media replacement.

Is a biofilter worth it?

Though biofilters have been only slowly adopted by small farms in the U.S. (and usually only in response to an odor complaint), I encourage you to think proactively about odor and how biofilters may fit into your farm system or future upgrade. So, while you might not have manure storage now, you may in the future as authorities push for better timed manure applications to improve nutrient management and protection of surface waters. And remember, foul odors are not good for you, your employees, your livestock, your community, or the environment. A less stinky farm is therefore in everyone's best interest, and is an important step toward your farm's sustainability goals. Consider low-cost biofilters a tool that can help you reach those goals.

Jason Oliver is a microbiologist in the Department of Biological & Environmental Engineering with expertise in biofiltration and livestock environmental systems management. He can be reached at 607-227-7943 and jpo53@cornell.edu.



A) Biofilter ducting constructed from treated plywood. The ducting lid is on hinges to allow access to barn ventilation and manure pit fans. B) Framing of biofilter ducting made from scrap lumber. C) Base of the ducting showing where odorous air enters the plenum air space under the media made from pallets. D) Close-up of an excavated section of the pallet plenum, showing the bird netting used to support the wood-chip mulch biofilter media.
Courtesy of J. P. Oliver, Cornell



A retrieved wood chip used as biofilter media showing diverse microbial biofilms.
Courtesy of J. S. Schilling, UMN

Resource Spotlight

To learn more about livestock odor, biofilters and their construction, see the University of Minnesota Air Quality Extension Page and the Fact Sheet Series on biofilters at the Cornell Dairy Environmental Systems webpage:

<http://www.extension.umn.edu/agriculture/manure-management-and-air-quality/air-quality/>

http://www.manuremanagement.cornell.edu/Pages/Popular_Pages/Fact_Sheets.html

FARM LABOR**Building Relationships with your Spanish-Speaking Workforce**

By Mario Miranda Sazo

Over the past five years, many New York fruit farm operations have undergone significant growth. Orchards that used to employ only a handful of people with low-skill horticultural talent now look for more help to meet this demand. Why does one fruit grower always have highly-efficient labor, while other similar farm operations do not? Why are some Spanish-speaking crews so efficient, hard-working, motivated, and committed, while other similar crews at other places aren't?

Today, many fruit growers have found that their horticultural or machinery skills don't always translate to Spanish-speaking people skills. Despite their search for horticultural talent to support their recent plantings and new investments, some fruit growers still lack a reliable, skillful, and committed horticultural team to fuel potential growth in the next 5 to 10 years. The competitive challenge for growers is to find, attract, and retain the right people (whether Spanish-speaking employees or not) from within the farm operation, assuming that full-time Spanish-speaking employees are legally employed, satisfied, engaged, and waiting for a new job opportunity inside the farm. Finding the right people that can support the development of new business opportunities won't be easy. Assembling the wrong horticultural team and staffing up prematurely could become costly and catastrophic.

Innovative growers understand that it is much

cheaper to develop a highly skilled and motivated Hispanic fruit team than it is to go out and bring in new people year after year. Empowered employees and orchard managers will perform at their best level, make independent decisions, and find ways to improve orchard operations – including planting, pruning, hand thinning, and harvest.

The Horticultural Team

Creating a high-functioning horticultural team is challenging under any circumstances. But when the team you are trying to build crosses different cultures, how do you meld individuals' talents, cultural expectations, and communication barriers into a super-performing team? For example, if you manage a Spanish-speaking harvest team (where only one or two people can barely communicate in English), you face greater communication challenges than those who lead a Jamaican harvest team (where the majority can speak English). Complicating your communication task is the probability that in a given growing season you will incorporate the use of some type of new technology or a motorized platform for higher labor efficiency and won't be fully able to explain the benefits of the technology to your Spanish-speaking employees.

In this complicated and rapidly evolving labor situation for fruit growing, you have to take action to capitalize on new opportunities and execute them efficiently. But it is also essential for you and your teams to learn quickly, to keep up with developing

events, and stay ahead of the competition. That will happen only if you foster strong working relationships with your most talented Spanish-speaking employees, and assemble skilled horticultural teams inside your farm.

Orchard Skills

While there is no single secret to success when building the perfect horticultural team, there are some common traits I recognize in the most successful fruit growers who employ Spanish-speaking employees at their operations. One of the single greatest changes you can make is to build basic Spanish-speaking relations in the orchard.

No matter how good or how poor your Spanish pronunciation is, you must learn to say "Buenos días" (Good morning), "Como está hoy?" (How are you doing today?). You can also say a few words in Spanish and smile – and mean it! When you or I smile sincerely, the warmth becomes self-reinforcing.

When I am asked to serve as a translator for a meeting between a grower and the Spanish-speaking orchard workers, frequently the first question that the employees will ask their "patron" (boss, in Spanish) is, "How am I doing in my job?" Though the grower may have just finished going through a list of things that have been done well and some that need improvement, Spanish-speaking employees crave one-on-one contact, horticultural coaching, and constructive feedback – positive or negative – from their

boss or orchard manager. Some growers do a good job of addressing this question, if not on a daily basis, then at least when they have a translator like me available.

Growers must show real interest in the well-being of your orchard workers, and regularly ask some of the questions mentioned above. This sort of attention to Spanish-speaking communication creates a relationship between you and your orchard worker, with the result that the labor task receives maximum attention. Your workers' commitment to the fruit farm also will increase. If you work hard at this aspect of communication with your Spanish-speaking employees, you will create better, trusted, longer-lasting relationships, and avoid having to look for and train new people every year.

Most successful Spanish-speaking orchard managers are smart, have good people skills, can build confidence and generate enthusiasm, enjoy interacting with other growers, know the horticultural details of pruning, hand thinning, and harvest, and reliably make their budgets and deliver results.

In addition to all this, the best Spanish-speaking orchard managers have something more – they are curious, walk the orchard regularly, and can look at a problem through multiple lenses. They excel at mobilizing and exciting Spanish-speaking

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RESOURCE SPOTLIGHT**Managing Complexity: Breakdowns**

By Claudia Kenny

A farmer manages complexity such as unpredictability in biological systems, changing weather and climate patterns, and ever-changing economic systems. When multiple stressors pile up, relationships often break down. Breakdowns on farms can manifest in many different ways, from debt default to family or employee tension or conflicts. Our business and personal lives are profoundly impacted by breakdowns and unresolved conflict, which waste time and energy, sabotage business and personal relationships, and diminish the quality of life in our communities.

NYS Agricultural Mediation Program (NYSAMP) offers opportunities in New York State for farmers to call on support from communication experts when the breakdown is in human relationships. Farmers can borrow a NYSAMP mediator's skill set to navigate in the same way they might borrow an accountant's knowledge skills when they need to solve a financial problem. Mediators help parties communicate what is most important and also listen, capacities that often shut down when we are in conflict or under a great deal of stress.

Looking back over the last few months, the majority requests to NYSAMP for mediation came for: farmer



A breakdown in people on farm is as bad as problems with equipment.

landowner lease disputes, debt issues, farm transfers, and farmer neighbor disputes. We also fielded requests with right-to-farm issues, interpersonal farm family conflicts, and agricultural business related organizational issues. Referrals most often occur through an agricultural advocacy organization, followed closely by self-referrals from farmers.

Other requests came from a police officer, a local town official, and non-farming landowners.

Self determination is a core value in a mediation process, meaning that the people involved make their own decisions. Mediation promotes understanding and often restores trust. Mediation outcomes are well informed and durable, since all the decisions are made by those directly involved.

An experienced, neutral mediator helps manage the discussion, and can draft written agreements. Mediators are experts in communication skills, conflict management and negotiation. Mediators do not give legal or other professional advice, nor do they decide or impose outcomes.

Mediation is a good fit for rural families and communities because it reflects the principles of independence, integrity, self determination, and a belief in working things out face-to-face.

NYSAMP is ready support the agricultural community with services available in every county in NYS. NYSAMP offers free or low cost mediation to the agricultural community. Call toll free 866-669-7267 for a free and confidential consultation. We will ask you a few questions about the situation and help you decide if a mediator might be able to help. For more info go to nysamp.com

Building *from page 7*

workers, and are clear about the tasks to be accomplished (i.e., number of fruit buds to leave per tree when conducting precision pruning), but also know when to change direction. They can see when a new pruning practice will be profitable and convert it to a new horticultural management tool. They can spot an unmet need (e.g., picking apples efficiently without the use of ladders) and change course to go after a bigger profit and more comfortable working conditions for Spanish-speaking orchard workers.

As their teams pursue new labor goals (more bins of high quality fruit per person per day when harvesting and clipping apples with motorized platforms) and strive to achieve this or other milestones, they have a clear view of what is in or out of alignment in terms of skills and capabilities, compensation, communication, how workers are collaborating and behaving.

How Our Program Began

In 2011, while working for of the Cornell Cooperative Extension (CCE) Lake Ontario Fruit (LOF) program, I began to realize that further training was necessary for Hispanic employees in Western New York. From 2009 to 2011, I was speaking to individuals during work time (planting, pruning, hand thinning, and harvest) and began to understand their work challenges, personal aspirations, relations with management and co-workers, job injuries, and overall technical understanding of the apple growing business. I also found that Hispanic employees tended to be younger on average than their non-Hispanic counterparts, and some of them were more eager for new technical knowledge and new opportunities.

Growers who were mentoring and taking care of their employees were experiencing an improved stability in the

workforce. It seemed to me that these Hispanic employees went out of their comfort zone to increase orchard efficiency above and beyond labor expectations. I envisioned that a basic training in horticulture and pest management would be beneficial for all Hispanic men and women working in fruit farms in Western NY.

In 2012, we began a horticultural and pest management educational program, which has been more successful on the west side of Rochester than in Wayne County. More than 280 employees have been trained in the Lake Ontario Fruit region. Classroom-based instruction has been successful, but it needs to be complemented with non-formal science education in the orchard. This year, 80 Spanish-speaking fruit workers participated in a full day educational winter session. Attendees were introduced to basic and applied pomological and pest management concepts, as well as modern apple pruning practices in the Spanish language.

Participants who have attended two or three of the five Spanish-speaking fruit schools offered so far have increased their overall understanding of rootstocks, crop

load management, and pruning of high density plantings. Lastly, the first summer tour conducted last summer for Spanish-speaking farmers and workers established some common ground and began a networking system for Hispanics in our fruit region. The tour was well attended, with approximately 105 participants. The success and future of the CCE LOF Spanish-Speaking Fruit School Program is very promising.

Mario Miranda Sazo is an Extension Associate who specializes in orchard management and orchard mechanization with the Lake Ontario Fruit Program through Cornell Cooperative Extension.

The author acknowledges the Cornell faculty and Cornell Extension staff who presented talks and prepared materials for this project. Additionally, the author thanks Jose Iniguez for his constant support and contributions for a more successful educational programming for Hispanics.

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CLIMATE CHANGE**Climate Smart Farming (Part Two)****Getting a Leg Up on Climate Change**

By Jonathan Lambert and Abbie Kramer

From increased flooding and short-term drought, to heat stress and unexpected freeze risk, the effects of climate variability and change are exacerbating the challenges that farmers already face on a daily basis. Climate change presents an unprecedented test for the ingenuity of farmers throughout the world, whose main goal is to produce high quality food, feed and fiber, while protecting the environment, paying living wages, and remaining profitable. These goals will become increasingly challenging when one factors in the need to sustainably increase agricultural production in order to feed an increasing population, given the increasingly variable and extreme changes in global climate. In order to achieve all of these goals, farmers, scientists, extension educators, and policy makers must all work together to formulate innovative solutions that not only mitigate (lessen) climate change and its effects on agriculture, but also help reduce risks and increase resiliency (adaptation) to climate change.

Previously, in Part One of our Climate Smart Farming series (Summer 2016, available online <http://smallfarms.cornell.edu/2016/07/05/climate-smart-farming/>) in the article "Climate Smart Farming: How is the Changing Climate Affecting Your Farm?" we discussed issues such as heat stress and flooding that are affecting farms today, and outlined the climate change impacts that are expected in the future for the Northeast. As a follow-up to part one, this article provides an overview on the tools, resources, and practices that can be used to better predict and manage these challenges and get a leg up on extreme weather and climate impacts.

Climate Change & Agriculture Tools & Information

In order to effectively stay ahead of the curve, farmers need the most accurate information on the changes that are occurring. Organizations such as the Cornell Climate Smart Farming (CSF) Program, the National Oceanic and Atmospheric Association (NOAA), and regional climate centers such as the Northeast Regional Climate Center (NRCC), provide useful climate and weather-based information that can be used to monitor current and projected weather and climate conditions to give farmers a better idea of how to stay ahead of the game and manage their climate risk.

The Cornell CSF Program was launched in 2015 to give farmers information on how the climate is changing, best management practices, and to support implementation of on-farm mitigation and adaptation strategies. Through the program, farmers can take advantage of a toolkit of resources to assist with decision-making, a specialized CSF Extension team for personal advice and climate-based recommendations, an interactive online farmer forum for Q&A, video tutorials and testimonials, and state-of-the-art climate-based agricultural decision tools. The CSF Program also collaborates with organizations such as the USDA Northeast Climate Hub and NRCC, and encourages the use of resources and information from other organizations such as NOAA and the U.S. Drought Monitor.

Strategically Using Climate Data and Tools

With such a wealth of climate change and agriculture information, it may seem overwhelming for farmers to figure out how to respond in a strategic and productive way. By pinpointing the key risks to your farm, however, the CSF program can help farmers identify specific solutions to reduce risk, as highlighted below:

Short-term Drought: One of the biggest challenges for farmers in the Northeast this summer was the severe drought in much of the region – short-term drought is exacerbated by climate change through warmer temperatures, increased evapotranspiration, and longer intervals between rainfall events. While many farmers will be able to determine for themselves that abnormally dry conditions are occurring, tools such as the U.S. Drought Monitor (www.droughtmonitor

**Frost Damage (Apple Tree)**

Photo by Gregory Michael Peck

tor.unl.edu/) can help farmers examine the level of short-term drought they are currently experiencing, and allow farmers to put this in a regional/national perspective. In order to make specific on-farm changes to mitigate and respond to short-term drought, farmers can also use the CSF Water Deficit Calculator/Irrigation Scheduler (www.climatesmartfarming.org/tools), which helps to determine the optimum frequency and duration of water necessary to avoid plant stress, given your location, crop type, soil texture, and the current and forecasted climatological conditions. Once farmers are armed with this information, they can think about utilizing best management practices to increase resiliency. For growers, these would include increasing irrigation capacity or improving irrigation efficiency, working to build up soil health, and utilizing cover crops to hold water in the soil, and experimenting with drought-tolerant crop varieties.

Warmer and Longer Growing Seasons: Another significant challenge (or opportunity) faced by farmers in the Northeast

**Using cover crops to adapt to a changing climate**

Photo by Rachel Erlehaber

Climate Change has been the focus of research at Cornell for many years now, with over 50 faculty and researchers in the College of Agriculture and Life Sciences alone contributing to studies on the topic. The Cornell Institute for Climate Smart Solutions works closely with a number of these researchers to produce information for websites, factsheets, and research/policy briefs. In particular, a series of fact sheets on climate change and agriculture authored by Professors Dave Wolfe and Art DeGaetano have proved particularly useful for this article. These factsheets are accessible at the following weblink: <http://climatechange.cornell.edu>

today is the fact that growing seasons are getting longer and warmer. NOAA data indicates that, on average, the Northeast sees 10 days more per year without frost than it did in the middle of the 20th century. Some crops may not respond well to higher temperatures, but this combination of longer seasons and higher temperatures may also allow for new varieties of crops to be planted, or more crops to be planted within a year. In order to visualize and adapt to this change, farmers can utilize the CSF Growing Degree Day (GDD) Calculator, which plots accumulated GDD (a measure of heat accumulation throughout the growing season) alongside climatological average GDD accumulations, and also makes a 6-day projection for GDD accumulation at the end of the graph. This allows farmers to optimize planting and harvesting dates based on GDD accumulation. In addition to the CSF GDD Calculator, farmers can get a feel for whole season projections through maps like the NOAA Seasonal Outlook on Temperature/ Precipitation (www.cpc.ncep.noaa.gov/). This map provides a projection and description of climate variations on timescales from weeks to seasons, allowing farmers to see the probability of below average, average, and above average precipitation and

temperature for a desired range of time, and plan accordingly.

Freeze Risk: In the past few years, late season freezes have struck orchards and vineyards after plants have already begun to bloom, causing serious crop losses, and this year in particular, an April freeze devastated entire peach orchards. With climate change, freeze events are not receding as fast as the first warm days are advancing, bringing elevated freeze risk to the Northeast. Because of this, the CSF Program is developing freeze risk tools for grapes and apples that will take into account chill requirements, species, location, and the current climatological conditions. The extra hours or days of notice provided by these tools will allow growers sufficient time to take mitigative measures such as putting out heating devices, fans, and covers to protect from damaging temperatures. With these tools, farmers will be able to better plan for the transition points in the growing season.

Important Takeaways

We have not exhausted the list of climate impacts and solutions for the Northeast United States in this article, but have given specific examples that can serve as building blocks and templates for other issues such as flooding, heat stress, and pest/disease pressures. Each of these issues has its own strategy/solution that accompanies it, based on an assessment of the specific risks to your farm. For additional support though, the USDA is developing a comprehensive new framework for climate risks and adaptation strategies, which should be finalized in 2016. In the meantime, your local Cornell Cooperative Extension (CCE) or Soil and Water Conservation District (SWCD) staff, and the Climate Smart Farming Extension Team, can serve as resources as well.

Jonathan Lambert is a staff member with the Climate Smart Farming Program at the Cornell Institute for Climate Smart Solutions (CICSS) in Ithaca, NY. Abbie Kramer provided support as a 2016 summer intern for CICSS.

For more information:

With greater access to resources, experts, and prediction tools for further insight into climate variability, farmers have a unique opportunity to both adapt to and help mitigate climate change, while raising their bottom line. For more information, see the following sites:

- www.climatesmartfarming.org
- www.climatesmartfarming.org/climate-smart-farming-extension-team/
- www.nrcc.cornell.edu/
- www.climateinstitute.cals.cornell.edu
- www.climatehubs.oce.usda.gov/northeast

CLIMATE CHANGE**Help your Soil Thrive in Hotter, Meaner Weather***Climate change is here. Is your soil ready?*

By Carrie Koplinka-Loehr

When Grant Gayman straddles the boundary line between his backyard and his neighbor's cornfield in Waynesboro, PA, one foot is on his own turf and the other rests a step down—a whole 12 inches lower—in the dirt. Fifty years ago, when Gayman's house was built, his land and the farmer's field were at the same elevation. But wind, tillage, rains, and lack of replenishing cover crops have whittled away at the neighbor's earth. America gifts 1.7 billion tons of topsoil each year to the sea and air. David Wolfe, professor of plant and soil ecology at Cornell, describes the loss per acre as enough to fill a dozen small pickup trucks every year. The rate of that soil loss is the kicker: it's more than ten times the rate at which nature forms new topsoil.

Can't get it back

Ideally, soil is 45% mineral (sand, silt, and clay), 25% air, 25% water, and 5% organic matter. The organic matter, which gives soil so much of its bulk, contains dead and dying leaves and other plant material, plus thousands of species of microbes and roots. According to Wolfe, "The uppermost layer of topsoil, which is the first to be eroded, unfortunately also happens to be where we find most of the soil microbes essential to decomposition, nutrient cycling, and healthy crops, and the highest concentration of plant nutrients."

"What's the big deal?" you might ask. "It's not as bad as the Dust Bowl years." You look up from reading this article and the ground is still there, with trees growing on it. The insidious side of soil loss is how slowly, yet persistently, it progresses. Gayman recalls walking snowy fields sprinkled with a dusting of soil, and his father reminding him that the wind moves soil every day, whether we can see it or not.

Wolfe describes this erosion as a fraction of an inch per year, a rate imperceptible to the naked eye. Most cropland erodes quickly because it's plowed and left without a protective cover of vegetation. But wind and water aren't the only culprits: Moldboard plowing, rototilling, and even turning soil with a fork hasten decomposition and decrease soil mass because they incorporate oxygen and the carbon-based organic matter actually burns up, just like our bodies burn food.

Forming an inch of new topsoil can take between two hundred and a thousand years, because the parent rock must be ground into sand particles and clay crystals. "So the two different components of soil run on very different time scales," says Wolfe. You can build up organic matter over the course of 5, 10, or 15 years, but gaining appreciable mineral content won't happen for generations. Do we have that long?

Climate change = heat, storms, drought

"Climate change is here," says Anthony Buda, hydrologist at USDA's Agricultural Research Service in University Park, PA. "For sure, global mean annual temperatures are 1.5 °C warmer now than they were in the 1800s." He points to recent NASA data (<http://climate.nasa.gov/vital-signs/arctic-sea-ice>) showing that about half of the Arctic sea ice has disappeared since 1980, with potential consequences for northeastern weather patterns.

If you struggle to imagine what the climate will be like in the future, the Union of Concerned Scientists has given us a hand. Their Migrating States visualization tool (<http://tinyurl.com/migratingstates>) assumes that if emissions of CO₂ and other heat-trapping gases continue at their existing rate, the climate in Central New York will likely resemble that of Augusta, Georgia by the century's end.

As temperature increases, so does the water-holding capacity of the atmosphere. For every 1°C rise, water-holding capacity bumps up 7%. One likely result will be more



Engineers use a machine to demonstrate wind erosion on a conventionally-farmed field. Also, notice the dust cloud rising on the horizon. Cover crops, no-till farming, and other sustainability measures can help build soil and prevent erosion like that shown here.

USDA ARS Image Gallery photo by Jack Dykinga

extreme rainstorms and increased precipitation for the Northeast. Climatologists have already documented a 71% increase in 2-inch rainfall events between 1958 and 2011. Predictions are that by 2050, Northeasterners will get 5-15% more annual rainfall than we currently do, but most of the extra is expected in the winter.

Climate change can be a bit of a mind twister. If it gets wetter, how can it be drier? Most scientists think that because of the heat, the number of successive dry days will rise by 5-10 percent and evaporation may actually outpace inputs from rain. According to the Cornell Institute for Climate Change and Agriculture, we're more likely to see summer droughts. With warmer temperatures and longer growing seasons, crops will need more water, but compared to past norms, summer rainfall is predicted to remain about the same or even decline.

What do soils have to do with climate change?

Healthy soils are more resilient to flooding and drought, according to Paul Salon, agronomist with USDA's Natural Resources Conservation Service (NRCS) in Corning, NY. They drain and store water better than depleted soils, have reduced crusting and runoff, and promote cycling of nutrients and resilient crops. A key concept for growing healthy soil is to disturb it as little as possible by limiting tillage and keeping stubble on the ground. After several years, no-till fields will hold soil and water longer than tilled soil. The organic matter acts like a sponge, with each 1% increase in soil biomass retaining about 13,500 gallons of water per acre that can be used by crops during dry periods or heavy storms. With no-till, roots, earthworms, and other soil inhabitants create tunnels that become tiny reservoirs for water and air.

Another key concept for healthy soil is to keep it covered with living plants year-round, i.e., diverse cash crops and cover crops (crops that are not harvested and sold). Leguminous cover crops, such as peas and clovers, specialize in returning nitrogen to the soil. Others, such as winter rye and cereal rye, add organic matter both above and below the surface.

Seeking healthy soil? Fall in love with mycorrhizae

"There's a saying that if you want to teach soil science," quips Joel Simmons, soil scientist at EarthWorks Natural Organic Products, "You have to be dead for five years." Simmons claims he slept through many of his agronomy classes before



A vetch-triticale cover crop mixture is rolled and crimped to form a soil-protecting mat into which cash crops will be planted. Photo by Clair Keene, Penn State University

See Help page 11

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getting inspired about how to keep soil alive. “Soil is a living, breathing, dynamic entity,” Simmons says, describing the microbes as “little Pacmen” chomping through organic matter, making it usable for the rest of the microbes—and ultimately the plants. A pinch of healthy backyard soil contains nearly a billion organisms. That same pinch also contains miles of thread-like fungal hyphae. These hyphae colonize plant roots and provide nutrients to the plant in a symbiotic relationship known as a mycorrhiza (“fungus” + “roots”).

“I’ve fallen in love with mycorrhizae,” says Simmons. Two reasons are that the fungi mine phosphorous—an endangered resource—and their hyphae contribute to the structure of the soil. Once you build a healthy soil, you get healthy plants. “It’s the same thing as what’s going on in your body,” says Simmons. “If you’re living right, eating right, you’ll have fewer problems. If you’re living on Coca-Cola and Twinkies, you’re gonna have problems.”

No-till combined with planting cover crops will add carbon to the soil, feeding the microbes that are working for you. When Jeff Moyer, executive director of the Rodale Institute, speaks to growers, he says, “We’re all livestock farmers.” It’s just that most of our teeny “livestock” live under the soil—and they’re hungry.

The crop (almost) nobody wants

About 99% of the country’s farmland stays “naked” after cash crops are harvested, meaning that only 1% of the country’s farmland gets a green cover. Why? First, the timing’s off. Farmers should plant cover crops the day the cash crop is harvested, but they’re busy on that day. Cover crops begin a new planting cycle and need to get established before the winter sets in. If farmers take the corn or soybeans off early, they’re risking a smaller harvest. Interseeding corn with a cover crop in the fall can help with the time crunch, but only if you’ve got the right equipment.

Second, the economics can look rough at first glance. Says Moyer, “When farmers look at the numbers, they see a break-even proposition. If they don’t get the yield dollar value, it’s barely break even, and most years it’s gonna cost them something.” Farmers who own their land can factor in the long-term improvement of the soil, but those who rent land often can’t justify enriching someone else’s fields.

Cover crops must be knocked down in the spring with either herbicides or a crimper/roller—a novel piece of equipment that most growers don’t own. The timing is critical: too early and you don’t get enough biomass to form a weed-suppressing blanket over the soil; too late, and you steal days the unplanted cash crop needs for growth. Furthermore, seed heads from overly mature cover crops can introduce unwanted seedlings into the new cash crop. And don’t forget social pressure. No-till fields with cover crops look more like salads than cleanly plowed, tidy rows. Weeds can be a problem, too, especially for organic growers.

Enriching the soil

David Wolfe, the soil ecologist who now devotes his work to the relationship between soils and climate change, believes that despite the challenges, there’s reason to be optimistic. Says Wolfe, “What keeps me from getting depressed about this is that there are so many people working hard on solutions, so many farmers who are getting it, so many young people who realize this is a challenge of their generation.”

All over the Northeast—with institutes like Rodale leading the way—growers are saying “yes” to no-till, cover crops, and healthier soils. In February, the Pennsylvania Association for Sustainable Agriculture hosted 1,800 registrants for a conference in State College, PA. Forrest Stricker, co-owner of Spring Creek Farms, LLC in Berks County, and a 4th generation dairy farmer, spoke about transitioning to organic and maintaining a herd that’s 100% grass-fed.

Twenty years ago, Stricker’s cropland was covered only 90 days out of each year. In 1996, he stopped growing corn conventionally and converted to hay and pasture, but had to supplement his cows’ diets. He learned the hard way that his herd was overgrazing. So he pared down to 120 cows for 180 acres of pasture in 2014. Stricker lets his cows graze when the grass is 16-20 inches tall and moves them after

they munch a third to a half off the plants. On nearby acreage, he began no-till and planted cover crops.

Now Stricker says he’s able to capture the rain and weather the droughts. The grass improves water infiltration and the crops shade the soil, keeping it moist while protecting it from the force of rain drops. Plant roots grow deeply, holding the soil and ensuring against dry spells. Stricker sees little runoff or erosion. He minimizes soil disturbance and compaction and maximizes biodiversity, providing the soil with living roots all year long—and he has reduced additional feed to some baleage and energy supplements. “The key to sustainability,” says Stricker, “is the soil.”

Freelance science writer Carrie Koplinka-Loehr lives in Lansing, NY, <http://naturesally.weebly.com/>

For more information

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This article originally appeared in the Hot Potato Press, March 16th, 2016
<http://hotpotatopress.org/2016/03/16/help-your-soil-thrive-in-hotter-meaner-weather/>

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EXTENSION NEWS**From Wegmans to Food Hubs, Extension Educators make Ag Development Connections**

By R.J. Anderson

While the consumer appetite for locally grown and sourced foods is at an all-time high, not all farmers have mastered how to access all-important distribution and delivery systems. For many, growing the commodities is the easy part. Getting their product in important retail outlets, such as Wegmans, can be another story.

To help bridge that gap, the Cornell Cooperative Extension Ag and Community Development program work team recently hosted a two-day workshop for CCE educators and other ag support entities who work with mid to large scale producers across New York state. Itinerary efforts were spearheaded by a trio of CCE agricultural economic development specialists, Harvest New York's Cheryl Thayer, CCE of Ontario County's Marie Anselm, and CCE of Broome County's Laura Biasillo, who also serves as the Co-Chair of the program work team.

The sessions were held at a number of venues in and around Rochester and Geneva, including the Wegmans Organic Farm, Swiftwater Brewing Company, Pioneer Malting, and McCann's Local Meats, covered growing opportunities for fresh fruit & vegetables, meats, or grains, and value-added processors along with the challenges of operating in these emerging markets.

On day one, the 20 or so educators—who traveled to the event from across New York State—toured the Wegmans Organic Farm, located on the rolling hills overlooking Canandaigua Lake. Joining them were produce, meat, cheese, and grain buyers from the company, who shared what they look for when partnering with local producers.

In setting up the programming, the organizers' goal was to provide solid takeaways that educators could take back to the farmers in their communities. "This was where Wegmans really shined," says Thayer. "In addition to relaying all of the protocols and safety standards Wegmans requires, the buyers provided their contact information—and encouraged the educators to share it with producers and growers. According to the feedback



Cornell Cooperative Extension educators from around New York state recently visited the Wegmans Organic Farm as part of a program to connect farmers with retail outlets.

we got from our educators, that was an absolute hit."

Another favorite stop came at McCann's Local Meats in Rochester, where owner Kevin McCann shared his story of full animal craft butchery using local livestock. That session also featured Chris Hartman from Headwater Food Hub, who talked about his group's partnership with McCann's Meats, as well as its recent venture to bag and distribute local produce greens.

In the afternoon, the group headed on to Pioneer Malting in Henrietta and Swift Water Brewing in Rochester, where they learned how the craft beverage industry is adapting to the new NYS guidelines. "That gave us an opportunity to explain this new market opportunity while also being clear about the barriers that exist," says Thayer. "So as our educators are working with the various stakeholders in the brewery chain—the maltster, brewer, grain grower—they can help those folks better understand the challenges they're facing. And, there are a lot of them."

The second day—a half day—saw attendees visit the Cornell Agriculture and Food Technology Park in Geneva. There, they were shown the basics of setting up a commercial kitchen and learned how to shepherd small batch processors through the process of fleshing out an idea and one day taking it to market.

While facility tours, engaging speakers, and learning technical expertise provided valuable nuts and bolts to the educational programming, many attendees credited the discussions among colleagues in attendance as being their favorite aspect.

"The post-event feedback showed us that the educators really enjoyed huddling with their colleagues from different regions in the state," Thayer says. "Many are facing similar challenges, but there really is so much nuance for agriculture from region to region, and learning how others are approaching those challenges is very, very valuable."

"Our goal was that by bringing all of these people together, giving them access to cutting edge speakers and providing them tangible resources, CCE's state and county agents will return to their communities armed with information they can share with producers in their communities on how to better market and distribute their products," Thayer continues. "And I think we've done that."

R.J. Anderson is a writer/communications specialist with Cornell Cooperative Extension. He can be reached at rj.anderson@cornell.edu.



As part of a program to help farmers bring product to market, educators from Cornell Cooperative Extension recently visited the McCann's Local Meats in Rochester, New York.

FARM PLANNING**Comparing Farm Personal Property and Business Personal Property**

By Reuben Dourte

If you have found yourself in the situation of expanding your farming operations to business activities that fall outside of the scope of normal or traditional farming ventures, you probably need to take time to reevaluate your insurance coverages. Often, farming policies will exclude coverage for what the insurance company considers as incidental commercial business pursuits unless they are endorsed on the policy and accounted for appropriately so an accurate premium rate can be determined.

Still, other situations may arise where your business activities are beyond incidental in nature, in which case the underwriter may require that a separate commercial policy be purchased to insure for general liability and products liability exposures arising from those business activities. This doesn't automatically mean that having an additional policy will require you to pay more for your insurance. In fact, there are cases where the opposite may be true! You may also find it advantageous from a legal standpoint to separately insure your operations if your farm is operated as a sole proprietorship, and your on-premises business is operated under the name of an LLC. A lawyer can assist you in

determining whether or not you would benefit from having separate liability policies.

Aside from the legal matter of entity separation, the incorporation of business activities into your farming operation may create unforeseen challenges from an insurance point of view, or even possible problems for you in a claim situation. One area where the insurance buyer may find a potential coverage pitfall is in the case of Business Personal Property (BPP) versus Farm Personal Property (FPP). Even though these coverages sound similar, they have significant areas of difference.

Farm Personal Property

Farm Personal Property can include your farming equipment, implements, machinery, tools, supplies, products, and even livestock; in other words, the items you use in your pursuit of agricultural operations. Typically speaking, a farm insurance company will insure these items on an actual cash value basis, meaning the amount you may receive for the item will be calculated by subtracting the depreciation of the item from the replacement cost of a new item of like kind and quality. Your Farm Personal Property inventory coverage is very similar to what is commonly referred to in Commercial

Insurance as Inland Marine coverage. Like Inland Marine, your FPP inventory is covered even when it is not on your premises. This means if you are driving a tractor down the road between two farm locations and you hit a tree, you may still receive a claim payment for your damaged equipment. In this sense, farm personal property is not a location specific coverage.

Scheduled and Blanket Coverage

It's also important to note that your farm insurance company will allow you to insure your FPP inventory on a scheduled or blanket basis. Scheduled FPP requires you to assign a value to each individual piece of equipment for which you want to purchase insurance. This means you may insure your old Massey Ferguson for \$5,000, your 2016 New Holland discbine for \$30,000 and your miscellaneous hand tools for \$10,000. If you were to lose one of these items due to a covered cause of loss on your policy, your insurance company will pay you the actual cash value of the item(s) lost up to, but no more than, the policy limit (less your deductible).

The other option when insuring FPP is to place it on blanket coverage. With this method you will need to account for your entire inventory. The company may allow you to specifically exclude certain items, such as livestock or feed, for example. Your entire equipment inventory should be accounted for when insuring on a blanket basis. Your insurance company will then allow you to insure to as low as 80% of the total limit of your entire inventory. This

can save premium dollars since you may have a total of \$100,000 of equipment, tools and supplies but only have to pay premium based on \$80,000! Insuring for less than 100% of your equipment inventory should only be considered if you have your loss exposure adequately segregated. This is simply a fancy way of referring to spreading your equipment across multiple buildings or locations. Since it is unlikely (or at least less likely) that a wind storm or fire will hit buildings at two separate locations at the same time, having your equipment separated makes a total loss very improbable.

The second thing to be aware of when insuring on a blanket basis is that you want to be sure you the inventory value you are insuring is in fact within 80% of your total actual inventory in order to avoid a coinsurance penalty at time of loss. For this reason it is advisable to insure your inventory at 85-90%. In our example, you would insure your \$100,000 of FPP at \$90,000 and still save some premium while allowing for some small calculation errors on inventory value or the addition of a new piece of equipment in which you forgot to tell your agent about. Since you do not need to name specific items on your blanket FPP, you can still receive a claim payment for an item lost that you did not account for in your inventory as long as you are within 80%, whereas scheduled FPP requires a listing of specific items; in other words if you forget to add your new equipment, you have no coverage!

Business Personal Property

Business Personal Property BPP is similar to farm personal property; however, it usually comes with more limitations in certain areas. If

you have a farm policy coupled with a commercial policy, you may need to divide items between FPP and BPP.

You may decide to sell your farm produce through a retail store location, which you own and operate. You may have significant value in the items within the store, such as shelving, display cases, freezers and coolers, signs, cash registers or computers, and even items purchased for resale. These items should not be insured on your farm personal property. Instead, they should be included in a BPP limit on your commercial policy, (or within the commercial section of an agribusiness type of policy, which can cover commonly owned farm and commercial risks together). These items are used in the commercial business and are not considered farm property. If you have several thousand dollars of freezer beef cuts that you purchased from the organic farm down the road to sell in your store, a loss to this inventory could go unpaid if you have these items insured under FPP. Since they are not your own farm product that you raised, it will likely be considered as Business Personal Property. Bear this in mind when you are deciding where to insure certain items and ask your agent to help you determine the correct place on your policy for each item.

The second large difference between FPP and BPP is that most companies will place a limitation on how far from a building Business Personal Property will be covered. Standard language may only provide for coverage within 100 feet of the commercial building, while some companies may extend this to 1000 feet or more. If you are moving BPP from one location to

another, you may need an inland marine policy, an auto policy with owner's cargo coverage, or possibly a policy endorsement providing a limit for "property in transit". An experienced agent can help to make sure you are appropriately covered if your business property is not contained to one location and building.

Like Farm Personal Property, Business Personal Property may be insured on a schedule or a blanket. The minimum 80% coinsurance requirement still applies to the blanket, but you may be able to receive a lower rate per thousand dollars of coverage if you choose to insure to a higher percentage of your total inventory. This is important to keep in mind when looking to receive the most value from your policy. One difference between FPP and BPP is that insurance companies will more likely offer BPP coverage on a replacement cost basis. In the event that you choose to insure your BPP at replacement cost, you would receive "new for old", or in other words, the value of a new replacement for the item you lost (less your deductible). This can be an important consideration for the perpetuation of your business after a large loss.

There are certainly a lot of confusing acronyms and coverages within farm and commercial insurance policies. Understanding the differences between certain line items is important, however. An agent with experience in agricultural types of risks as well as commercial insurance is a valuable asset to your business. With ever-increasing frequency, farmers are implementing commercial operations into their farms and if you find yourself within that group, it is time to have a detailed conversation about your insurance policies and the coverages they contain.



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FARM SAFETY**Now Accepting Applications for the John May Farm Safety Fund!**

By Alissa Kent, Research Assistant for the New York Center for Agricultural Medicine and Health

The John May Farm Safety Fund is a funding assistance program that was launched by the New York Center for Agricultural Medicine and Health (NYCAMH) in January of 2016. The Safety Fund, set up by NYCAMH, honors the organization's co-founder Dr. John May and will assist New York farmers who need financial help improving safety on their farms.

As the first program of its kind in New York State, this cost sharing program will allow farmers to make lifesaving safety upgrades. "We're excited to integrate this program into the portfolio of health and safety services we offer to the agricultural community," says NYCAMH's Director Julie Sorensen. "The John May Safety Fund fills a gap in services to small farms, where slim profit margins often make it difficult to do more than what is needed to keep the farm running every day."

Who can apply?

The program is geared towards smaller farms of all commodities. Awardees must meet the following eligibility requirements:

1. Resident of New York State
2. Active farmer (part-time or full-time)
3. Annual farm gross receipts are \$10,000 - \$100,000 OR dairy farm has fewer than 400 milking cows.

What types of projects are applicable?

Any project that directly improves safety on the farm will be reviewed. Some examples include but are not limited to:

1. The purchase and installation of equipment to improve animal handling safety
2. Repairing or replacing broken or outdated machinery that poses a safety risk
3. Repairing or replacing faulty electrical systems
4. Making necessary changes to operations to become OSHA compliant
5. Adding or replacing worn out safety signage

Where to apply and how it works:

1. Applications to the program may be submitted at any time and may be obtained online at <http://www.nycamh.org/programs/john-may-farm-safety-fund/>, by calling NYCAMH at (800) 343-7527 (ask for the John May Farm Safety Fund) or emailing info@nycamh.org. The number of awards and the award amount will be determined by NYCAMH on a first-come, first-served basis.
2. For applicants being considered for an award, a site visit will be conducted by one of NYCAMH's farm safety staff.
3. Funds will be awarded with the stipulation that the project must be completed within one year of award notification, unless an extension has been requested and approved.
4. No later than 60 days after project completion, the award recipient is required to contact NYCAMH farm safety staff to schedule a post-project site visit; and submit an evaluation and expenditure summary form, along with copies of paid receipts. After NYCAMH staff review the post-project site visit, the expenditure/summary form, and copies of paid receipts, and the recipient schedules a media promotion visit with NYCAMH, we will send the full award to the recipient.

History of NYCAMH:

NYCAMH was established in the early 1980's by Dr. John May and Dr. David Pratt, pulmonologists at The Mary Imogene Bassett Hospital in Cooperstown, NY. Initially known as the Bassett Farm and Safety Health Project, it was officially designated the New York Center for Agriculture and Medicine in 1988 with a mission of enhancing agricultural and rural health by preventing and treating occupational injury and illness. Learn more at www.nycamh.org.

"NYCAMH provides an essential service for farms across New York. The efforts to improve safety and working conditions for both farmers and their employees has, no doubt, saved lives and reduced the number of injuries. New York Farm Bureau is a strong supporter of NYCAMH's work and is hopeful our members will take advantage of the new grant



Funding is available for on-farm practices in New York that help improve safety.

program to make farms in this state even better places to work," said Steve Ammerman, New York Farm Bureau Manager of Public Affairs.

Since its founding in the early 1980's, NYCAMH has established a farmer's clinic to help diagnose and treat farm related injuries and illnesses, developed a NYS ROPS Rebate Program that has retrofitted over 1,400 tractors, and performed hundreds of on-farm safety trainings to thousands of farm workers.

Dr. May co-founded and directed NYCAMH from the early 80's through 2015, and his work in promoting safety measures has given him a national reputation in his field. Even as he prepares to retire, Dr. May receives glowing remarks on his work within this industry. "Dr. May has become an icon in the field of agricultural health and safety and is nationally

recognized for his dedication and passion for improving the health and safety of farmers," said Dr. Sorensen, who is taking over daily responsibilities at NYCAMH.

"Turning Point Dairy strives for a safety environment on the farm. This is not an easy task. With NYCAMH and the help they have offered our farm, we have become a more safety conscious farm. NYCAMH has also helped us with our OSHA training and compliance. We wish to thank NYCAMH and their staff and hope they can continue to offer this invaluable service," said Marty Hanehan, Co-owner of Turning Point Dairy.

Success Stories:

Since the launch of this program in early 2016 we have funded 12 applications totaling \$39,086.96 in funding.

"Every time we run the animals through (the animal handling system) we say to ourselves 'This is such a great improvement.' Calves through bulls, we run a whole variety of animals through and they are not afraid." - Marie K

Marie's family installed a squeeze chute for their beef farm with funds from the JMFSF.

"I would like to add that the overall experience with applying and participating with the John May Safety Grant was a positive experience. You were very helpful and wonderful to speak with on any question I had. The safety inspection was helpful in that our tractors now have fire extinguishers with them. This safety grant allowed my little farm to purchase a much needed cattle chute to perform vaccinations and health checks on our animals. My kids can now participate with that activity as it is done in a much safer fashion...Again, thank you for this experience and helping our farm grow....safely."- Vicki K

Vicki installed a squeeze chute for their beef farm with funds from the John May Farm Safety Fund.

Contact us:

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URBAN FARMING**Mushrooms are Fruiting in Philadelphia*****One mushroom growing operation proves farming in the city is possible and profitable.***

By Molly R. Bucknum

Most urban farmers have a tough time finding space to grow food. Location, high rent costs, and lack of infrastructure all make securing farmland in a city difficult. That's why Tyler Case and Brian Versek of Philadelphia were thrilled when they found the perfect place for their urban farm: a cold, dark warehouse basement.

Case and Versek, both in their early 30s, founded a Mycopolitan Mushroom Company in 2013, and moved into the basement soon afterward. The pair bonded when Case, a mushroom-foraging fanatic since his teens, invited Versek on a foraging trip. After a few years and a lot of experimentation, their urban ("politan") mushroom ("Myco-") company is on solid financial footing and a go-to name for high quality, hard to find culinary mushrooms in the Philadelphia area. Case, Versek, and their sole employee, mushroom spawn-producing expert Dan Howling, shared their story, including their start-up, challenges, future prospects, and call for more mushrooms to be grown in cities around the country.

Finding a home

Case and Versek searched for land near Philadelphia nearly two years before posting a plea for leads on the Philadelphia Urban Farm Network, a local Google-group of urban farming enthusiasts. A user connect-

ed them with The Common Market, a non-profit distributor of sustainable food from regional farms. The Common Market had just moved into a 70,000 square foot warehouse, with an unoccupied 10,000 square foot basement.

It was a great fit. The Mycopolitan team erected two hoop houses in the basement—a heated incubation room, and a cooler humidity-controlled grow room. On the opposite side of the basement is an inoculation room where mushroom spawn is added to 6lb. plastic bags of sterilized substrate, starting the growing process.

The Common Market partnership offers several benefits, including access to cold storage for harvested mushrooms, use of pallet jacks and a freight elevator, and even some backhauling of mushroom materials on the distributor's returning trucks. Though its rent, electricity bill, and a Common Area Maintenance fee cost is \$1,100 a month and rising, Case says the benefit of producing high-value mushrooms almost year-round make it a partnership worth keeping.

DIY approach

Case, Versek, Howling, and some eager volunteers assembled its hoop houses and welded shelving, and incubator over the course of several months. At first, they and their investor, a childhood friend of Case's, thought of building bigger rooms, but Case realizes now it would have been foolhardy. "[At first] we felt like, 'Start medium,'" says Case, "but you see how important it is to start small, because with every generation of mushrooms you're learning so much. To jump into it all at once would have been a bad move."

"Unless you're an experienced grower going into it, you should take a step-wise approach," agrees Versek. "In this economy, you can be an economically functional and profitable farm, [but] it's a balancing act. You can

spend a lot of money and build a place that looks like what you imagined yourself farming in, but the realities of workflow and employment would be disastrous if you started from scratch on that. If you stay small, you're flexible. And then when you're comfortable, you take that next step."

The small, stepwise approach meant that even their substrate sterilizer—a hulking, steaming, burlap-wrapped sculpture on wheels that sterilizes hundreds of pounds of wood shavings and rye grain per week—was made by hand from found and borrowed materials. It may look funny, says Versek, but building a sterilizer saved the business thousands of dollars. There is, "a leap in infrastructure costs when getting above a certain size," says Case. After three years, the company is growing bigger than its DIY-capacity can handle, but moving toward more professional equipment will still prove to be costly.

One man's trash is a mushroom's food

One way Mycopolitan keeps costs down is sourcing its substrate—the medium and nutrition through which mycelia grow and eventually bear fruit (the mushrooms)—from other businesses' waste products. Wheat bran and grain sweepings from the floor of a local flour mill, sawdust from a local lumberyard, and coffee chaff and grounds from a local roaster make up much of the substrate. Local is an ethos, but it's also practical. Working with local businesses means not paying high shipping charges for heavy substrate. If Mycopolitan were to certify Organic, it would have to get substrate from further away.

"It would be less sustainable and more expensive in the long-run to be Certified Organic," says Versek.

Food safety and environmental risks

Unlike many urban farms, who host dozens of curious visitors, Mycopolitan's location and operation mean it keeps to itself, except for special tours. Personal diligence, cleanliness, and ventilation are crucial to keeping employees and mushrooms safe. Risks to mushrooms in this small, subterranean space are often airborne. Keeping the inoculation room sealed, down-wind, and ventilated keeps spawn from catching in air ducts and potentially colonizing elsewhere in the basement. Meanwhile, contaminants brought in by foot traffic may introduce bacteria or molds that can infect mushrooms and wipe out the entire indoor system. "When it comes to growing mushrooms," says Howling, "you have to be obsessive-compulsive about cleaning."

The business's reliance on cleanliness is one reason why working toward Good Agricultural Practice (GAP) certification seemed like a no-brainer. "We assumed [a customer] would eventually ask us for [GAP certification], so it's good to have around,"



Trumpet and shiitake mushrooms are two of the more recognizable varieties grown by Mycopolitan Mushroom Company. It also grows fluffy white Pom Poms and glossy amber Namekos.

says Versek. The main difference, he says, is keeping detailed records of their cleanliness and food safety practices.

More mushrooms in the city

Case, Versek, and Howling, are growing mushrooms just 30 miles from Kennett Square, PA, the self-proclaimed "Mushroom Capital of the World," home to dozens of large-scale mushroom production facilities. But they are not worried about competition. "You have to build your niche: every environment is different, every locale is different, customers are different, things are always changing," says Versek. Mycopolitan's high-quality culinary mushrooms—including Trumpets, Pom Poms, Pioppini, Shiitakes, and Namekos—are unlike those of their larger predecessors. The company's rare mushrooms and odd location set it apart, and helped Case and Versek educate Philadelphia chefs about incorporating mushrooms into their dishes when other seasonal produce is not available.

Mycopolitan's reputation for quality mushrooms seems to have surpassed its novelty as an urban mushroom farm. Philadelphia restaurants are responding enthusiastically, enough that Mycopolitan just increased its production space by 60% in late 2016. Unafraid of competition, Case says he would like to see more urban mushroom farms. "Considering what foods a lot of folks are eating, having even one meal a day be packed with things like phytochemicals, fiber, pro-biotics, pre-biotics, beta glucans, vitamins, and minerals would have a noticeable effect," Case says. Mycopolitan believes more mushrooms should be on urban people's plates, and more urban mushroom farms is a logical first step.

Molly Riordan-Bucknum is the Cornell Small Farms Program associate for urban agriculture development. This article part of a case study on Mycopolitan Mushroom Company, part of a forthcoming report on commercial urban farming. The report, entitled "The Promise of Urban Agriculture," is the result of a cooperative agreement between USDA AMS Division of Local Food Research and Development and Cornell Small Farms Program. To find out more, contact her at mer279@cornell.edu



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LESSONS FROM THE LAND

Tools (Assets & Liabilities)

By Groundswell Center for Local Food & Farming

The Groundswell Center for Local Food & Farming and the Cornell Small Farms Program are teaming up to create a new column called "Lessons from the Land", which captures and shares the stories of lessons learned from farmers, homesteaders and land workers around New York and the Northeast. We want to hear stories from growers of all types and sizes, on real topics, that matter!

Each issue has a theme, and upcoming themes and deadlines can be found at <http://groundswellcenter.org/lessons-from-the-land/>.

Submissions of 400 – 800 words are requested, and can be submitted at the website above.

We will publish only nonfiction submissions. Feel free to submit your name, farm name, city and state, or submit your piece as "anonymous" if it allows you to be more honest.

Murphy's Law of Farm Country:

You have been either bumping over that small stubborn stone or hooking your plow or cultivator on it for years. You finally say to yourself, "that is enough – I am going to get rid of that pest once and for all." So you get out your shovel and dig around it a bit and find that it is not as small as you thought.

Back to the barn you go, and get a pry bar to get it out of the ground. Soon you realize there is nothing to pry on so you decide to dig deeper, deeper and deeper. Now this stone appears to be a small boulder. Thinking better of all of this manual work you return to the barn again and bring out the tractor with the bucket on it. After considerable digging on all sides you finally reach the bottom. It becomes evident pretty fast if you try to lift it you will probably will break something or stand the tractor on its head.

The only way to get it out is to dig a ramp on one side, hook a long chain on it, and drag it up the ramp. Finally the stone is out and you need to find a close permanent home for it and you are left with a good sized pit that cannot be filled with the dirt you dug out.

The farmer's version of Murphy's Law is that the stone that you try to remove is always bigger than you think. (Kind of like a iceberg.)

Gary Gates
Mathew 25 Farm, Tully, NY

It was a hot September day, and I was on the top of the hill, a round bale on the back of my '58 John Deere 420, with just a baseball cap between me and the sun. This was my first time back on the machine since it was serviced and a new battery put in two weeks prior. It was time to move the round bales from the hay fields to the winter area of the property. Before I got on the tractor, I did notice that the battery seemed to be too big of a model. The previous battery had fit perfectly into the recessed area, but the new one was much longer. I fired it up, let out the clutch, and away we went bouncing through the fields.

I had been working for about 30 minutes, and

had put a good dent into the hundred bales I had to get off of the field, when I looked down at my feet on the pedals. Suddenly, a fountain of flames began streaming down onto my feet and engulfing the controls. I had never seen anything like it but my instincts took over and I went into critical mode. I put the tractor in neutral, and pulled the break as I simultaneously swept my legs to the side and jumped off the tractor.

By this time the flames were beginning to creep upwards and lick the battery and surround the fuel tank, but I was more concerned with the flames on my boots. After putting out my footwear, I grabbed a couple of important tools out of the utility box and for some unknown reason the very empty pail in the bucket and began to run down the hill towards the barn. I called 911 and explained the situation and where to meet me. After the dispatcher and I spoke for what seemed like an hour, I called two friends to also come to the farm as this fire, with the dry conditions and heat, could quickly spread to the fields, destroying my hay and possibly my fences.

I stood at the end of the road watching the deep black smoke rise as the local fire chief pulled up. We decided to call additional units as the engines could not make it out into the field and we would require the mobile units they use for extinguishing brush fires. Being a firefighter, I had already donned my gear and the chief and I drove into the field to begin the plan of attack, but before we arrived at the scene, the sky opened up and a deluge of rain began pouring down. The bout of heavy rain had just extinguished the fire as the emergency personnel began to arrive. I lost the tractor, but I was unharmed and the fields were spared as well.

I mention this incident as a reminder of how dry it is outside right now. There is an elevated risk for brush fires and with so many of us making hay we need to take precautions while working. Do you have a fire extinguisher on your tractor (I didn't), have you spoken with your insurance agent about your coverage lately (I wasn't covered), and have you ever practiced emergency evacuation maneuvers on your machinery to find any snags or issues with your exit (I hadn't). Each season delivers new dangers to farmers and we all know it's not if something will happen, but when. Please be safe out there.

For those of you interested, further investigation revealed that the positive battery terminal was contacting the gas tank, which melted the tank and allowed the fuel to run over the battery and ignite both me and the tractor. Although I was not covered by my insurance plan the gentlemen who had made the repairs fixed the tractor for free, although it hasn't really ever run the same since.

Jason Detzel, Owner Operator
Diamond Hills Farm, Hudson, New York

I think of my body as my most versatile tool, or more accurately, a complex set of tools working together. Consider my hands. They allow me to grip, grasp, zip, button, hold, type, open lids, turn screwdrivers, and hold a steering wheel. With them I can touch, sense, and connect. Without them I could

not grasp a hammer or a hoe, pick beans, or give a hug. I could not milk my goats or scratch them under their ears. As I walk out to the barn this morning, I am aware of my feet on the ground, knees bending, hips supporting. Carrying a pail of apples, my hand, elbow, and shoulder work in synchrony.

My eyes take in the morning sunrise. I smell familiar barn smells, I hear the goats call out to me. How well our bodies work! How much we take for granted this intricate interplay of brain, sensory organs, and cellular synapses, muscles, joints, cartilage, and tendons, breathing and circulation. Sometimes things go awry. I work with Maine AgrAbility, a program dedicated to farmers who are experiencing pain, illness, or injury. Our staff goes on farm to assess farmers' needs and observe their working routines. We can suggest small changes that add up to big dividends. We can recommend assistive technology—tools to assist with their work and accomplish specific tasks.

For example, Phil is a veteran who broke his back while serving in Iraq. On most days he rates his pain as a 7 or 8 on a scale of one to 10, with ten being severe pain. Phil loves his animals. Farming gives him freedom to be his own boss and set his own schedule. He sees farming as a way to serve his community and his country in a new way. He rejects the medical model, which to his mind, pushes pills and would have him lying on a couch all day. AgrAbility suggested adding rear-view mirrors to Phil's tractor so he doesn't have to twist to turn around and

replace a worn out seat. He has found that wearing shoes with good support adds to his daily comfort.

Taryn farms with her husband. She was diagnosed with multiple sclerosis 25 years ago, and has been in a wheelchair since the early 1990s. That didn't stop her from raising three children and keeping the farm records. Her wheelchair has been an incredible mobility tool, but over time, she became housebound when she could no longer transfer into a car. She and her husband, Mason, received a loan for a wheelchair accessible van. Now Taryn can stay connected to her community. She accompanies Mason when he makes egg deliveries and plans to sell farm products at the local farmers market.

Soon after I started to milk goats, I developed arthritis in my hands. My hands are stiff and painful. I drop things and struggle to open a doorknob or remove a jar lid. What to do after making a sizeable investment of time and energy with my goats? As a small operator, I couldn't justify the expense of a milking machine. I have traded milk for milking labor, used the WWOOF program, and now employ a hired hand and she literally saves my hands. During a lifetime of bumps and scrapes, everyone experiences ailments of one type or another. No one can avoid the natural aging process.

How to keep problems at bay? AgrAbility

See Lessons page 17



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EXTENSION NEWS**Extension Specialists Shine in Disaster Response Role**

By R.J. Anderson

In an exercise based on fallout from past weather disturbances, strong and sustained autumn rains cause the Mohawk River to flood its banks rapidly, compromising the safety of people, homes and businesses in at least three New York counties. Among those in immediate danger is a Lewis County Amish farmer who became stranded while trying to save livestock from rushing floodwater. With no cell phone, he is unable to call 911. However, word of his predicament soon reaches one of the county's Cornell Cooperative Extension (CCE) specialists, who immediately springs into action, tapping into a comprehensive disaster response network.

This was one of a number of hypothetical scenarios injected into a recent statewide disaster response simulation administered by New York State's Office of Emergency Management, which gathered officials from New York state agencies including the State Police, and the Departments of Transportation, Human Services, and Agriculture and Markets (NYSDAM). Monitoring the exercise was the Federal Emergency Management Agency. Making the disaster scenario even more authentic, updates from the two-hour exercise were sent to Gov. Andrew Cuomo's office every half hour.

As part of the simulation, the CCE specialist, who works closely with Lewis County farmers, immediately logged onto the Ag Sentinel dashboard, an online disaster response tool administered by the New York Extension Disaster Education Network (EDEN), a CCE program partially funded by the U.S. Department of Agriculture. Manned by New York EDEN Director Keith Tidball, a CCE assistant director and senior extension associate in Cornell's College of Agriculture and Life Sciences' (CALS) Department of Natural Resources, the Ag Sentinel is tied into the statewide emergency response network, and its dashboard is displayed on a computer screen in the state emergency operations center in Albany. Based on the CCE specialist's dispatch, the Ag



New York Extension Disaster Education Network (EDEN) Director Keith Tidball, a senior extension associate in Cornell's College of Agriculture and Life Science's Department of Natural Resources, surveys drought damage to a Finger Lakes cornfield.

Sentinel alerted the state's Disaster All-Hazards Response Team and NYSDAM partners who assisted in directing first responders to the scene.

For Tidball, the exercise illustrated one of the many roles Cornell and CCE play in disaster response and relief. "As a state program with satellite offices in every county, CCE has a vast communication network and is ideally positioned to provide boots-on-the-ground support and eyes-on-the-scene intelligence to state- and county-led disaster efforts," Tidball says. "And because we are part of Cornell University, New York's land-grant university, we are able to provide evidence-based resources that can be valuable components in the recovery and rebuilding phases."

In most cases, Tidball says CCE's role in disaster response centers on issues affecting natural resources, agriculture and livestock. And its impact is not only confined to acute situations like hurricanes and floods. Relying in part on data reported by Tidball and CCE county associations through the Ag Sentinel, 25 New York counties were recently designated by Cuomo as natural disaster areas due to this summer's drought, making farmers in those areas eligible for assistance, including emergency loans, from the USDA Farm Service Agency.

"When dealing with these types of incidents, we're acting as a conduit between our agriculture growers and producers and the various state agencies addressing the situation," Tidball says. "It starts with every agency putting out information in a broad format, then we pare that down and deliver essential details to our farmers, and all the other players in our communities."

"Our people also reach out to farmers and ag producers and share what they learn through the Ag Sentinel," Tidball adds. "I'm then able to monitor the broadcast net centrally from campus or from Albany and work with state agencies and our associations to determine if an expert needs to be contacted, and who that should be."

CALS Associate Dean Chris Watkins, who is director of CCE, says his organization is uniquely positioned to play a major role in disaster management because of its access to important research-based resources and in close partnerships with key New York state agencies.

"Disasters of any type – including the recent drought gripping much of the state – can have serious consequences on New Yorkers, their families and the communities in which they live," says Watkins. "The impacts can be very personal as well as directly affecting the economic well-being of farms and other businesses. Not only are we suited to help, we are obligated to do so."

R.J. Anderson is a writer and communications specialist with Cornell Cooperative Extension. He can be reached at rj.anderson@cornell.edu.

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has a few recommendations: Be mindful of what your body is telling you. Are you thirsty? Drink water. Hot? Rest in the shade. Feeling rushed and stressed? Breathe. Avoid doing work in awkward positions. Keep the height of work between the knees and the shoulders. For tasks that require several hours, set up a work station so that you can alternate between sitting and standing. If an activity has multiple tasks, rotate jobs about every 20-30 minutes to avoid oversteering any one group of muscles. A body that functions well is a priceless tool. Take care of it and reap a lifetime of rewards.

Names have been changed to protect privacy

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FARM PLANNING**Memorable Legacy or Major Obstacle in the Farmer's Estate Plan?***Land offers both challenges and opportunities in transfer to the next generation.*

By John H. Lavelle, CPA, LL.M., Attorney at Law

One of the defining characteristics of farming is the presence of significant real property. This property is essential to the business, the family, and a way of life. In many ways, a farmer is exactly like the small business owner. His or her major asset is the business itself, and everything else is secondary. Unlike a small business owner, a farmer's major asset always has a split personality. It may be the key asset of the business, but it also may represent something far more important. The farm can be a legacy that defines a family for generations.

This dual nature of the farm as principal business asset and treasured legacy is at the heart of every estate plan for a successful farmer. How the family values the business of farming compared to its legacy can greatly influence how an estate plan is constructed. Whether the plan achieves its goals depends on it matching the family's values. This article outlines some strategies commonly used in land-centered estate plans, and how each contributes to solving the four major concerns farmers have in planning their estates.

The Four Big Issues Facing Successful Farmers

While developing a plan for the farm, every farmer needs to consider the following four big issues:

1. Estate taxes (federal and state)
2. Income taxes (current and future generations)
3. Succession plan (in or outside of the family)
4. Retirement income (for the farmer and spouse)

Certainly more issues will arise when a plan is fully developed. If the above four are handled wisely, most other issues dissipate. On the other hand, mishandle any of these four, and the best plan in the world can easily fail. Problems can be immediate or felt by the next generation. The key to success or failure is often the treatment of the land.

While most farmers do not need to concern themselves with **estate taxes** at the federal level, state estate taxes are still common in some northeastern states. In addition, northeast real estate values are on the rise again, and can easily push successful farmers with valuable land back into the range of estate taxes. So one can never safely ignore this issue.

Income taxes are the new estate taxes for most successful people. While estate taxes only apply to a very small percentage of taxpayers, income taxes apply to nearly everyone. And as was discussed in "Successful Farm Succession" in the Summer 2016 issue of *Small Farm Quarterly* (available online), income tax rates can now exceed estate tax rates. Every transfer strategy must focus on income tax effects to all involved.

The succession plan can be the most difficult of all. A big part of that is how to transfer the land in an affordable manner. "Affordable" means something to both sides. The next generation must be able to afford



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to acquire the land. Plus, the transferring generation must be able to afford retirement after the transfer. This one aspect can dictate much of the estate plan.

Finally, the transferring generation must have dependable retirement income as part of the overall plan. The land often figured into these senior farmers' plans in this regard. That crucial goal cannot be ignored. If the farm is to stay in the family, however, this will require much attention.

The Toolkit for Land-Centered Estate Planning

A successful estate plan will often include several of the following strategies. Each may handle one or more of the above issues. Some are simple, many are complex. If implemented correctly, they can solve some intractable problems presented by the land. Having command of these techniques allows them to be adjusted to work for many situations. This can include: (i) farm retention and preservation; (ii) reduction in the transfer cost of farm property to younger farmers; and (iii) creation of cash flow to satisfy income needs.

Here is a quick look at some of the tools:

Reduce estate tax exposure:

Conservation Easements - lifetime income tax benefits followed by substantial estate tax reductions make this a top technique. Land values are also lowered, making family transfers more affordable.

Unbundling Values and Lifetime Gifting - a well-designed lifetime gift program can transition farms to family at highly discounted values. Proper unbundling of land values from farm business values can facilitate this and provide equity to non-farming kids. Warning: new rules are on the horizon to reduce discounting strategies, possibly as early as December of this year. If your plan involves lifetime gifting, time is of the essence.

Sale of Development Rights - like conservation easements, this permanently preserves the land, but unlike a donated easement, it trades tax benefits for actual cash payments from one or more government programs. In the meantime, land prices are lowered, allowing an easier transfer to family. In many cases, retained until death, the land has a lower value for estate tax purposes.

Manage Income Taxes:

Die Holding Appreciated Farmland - if estate taxes are not a problem, this strategy removes income tax gains for the next generation. In this situation, lifetime gifts of land can be a disadvantage.

Charitable Remainder Trust - this strategy allows the disposition of unwanted but appreciated real estate without paying any income tax up front. It can create cash flow for the sellers on favorable tax terms for one or more lives or up to 20 years. A terrific way to create retirement income from the sale of unneeded property. Couple with survivor life insurance for additional benefits.

Plan Succession of the Business:

Low Interest Rate Purchase by Children - coupled with other techniques, a sale of the farm to the next generation is particularly attractive right now. The tax law requires transactions with family to have at least minimum interest rates. Right now those rates are the lowest ever. A family sale can lock in these low rates for 30 years, giving senior farmers secure cash flow, and affordable payments for the children.

Deferred Compensation - If there is time before the senior generation wants to retire, adopting a deferred compensation plan can help with retirement income. This can take the pressure off selling the farm for cash needs. At retirement, the farm business gets tax deductions for the payments made while the retired farmers often have lower tax rates.

Unbundling - mentioned above, this is the idea of separating values from risk and



Farm legacy is as important as the financial considerations one must consider when planning for succession.

structuring the business to meet the needs of the next generation of owners. For example, a farmland LLC and a farm business LLC can be created. The farmer kids acquire the farm business LLC (using any of the strategies mentioned). Non-farming kids can receive non-controlling equity in the farmland LLC, helping to treat all kids fairly. In addition, a proper structure can protect valuable assets from business claimants and lawsuits.

Create Retirement Income:

Several of the above strategies can generate significant new cash flow for retiring farmers. In addition, consider:

Maximize Social Security - absent special circumstances, it almost always makes sense to wait until age 70 to claim social security. This locks in a 32% increase for the life of the retired farmer (and spouse). With most people living longer, the 32% a year increase makes up for not taking the earlier payments very quickly, and the retired couple is quickly ahead. Hedge with term life insurance if nervous.

Reverse Mortgage - today's programs from reputable lenders can be a very valuable strategy. Benefitting from low interest rates, this plan can provide tax-free retirement income with no obligation to repay during the retired farmers' lives. This can buy valuable time for the next generation to get established, without forcing a sale of the farm. Although a mortgage debt is created, its repayment is potentially deferred many years. As long as it is planned for, this debt may not present a significant problem for the children. Survivor insurance could be used to repay the debt if desired.

A farmer's land is the key to a great estate plan. Use of some of these strategies can assure that another generation of farmers can continue the legacy.

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HIGH TUNNELS**High Tunnel Tree Fruit and Grape Production for Eastern Growers**

By Guy K. Ames

High Tunnels and Eastern Fruit Production

Almost all of the domestic organic table grapes and tree fruits sold in the United States come from the West. In the eastern United States, organic production of perennial fruits is complicated by myriad insects and diseases. If an eastern grower could find a technique to grow good-looking organic fruit that didn't cost any more than transporting western fruit to eastern markets, then eastern organic fruit production could be competitive. Growing grapes and tree fruits in high tunnels could be one of these techniques.

Properly managed, a high tunnel can allow a grower to get her product to market before her competition in the spring, and can extend a crop's market season into late fall or winter. By keeping untimely frosts, rain, hail, and excess wind off crops, the grower can also reduce losses from pests, disease, and environmental damage.

A high tunnel can take a lot of worry out of production, but it is not without its own imperatives. First among these is daily maintenance. Rain does not fall in the high tunnel, so irrigation is up to you. Unless you utilize temperature-sensitive timers and mechanical retractors, you'll be the one raising and lowering the side coverings. Because the few pests that are common to high tunnels tend to have a rapid reproduction rate, during the growing season you should be doing pest-monitoring daily. In short, though you've taken some of the uncertainty out of growing, the cost is increased vigilance and labor.

Diseases and Pests in High Tunnels

For the organic grower, the main benefit high tunnels offer is the ability to exclude and inhibit disease. Splashing, blowing rain is the main vehicle for spreading most fruit diseases. Where rain can be excluded, potentially devastating diseases like brown rot can be almost, though not entirely, eliminated. The one notable exception is powdery mildew, which thrives with high humidity and is the one consistent disease problem on plants in greenhouses and high tunnels. Luckily, powdery mildew is not terribly difficult to control organically.



Putting the finishing touches on a high tunnel intended for table grapes at the University of Arkansas research farm. Note the grape trellis already in place. Building trellises is best done before the tunnel goes up.

Though high tunnels are often left open at the ends, and sides are lifted for ventilation, surprisingly few insect pests move in. The pests that seem to be most problematic in high tunnels are the same as in greenhouses: white flies, aphids, and mites. A relatively new pest that has proven troublesome is the spotted winged drosophila (SWD). If pests are getting in, small-mesh screen can be used to block them at the ends and sides, though this represents another monetary investment.

Because high tunnels are semi-closed systems, naturally occurring beneficial insects don't often find their way inside. Conversely, introduced beneficials cannot easily disperse into the outside environment, so you might get more biological pest control for your money.

What Fruit Crops Look Profitable for High Tunnel Culture?

Foremost among the candidates for high tunnel production are seedless table grapes, sweet cherries, peaches, nectarines, and plums. Research has already indicated that these can be grown successfully and organically in high tunnels.

Organic sweet cherries are among the highest-valued fruit crops. High tunnel production can bring the crop in earlier. Also, high tunnel culture can come close to eliminating the threat of bacterial canker and brown rot. Furthermore, being able to control water during the final ripening period gives growers with high tunnels a big advantage in avoiding cracking problems.

The sweet cherry is probably the most studied tree fruit in university-sponsored high tunnel research, and the most tried among early-adopting private growers. However, profitability of sweet cherry or any other fruit crop produced in high tunnels is highly dependent on good management. With cherries, this means using the latest dwarfing rootstocks and training systems to get the most out of the small area protected by the high tunnel.

Seedless table grapes also look like a very good candidate for high tunnel culture. The extra expense of trellising grapes is more than compensated by the earlier bearing of grapes grown in high tunnels. Also, early research indicates that grapes experience huge benefits in quality and yield when grown in tunnels.

Peaches and nectarines are probably right behind sweet cherries in the value of the harvested crop. They are also exceedingly difficult to grow organically in the East because of brown rot, plum curculio, and other threats. For growing in high tunnels, training systems that have been developed to keep the trees very small, yet highly productive, are used.

Plums, apricots, and their crosses are stone fruits for which frost control is as important as disease control when considering the value of a high tunnel system. Apricots, especially, are notorious for blooming too early and losing their crops to spring frosts. A properly managed high tunnel can help apricots and other stone fruits set a viable crop by protecting them from frost damage.

Additional Production Considerations

Because honeybees have problems navigating in high

See Tunnels page 20

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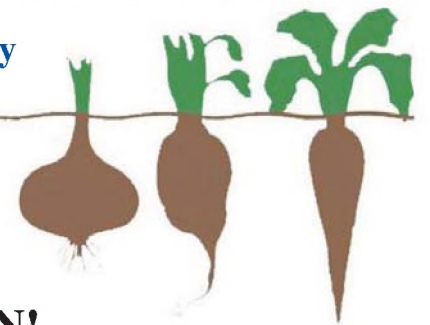
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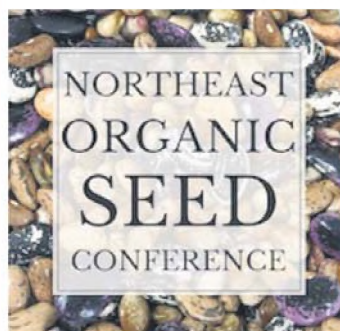
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Tunnels from page 19

tunnels, high tunnel growers will have to provide pollination either by hand, or by purchasing bumblebee colonies. Table grapes have a "self-contained" pollination system, so nothing needs to be done to insure pollination for grapes.

Without rain or overhead irrigation, some bulky organic fertilizers like compost will not readily break down and move into the soil. Because these fruit crops are perennials, cover crops cannot be relied upon for nutrition after the initial planting, so consider the plants' nutritional needs before planting.

Post-planting nutritional needs will be met with fertigation, precision hand-application of compost or pelletized organic fertilizers, or hand-application of liquid organic fertilizers. Dry fertilizer materials will have to be placed where the soil is wet from irrigation; otherwise, the nutrients from such materials will not move into the root zone.

It's advisable to remove the plastic cover every winter to insure that the trees meet their chill requirement, but also to allow rain to rinse out excess salts from the fertilizers. This is a time when manure or compost could be applied.

While under cover, the trees or vines will be dependent on the grower for water. Even during dormancy, if the soil gets too dry, trees can die. There are many ways to supply water, but anything that gets the foliage or fruit wet will be undoing the big advantage of growing fruit under cover. Most growers choose standard drip irrigation.

Though a high tunnel can facilitate pest and disease management on tree fruits and grapes, growing woody perennials is significantly more complicated than growing most annual crops. In fact, because you're growing in the tight, prescribed area of a high tunnel, cropping efficiency becomes even more important than when these fruiting plants are grown outdoors. This means that you will almost certainly need to adopt modern intensive techniques that rely on dwarfing rootstocks. And you will have to adopt the right training system for the varieties and the market you



High tunnel-grown grapes in University of Arkansas research yielded three times the fruit of the same variety grown outside the tunnel.

Photos by Susan Alman, University of Arkansas

choose. Viticulture (grape growing) is yet another world. Growing tree fruits and/or grapes are not endeavors that should be entered into without study and, preferably, experience.

Economics

The big question, of course, is whether a grower can make money growing fruit in a high tunnel. The quick answer is "yes." The simple truth of that is in the thousands of acres dedicated to fruit culture in high tunnels in China. In general, there are higher marketable yields and earlier harvesting within high tunnels. Another quick indicator of the potential profitability of high tunnel fruit production is that in many years, whole crops of unprotected stone fruits are lost to untimely frosts that a high tunnel crop could avoid.

Nevertheless, this is not a low-input system, and returns have to cover 1) costs of construction of the high tunnel itself

(materials and labor), 2) an irrigation system, 3) maintenance costs, 4) the non-productive time before long-lived fruit plants start bearing, as well as 5) the risks of damage to the tunnel itself from extreme weather events.

The initial cost of the tunnel (materials and labor) is generally going to be the greatest expense. Costs can vary, but a typical 30-foot wide, 100-foot long high tunnel will likely cost \$3,000 to \$10,500. Detailed budgets for constructing high tunnels are easy to find on the Internet. The Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture (USDA) may be able to underwrite the major share of the cost of a high tunnel for individual growers through the Environmental Quality Incentives Program (EQIP). Talk with your local Soil & Water office about this possible avenue of support.

Detailed enterprise budgets for organic tree-fruit and grape production in high tunnels do not yet exist and perhaps that is because the very best systems have yet to be determined. Nevertheless, with 1) an NRCS-underwritten tunnel, 2) marketable crops possibly two to three times the yield of outdoor-grown crops, 3) consistent frost protection sometimes saving entire crops, and 4) the possibility of price premiums for local, organically grown fruit, a good manager could make substantial profits with high tunnel-grown fruit.

Conclusion

Profitable high tunnel culture of table grapes and certain tree fruits holds significant promise for organic growers, especially in the eastern United States, where organic culture of these fruits has proven very difficult. The main benefit for organic growers is disease and insect control, but other benefits, like earliness to market and reducing rain-induced cracking, are also attainable. For more information on growing fruit in high tunnels, consult the ATTRA publication High Tunnel Tree Fruit and Grape Production for Eastern Growers, available free online at the ATTRA Sustainable Agriculture program website, www.attra.ncat.org.

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Bejo is a family-owned company with worldwide operations, and is the world's largest producer of True Organic Hybrid Seed.

Bejo maintains Organic breeding programs which are regionally and locally focused.

Non-GMO. All registered and commercially available Bejo varieties were obtained by using traditional plant-breeding methods. Bejo has no genetically modified varieties available for commercial use.

See the Bejo assortment at bejoseeds.com, and the full lineup of 120 organic varieties at organicseedfinder.com

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