News From CCE

By Jingjing Yin, CCE Chemung

Fall is approaching here in upstate New York. Are you busy harvesting your garden and preserving your produce, like I am? Luckily, I am having very good tomato production in my garden this year. I remember in early September of 2014, I lost all of my beautiful ripening tomatoes to late blight. So far this year, late blight has been confirmed in Steuben, Broome, Tompkins County and some of the western counties of the Finger Lakes. Watch out closely for late blight on your tomato and potato plants. If you see any suspicious symptoms on your plants and need diagnosis or want to learn more about late blight, contact your local cooperative extension office.

Do you like gardening and want to improve your gardening skills and knowledge? Do you enjoy teaching and working with others? Do you want to volunteer your valuable time to help improve your community? If your answers are “Yes!” to all of these questions, become a Master Gardener Volunteer! Regional Master Gardener training is coming back this October and will run through next spring, with five Saturday workshops held once a month. The training will cover topics including soils, vegetable gardening, ornamental plants, plant pathology, pest management, etc. Contact Barb Neal at CCE Tioga or Jingjing Yin at CCE Chemung for more information about the training and being a Master Gardener Volunteer.

Finally, if you have any questions, concerns, or comments, please feel free to contact us. Happy harvesting!

Margaret Ball, CCE Tioga Ag Development Specialist, mgb225@cornell.edu

Barb Neal, CCE Tioga Horticulture Educator, ban1@cornell.edu

Shona Ort, CCE Chemung Ag Development Specialist, sbo6@cornell.edu

Jingjing Yin, CCE Chemung Horticulture Educator, jy578@cornell.edu

Love Gardening? Join Us!

You do not have to be an accomplished gardener to be a Master Gardener Volunteer—you just need to love gardening and have a yearning to learn more and to give back to your community.

Being a Master Gardener means joining a group of gardeners who love to share their knowledge, build community and have fun and fellowship.

The Master Gardener training for this year starts soon—contact Jingjing Yin or Barb Neal to sign up or to learn more.
Garden and Farming Workshops in Tioga County. All classes held at 56 Main Street in Owego unless otherwise noted.

October 2nd—High Tunnel Workshop  9 am to 3 pm  CCE Tioga Are you a farmer looking to increase your yields and profits? Consider growing high value vegetables and fruit in high tunnels.

Love growing your own vegetables? High tunnels significantly expand the growing season for farmers and homesteaders. This workshop will give you some of the basics of high tunnel set up and culture so you can maximize your income and minimize pest and diseases. Learn from the best! Cornell professors will lead the talks and the tour of an established high tunnel operation. $25 per farm. Call Barb Neal at 607-687-4020 or email ban1@cornell.edu to register.

Garden and Farming Workshops in Chemung County

Pork Production Basics: Breeding and Farrowing
Friday, September 1, 2017, 6:00 PM - 8:00 PM
Are you interested in learning more about raising hogs? If you are, please come join us on September 1, 2017 from 6 – 8pm at the Chemung County Fairgrounds (171 Fairview Road, Horseheads, NY 14845). In this first class we will cover the basics of pork production in terms of breeding and farrowing. A follow up class on feeding and finishing hogs is tentatively planned for spring 2018. Our speakers will be Don and Brandee Bower who breed and raise hogs on their farm Tender III Acres here in Chemung County, NY. Cost is $10 per person. Pre-registration is required by 8/25/2017. To register please visit https://reg.cce.cornell.edu/porkproductionbasics1_207. For more information, please contact Shona Ort at 607-734-4453 ext. 227 or sbo6@cornell.edu. Held at the 4-H Building, Chemung County Fairgrounds 171 Fairview Drive Horseheads, NY 14845.

Workshop: Composting
September 19, 2017; 6:30 – 7:30 PM. Do you have kitchen scraps and yard debris that you don’t know what to do with? Would you like natural, home-made compost for your garden? In this one-hour workshop, Chemung County Master Gardener, Peg Weidemann, is going to talk about how to turn your yard and kitchen waste into valuable soil amendment and plant food. She will also give an introduction on vermiculture (worm composting).

Speaker: Peg Weidemann, Chemung County Master Gardener

Place: Steele Memorial Library (IT room), 101 E Church Street, Elmira, NY

Workshop fee: Free, but a $3 suggested donation helps support our Horticulture program.

Please register with Chemung CCE at 607-734-4453, or jy578@cornell.edu
For more specific information about the Chemung County Master Gardener program, please contact Jingjing Yin at 607-734-4453 or jy578@cornell.edu.

For more information about the Tioga County Master Gardener program, please contact Barb Neal at 607-687-4020 or ban1@cornell.edu.

PROTECT YOUR LANDSCAPE NOW FROM ROAD SALT DAMAGE LATER

By Barbara Classen, Chemung County Master Gardener

Gardeners know that fall is a good time for planting. It’s also a good time to prep new beds (cardboard anyone?) so that they will be ready to be planted in the spring. I have a spot just begging to be beautified, and I’ve been giving some thought to what I’ll plant next year. However, there’s one problem that needs a solution before anything can go in the ground. The bed will sit close to the road – right in the path of runoff from winter road salt and mounds of contaminated snow deposited by town plows. This is a pretty common problem, so here is some information I hope others will find useful.

The use of anti-icing and/or de-icing compounds is widespread in New York and elsewhere. Home-owners use them to prevent falls on their driveways and sidewalks. Municipalities use them to promote safety on local roadways. Experts estimate that our highway departments will spread between 20 and 22 million tons of salts on the nation’s roads. Studies also show that concentrations of de-icing salts can leach away from a treated roadway for up to 10 feet from the road’s edge. Sodium chloride (rock salt) is the most common chemical ice treatment, accounting for 98.5% of the salt spread on roads and other hard surfaces. While there are other compounds proven to have lesser environmental effects (e.g., calcium chloride, calcium magnesium acetate), they are more expensive and so less popular.

Road salt impacts water, soil, and plant nutrition. Plant roots in the road salt zone absorb less water. Chemicals in road salt displace potassium and phosphorous to the detriment of soil health. Soils in the salt zone become denser and more compacted with predictable consequences – poor drainage and aeration. At the same time, the nutritional values phosphorous and potassium usually provide are not available. As a result, plant growth is inhibited and plants lose overall vigor. Road salt can damage all parts of a plant. It can distort or even kill stems. Leaves will not develop normally. They may be fewer, smaller, scorched, or discolored, especially on the sides of the plant facing the road. In the fall, leaves may develop color and/or drop earlier. Buds may develop more slowly or even die back. Flowers too can be delayed or smaller. Severe weather events during the year can increase these effects, making winter salting a year-round problem.

What can homeowners do to minimize road salt damage? First, we can avoid using rock salt in favor of less toxic chemicals or non-chemical substances such as sand or sawdust. A more challenging but still viable option is to erect a barrier between our plants and the road. More practically, we can water well before spring root growth begins, especially if late-season storms brought the salt trucks out in force. Finally, and most simply, we can use salt tolerant plants in areas of our landscape most vulnerable to damage (those closest to the road and/or walkways and driveways).

An hour or two searching online will turn up extensive listings of salt tolerant plants from trees to groundcovers. Cornell University and the University of Vermont Extension are good places to start.

Here are some examples to get you started:

Trees: Northern Red Oak, Black Tupelo, Colorado Spruce, Crabapple, Japanese Tree Lilac

Shrubs: Beautyberry, Inkberry, Japanese Holly, Summersweet, Chinese Juniper, Mugo Pine

Perennial flowers: Artemisia (‘Silver Mound’), some daylilies (‘Stella d’oro’), Dianthus, Peony, Russian Sage, Sedum ‘Autumn Joy’

Perennial ornamental grasses: Feather Reed Grass (‘Karl Foerster’), Little Bluestem

Annuals: Calendula, Dusty Miller, Geranium, Ornamental Cabbage/Kale, Petunia

Groundcovers: Ajuga species, Liriope, Sedum species, Veronica species, Waldsteinia
**Beauty Marks**

*By Paul Hetzler, CCE St. Lawrence*

In the world of forestry (urban and otherwise), ugliness is not pathological. Arborists live with it, and so do trees. Tar spot, for example, which can make your tree look like a roofing contractor has vandalized its leaves in the night, is a benign affliction.

Across the region this year, leafcutter moth larvae have excised near-perfect circles of tissue from maple leaves, making it seem as though someone went berserk with a hole-punch. Even though maple leaves end up brown and bedraggled, leafcutter damage occurs late enough in the season that it does no real harm. Trees may be embarrassed by their looks now but they’ll be fine come spring.

Beauty, on the other hand, can be beastly. Take the practice of piling up mulch against the trunks of trees to make tidy and color-coordinated perimeters. Apparently in some quarters these “mulch volcanoes” are considered attractive, and I have to admit they go well with white-painted rock borders and pink plastic flamingos. Sadly, this volcanic loveliness comes at a cost to trees, leading to insect infestations, diseases, and root problems.

But the worst kind of beauty-related damage affects only young trees. The trouble with young landscape trees is that they’re planted. What I mean is, they’re stuck in the location we choose for them, and can’t run away from hazards such as dogs, drought and deicing salt. Even if they could just flinch they might be able to dodge certain lethal beauty marks.

“Lawn mower blight” can occur any time the obsession with a perfect lawn meets up with powerful equipment in the vicinity of a young tree. Contributing factors are zero-turn mowers that can hit Mach 2 in half a block, and youthful operators. If an MP3 player and ear buds are in the picture, lawn mower blight is almost certain.

Injury to the lower trunk reduces the vigor of a young tree, slowing its growth and making it more susceptible to disease and insect damage. Most landscape trees are grafted cultivars, and damage to bark near the graft union can cause the graft to fail. Many times, repeated hits by lawn mowers will cause enough decay that a tree will snap off at ground level even though it still has a live crown.

The most virulent strain of this beauty-related disease is “string-trimmer blight.” A string trimmer, or “weed eater,” is deadly because the string will reach around the trunk, girdling it entirely. When this happens the tree is doomed because the cambium tissue just beneath the bark is removed. Sugars produced through photosynthesis flow down through the cambium to the roots.

A girdled tree may actually leaf out for one or two years following a lethal injury because water and nutrients are pulled up the xylem tissue, or sap wood, which is below the cambium.

There is still plenty of time left in the season to be thinking about lawn mower blight. You can help prevent it by replacing sod around your tree with a ring (not a volcano) of mulch 4” deep and extending to the drip line. You’ll keep the mower away and make your tree happier in the process because it won’t have to compete as much with the grass. Installing plastic trunk guards around the lower 12-16 inches of trunk should keep string trimmers at bay.

Of course you can always just leave some long grass near the trunk to clip by hand later on. That might not look perfect, but beauty isn’t all it’s cracked up to be.
2017 Tioga County NY Farmers' Markets

**Owego, NY**
Tuesdays & Fridays - 9:00 AM to 1:00 PM
Rite Aid Parking Lot, Main Street & Central Ave
June 13 to October 31
John Purdy 607-642-8439  braden-son@msn.com

**Candor, NY**
Thursdays - 3:30 to 6:30 PM
Candor Town Hall, Route 96
June 1 to September 14
Carol Murphree  carol.murphree@gmail.com

**Owego, NY**
Thursdays - 4:00 to 7:00 PM
Farm to Fork Market on Front Street
June 15 to October 5
Teri Bishop 607-972-7553 teri.bishop4@gmail.com

**Spencer, NY**
Saturdays - 9:00 AM to 12:30 PM
Nicholas Park on Route 34, Spencer
June 3 to September 30, rain or shine
Terry Carling 607-589-7367 ttlc56@yahoo.com

**Richford, NY**
Saturdays - 10:00 AM to 1:00 PM
Town Barn Road, Richford
June 10 to September 9
Doris Caskey 607-280-1262 richfordmar ket@gmail.com

**Make it a weekly habit!**
Soil Health Institute Endorses 19 Soil Health Measurements After 3 Years of Collaboration

Reprinted with permission from the Soil Health Institute

For scientists, farmers and ag policy makers, one nagging question has yet to be completely “unearthed.” Just how healthy (or unhealthy) are the nation’s soils?

“We can’t really know the answer to that question until we have a set of common soil health measurements that scientists and farmers can compare and track over time,” said Dr. Wayne Honeycutt, CEO of the Soil Health Institute. “But we believe our endorsement of 19 measures today will help us seek and track that common ground – and ultimately answer that important question.”

The concept of soil health is gaining widespread attention because it promotes agricultural practices that are not only good for the farmer, but also good for the environment. An abundance of research shows that improving soil health boosts crop yield, enhances water quality, increases drought resilience, reduces greenhouse gas emissions, increases carbon sequestration, provides pollinator habitat, and builds disease suppression. To help implement widely-applicable, consistent measures of soil health, the Soil Health Institute announces its endorsement of 19 national soil health measurements.

Over the last three years, scientists from public and private sectors, farmers, field conservationists, soil test laboratories and many others provided input to develop a “Tier 1” list of recommended soil health measures, considered effective indicators of soil health. These specific measurements are regionally defined, have known thresholds, and help define management strategies to improve soil function – like providing nutrients and water.

“Establishing these measurements of soil health will allow a broad group of stakeholders to speak the same language,” said Honeycutt. “This will go a long way in mobilizing further efforts to improve sustainability of our food production systems.”

“The National Association of Conservation Districts believes a shared, foundational understanding of how we measure soil health is critical to advancing the adoption of conservation management practices countrywide,” NACD President Brent Van Dyke said. “We anticipate that through our own Soil Health Champions Network, and supported by the measurement efforts of the Soil Health Institute, our nation’s agricultural producers will be better equipped than ever to sustainably grow America’s food, fuel, and fiber in an era of unprecedented global demand.”

Soil health, like human health, is a complex and holistic concept. For example, when a person goes to a medical doctor, their health is not judged by blood pressure alone. Instead, many tests are used to assess their health. In a similar way, soil health is based on numerous chemical, physical, and biological measurements.

Specific Tier 1 measures endorsed include:
- organic carbon,
- pH,
- water-stable aggregation,
- crop yield,
- texture,
- penetration resistance,
- cation exchange capacity,
- electrical conductivity,
- nitrogen,
- phosphorus,
- potassium,
- carbon mineralization,
- nitrogen mineralization,
- erosion rating,
- base saturation,
- bulk density,
- available water holding capacity,
- infiltration rate, and
- micronutrients

“Many of these Tier 1 measures have proven effective to help producers achieve high yields for decades,” Honeycutt said. “Consequently, many of the soil test laboratories and field conservationists are already using these measurements. Currently, the Soil Health Institute is reaching out to those organizations to explore additional implementation opportunities.”

“We support the wide scale adoption of these soil health indicators, recognizing the robust process and scientific collaboration behind them,” said Nick Goeser, director of the Soil Health Partnership, and National Corn Growers Association director of soil health and sustainability. “We encourage farmers and agronomists to regularly test soil, use these indicators as business management tools for greater insight, and adopt practices that will improve soil health, like reducing the intensity of tillage to build soil organic matter.”

“The Soil Science Society of America supports development of scientifically-rigorous methodologies to quantify soil health, foster research, and promote outreach of reliable metrics to ranchers and farmers,” added Dr. Andrew Sharpely, President, SSSA.

Work continues with the agricultural industry to add more measurements to the Tier 1 classification – currently being researched as Tier 2 and Tier 3 measurements. They require
additional research to elevate them to Tier 1 usefulness. Such research may involve understanding regional differences in interpretation, establishing thresholds, and developing management recommendations to improve soil functioning.

“In particular, several biological measurements have significant potential to help suppress diseases naturally, improve water quality, build drought resilience, increase carbon sequestration, and reduce greenhouse gas emissions,” said Dr. Steven Shafer, Chief Scientific Officer with the Soil Health Institute. “However, additional research is needed to evaluate Tier 2 and Tier 3 measurements and interpret their contributions to soil health in different climates, soils, and production systems.”

“We are working with numerous partners to advance that research and are already making plans to get it into the hands of farmers and ranchers,” added Honeycutt.

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**Harvest Share Free Veggie Stand**

Still Accepting Your Excess Produce and Fruit

Inundated by apples? Over-run with squash? Gob-smacked by zucchini?

Donate your excess produce to one of the two Harvest Share stands in Tioga County. One stand is on the grounds of the Spencer Lions Club Community Gardens on East Tioga Street in Spencer, and the other is at Tioga Rural Ministry in Owego at the end of South Depot Street.

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**Cornell Maple Program**

**Fall Open House**

Held at the Arnot Forest Sugarbush
10 am to 4 pm Saturday October 7TH

Join us at the 1st annual Cornell Maple Program fall open house, and experience the fun and fascination surrounding this unique and delicious product.

Enjoy hiking along scenic Banfield Creek while experiencing brilliant fall foliage, demonstrations, free samples and information on cutting edge maple research.

Admission is FREE and open to all.

An assortment of Maple Syrup will be available.

For more information visit [cornellmaple.com](http://cornellmaple.com).

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*Cornell University*

*Cornell Cooperative Extension Provides Equal Program and Employment Opportunities*
Wednesday, Sept. 13th
6:00 PM
Hill Top Inn
171 Jerusalem Hill Rd.  Elmira, NY

Celebrate our rich agricultural heritage with a meal of foods grown on local farms and prepared by area restaurants.

Tickets: $30 in advance  $35 at the door
Available at CCE Chemung, by calling 734-4453 or at EastSide and Wisner Markets

Cornell Cooperative Extension offers equal program and employment opportunities.

Farm to Feast 2017
Friday, September 15th from 6 to 8:30 pm
Trackside at Tioga Downs, 2384 W River Rd, Nichols NY 13812

Enjoy Tasting Local Wines & Craft Beer
Fresh Ingredients Grown By Local Farms & Growers
Cheer your favorite mascot in the Run for Funds Derby

Tickets are $30 ADV/$35 DOOR
Available at our office or online at tioga.cce.cornell.edu

Questions?
Call 607-687-4020
Tour Wagner Hardwoods and the Arnot Forest

The Southern Tier of New York is home to some of the most valuable forests in the World that provide invaluable environmental, social and economic benefits to our local communities. Many of you in your public and professional roles are stakeholders that influence the stewardship of these woodlands and the vitality of related industries in our region.

We invite you to join us on Friday, September 15th from 9:30 am – 3:30 pm at Wagner Hardwoods (6307 State Route 224, Cayuta, New York - Schuyler County) and Cornell University’s Arnot Teaching and Research Forest (www.arnotforest.info) for a unique opportunity to learn more about the forest community in the Southern Tier and how your public and professional roles are interconnected with forest industry and the management of private woodlands. The morning will feature a tour of Wagner Hardwoods’ Cayuta Mill - one of the largest sawmills in the Northeast. The afternoon session will tour the nearby Arnot Forest to see active timber harvesting operations and related research.

Please arrive by 9:30 am for coffee and donuts. A light lunch will be served at noon - compliments of host, Wagner Hardwoods. This event is free, but please RSVP by Tuesday, September 12th to help us plan for lunch. To register please contact Brett Chedzoy/Schuyler CCE by e-mail at bjc226@cornell.edu or call (607) 535-7161.

Did you know?

- New York Forest Area: 18.95 million acres, 63% of land area, about one acre per resident
- Publicly-owned Forest Land: at least 3.7 million acres. Privately-owned Forest Land Area: 14.4 million acres (76% of total forest land) owned by 687,000 land owners
- Number of tree species: more than 100 commercial and non-commercial
- $300 million in annual payments to private landowners □ 488 million board feet of logs harvested annually (over 100,000 truckloads)
- 2.1 million green tons pulpwood and wood chips (~85,000 truckloads)
- 25% of New York timber harvest is exported for processing (~ 75% in Southern Tier)
- Economic contribution of forest products-related manufacturing and services: $14 billion (US Census)
- Forest-related tourism: $1.9 billion

Fungal spore 'death clouds' key in gypsy moth fight

By Krishna Ramanujan  Cornell Chronicle August 22, 2017

A fungus known to decimate populations of gypsy moths creates “death clouds” of spores that can travel more than 40 miles to potentially infect populations of invasive moths, according to a new Cornell study.

That’s good news as gypsy moth (Lymantria dispar) caterpillars ravage the leaves of forest trees – especially oak and aspen – decimating forests, orchards and properties across the northeastern United States. In 2016, gypsy moth caterpillars ate the leaves off 350,000 acres of forest plants in Massachusetts alone.

The study, published online Aug. 17 in the journal Applied and Environmental Microbiology, describes a new method for tracking the geographic range of this airborne insect pathogenic fungus from areas of a disease outbreak.

Better understanding of the distances these killer spores travel could help researchers correlate the fungus’ range with weather patterns to better predict how bad gypsy moth damage will be in a given year.

“One spore can infect a gypsy moth caterpillar and kill the insect, and after it’s dead, the fungus can use the body to make one million more spores. An insect is a huge source of nutrients for making spores,” said Ann Hajek, professor of entomology and a co-author of the paper. Tonya Bittner, a postdoctoral associate in Hajek’s lab, is the paper’s first author.

The fungal pathogen (Entomophaga maimaiga) first appeared in New England in 1989 and only infects gypsy moths. The pollen-sized spores stick to caterpillars when they walk over them. Once attached, a spore uses enzymes to create a hole and enter the caterpillar’s body, where a cloaking mechanism allows the fungus to remain undetected by the moth’s defenses. Over four to six days, the fungus multiplies and then kills the host, after which new spores are literally shot from the cadaver into the air, where they become windborne.

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My Name on the Milk Sign

By Michael J. Taddy

Any major life transition can be difficult for individuals and families. At various points in life, most of us will find ourselves faced with major changes—new locations, homes, schools, careers, and relationships. Under normal circumstances, times of transition lead to excitement as well as anxiety, uncertainty, and physical and emotional stress. For those transitioning from military service, stressors are often compounded by the emotional ties that come with service to our nation. The commitment to fellow service members, which is emphasized throughout training, various operations, and unit of assignment, fosters teamwork and an identity readily recognized by a respective service’s uniform. When that uniform is removed for the final time, many veterans testify to the loss of identity.

In my early years of service, words shared by a popular Air Force speaker helped me gain perspective with maintaining and remaining true to an identity—no matter the situation. One afternoon, Bob, an Air Force retiree in his mid-seventies, found himself outside working in his yard in southern Texas. As most summer days in Texas, temperatures climbed past 90 degrees. Bob’s neighbor, whose name I cannot recall, so I’ll refer to him as “John,” was also working in his own yard. After some small talk, Bob looked at his neighbor and asked, “John, what are we doing? We’re retired, in our seventies, and we are the only ones out in this heat working! Look around, none of our neighbors do the same. Either they hire someone or let their yards go to waste. Again, what are we doing in this heat? Are we crazy?” John rose from his knees, looked at Bob and simply said, “That’s easy Bob. We do it because our name is on the mailbox.”

After recounting this story, Bob explained to me that each one of us has our “mailbox”—whether it’s the pride in our home, organization, work ethic, business, or simply our family name. Any decision not to impact ourselves and those around us in a positive way, risks our reputation and name. “Our name is on the mailbox” guided me over the years at home and work. Today, that statement drives me to return to my roots in dairy farming.

When first seeking a path for my post-military career, I began to see how my military experience created deep motivations and fulfilled them in ways I had taken for granted during my service. I would need a new career that was equally satisfying. In reflecting on my early dairy days, along with research for future opportunities, I concluded that dairy farming could possibly “scratch the itch.”

Military service and dairy farming share core characteristics

People often ask why I chose a military career. Even though I didn’t fully realize it upon enlistment, a sense of “service” drew me into the lifestyle. I am compelled to serve a larger cause than myself, helping defend my great country, while establishing trust with the American people. As I envision my departure from the Air Force, this deep-seated desire continues to guide me as I prepare to transition to a life that is very different, at least on the surface. The truth is that dairy farming also provides an excellent opportunity to serve a larger cause. As in my service my country, I don’t have any grand expectations of wealth. Instead, my goal is to enrich my family’s lifestyle while helping to provide for America’s food and agricultural needs—all while building trust with the people we “serve,” creating a sense of stewardship.

In my view, one of the greatest rewards while serving was accepting the responsibility of stewardship to the American taxpayer. Our nation is comprised of people from all walks of life who work very hard and expect the military to be good stewards of their money and trust. As a military member, I owe them fiscal judiciousness and responsibility. Responsibilities in dairy farming are similar. The people demand we serve as good stewards of government programs and, just as importantly, of our land and natural resources. My research into pasture-based dairying, and the many successful examples already in the industry, affirms my belief farmers can achieve the proper balance while delivering healthy and safe farm products.

Productivity—and witnessing the fruits of labor—is a tangible reward of military service. Throughout my career, I produced both physical labor outputs and important outcomes that were less obvious. With every end product, I witnessed a “job well-done” or the byproduct of team cohesiveness. Productivity
easily translates into dairy farming, as dedicated farmers not only deliver milk, cheese, yogurt, and butter, but also satisfied customers. At the end of each day on the farm, tangible results await reflection. Understandably every day isn’t one of positive results, but overall, the product or service delivered reminds the hard work is worth the effort. Producers not only take this satisfaction for themselves, but also share it in as a community.

Leaving the service, whether after 4 years or 30 years, veterans continually attest to the loss of “camaraderie.” The shared knowledge and skills, experiences, challenges, and daily routines that are outside the mainstream of American civilian life creates a vibrant subculture that is a source of pride and identity as well as a resource for continued personal growth. A similar network within the dairy grazing community, as I’ve witnessed over the past year, also provides a sense of camaraderie. Pasture-based dairymen and women consistently demonstrate a willingness to assist and educate their fellow farmers—strengthening this close-knit yet open community.

**The barriers to dairy farm entry can make a dream seem impossible**

Growing up in rural Wisconsin, I often found myself helping on neighboring dairies. My interest in dairy solidified during my high school years, working four years for a neighbor. Although decreasing at that time, family dairies still remained prevalent on the local landscape. Each of these dairy owners were easily identifiable by the milk sign posted in the front yard. Along with the family and farm name, the milk sign listed the company that purchased the family’s milk. This simple sign in front of a dairy farmer’s house represented ownership, commitment, legacy, and an identity.

Deep down inside for years, I wanted to see my name on a milk sign. Through the past nineteen years of service while monitoring the dairy landscape, I always thought it would be impossible to do so. From afar, I witnessed the demise of the small family dairy farm with increasing land, equipment, and maintenance costs. Both psychological and physical barriers contributed to my perception. I heard about and witnessed the nightmares of small family dairies losing milk contracts, family disputes over ownership, and the increase of large-scale dairies. Additionally, when I expressed my interest in dairying, my friends and family looked at me as though I had a foot-long unicorn horn protruding from my forehead.

Inside, I began to question my desire to follow this path and was ready to forfeit my fight to get my name on the milk sign. However, my discovery of the Dairy Grazing Apprenticeship (DGA), which demonstrates an exciting, practical, and proven path, has renewed my hopes.

**Dairy Grazing Apprenticeship provides a pathway for aspiring dairy farmers**

DGA is an accredited National Apprenticeship registered under the U.S. Department of Labor-Employment and Training Administration. DGA addresses barriers to dairy farm entry by utilizing an educational model that has trained people in skilled professions for more than 100 years. Using the model of education that has prepared skilled workers in the trades for more than a century, DGA combines work-based training with related instruction for the federally recognized occupation of “Dairy Grazier.” A dairy grazer is a farmer who uses managed grazing. In managed grazing systems, the majority of farm acres are planted to perennial forages and cows are rotated through paddocks of high quality grasses that are allowed to rest and regrow. Using this cost effective method, dairy graziers are able to restore natural resources, produce high quality milk, and remain profitable in both conventional and value-added markets.

The Apprenticeship consists of 4,000 hours of employment and training over a period of two years. Of these hours, 3,712 hours are employment and mentoring under an approved Master Dairy Grazier. A comprehensive DGA Training Manual (or “Job Book”) lays out the competencies that must be met in order to own and operate a managed-grazing dairy farm, providing a blueprint for the mentoring process. The other 288 hours are related instruction designed to enhance on-farm training. Apprentices who complete the program graduate to certified Journey Dairy Grazier status and receive business planning services as they advance into management, equity earning partnerships, farm transfer or farm start up.

Over the past year, I registered for an Apprenticeship to begin in 2018, after retiring from the Air Force. I’ve contacted and met DGA staff members and approved Master Dairy Graziers. The staff is incredibly friendly and helpful—traits also demonstrated by the numerous graziers I visited. Both entities eagerly answer my multitude of questions and concerns. This positive interaction continues to solidify my desire to pursue an Apprenticeship, with an ultimate goal of farm ownership. To help ease the transition, veterans can utilize their G.I. Bill during the Apprenticeship, both for housing and tuition for the requisite classroom requirements. As a veteran, you can begin your dairy Apprenticeship exploration by contacting DGA.
During one of my visits to a Master Dairy Grazier’s farm, the potential Master inquired about my military experience, which we discussed along with opportunities my retirement will provide (i.e. pension, health insurance). He asked, “With those experiences and benefits, why do you want to be a dairy farmer?” I told him of the lesson learned from Bob, and simply stated, “I want my name on something. I want to leave a legacy and opportunity for my children. In short, I want my name on the milk sign.” Through opportunities with DGA, combined with your military benefits, you too can have your name on the milk sign.

About the Author: Michael Taddy (pronounced toddee), originally from Reedsville, Wisconsin is a Major in the United States Air Force and serves as an Aircraft and Munitions Maintenance Officer. Along with his wife, Stephanie, they raise four children: Hailey, Hunter, William, and Evelyn. Mike can be reached at taddy1340@yahoo.com

DGA is the first accredited Apprenticeship program for farming in the United States

Do you want to run your own dairy farm?

Dairy Grazing Apprenticeship is a National Apprenticeship registered with the U.S. Department of Labor-Employment and Training Administration. This innovative training program provides paid employment, comprehensive training in all aspects of owning and operating a managed-grazing dairy operation, and the experience to move into farm ownership.

DGA consists of fulltime employment, training, and mentorship under an approved Master Dairy Grazier over a period of two years with opportunities for advancement upon completion. A comprehensive DGA Training Manual (or “Job Book”) lays out the competencies that must be met in order to own and operate a managed-grazing dairy farm, providing a blueprint for the mentoring process.

For more information, visit: https://www.dga-national.org/Home

Ed. Note: photos from the Dairy Grazing Apprenticeship website.

Growing Black Locust as a Timber Cash Crop

Friday, October 20th from 9:30 am – 4:30 pm at the USDA NRCS Plant Materials Center in Big Flats, NY (3266 State Route 352) for a special day conference on “Growing Black Locust as a Timber Cash Crop”. Black Locust (Robinia pseudoacacia) is an Appalachian native with many positive attributes that merit consideration for any tree planting project. To name a few: locust has very strong, highly decay-resistant lumber that is an excellent alternative to pressure treated lumber and posts; it is a nitrogen-fixing Legume; and the fragrant, attractive flowers that appear in early June are excellent bee fodder. But one of the best reasons for considering Locust is that it can be grown as a profitable timber cash crop throughout much of the Northeast! This intensive one-day conference will be an invaluable networking and learning opportunity for those interested in growing Black Locust successfully and profitably. For full agenda and to register by Monday, October 16th please visit: (https://docs.google.com/forms/d/e/1FAIpQLSeVZAViRORQ-cA1l1K6paFedO1Pr_Hm1wlw4OBUZ3XYYGw/viewform). Cost is $20 (pay at the door) and includes a hot lunch and a Black Locust seedling grown from improved seed orchard seed. Please dress for the weather for an afternoon tour. Hosted by the USDA NRCS Big Flats Plant Materials Center (https://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/northeast/nypmc) with support from Cornell Cooperative Extension and the Cornell Small Farms Program (http://smallfarms.cornell.edu). For more information, please contact Brett Chedzoy at Cornell Cooperative Extension of Schuyler County by phone: (607) 535-7161 or email: bjc226@cornell.edu
Biochar shows benefits as manure lagoon cover

A mission for fewer emissions

Reprinted with permission from American Society of Agronomy, Soil Science Society of America, Crop Science Society of America (email of 8/9/2017). Collectively, these Societies represent more than 12,000 individual members around the world. The scientists’ memberships build collaborating partnerships in the agronomy, crops, and soils science fields for the advancement of knowledge.

Manure is a reality in raising farm animals. Manure can be a useful fertilizer, returning valued nitrogen, phosphorus, and potassium to the soil for plant growth. But manure has problems. Odor offensiveness, gas emissions, nutrient runoff, and possible water pollution are just a few. Timing is also a problem. Livestock produce manure 24/7—even when it is impractical or unwise to move it to the field. Delivering manure to the field needs to be timed to nutrient needs, soil moisture levels, and temperature. How can farmers handle this timing issue, as well as other manure problems?

In cities, sewers and water treatment facilities deal with human waste. On farms, manure storage lagoons can hold the manure until the time is ripe. This solves the timing and delivery problem—but what about odor and gas emissions? In addition to the inconvenience of odor, manure can release gases connected to air pollution and climate change. Methane, nitrous oxide, ammonia, and hydrogen sulfide are examples. Scientist Brian Dougherty and colleagues researched methods to reduce these negatives while potentially adding some positives: biochar covers.

Biochar is plant matter, such as straw, woody debris, or corn stalks, that has been heated to high temperatures in a low- to no-oxygen environment. The result is a black, carbon-rich material similar to charcoal.

Dougherty says biochar is like a sponge. “Biochar provides a structure with lots of empty pore space” he says. “The outer surface may appear small but the interior surface area is absolutely massive. A few ounces of biochar can have an internal surface area the size of a football field. There is a lot of potential there for holding on to water and nutrients.” In addition to its hidden storage capacity, the surface of the biochar tends to have a chemical charge. This gives biochar the ability to attract and hold nitrogen, phosphorus, and potassium ions, metals, and other compounds. Biochar can also float (some types more than others). That attribute means it can trap gases at the water’s surface.

Growing up on a dairy farm, Dougherty is no stranger to the challenges of manure storage. “Once I realized the properties of biochar, I thought it had good potential for a lagoon cover,” he says.

Dougherty’s research studied two liquid dairy manures with differing nutrient levels. It also studied two types of biochars, made at different temperatures. Biochar is somewhat fickle, showcasing different properties when created at different temperatures. He also included pails of manure with a straw cover for comparison, and au natural with no cover as his control.

The research found that the biochars picked up the most nutrients from the more concentrated manure with a higher nutrient content. “The biochar will take up whatever it can, so if there are more nutrients available the potential for nutrient uptake is greater,” Dougherty says. Nitrogen, phosphorus, and potassium are nutrients with the greatest economic value on a farm, but applying them in excess of what the crop can take up can lead to nutrient loss to the watershed.

Dougherty also measured the ammonia at the top of each pail. Ammonia and sulfates are the main source of manure’s odor. The cooler-crafted biochar did best here, reducing ammonia by 72-80%. It also floated better. But because it floated better and tended to repel water, it was less effective at attracting and attaching to the nutrients than the warmer-crafted biochar.

Biochar is currently more expensive to buy than straw, but Dougherty is undaunted. Biochar could have a good economic return: excess farm and forestry residue could be used to create the biochar on site. This process generates energy that could be used heat water and warm buildings during colder months. There is also potential for generating electricity, fuels, and other by-products using more sophisticated equipment. After its use in the lagoon, the biochar could be spread on fields as needed. Any excess could be sold as a high-value fertilizer product.

And biochar has great environmental benefits. “Anything you can do to prevent gases from escaping the lagoon is a good thing,” Dougherty says. “Biochar applied to soils—particularly poorer quality soils—is very helpful. Making biochar can also help reduce atmospheric carbon dioxide levels. A portion of the carbon dioxide that was taken in during plant growth ends up as a very stable form of carbon in the soil. The overall picture has multiple benefits.”

Dougherty’s research did not avoid the obvious. Would biochar or straw best improve the dairy air? Since the human nose knows, Dougherty recruited a panel of judges. The weather intervened, however, with freezing temperatures and rain affecting the odor intensity over the 12 week trial. Despite these challenges, three different biochars were shown to reduce odor from liquid dairy manure, whereas a straw cover was not effective.

“Determining the best trade-off of biochar properties will be an important next step,” Dougherty says. “More research could find the right biochar production temperature, particle size, pH, and float properties. The potential is there.” This portion of the research still needs to be sniffed out.

Read more about Dougherty’s biochar research in Journal of Environmental Quality. Oregon State University’s Agriculture Research Foundation and Agricultural Sciences Bioenergy Education Program funded his research.

Photo credit Brian Dougherty.
News, Notes and Workshops for Tioga and Chemung County Farmers and Gardeners

Become a Master Forest Owner!

The Master Forest Owner (MFO) volunteer program continues to expand and build on its success as a premier peer-to-peer woodland owner support network. Over the past year we have expanded support to volunteers, improved monitoring of woodland owner needs and requests, and streamlined documentation for impacts.

MFO volunteers do not offer technical assistance, perform management activities, or give professional advice. Rather, they meet with owners to listen to their woodland goals, concerns and questions; volunteers then offer sources of assistance, and encourage them to work with professionals. The success of this program is grounded in the power of approximately 150 peer woodland counselors.

Volunteers can be from any background, young or old, resident or absentee, large or small parcels, with varied woodland experiences. Candidates receive a bit of forest management training, but the program is primarily designed to help them develop as volunteers for peer-to-peer counseling to encourage sustainable woodland management.

The 2017 training will be September 6 – 9 at the Cornell University Arnot Teaching and Research Forest in Van Etten, NY (www.arnotforest.info). The $125 ($200 per couples) fee helps defray the cost of publications, food, and equipment for the 4-day training. Volunteers may stay at the Arnot at no additional cost. The training combines classroom and outdoor field experiences on a variety of woodland management and educational topics.

If you would like to become a MFO or have questions, please call Barb Neal at 607-687-4020.

Equipment Tutorial for Small Farms

September 13 @ 6:00 pm - 8:00 pm Remembrance Farm 6294 Searsgard Rd Trumansburg, NY 14886 $15

Are you a new or growing farm looking to purchase equipment that’s right for you both financially and logistically? Making mechanized equipment purchases can be a daunting task! Join us for a hands-on evening to look at and learn about various different types of equipment to determine what will be appropriate for the size and needs of your operation. In partnership with NOFA-NY Field Days and taught by experienced farmers and a mechanic, this Field Day will help you consider buying new or used, parts and maintenance, size and condition, and some of the precautions needed to make realistic choices. This just might be the risk management tool that will make your next investment a success!

Register for this event through NOFA at https://www.nofany.org/events-news/events/2017-on-farm-field-days

This event is produced by NOFA-NY and Groundswell with support from the USDA-Risk Management Agency

The Grassfed Exchange – September 27th to 29th – The Desmond Hotel, Albany – Mark your calendar - Early bird registration now open! The 2017 Grassfed Exchange, set to be held at Albany, New York's award winning Desmond Hotel, promises to be an experience you won't want to miss. This year's event will feature a lineup of renowned keynote speakers, live cooking demonstrations, interactive farm tours, two full days of seminars with exhibitors, and outdoor livestock display pens. We invite you to come network and learn from some of the industry’s most innovative producers, thought leaders, top chefs, and bloggers that have their finger on the pulse of what is driving the fastest growing segment in the beef industry. Now more than ever, as grassfed and regenerative agriculture continues to rapidly evolve, it will be crucial to stay in-tune to the latest changes and advancements that will continue to shape the future of our industry. Keynote speakers include Ray Archuleta of USDA-NRCS’s Soil Health Division, David Montgomery, author of the newly released book “Growing a Revolution: Bringing Our Soil Back to Life”, Jeremy Stanton, operator of Fire Roasted Catering, and more.

Registration and more information about all the speakers is now available at http://grassfedexchange.com

Trees for Tributaries Seeks Landowners in Tioga County

Trees for Tributaries, is seeking new projects in Tioga County! Trees for Tributaries is a planting program, coordinated by the Upper Susquehanna Coalition, that works to reforest tributary streams throughout New York State, in order to reduce negative impacts upon riparian ecosystems, as well as, reduce the negative effects a riparian ecosystem can have on society.

Since the colonization of the Susquehanna River watershed in the 17th century, the Southern Tier has experienced a significant loss of forested habitat, specifically forested riparian buffers. A riparian buffer is any vegetated land, ideally forested, that border waterbodies and wetlands. These forest edges provide many services both to its human and organismal residents.

Implementation of buffers has been shown to maintain and even increase the property values of those located in riparian zones. Trees, and other vegetation that comprise a buffer, hold the soil together in the roots slowing the erosional processes; keeping waterfront property from rapidly shrinking. Plant roots also help prevent nutrient rich soil from floating away downstream, which decreases eutrophication in natural ecosystems, and prevents farmers from losing the fertile soil their crops require.

In addition to personal gains, installation of riparian buffers can also aid in economic growth of a town by increasing recreational opportunities. Buffers enhance the species diversity of an area by creating microhabitats. These microhabitats host organisms with high sensitivity to environ-
mental conditions known as indicator species. Stoneflies, salamanders, and lichens are all examples of organisms with this type of habitat specificity. Although, stoneflies may not attract masses of tourists; stoneflies are a great lure for brook trout and several other species of game fish. Diversity of game fish is not the only draw of riparian buffers; these wetland ecosystems are also host to an array of bird species. Wood ducks, kingfishers, great blue herons and even bald eagles find refuge in riparian ecosystems.

Whether you are a farmer, fisherman, or aspiring ornithologist, if you own or manage property along a stream you may qualify for assistance. Trees for Tributaries will provide the native trees, and shrubs necessary for streamside planting projects, and regional staff will be available throughout the process for technical aid. Public and private sites qualify for assistance, although projects led by environmental organizations, or sites located in high-profile, highly visible areas will receive precedence. Since there is greater success in establishment of trees in spring and fall this is when buffers will be installed.

To learn more and apply visit our webpage: [http://www.dec.ny.gov/animals/77710.html](http://www.dec.ny.gov/animals/77710.html) or Contact: Tioga County Soil and Water Conservation District at (607) 687-3553 or email: Laura Grant at GrantL@Co.Tioga.ny.us.

**Cover Crops for Home Gardens, at CCE Tompkins in Ithaca**

**Wed, Sept. 6, 6:00 - 8:00 pm**

Reduce your carbon footprint and enhance your soil all at once! Planting cover crops in your garden is a cost effective form of nutrition and organic matter and keeps your soil, water, and nutrients from running off. Come learn which cover crops do well in our area and which ones work best for your garden situation. We'll cap off the evening with a hand-on cover crop planting demonstration in the CCE garden. Self-determining sliding scale fee $5-10. Pre-registration required. Check out the CCE Tompkins website.

**Equipment Tutorial for Small Farms**

September 13 @ 6:00 pm - 8:00 pm - $15. Are you a new or growing farm looking to purchase equipment that’s right for you both financially and logistically? Making mechanized equipment purchases can be a daunting task! Join us for a hands-on evening to look at and learn about various different types of equipment to determine what will be appropriate for the size and needs of your operation. In partnership with NOFA-NY Field Days and taught by experienced farmers and a mechanic, this Field Day will help you consider buying new or used, parts and maintenance, size and condition, and some of the precautions needed to make realistic choices. Held at Remembrance Farm 6294 Searsbury Rd.in Trumansburg. Please click on the picture for additional details.

**Tour the Groundswell Incubator Farm! Tuesday, September 12th, 5:30-6:30PM**

Come out to Groundswell’s Incubator Farm for a tour led by the Farm Manager or Groundswell staff member, and learn about how immigrants, refugees, and people underrepresented in the food system are getting support to start food and farm businesses.

Groundswell Incubator Farm at Ithaca Ecovillage, 100 Rachel Carson Way, Ithaca, NY 14850

Curious to learn more?

Check out this info about our farm, NY State's first incubator! [http://groundswellcenter.org/incubatorfarm/](http://groundswellcenter.org/incubatorfarm/)

*Editor’s Note: I have been a long time advisor to the incubator farm and seen it grow and thrive. There are currently two flower farms and several Burmese refugees who are growing vegetables unique to Southeast Asia. You will enjoy your tour! B. Neal.*
Business Help for New Farmers

U.S. Agriculture Secretary Sonny Perdue today signed a Memorandum of Understanding with officials from SCORE, the nation’s largest volunteer network of expert business mentors, to support new and beginning farmers. Today’s agreement provides new help resources for beginning ranchers, veterans, women, socially disadvantaged Americans and others, providing new tools to help them both grow and thrive in agri-business.

“Shepherding one generation to the next is our responsibility. We want to help new farmers, veterans, and people transitioning from other industries to agriculture,” said Secretary Perdue. “They need land, equipment, and access to capital, but they also need advice and guidance. That’s what SCORE is all about.”

SCORE matches business professionals and entrepreneurs with new business owners to mentor them through the process of starting-up and maintaining a new business. USDA and its partners across rural America are working with SCORE to support new farming and ranching operations, and identify and recruit mentors with a wealth of agricultural experience.

Secretary Perdue announced the new partnership in Des Moines during the Iowa Agriculture Summit. Perdue was joined by Steve Records, Vice-President of Field Operations for SCORE in signing a Memorandum of Understanding that will guide USDA and SCORE as they partner in the mentorship effort, which will soon expand to other states.

“SCORE’s mission to help people start and grow vibrant small businesses is boosted by this new partnership with USDA. America’s farmers, ranchers and agri-businesses will benefit from the business knowledge and expertise SCORE can offer,” said Records. “The partnership allows both SCORE and USDA to serve more people while providing America’s farmers added support to lead to more sound business operations, create profitable farms with sustainable growth and create new jobs. We are excited at the opportunity to extend SCORE’s impact to our farmers and the agriculture industry.”

SCORE mentors will partner with USDA and a wide array of groups already hard at work serving new and beginning farmers and ranchers, such as the Future Farmers of America, 4-H, cooperative extension and land grant universities, nonprofits, legal aid groups, banks, technical and farm advisors. These partnerships will expand and integrate outreach and technical assistance between current and retired farmers and agri-business experts and new farmers.

This joint initiative leverages SCORE’s 10,000 existing volunteer mentors and USDA’s expertise and presence in agricultural communities to bring no-cost business mentoring to rural and agricultural entrepreneurs. This initiative will also be another tool to empower the work of many community-based organizations, cooperative extension and land grant universities, working with beginning farmers in their communities. SCORE mentorship will also be available to current farmers and ranchers. Anyone interested in being a mentor can get more information and sign up on the USDA New Farmers’ website at https://newfarmers.usda.gov/mentorship.

We still have room for you at the 2017 Cornell Maple Camp  September 13-16, 2015

Cornell University’s Arnot Teaching and Research Forest 611 County Road 13, Van Etten (Cayuta), NY

Cornell Maple Camp is designed to provide beginner and less experienced maple producers with focused, hands-on, intensive training to help them produce maple products with greater efficiency and profitability.

Key topics include:
- Measure and manage their sugarbush for improved tree growth, health and productivity.
- Plan and install a tubing system
- Plan and assemble a sap processing system, including sap storage, reverse osmosis, evaporator operations, filtering, syrup storage and making maple value added products.
- Learn directional tree felling and low impact tree harvesting.
- Understand the principles for marketing of syrup and value added products.
- Analyze your own maple enterprise and develop business management skills.

Maple Camp starts with dinner at 5 PM on Wednesday September 13 and ends with Lunch at Noon on Saturday September 16. Registration includes instruction, all training materials, and lunch and supper (Wednesday supper through Saturday lunch). Cost is $225 per person. Lodging is arranged by participants, with options available upon request. No cabins are available at the Arnot Forest. This training is sponsored by the Cornell Maple Program. For more information and registration go to www.cornellmaple.com or http://blogs.cornell.edu/cornellmaple/
Cornell Classes Teach Beginning Farmers

The Cornell Small Farms Program offers 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 September 25 include:

**BF 101: Starting at Square One**

This course helps new and aspiring farmers take the first steps toward setting goals, assessing resources available (physical, financial, and personal), and exploring enterprises that are the best fit for you and your land. Carefully defining what you want to do and how you will do it is a key element of any successful new farm enterprise. This course is taught by Erica Frenay (Shelterbelt Farm) and Steve Gabriel (Wellspring Forest Farm & School). Both also coordinate online courses for the small farms program.

**BF 150: Farm Woodlot Management**

Woodlots are a common feature of most farms in the eastern US, and are often overlooked for the value they might bring to the landowner and to farm enterprises.

During this course, we will examine the methods to assess forest resources and discuss common woodland activities such as cutting firewood, harvesting logs for mushroom cultivation, and support for wildlife and long-term forest health. This course is taught by Peter Smallidge, who is NYS extension forester and coordinator of the acclaimed ForestConnect webinar series on YouTube.

**BF 204: Quickbooks for Farmers**

This course is an introduction to QuickBooks, designed to provide an overview of the QuickBooks Pro software application. It will cover the basic features, such as sales tax, inventory, invoicing, adjustments, and year-end procedures. Each student will gain hands-on experience reproducing the exercises presented by the instructor.

Each course is $250, which entitles two people from a farm to attend.

Upon registering, you will receive a receipt with a link you can use to register the second person from your farm. Check out the listings at [http://smallfarms.cornell.edu/online-courses/](http://smallfarms.cornell.edu/online-courses/) for more information on a particular course and the instructors.

Contact Erica Frenay, ejf5@cornell.edu or Steve Gabriel, sfg53@cornell.edu or call 607-255-2142.

Gypsy Moth—continued from page 9

From May through June, when gypsy moth caterpillars are feeding and before they pupate, the fungal pathogen can run through up to nine infection cycles, while the numbers of infections increase dramatically. During the study, the researchers found the peak caterpillar death rate due to E. maimaiga reached 86 percent, meaning that if you found 100 caterpillars munching leaves that day, 86 of them would die within the week.

In the past, researchers studied the airborne spores by collecting air samples on a transparent surface and studying particles under a microscope, a time-consuming and potentially inaccurate process, Bittner said.

The new method makes use of quantitative polymerase chain reaction (PCR), a standard method for quantifying RNA and DNA. The researchers designed a trap, a chamber with a hole on the top.

“Whatever is falling in the air can fall into that hole,” Bittner said. A cup in the bottom of the trap contains a buffer that prevents the spores from germinating but preserves each spore’s DNA.

Back in the lab, the researchers filtered the contents of each trap for pollen-sized particles, then measured the amount of E. maimaiga DNA in each sample using quantitative PCR. “We found there was a correlation where if the trap was closer to a defoliated area, it had more spores, and further away it had fewer spores,” Bittner said. “We did detect spores in a trap that was 70 kilometers [43.5 miles] from a defoliated area.”

Andrew Liebhold and Harold Thistle, both United States Department of Agriculture (USDA) researchers, are co-authors on the paper. The study was funded by the USDA and the Gypsy Moth Slow the Spread Foundation.
To Serve and Strengthen Local Farms, Local Food,

Members are at the heart of Farm Bureau, a grassroots-driven organization of families and individuals in New York who care.

Chemung County Farm Bureau
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