

# SMALL FARM QUARTERLY

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



## Feature Articles

Farm Ops Veterans are Armed to Farm .....Page 2

Stay the Course: Six Generations of Stewardship on the Corse Family Farm .....Page 6

A Farmer's Perspective – Long Term Soil Health and Fertility in a High Tunnel .....Page 19



## FALL 2017

Supplement to Country Folks



**VETERANS IN AG****Farm Ops Veterans are Armed to Farm**

*Veterans in New York participate in agricultural training opportunities across the state, growing skills and strengthening community connections.*

by Kat McCarthy

Walking into classroom 167 at SUNY Adirondack on July 31, the average person wouldn't know from a quick visual observation that there were two unifying features of the 2017 Armed to Farm cohort. Twenty-five individuals from across New York filled the classroom, each with a one-foot high stack of books in front of them on the table, and many with steaming cups of coffee. From a quick glance, it would seem more likely that this group was attending a crash course in statistics than a week-long intensive designed for veterans interested in farming.

As the initial conversation circled the room, with individuals making introductions and sharing background information, the energy and enthusiasm for growing food and giving back to the community was unmistakable. Each year draws a unique cohort of dedicated individuals seeking to learn more about farming, and as usual, the 2017 cohort represents a range of experiences – from those beginning to explore their options, to employees on farms interested in becoming owners, to beginning and more advanced farmers. And as expected from a group of 25, a wide range of interests was also represented: hydroponics, aquaponics, Christmas tree production, dairy management, grazing and pasture management, market gardening, agrotourism, mushroom cultivation, livestock management, beekeeping, fruit tree cultivation, and more.

This year marks the third consecutive year in which New York State veterans have had the opportunity to attend the Armed to Farm business and entrepreneurship training. Over the course of the week, participants interacted with educators from the National Center for Appropriate Technology (NCAT), staff from the Cornell Small Farms Program, regional service providers, and local producers. Developed by NCAT, and brought to New York with support from the Cornell Small Farms Program, the program offers



Group photo at SUNY Adirondack of Armed to Farm participants.

Photo by Elizabeth Goodwin

the opportunity to learn constantly - during classroom presentations, through conversations with peers, and while engaging in hands-on activities during farm visits.

Intended to offer an introduction to many areas of agriculture, the 2017 program featured visits to six area farms. Starting at Sunset Farm, attendees got a taste for managing vegetable crops and operating a road-

side stand. On day two, participants took a pasture walk at Mack Brook Farm and learned about tools to improve efficiency in vegetable production at Slack Hollow Farm, seeing a flame weeder, mechanized high tunnel ventilation, and numerous cultivating tools. Day three included an overview of hops production and processing at Argyle Craft Malts and Hops, an overview of dairy operations at Clover Bliss Farm, and a visit

to Moxie Ridge Farm & Creamery, which highlighted agritourism opportunities - raising goats, sheep & chickens, making cheese, all while running a bed and breakfast. Closing out the farm visits, attendees met with Paul Arnold at Pleasant Valley Farm on day four, demonstrating a model for continual improvement in diversified vegetable production.

Considering the wide range of interests represented throughout the training, this broad focus was beneficial. "This program allows someone to see a lot of options that are available to them and decide what may or may not be a good fit," notes Dean Koyanagi, the Veterans Program Associate at the Cornell Small Farms Program. "For example, at the end of the week, one couple left the training with the take-away that they would rather focus on livestock and not get involved with growing veggies. These lessons are invaluable in helping people save time and money while focusing on what is most important to them." At the end of the week, participants left having gained new resources to tap into, new ideas for enterprises, and new community connections as they continue to pursue their aspirations for farming.

Opportunities for veterans interested in farming are not limited to this week-long training. In August, the Farmer Veteran Coalition of New York, in partnership with the Cornell Small Farms Program, offered two additional events – one in New York City, and another on Long Island. On August 9, 11 veterans gathered to tour the rooftop farm at the Brooklyn Grange and the Union Square farmer's market, ending with a networking lunch coordinated by GrowNYC. Individuals interested in oyster farming were provided with a hands-on opportunity to learn on fishing boats at a workshop held August 12th.

**See Farm Ops page 3**



Harvesting carrots with veterans and the Slack Hollow Farm crew.



Armed to Farm participants tour Pleasant Valley Farm.

Photos by Kat McCarthy



# Cornell Small Farms Program Update

## Online Course Registration NOW OPEN!

Registration is open for the 2017-2018 season of Small Farm Online Courses building the technical and business skills of farmers. Expert farmers and extension educators guide students through the latest research-based information to help improve efficiency and increase profit on small farms.

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.

Watch our short video about the courses: <https://youtu.be/ki8-S5HA950>

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.

From aspiring to experienced farmers, there is a course for nearly everyone. There's a

handy chart on the course homepage to direct you to the right courses for your experience level. Courses starting soon include Veggie Farming, Berry Production, Poultry Production and more! See all the course listings at <http://smallfarms.cornell.edu/online-courses/>

### Course Calendar

#### Week of Nov 6 – Dec 15

- BF 120: Veggie Farming 1 – From Planning to Planting
- BF 122: Berry Production
- BF 130: Poultry Production
- BF 152: Introduction to Maple Syrup Production
- BF 205: Developing and Using an Effective Marketing Plan

#### Week of Jan 15 – Feb 23

- BF 102: Markets and Profits
- BF 107: Climate Smart Farming
- BF 121: Veggie Farming 2 – From Season-Long Care to Harvest
- BF 151: Woodland Shiitake Mushroom Cultivation
- BF 203: Holistic Financial Planning
- BF 223: Tree Fruit Production
- BF 232: Commercial Sheep Production

## Week of Feb 26 – April 6

- BF 103: Taking Care of Business
- BF 153: Oyster Mushroom Cultivation
- BF 160: Introduction to Beekeeping
- BF 202: Writing a Business Plan
- BF 220: Season Extension with High Tunnels
- BF 231: Grazing Management

### Agroforestry in Practice: a 3-day training for Service Providers

October 17, 18, and 19, 2017

Schuyler County Cooperative Extension, Montour Falls, NY

Agroforestry is the science and art of combining trees and forests with crop production. It is a topic of great interest to many landowners and farmers, and offers many promising enterprises including maple syrup, log mushroom cultivation, silvopasture (combining trees and livestock) and others.

This three-day course is designed for service providers including extension educators,

farm non-profit organizations, public and private foresters, and consultants who routinely work with landowners and farmers to implement best practices.

See the agenda, and learn registration and lodging details at: <http://smallfarms.cornell.edu/agroforestry-in-practice/>

### Veterans in Agriculture Conference

Calling all veterans interested in farming and the service providers that support them. A Veterans in Agriculture Conference will be held in late fall in central New York. Don't miss the chance to attend this one-day event featuring educational workshops, networking opportunities, and updates about resources that are available to veterans in New York State. Date and details will be announced by the publication of this paper on the website below.

For more information, or to register, visit the FarmOps website at: [smallfarms.cornell.edu/projects/farm-ops/](http://smallfarms.cornell.edu/projects/farm-ops/)

### From the Editor

While Fall might feel like the end of the year for many farmers, in some cultures it is seen as the "New Year." In some senses, after the long hard work of the season, with hay bales and canned tomatoes stored for the coming winter, it makes sense to start over, begin things anew.

Regardless, we can mark Fall as a transition point, and start to reflect on the season that was. This rather rainy and wet year is markedly different from last year at this time, when much of the region was still in a historic drought.

Despite the ups and downs, we can be grateful for making it through the season, and finding ourselves whole again. We hope you enjoy this issue of the Quarterly, and wish you a happy and restful fall.

~ Steve

## How can I get Small Farm Quarterly?

**Country Folks subscribers** automatically receive SFQ four times a year at no extra cost. Country Folks is delivered weekly for \$50 per year.

**SFQ-only subscribers** receive just the 4 issues of Country Folks that contain the SFQ insert for only \$5 a year.

**Cooperative Extension Associations and other organizations** can offer their members a subscription to SFQ as a member benefit! Your organization collects the names, forwards them to Country Folks Subscriptions, and pays Country Folks just \$2.50 for each subscriber. Country Folks mails out the copies.

**Bulk orders:** You can order multiple copies of any issue for just 10¢ a copy! Minimum order is 50. Orders must be placed at least 4 weeks before the publication date

To find out more, contact:  
Tracy Johnson  
Country Folks Subscriptions  
P.O. Box 121, Palatine Bridge, NY 13428  
1-888-596-5329  
email: [subscriptions@leepub.com](mailto:subscriptions@leepub.com)

### Farm Ops from page 2

Looking ahead, Farm Ops partners across the state will continue to offer training opportunities on a rolling basis. Cornell Cooperative Extension offices in Jefferson County, Broome County, and Allegany County, as well as the Farmer Veteran Coalition, Heroic Foods, and Equicenter all have educational events scheduled in the coming months. The Cornell Small Farms Program also offers online courses on a wide variety of topics and registration is currently open on its website. Funding for these initiatives is provided through support from the New York State Department of Agriculture and Markets, and by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2015-70017-22882.

*Kat McCarthy is the Beginning Farmer Project Coordinator at the Cornell Small Farms Program. She can be reached at [kmm485@cornell.edu](mailto:kmm485@cornell.edu).*

*For more information about available programs, please visit the Farm Ops webpage, [http://smallfarms.cornell.edu/projects/farm-](http://smallfarms.cornell.edu/projects/farm-ops/)*

*ops/. To learn more about NCAT and the Armed to Farm training, please go to: <https://www.ncat.org/armedtobfarm/>. Information about the Farmer Veteran Coalition can be found: <http://www.farmvetco.org/>.*

### Farm Ops

Farm Ops strives to provide access to resources and training events for veterans pursuing careers in agriculture in New York State. In addition to making available educational workshops, the program offers veterans scholarships for educational events and the Cornell Small Farms Program online courses. To support veterans seeking jobs on farms, the program works with farms around the state to set-up On the Job (OJT) Training opportunities. Information about these and other relevant initiatives are posted on the Farm Ops website. News, resources, and updates are also shared regularly through the New York State Veterans in Agriculture Network Listserv, which can be joined by following instructions through the Farm Ops webpage.



Veterans gather around to learn about production at the Brooklyn Grange rooftop farm. Photo by Kat McCarthy



TABLE OF CONTENTS

Cornell Small Farms Program Update .....	Page 3
<b>BUSINESS MANAGEMENT</b>	
The Basics of Impact Investors: What a Farmer Needs to Know by Kevin Egolf.....	Page 8
<b>COMMUNITY &amp; WORLD</b>	
In Search of a Peasant Culture in Upstate New York by Johann Strube.....	Page 18
<b>EXTENSION NEWS</b>	
Agriculture Career Day Exposes Teens to Diverse Fields by R.J. Anderson.....	Page 9
Extension Helps North Country Grow Grapes, Wine Community by R.J. Anderson.....	Page 5
<b>FARM SAFETY</b>	
Chainsaw Safety, An Absolute Necessity by Rich Taber.....	Page 7
<b>FOREST, FIELD &amp; WOODLOT</b>	
Working With Little Reverse Osmosis Units for Syrup Production by Stephen Childs.....	Page 10
<b>LIVESTOCK AND POULTRY</b>	
List of Items for a Beginning Sheep Farmer, Part Two by Ulf Kintzel.....	Page 14
<b>LOCAL FODDS &amp; MARKETS</b>	
Do Your Products Meet Your Customer Values? by Brian Moyer.....	Page 15
<b>RESOURCE SPOTLIGHT</b>	
John May Farm Safety Fund Eligibility Requirements Expanded to Help More Farmers by NYCAMH.....	Page 17
Minority Landowner Magazine.....	Page 16
<b>SOIL HEALTH</b>	
A Farmer’s Perspective - Long Term Soil Health and Fertility in a High Tunnel by Andy Fellenz.....	Page 19
Building Healthy Pasture Soils by Lee Rinehart.....	Page 12
<b>STEWARDSHIP &amp; NATURE</b>	
The Alfalfa Honeybees: An Observation by Debra Welch.....	Page 17
SPDES and On-Farm Construction by Doug Kierst & Judy Wright.....	Page 16
Stay the Course: Six Generations of Stewardship on the Corse Family Farm by Amy Overstreet.....	Page 6
<b>VETERANS IN AG</b>	
Farm Ops Veterans are Armed to Farm Kay McCarthy.....	Page 2
Cover photo by Elizabeth Weller	

# 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.

Small Farm Quarterly is produced by Lee Publications, Inc., and is distributed four times a year as a special section of *Country Folks*. Publication dates: January 9th, April 3rd, July 3rd and October 2nd, 2017.

**EDITORS & CONTRIBUTORS:**

• Steve Gabriel, Cornell Small Farms Program	Managing Editor	sfg53@cornell.edu
• Anu Rangarajan, Cornell Small Farms Program	Editor-in-Chief	ar47@cornell.edu
• Tara Hammonds, Cornell Small Farms Program	Student Intern	tkh25@cornell.edu
• Ryan Maher, Cornell Small Farms Program	Vegetables	ryan.maher@cornell.edu
• Rich Taber, CCE Chenango County	Farm Tech/Farm Woodlot	rbt44@cornell.edu
• Ulf Kintzel, White Clover Sheep Farm	Sheep	ulf@whitecloversheepfarm.com
• Petra Page-Mann, Fruition Seeds	Seed Stories	petra@fruitionseeds.com
• John Thurgood, USDA Natural Resources	Stewardship and Nature	john.thurgood@vt.usda.gov
• Jason Foscolo, The Food Law Firm	Farm Law	info@foodlawfirm.com
• Reuben Dourte, Ruhl Insurance	Farm Insurance	ruhlinsurance@gmail.com
• Elizabeth Henderson	Labor	elizabethhenderson13@gmail.com
• R.J. Anderson	Extension Communications	rj.anderson@cornell.edu

**FOR SUBSCRIPTION INFORMATION CONTACT**  
Tracy Johnson, Lee Publications, Inc., PO Box 121, Palatine Bridge, NY 13428  
888-596-5329, ext. 146 • subscriptions@leepub.com

**FOR ADVERTISING INFORMATION CONTACT:**  
Tina Krieger, Lee Publications, Inc., 518-673-0108 or 800-218-5586, ext. 108  
or tkrieger@leepub.com

**SEND YOUR LETTERS AND STORIES TO:**  
Cornell Small Farms Program  
15A Plant Science Building, Cornell University, Ithaca, NY, 14853  
607-255-2142 • sfg53@cornell.edu





Small Farm Quarterly is compiled by the Cornell Small Farms Program, based at Cornell University in Ithaca, NY. The Cornell Small Farms Program fosters the sustainability of diverse, thriving small farms that contribute to food security, healthy rural communities, and the environment. We do this by encouraging small farms-focused research and extension programs.

Anyone is welcome to submit articles for consideration. See our guidelines at [smallfarms.cornell.edu/quarterly/writers/](http://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.

About copyright: The material published in *Small Farm Quarterly* is not copyrighted unless otherwise noted. However, we ask that you please be sure to credit both the author and *Small Farm Quarterly*

**SUPPORTING ORGANIZATIONS:**

 <p>Cornell Small Farms Program <a href="http://www.smallfarms.cornell.edu">www.smallfarms.cornell.edu</a> 607-255-9227</p>	 <p>Cornell University Cooperative Extension</p>
 <p>United States Department of Agriculture Natural Resources Conservation Service <a href="http://www.nrcs.usda.gov">www.nrcs.usda.gov</a> 802-865-7895</p>	 <p>Vermont Sustainable Jobs Fund <a href="http://www.vsjf.org/">http://www.vsjf.org/</a> 802-318-5527</p>

**ABOUT OUR ADS...**

All advertisements in Small Farm Quarterly are managed by Lee Publications. Cornell's Small Farms Program, Cornell Cooperative Extension, and other Small Farm Quarterly sponsors and contributors do not endorse advertisers, their products or services. We receive no revenues from advertisers.

To find out how your business or organization can advertise in Small Farm Quarterly, contact: Tina Krieger, Lee Publications, 518-673-0108 or 800-218-5586, ext. 108, [tkrieger@leepub.com](mailto:tkrieger@leepub.com)



**EXTENSION NEWS****Extension Helps North Country Grow Grapes, Wine Community**

by RJ Anderson

Growing grapes in northeastern New York and Vermont requires a hardy vine and a committed hand. Offering wineries a helping hand with the agriculture, viticulture and commercial challenges of growing grapes in a rugged climate are researchers and extension educators from Cornell and the University of Vermont.

The green and red partnership was on display at the 2017 Northeastern New York and Vermont Grape School, held March 9 in Lake George, NY. Co-hosted by Cornell Cooperative Extension's (CCE) Eastern NY Commercial Horticulture (ENYCH) program and the University of Vermont Grape Program, the one-day workshop brought together 47 current and potential vineyard and winery owners from the region.

"Cornell's role is an important one in this region because the cold climate grape and wine industry in the North Country of New York and Vermont is very young," said Anna

Wallis, grape and tree fruit specialist with ENYCH who also oversees planting of cold-hardy grape varieties at Cornell's Willsboro Research Farm. "And it is undergoing significant growth in terms of the number of producers, acreage planted, employment, and development of growers' expertise.

"The community aspect is also still a work in progress," she continued. "We're working to develop relationships between all the industry players."

Lindsay Campagna, a winery owner in New York's Champlain Valley, appreciated the opportunity to connect with experts and peers as well as the broad variety of topics covered. "We look forward to networking with individuals who 'have been there and done that' to get some firsthand knowledge of specific hurdles we are facing," she said. "The vineyards in the Champlain Valley recognize that we need to work together to grow our industry and increase tourism. Since the Champlain Valley hasn't been formally seen as a wine region, we are the pio-



**Vineyard and winery owners from Northeastern New York and Vermont trained their noses to identify wine traits and faults that affect product quality.**

neers in this voyage and have to work especially hard to brand our wines."

traits consumers find favorable and flaws that rate as unfavorable.

Supplying expertise at the Grape School were CCE business management, fruit and viticulture specialists, along with a UVM fruit specialist, and officials from the New York Grape and Wine Association.

Many of the presenters are members of the Northern Grapes Project, a multistate team providing viticulture, enology, and marketing guidance to rural vineyards and wineries in the northeast and upper midwest. Plants developed through the Northern Grape Project inhabit many of the North Country vineyards and can withstand temperatures as low as minus 30 Fahrenheit.

Tim Martinson, Cornell viticulture specialist and senior extension associate, is the team's project director. Specializing in crop-load management and training systems in commercial vineyards in northern New York, Martinson's Grape School presentation updated attendees on weed and floor management best practices.

Highlighting the event was an afternoon program on using olfactory receptors to identify wine faults presented by Anna Katharine Mansfield, Cornell associate professor of enology, and extension associate Chris Gerling. Both are members of the Northern Grape Project and under their tutelage attendees used their noses to identify wine

"Based on the post-event feedback, attendees appreciated learning about elements that affect wine quality," said Lindsey Pashow, agriculture business development and marketing specialist with CCE's Harvest New York regional agriculture team. "In order for the cold-climate wine industry to have an economic impact, gain recognition and expand, our wineries need to continually strive to improve wine quality – just like our counterparts in more established regions such as the Finger Lakes and Long Island have done."

Campagna said the Grape School epitomizes CCE's commitment to that growth – both regionally and with her operation. "Extension has been such a huge help in getting us where we are today and they are always our first call when we encounter a problem or have questions," she said. "Anna and Lindsey have been great at guiding us through things or steering us in the right direction on who to ask. I think the North Country is truly an exciting place right now, just being recognized as a wine region, and I'm excited about seeing our region grow in the coming years."

*R.J. Anderson is a writer/communications specialist with Cornell Cooperative Extension.*



**Lindsey Pashow, agriculture business development and marketing specialist for Cornell Cooperative Extension, pours wine for attendees at the 2017 Northeastern New York and Vermont Grape School.**



**LAKEVIEW  
ORGANIC  
GRAIN**

**Box 361, 119 Hamilton Pl  
Penn Yan, NY 14527  
315-531-1038**

**Certified Organic Feed, Seed & Livestock Products**  
✧ From Northeast organic farmers ✧  
✧ for Northeast organic farmers ✧

[www.lakevieworganicgrain.com](http://www.lakevieworganicgrain.com)



**CIDER  
MILLER**  
GRAINERY STUDIOS

The new **CIDER MILLER** is a 1/2 HP electric powered apple grinder for cider making. This unique stainless steel machine also converts to mill malted grains for brewing and distilling.

- Made in New York
- Power & capacity for both the avid home brewer/cider maker or small commercial operations
- Includes 14 gallon storage barrel that doubles as a fermentation tank

**cidermiller.com**  
**315-525-7299**



**STEWARDSHIP & NATURE****Stay the Course: Six Generations of Stewardship on the Corse Family Farm**

by Amy Overstreet

Over the years, the Corse family developed a strong working relationship with the USDA-Natural Resources Conservation Service (NRCS) and implemented soil and water conservation practices to ensure a healthy and sustainable future for their dairy operation and herd of 60 grass-fed dairy cows. In a part of the state not considered ideal for farming, they continue to defy the odds. Instead of working against the land, they work with it to mimic nature's rhythmic cycles. Neither bedrock, nor wet, heavy soils deter them from their goal to farm sustainably. The Corse family formula for success includes fierce determination, commitment to conservation, and a deep and loyal pledge to stay true to family heritage and tradition.

**Carrying the Torch**

Abbie Corse grew up on her family's dairy farm in Whitingham, Vermont, with her parents Leon and Linda and two brothers, Henry and Caleb. The 34-year-old earned a degree in journalism at St. Michael's in Burlington, Vermont, and went on to pursue a career in the arts. Had you asked Abbie upon college graduation if she would ever consider returning to the family farm, her answer would have been an emphatic, "no."

It was a barn fire in 2007 at the Corse farm that marked her turning point. In a critical moment, the question became, "Should we continue and rebuild, or sell the family farm?" Leon and Linda had to consider all the options and then pose the reality to their children. "If there is any thought in your mind that you might want to be here someday, we need to know, even if it isn't going to be for 10 years."

At that point they were two years into their transition to organic. If they continued, the cows would need to be moved to a local farm and milked 18 miles away in order to complete the transition. It was a logistical nightmare, but one Leon and Linda felt worth doing if there was a chance one of their children might eventually wish to continue their farming tradition. The switch to organic was incredibly important to Abbie, and she couldn't imagine a world where the family farm didn't exist. So, she told her parents, "Yes. At some point, I do want to come back." It was a revelation that surprised everyone, especially Abbie.

**Stewardship Is In Their Blood**

The one person it didn't surprise was Abbie's then-boyfriend and now-husband, Dave. A year or so later, in spite of making the decision to relocate back to their hometown and living a few miles across town from the farm, Abbie still hadn't made the jump to go back to farming. It was Dave who reminded her that the happiest he'd seen her was the summer they had met again, while she was filling in for her brother. Worried about finances and insurance, and other practical



**Seven generations of the Corse family—from left to right, Linda, Leon Abbie, Niko, and Eli.**

life concerns, Abbie couldn't figure out how it was going to work to come back, but Dave assured her that they would figure it out. If this was where she was going to be happy, they would make it work.

Now, Abbie works alongside her parents, while raising their two sons, six-year-old Eli and three-year-old Niko. "You don't realize, when you're growing up here, how entwined you become in the rhythms of the seasons and the pull of the land," says Abbie. "But once I had been away for long enough I came to realize that it was integral to my wellbeing and something I didn't know how to be without."

The Corse family first purchased this land in 1868, and Abbie is the sixth generation to carry on the family's steadfast commitment to conservation. To this tune and that of wishing her father's knowledge to be passed along to more than just her, she encouraged her parents to consider a mentoring program for beginning farmers. After a few years of thought and reviewing options, Leon decided that the best way to accomplish this was through the Dairy Grazing Apprenticeship Program (an independent non-profit organization and a National Apprenticeship under the U.S. Department of Labor-Employment and Training Administration). Leon became a Grazing Master and was the first to sign on as a Master in Vermont. This spring they welcomed the first Dairy Apprentice to be placed on a farm in Vermont. The beauty of this program is that it encourages pasture-based grazing practices as the most affordable and realistic option for beginning farmers interested in a sustainable way forward.

USDA-NRCS Soil Conservationist Sylvia Harris worked with the family recently and says Leon truly embraces conservation. "He has adopted practices like rotational grazing and grass-based farming because he is, at heart, a grass farmer, and understands the importance of keeping his pastures healthy so his animals will thrive." With a degree in plant and soil science, Leon says that it took him 10 years to realize he needed to farm the way this farm needed to be farmed. "You have to work in concert with the natural resources. If you work with Mother Nature, and not against it, life is much easier," he says.

Leon's wife Linda is also very active on the farm and serves as the young stock manager and bookkeeper, and is the afternoon milker three or four times a week. She is an active conservation leader, serves as Chair of the Windham County Natural Resources Conservation District, and treasurer of the Vermont Association of Conservation Districts. She was also the first female to serve on Windham County's Farm Service Agency committee. But Linda had no farming expe-

rience prior to meeting Leon. They met thanks to Linda's sister, who knew Leon through a square dancing club. When Leon heard that Linda was studying accounting in college, he remarked, "A farmer can always use a bookkeeper for a wife." She says that soon after that, Leon called her for a date and seven months later, in 1980, they wed. "My only experience with a farm before I met Leon was when a friend in school let me learn by touch about electric fences!"

**Going Organic and Staying Committed to Conservation**

The family hasn't plowed in 30 years. As a result, they have seen a marked improvement in soil health and forage quality. They also eliminated the use of nitrogen fertilizer and have seen clover make a comeback. "On paper, this isn't a viable farm," Leon explains. The soil maps indicate that the soil is very wet and acidic, with lots of dense material and poor drainage. Harris says that there are many obstacles to farming with this type of soil, but that the family has worked hard to overcome those by building organic matter through intensive grazing management. In addition, a very short growing season and high winds add to the challenges.

They manage around 90 acres of permanent pasture for sixty cows and now ship their milk through CROPP Cooperative/Organic Valley. Vermont NRCS Grazing Specialist Kevin Kaija worked with the family to implement practices through the Environmental Quality Incentives Program (EQIP). One of these practices was animal trails and walkways. "Leon told me he had a problem with animal trails and I shuddered," says Kaija. "But then he explained that the problem was when he got one, he wanted another." These walkways provide improved access to forage, water, and shelter, ameliorate grazing efficiency, and help prevent erosion.

Other practices implemented through EQIP include fencing to keep cows out of waterways, nutrient management, pasture planting, pipeline, watering facilities, and a prescribed grazing plan. They also installed a solar powered water pump system to get water to the pastures. Abbie says that the prescribed grazing system and associated practices is a huge benefit: "it is so much easier, systematically." Their conservation plan is ensuring that nearby waterbodies, including wetlands, are protected and that their improved soil and forage quality are paying dividends through a healthy herd. "Cold, wet, glacial soils are rebellious when placed in an artificial agronomic setting," said Kaija. "The more artificial one gets, or the more equipment and disturbance, the less profit in the long run."

**The Rewards - and Challenges - of Farming with Family**

Abbie never envisioned she would be the one to carry on the family tradition. She admits that the transition has presented some tricky moments: "I'm taking over Dad's role on the farm, but he's in a partnership with mom, who is our primary caregiver when we were young (and still is, she jokes), so we had to come to a place where we all understood that I couldn't be him and mom and raise my family at the same time," she explains. Her husband Dave owns and operates his own business off the farm. "When you farm with your partner, there's a shuffling that can happen," says Abbie. "My situation doesn't allow for that." She says it was particularly challenging when the kids were very young. "We had to figure out ways that I could be involved on the farm, but still be the primary caregiver for my kids."

Abbie admits that the challenges can sometimes be overwhelming as she balances the role of mother and farmer. But she is eternally grateful to the sacrifices her parents have made (and continue making) that enable her to be part of the farming operation. "Realistically, I need to find another me!" she jokes. "But we are figuring it out as we go."

The shift from a family unit to a working entity was, at times, awkward. "We were raised with an open and honest atmosphere where we didn't always agree, and that was okay,"



**Leon Corse holds an old photo of his ancestors who first purchased the farm in 1868.**



## Chainsaw Safety, an Absolute Necessity

by Rich Taber

Most farmers and rural landowners own chainsaws for a variety of purposes, the majority of which involve the cutting of trees and firewood. Chainsaws, in the hands of the untrained or those who do not follow common safety rules, are in danger of causing serious injury or death to themselves. This year alone, I have seen chainsaws used in reckless, hazardous manners on a number of "homesteading" oriented television shows. I cringe when I see chainsaws operated by people with no personal protective equipment at all, who are using the chainsaws recklessly. These shows are a disservice to those watching, who may then seek to emulate the heroes they see on television by adopting unsafe, dangerous practices. If you are an employer, and have employees using chainsaws for any reason, it is incumbent upon you to provide the correct safety equipment and training for your employees.

The chainsaw is one of the most efficient and productive portable power tools in use today. It can also be one of the most dangerous. If you learn to operate it properly and maintain the saw in good working order, you can avoid injury in addition to achieving higher productivity.

I speak from experience; in the early 1980's I was cutting firewood in my farmyard when I was involved in a serious kickback injury with the bar of the chainsaw ripping through the left side of my face and left upper shoulder. After healing from this ordeal I knew enough to purchase a chainsaw that has kickback protection built into the saw.



"Game of Logging's Bill Lindloff" shows participants at a workshop proper tree felling techniques.

No better source of information can be found than the U.S. Department of Labor's OSHA (Occupational Safety and Health Administration) "Working Safely with Chainsaws" fact sheet, available at [https://www.osha.gov/OshDoc/data\\_Hurricane\\_Facts/chainsaws.pdf](https://www.osha.gov/OshDoc/data_Hurricane_Facts/chainsaws.pdf).

I will paraphrase and summarize much of this information here, in the interest of brevity.

More information than can be included in this article will follow in the future on pre-operational chainsaw maintenance

checks, what to do while running the chainsaw, and training requirements for employers.

### Personal Protective Equipment Requirements:

- Personal protective equipment (PPE) for the head, ears, eyes, face, hands, and legs are designed to prevent or lessen the severity of injuries for workers using chainsaws.
- PPE must be inspected prior to use on each work shift to ensure it is in serviceable condition
- The following PPE MUST be used when using chainsaws:
  - Head protection
  - Hearing protection
  - Eye face protection
  - Leg protection
  - Foot protection
  - Hand protection

An excellent training vehicle available to loggers, farmers, homeowners, and anyone regularly using chainsaws is available from "The Game of Logging", a program which has its roots in Sweden and which has been regularly used here in the United States. Different levels of training are available, and are often cost-shared by the NY State Center for Agriculture Medicine and Health in Cooperstown. Information on the Game of Logging and the New York Logger Training program can be found at: <http://www.newyorkloggertraining.org/>.

Rich Taber, M.S., M.S.F., is Grazing, Forestry, and Ag Economic Development Specialist with CCE Chenango. He lives on a farm in Madison County with his wife Wendy where they enjoy a variety of amenities from their 100-acre woodlot. 607-334-5841 ext. 21 or email: [rbt44@cornell.edu](mailto:rbt44@cornell.edu).

### Stay from page 6

says Abbie. And Linda says that she took an important role of counselor and moderator between Leon and Abbie. "I spent many hours talking to them both when we started this venture," she says. Linda says that both she and Leon had to realize and appreciate that Abbie is raising kids in a totally different world than the one in which they raised kids. "We had to adjust our perspective. Things are different today, and we are learning that." This attitude marks exactly how this family is able to manage their process. And according to both Leon and Abbie, Linda is the backbone and keeps them both going. "Without her, we would both be lost," says Abbie of her mom.

Linda says having Abbie work with them keeps the heart and soul in their farm, and it's obvious that her parents are proud of her. "My hopes and wishes for her as she takes on this role are that her love of this farm, her strong beliefs in organic living, and her even stronger belief in the value of family and our roots here, will sustain her through the challenges she faces," says Linda. "The road she has chosen is not an easy one. She is juggling being primary caregiver to her sons, strong partner and wife to her self-employed husband, on-site support to parents who aren't as young as they used to be and who want to keep farming, and a strong advocate

for organic farming when she has time to spare."

### Forever Protected

In 2013, the family worked to secure a permanent conservation easement through the Vermont Land Trust. The Vermont Housing and Conservation Board, with matching funds from NRCS, funded the easement purchase. Today, the Corse family is caring for the land with the next generation in mind. Abbie says that she and her husband feel lucky to be raising their sons on the farm where she gained her appreciation for nature. "People are isolated today," she says. "I grew up near all my grandparents, with the passing down of stories, and a real sense of family." She says that growing up on a farm really shaped the way she sees the world. When Abbie was young, her father was interviewed by a reporter who asked if his sons would farm after him. To that he replied, "I have a daughter too, and my bet's on her." Little did he know that this remark would become reality.

### The Future Is Bright

Abbie emphasizes the fact that her parents never pressured her or her brothers to take on farming as a career. She said they got "the talk" at age 15. That talk reassured them that their parents would support their chosen career paths, even if it was away from the farm. But Abbie realizes now that farming is in her blood. "I didn't know how to think about life without this farm." She says it's very interesting to watch her boys grow up on the farm, with Eli taking a real interest in



Three-year-old Niko (foreground) and six-year-old Eli are the seventh generation of the Corse family to care for the land in Whitingham, Vermont.

the animals and "loving to be in the middle of it," while Niko is a little less enthusiastic. But as important as she feels it is for them to grow up here and have this as a base, there will be no expectation that they should come back.

"Dave and I firmly believe that they need to be afforded the same respect in that regard that I had; to be encouraged to go and explore the world and decide with full understanding if this is the place for them." Though overall she is overwhelmed by the reality of what lies ahead as the farm transitions to her stewardship, she is excited to think about the possibilities. She is fascinated by the idea of keeping bees in tandem with cows. And, she says she would love write a book to share the story of her family and their relationship to this land. For now, their story is still being written as the family stays the course on their path of stewardship.

Amy Overstreet has been writing about stewardship for the USDA Natural Resources Conservation Service since 1994. A native of South Carolina, she is learning to enjoy the climate of the Northeast and enjoys living in Vermont with her husband and two dogs. She can be reached at [amy.overstreet@vt.usda.gov](mailto:amy.overstreet@vt.usda.gov).



**williams Fence Supplies LLC**  
2033 Brothertown Road • Deansboro, NY 13328  
315.841.4910

2033 Brothertown Road  
Deansboro, NY 13328  
Phone: (315) 841-4910  
Fax: (314) 841-4649  
Summer Hrs:  
Mon-Fri 8am-4pm  
Sat. 8am-12pm  
[www.williamsfarmfence.com](http://www.williamsfarmfence.com)  
[williamsfence@gmail.com](mailto:williamsfence@gmail.com)

~ Available Now ~  
reels ~ poliwire ~ step in posts etc. ~ hi tensile ~ wire mesh  
gates ~ split rail fencing ~ hay feeders ~ posts of all sizes  
tools ~ cattle handling equipment ~ water tubs & valves  
mineral feeders



## STAND 'N PLANT

### SEEDER

Use for...

- Seeds
- Onions
- Garlic

Easily plant hundreds of seeds or plants per hour into plastic covered or bare ground seed beds.

### PLANTER

Use for...

- Transplants
- Potatoes
- Bulbs

## Stand 'N Plant

95 Rose Road, Saltsburg, PA 15681  
Phone: 724-639-3965 or visit: [www.standnplant.com](http://www.standnplant.com)



**BUSINESS MANAGEMENT****The Basics of Impact Investors: What a Farmer Needs to Know***A primer for working with an impact investor focused on farmland access.*

by Kevin Egolf

Small farmers and small farm advocates have probably heard statistics about average farmer age (nearly 60 years according to the USDA) and young farmer land access issues (68% of farmers cite land access as the biggest obstacle for young and beginning farmers according to the National Younger Farmers Coalition). In response to these problems you may have also seen a rise in the number of “impact investors” focused on helping farmers with land access.

The goal of this article is to provide a basic background on these investors and prepare farmers for interactions with these groups. Please be aware that the services or products offered by these investor groups may not be helpful or the best option for many farmers. Contrastingly, it may also be the perfect situation for another farmer. I view understanding these options as having another arrow in the quiver (or seed in the ground) to be used if needed, and when appropriate.

Full disclosure: I manage one of these entities, called Local Farms Fund, a community investment fund that pools individual investors together to provide lease-to-own arrangements to early stage farmers in the NY Foodshed. In this article, I am speaking from my personal experience in this field. In this context, I am also trying to represent the impact investor universe as whole, but cannot speak specifically on behalf of the other people or organizations providing similar land access opportunities.

Let's start with a basic primer. What is “impact investing?” According to a simple Google search, impact investing refers to investments made into companies, organizations, and funds with the intention to generate a measurable, beneficial social or environmental impact alongside a financial return. I would add that impact investing generally also means investing in private entities that have a targeted positive social or environmental impact. This difference is exemplified by a hypothetical, publically traded solar panel company. That solar company's output may have a measurable environmental impact, but it is not necessarily formed or operated for the purpose of reducing greenhouse gases. Intention takes impact a step beyond the positive outcomes. I also think it is important to note the word “investing” is in the title and “financial return” is in the definition. Impact investing is very different from philanthropy. Folks working with an impact investor should fully understand impact investing is not charity. Investors are expecting to receive money back and make money from the investment. This return may not always be significant, but the intention is to make money while creating the positive impacts.

Another common term you will hear is “Due Diligence.” According to the Merriam family and Mr. Webster, due diligence is research and analysis of a company or organization done in preparation for a business transaction. Due diligence is really a fancy word for research.

A final primer item to note is that impact in-



Featherbed Farm (Saratoga County, NY), Local Farms Fund's first investment.  
Photos provided by Local Farms Fund

vestors can take all sorts of shapes and sizes. Impact investors may include an individual, multiple individuals, a family, multiple families, angel investors, an angel network, a fund, a company, a non-profit, the government, or any other legal formation / identity under the sun. Unfortunately, we do not have time to go into the specific details on each type of structure, but, as will be noted later, knowing who or what you are dealing with is extremely important.

In trying to summarize how to work with impact investors, I boiled my thoughts down to five basic guidelines: know yourself, create a business plan, review your options, assess the fit, and reverse the due diligence.

**Know Yourself.**

If you cannot articulate what you want, another person is not going to be able help. Any farmer should assess his or her own personal goals as well as his or her own per-

sonal situation. Understanding “Where am I now?” and “Where do I want to be?” is a critical first step. Going down this path will quickly lead into a personal plan to get from A to B. Throughout this process, it is important to be thinking about optimal versus acceptable and desires versus needs. When reviewing farmland access options, it is unlikely that an optimal situation will arise. Maybe a farmer wants a business focused 50/50 on vegetable production and pastured meat production. What if the farm is better suited for a 30/70 split? Is that still acceptable? This thought process and evaluation should expand one's horizons and ultimately help lead to a satisfactory outcome.

The first step in working with an impact investor is generally going to be verbally articulating your plans. This is how I initially differentiate between Local Farms Fund farmer candidates. I can usually tell from the first conversation whether there is potential

with a farmer. Knowing yourself will make you prepared for this first conversation.

**Create a Business Plan.**

I cannot stress this enough. Farming is an occupation, and a farm is a business. It is unlikely that impact investors will be interested in working with a person that does not take that perspective. A business plan should demonstrate the qualities of the business you want to run, you as a person and the financial merits of the operation. Even if you do not know exactly what the farm will look like, creating a business plan will assist the process of “knowing yourself.” Creating a business plan forces the writer to think about oneself as both a person and an entrepreneur. I also note it is much easier to alter a business plan than it is to create one from scratch. If you have a plan modeled on an enterprise that is producing vegetables on 2 acres and raising 300 layer hens it should be fairly quick to expand that to production on 4 acres and 600 hens. Having the plan established ahead of time will allow you to be better informed and react quicker to unplanned opportunities that may arise. I can almost guarantee an impact investor will ask for your business plan. If they do not ask for a business plan, I would actually be a little suspect of their motives. Being ready ahead of time will help you pass this essential due diligence hurdle—business review. About 50% of the due diligence process with Local Farms Fund focuses on understanding the business plan and assessing the farmer's understanding of his or her plan.

**Review Your Options.**

Ultimately the right path for any farmer is going to be driven by both the personal situation and business goals. Generally this takes one of two options—buy or lease—although frequently with impact investors these options are interconnected via a purchase option or lease-to-own arrangement. Every option has both positive and negative factors and, unfortunately, some of the decision process may be dictated by one's financial situation. Knowing your numbers will make this process easier since it will help you understand whether your goals are financially feasible. This concept also pertains to seeking and asking about alternative options. Do not assume that you cannot own a farm right away or that leasing is the best option, unless you have actually reviewed what is available. This means talking to all the different investment groups. Each investment group is going to have small (and sometimes significant) variations in how it operates. In certain situations, I know that Local Farms Fund will not be the right fit for a given farmer even if I would be interested in working with the farmer

**Assess the Fit.**

As noted earlier, every party will have different goals, processes and structures. Understanding these variances can be the difference between a successful, happy relationship and an unsuccessful, unhappy relationship. What is the process of working with a land access partner (steps, timing, costs)? What is the philosophy or motivation of the impact investing entity? Where is the money



Chad Williams talking about his pastures at HoneyMade Farm (Columbia County, NY), Local Farms Fund's second investment.



**EXTENSION NEWS****Agriculture Career Day Exposes Teens to Diverse Fields**

**Finger Lakes Workforce Investment Board, Cornell University College of Agriculture and Life Sciences, and Cornell Cooperative Extension team up to host 2017 Building the Agricultural Intellect of the Finger Lakes Youth Career Day.**

by R.J. Anderson

From dairy robotics and precision farming technology to the chemistry of wine making and integrated pest management, jobs in agriculture dot a diverse and varied career map in the Finger Lakes. Helping area high school students navigate ag-related vocational opportunities was goal of the 2017 Building the Agricultural Intellect of the Finger Lakes Youth Career Day on April 26.

A collaboration among the Finger Lakes Workforce Investment Board, Cornell's College of Agriculture and Life Sciences (CALS), and Cornell Cooperative Extension (CCE) of Ontario, Wayne, Seneca and Yates Counties, the second annual event brought together 220 high school students from 17 school districts in the Finger Lakes area.

Featuring field trips to the New York State Agricultural Experiment Station in Geneva, New York; the Finger Lakes Community College (FLCC) Viticulture Center; and Hemdale Farms, a high-tech dairy with a robotic milking parlor and high-volume vegetable growing operation, the event paired ag-minded high school students with experts from Cornell, FLCC, SUNY Cobleskill, and professionals from the private sector. Each location included additional exhibitors, such as Fowler Farms, SUNY Cobleskill, CCE, Finger Lakes Technical and Career Center, Farm Credit East, Keseca Veterinary Clinic, and Lakeland Equipment.

Marie Anselm, a CCE agriculture economic development specialist based in Ontario County, guided a group of animal science students enrolled in the Finger Lakes Technical and Career Center animal science program. "Both years I've participated in this event I think the students and the participating guidance counselors have walked away surprised by how many career options there are in agriculture, particularly those that involve STEM fields," she said. "Even if students have an interest in agriculture, they may not be aware of many career options are available to them. Exposing young people to these careers, whether they be on farms, in research and technology or in sales, gives them a better understanding of the overall industry and the opportunities that exist."



High school students enrolled in the Finger Lakes Technical and Career Center animal science program participate in a workshop hosted by Keseca Veterinary Clinic at Hemdale Farms in Seneca Castle, New York.



© R.J. Anderson/www.CCE.Cornell.edu

As presenter at the 2017 Building the Agricultural Intellect of the Finger Lakes Youth Career Day, Larry Smart, CALS associate professor of plant breeding and genetics, showed high school students some of the tools he uses in his research at the New York State Agricultural Experiment Station in Geneva, New York.

Amanda Lesterhuis, Youth Systems Coordinator for the Finger Lakes Workforce Investment Board, who also led a tour group, agreed. "When community members, including high school students, think about the ag industry, they most likely just picture farmers driving tractors in fields, and while those are all very important roles, there are so many career opportunities available in this region that require a broad range of skills and education. Exposing students to these careers early on will hopefully entice them to remain in this area after high school and college and help eliminate skills gaps that exist in this industry on a local level."

At each stop, attendees listened intently to multiple presentations that included hands-on demonstrations highlighting real-world applications of technology in agriculture. At the conclusion of each session, students peppered presenters with pointed questions about why they chose their particular career path and how they got started.

"For me, that was the best part," said Anselm. "Seeing how engaged the students were at each stop was very satisfying. The presenters were blown away by the students' interest and how great the questions were."

For Lesterhuis, the biggest – and most unexpected – takeaway was the evolving conversation between chaperones. "The guidance counselors and school-to-career counselors I spoke with were impressed [by] how much technology and science are involved in agriculture," she said. "They also talked about how they will adjust their recruiting tactics next year to entice more students who want to pursue science or engineering degrees, but may not know they can use those degrees in various agriculture fields."

While organizers admit that putting together an event that excites a couple hundred teenagers from four counties while busing them to three locations is no easy task, they recognize it was their collaborative approach that made the event such a fluid and lasting experience. "The partnership between the Finger Lakes Workforce Investment Board, CCE, CALS, FLCC, and Hemdale Farms was vital to the day's success," said Anselm. "This event really strives to represent many sectors of agriculture, and that wouldn't be possible without our partnership. We've really been fortunate to have so much community support come together to make it happen."

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

**Basics from page 8**

coming from? Could the source of funding impact the relationship? Does the model offered fit your plans? Can it be altered?

Note that farmland access may not always equal affordability. Understanding this trade-off may be helpful in your decision process. Does the group provide other services? If you require or desire other services it will be important to know from where those are going to come. Ultimately a large part of figuring out if the partner is good is going to be one's gut reaction. Do you get the "right feeling" from this potential partner?

**Reverse the Due Diligence.**

I can almost say with 100% certainty that any impact investor is going ask a lot questions. They are doing due diligence on their potential investment. Any farmer going through this process has the right to ask as many questions in return as he or she deems appropriate. This is the main way you are going to be able to properly and fully assess the fit of a potential partner. I note that this section could also be titled "Ask Questions," as more broadly a farmer should realize that nearly everything is negotiable in some way shape or form. Ask if they can change the deal to make it work better for you. After all if they truly are an impact investor, their goal should be to make

something work for you within a reasonable set of boundaries.

When I get these kinds of questions on Local Farms Fund, it actually creates more reassurance that this is the right farmer. I know that farmers asking the tough questions are thinking about all the options and carefully reviewing the situation. I want to partner with somebody focusing on all the details.

I completely realize this adds additional complexity into an already complex, risky and time-consuming process. The good news is much of the work needed for working with impact investors is part of being a good business manager. I generally find that the farmers that can answer all my questions well, and in a timely manner, are the ones that I think have the best chance for success, with or without an impact investment group providing land access.

Kevin Egolf is an impact investing professional focusing his efforts on socially responsible farmland investing. He can be reached at [LFF@localfarmsfund.com](mailto:LFF@localfarmsfund.com).

For more information about Kevin Egolf or Local Farms Fund, please visit [www.localfarmsfund.com](http://www.localfarmsfund.com)

**Local Farms Fund**

Local Farms Fund is a community impact farmland investment fund that supports young and early-stage farmers in the NY Foodshed with secure land access. The Fund provides sustainable farmers with lease-to-own arrangements on farm properties in the states connected to the NYC metropolitan area, the NY Foodshed—with a focus on the Hudson Valley. This model, using Slow Money principles, delivers positive social (farm business & community development) and environmental (sustainable agriculture) impacts while generating modest financial returns for the investors. Local Farms Fund is open to all investors in the NYC tri-state area (NY, NJ, CT) looking to have a positive impact on the local farming community and beginning farmers, while also achieving a modest investment return.



**FOREST, FIELD & WOODLOT****Working with Little Reverse Osmosis Units for Syrup Production**

by Stephen Childs

One of the biggest drawbacks of making maple syrup for a back yarder or small maple producer is the time it takes to boil the sap into syrup. The idea of using a small reverse osmosis unit to assist with the syrup making is very interesting to many small maple producers. There are many little reverse osmosis systems available for water purification in households or for small commercial applications. These can be purchased from a number of big box stores, home improvement stores, or online. These RO units can be used to remove water from sap to speed up the concentration and syrup boiling process. To make a small RO unit work you must first get the sap under pressure using a pump, typically a shallow well pump.

About 9 years ago, I started experimenting with small reverse osmosis units to try and cut down on the amount of boiling time needed to make my family maple syrup. I started with a GE Merlin that was rated to deliver 30 gallons of pure water per hour when operated at about 60 psi. That rating is for when purifying permeate from water. When you are removing water from maple sap the permeate removal rate is reduced by 6x or I was removing between 4.5 and 5 gallons per hour. This was still a huge benefit for reducing the time of boiling my 25 taps on my 2' x 4' wood fired flat pan from about 8 hours per run to 4 hours. It would sweeten the sap from about 2% up to between 4 and 5%. The investment was about \$360 for the RO unit and I already had a shallow well pump that I used to pressurize the sap to about 55 psi and had to purchase a pre-filter canister. Though this system reduced my wood use by about 50%, the primary benefit was the reduction in boiling time with no identifiable change in the taste or quality of maple syrup.



**Small table top RO with stainless filter casings. This one should last a long time.**

ally added more taps so after using the Merlin for four years, it was time to go bigger. I had a larger RO unit come available that had a higher pressure option using a small Procon pump on a half horse power electric motor and one 2.5" by 21" membrane. To this unit I added two more 2.5 by 21" membranes to boost the capacity to handle my now 70 taps. This unit operated at 250 psi, would remove about 15 gallons of permeate per hour, and could bring the sap up to 12% sugar if given enough time. So boiling for 70 taps was still taking about 4 hours of boiling time per run only with much greater yield. I continued to use the shallow well pump to feed this unit. As the sap became sweeter, the water removal rate would gradually be reduced.

I found the best way to keep the production high was to process the sap in 15-gallon batches. So, I would hook the RO to a 15 gallon jug of sap and run the concentrate back into the sap jug until the sap reached 10 to 12% at which time the permeate removal would be down to about 8 gallons per hour. The concentrated sap would then head to the boiler. As soon as we started on the next jug of 2% sap, it would rinse out sugar build up in the membrane and go back to the full capacity of 15 gallons per hour. Both of the units above were used in the USDA Forest Farming YouTube videos.

Unfortunately, the three membrane RO made the middle sized RO in the videos look much more complicated than it needs to be, creating lots of inquiries. It was nice that the shorter membranes were easier to transport to maple programs for demonstrations. It seems the 40" membranes and pressure vessels are more standard production than the 14" or 21" alternatives, so they are much more economical to purchase for the amount of output. I had the three membranes hooked up in parallel to get the most water removed per hour. If they were hooked in series, less water would be removed per hour, but the sap could be much sweeter in one pass. For the off season, I would store these membranes in holders made from PVC pipe that would be filled with permeate and a screw tight lid sealing the liquid and membrane in.

It was at this point that I began to gain friends. Friends who would show up at my garage with a 50-gallon barrel of sap or more and we would RO that down to about 15 gallons in about 2 and a half hours but these visits would save them between 8 and 20 hours of boiling time each time the sap ran. But the desire for something bigger was growing. The question of how to make a simple RO that would be most useful for maple operations of 300 to 500 taps lead to the next experiment. The fact that each year in the maple industry some percentage of maple producers are updating their 8" by 40" membranes that have lost some percentage of capacity seemed like it could be a low cost source for operations that don't need that maximum capacity.

Breezy Maple Farm was updating some of their membranes and provided one for our testing. An 8" by 40" Codeline fiberglass pressure vessel was purchased on line

along with a 330 gallon per hour Procon pump. This pump was connected using a cone connection to a standard shaft 1 horse motor that I already owned. This system operated at 250 psi, and would remove about 300 gallons of permeate per hour. Total cost of materials was about \$1150. This performed with great efficiency but had a couple of unexpected issues.

At first the pump would run but nothing happened, even when well primed. It turned out that the motor was running backwards, and needed to be rewired. The bolts in the motor were too short to connect to the cone, so they had to be replaced with threaded rod and there was enough vibration in the cone to pump connection that it would wear out the rubber in the motor to pump coupling every couple of weeks. The clamp style connection between a motor and pump seems like a much better system. Here again, I used the feed pump in addition to the higher-pressure pump. Some are not using the feed pump, especially if the sap is slightly elevated over the pump so that it can help with priming. This eliminates the cost of the feed pump. I've run them both ways but I get less chatter in the high-pressure pump when I use the feed pump, but performance seems equal. This system had more capacity than I needed and sometimes I had trouble having enough permeate to give the 8" membrane the rinsing it should have following use.

The next year, I tried a 4" by 21" membrane with the 330-gallon Procon pump. This unit did not put out as much as I expected. I had heard that it could do about 60 gallons per hour at 250 psi but I was usually getting about 45 of permeate per hour. Still great for my 70 taps and friends but when you look at the price of the 21" membrane and pressure vessel it is not that much less than a 4" by 40" which will have twice the performance. So, the last year of making maple syrup at home, we tried a 4" by 40" with the 330 gallons per hour pump and it performed very well, delivering 80 to 100 gallons per hour of permeate.



**Smaller unit using a home RO filter pack, available at many hardware stores.**

In the off-season, the membranes were stored in the unit with permeate created by the unit. I used this unit for 4 years and by the fourth year noticed a slight reduction in performance. To keep the pump from continually turning on and off while feeding the membrane, and to maximize the pressure, the pressure switch on the pump had to be set at maximum. The 6x reduction in capacity seems to be universal when processing sap vs. processing water with any unit set up and rated for water purification. So a home RO rated for 50 gallons per day would remove about 2 gallons per hour with water or would take about 1/3 of a gallon of water out of your sap per hour. That would be fine for someone with 2 or 3 taps. A larger unit that claims 240 gallons of water purified per day should take out about 10 gallons per hour from water, but only about one and a half gallon of water from sap. That should be good for someone with up to 5 to 12 taps. With these water purification units you must remove the carbon filter, as it will remove sugar and many other things you normally want in syrup.

Like any normal maple producer, once the small RO was working well and syrup was more efficient to make, I annu-



**Larger capacity RO with one main filter. Note the separate tanks for concentrated sap and the removed water.**

The reason I felt it necessary to put this information together is the over whelming response we have had to the little RO YouTube videos. The USDA wanted some Forest Farming Videos, so they sent a crew to tape and record some presentations, which went online a little over two years ago. I figured there were likely a couple of hundred people who would be interested in making their own little RO. There are five videos on YouTube talking about RO and covering the three different sizes I had experimented with at that time. As I checked last week, they combined had over 60,000 views and hundreds of people have emailed questions about some aspect about building a little RO. If you are interested go to youtube.com and type in Cornell Reverse Osmosis and they will pop up.

I hope this information will help answer many of people's questions so they don't have to try to track me down. If you are not at all mechanically inclined making your own RO is probably not the best idea. They are becoming more avail-





This unit is strapped to a hand cart, for easy moving. It's important not to let the RO freeze.

able at more reasonable prices than ever before. Buying one can save significant aggravation. If you are a do it yourselfer, this is a reasonable project to put one together. Some of little ROs from this project are now assisting with concentration of sap at the Cornell Arnot Forest.

Here are a few details that should help:  
The Merlin is no longer available.

Flush the RO filters with all the permeate you can save after every use. Do not use chlorinated water in your RO at any time. Store the membranes in pure permeate in the off-season in your pressure vessel or make an airtight holder out of PVC pipe. There are preservatives and soap available for membranes if you need them. Follow suppliers' instructions and store where children cannot access.

The pressure in the RO is controlled by a valve on the exit end of the membrane on the concentrate line. Permeate comes out of the center of the membrane on both ends, you can block one end so all the water come out one line. The concentrate goes in one end and out the other at the outside fittings by the rings of the membrane. Most small ROs without internal recirculation should send the concentrate back to the sap tank. Concentrate in batches.

Flow meters can be handy, but you can get a quick measure by just putting the permeate line in a 5-gallon bucket and measuring how long it takes to fill it. After a few times, you get pretty good at seeing when you are getting a great flow and when it is slowing down. I get excellent results with my 4x40 with a 3/4 hp pump and a 330-gallons per hour pump. If you get a much smaller pump, say a 150 gph, you get less flow over the membrane at a given pressure which allows the sugar to build up on the membrane and reduce its capacity. The membrane is like a fine screen and the more flow pushing the sugar along the longer it stays clean and functioning. You want a pump that has at least 50% more capacity than the rated capacity of the membrane and more is not a problem.

**Change or clean your pre-filter often**  
Supplies are available in many places. I have used maple dealers, amazon.com, ebay.com, americanro.com, altanticro.com, freshwatersystems.com, nextgenmaple.com and Deer Run Maple plus there are many more.

A sap refractometer is very helpful when working with an RO, as it can give you sugar contents in seconds and harder to break than a hydrometer.

There are many membranes available; I tend to pick the ones with the highest rating for the price.

Starting at the sap tank, here the suggested parts in order: A foot valve, a line to either the feed pump (a valve just after the feed pump can cut down on the need to re-prime the pump so often, shut it when moving the line from one tank to another) or the pre-filter, from the pre-filter a line to the high pressure pump, a line from the high pressure pump to the outside fitting of the pressure vessel, a pressure vessel with a membrane inside, a concentrate line

from the outside fitting on the exit end of the membrane that goes back to the sap tank or to a tank supplying the boiler, and a line from the center fitting on the pressure vessel to a tank for storing permeate.

End of season cleaning: For most of the years, I have just run permeate water through the membrane at low pressure, lots of permeate water, and then save the permeate from the water rinsing to store the membrane in. I made a storage chamber out of pvc pipe with a solid bottom and screw on top. Fill the pvc cylinder with the pure water and put the membrane in there completely submerged and put on the top. With our commercial membranes here at the forest, we run a wash using membrane soap from one of the maple supply companies, rinse and do a second soap wash, followed by lots of rinse with permeate – about 350 gallons per 8" membrane. Then store it in a pvc can, like above with membrane preservative added. I have not had

trouble just rinsing and storing the membranes in the very pure water but I've heard of some who did not rinse enough or get clean enough water for the storage and it smelled bad after storing. I don't like using the preservative as it takes a lot of rinsing the following season to get the off odor and taste back out of the membrane. I've avoided using the soap wash at home as the soap is very caustic (NaOH) and I didn't want to have it around in case the grand kids happened to get into it. At the forest we have a good cabinet for storing these things.

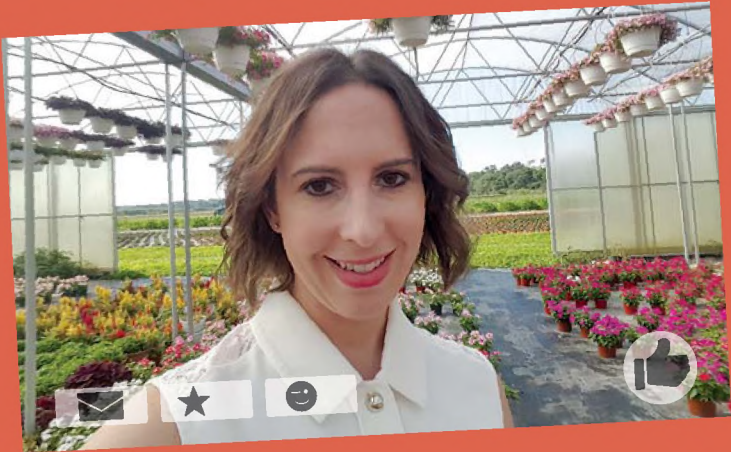
A special thanks to Next Generation Maple and Deer Run Maple for all the help and encouragement with this project.

View the videos at: <http://bit.ly/2wTy8qi>

Steve Childs is a New York State Maple Specialist and can be reached at [slc18@cornell.edu](mailto:slc18@cornell.edu).

# LOVES

farm-fresh vegetables,  
yoga, hiking and



# tax planning.

The word "taxes" may not bring a smile to most people's face, but Jamie Johnson isn't most people — she's a tax consultant for Farm Credit East. And as a consultant, she loves helping our clients maximize their deductions, stay up-to-date with current tax law, and ensure that they never pay more than they should. That means planning well before it's time to file, forecasting your end-of-year liabilities and developing strategies to keep your tax burden to an appropriate minimum.

Preparing taxes may not be your idea of a good time, but with a Farm Credit East tax consultant in your corner, you can be sure that you've put in place the most beneficial tax arrangement for your business — because WE ARE YOU.



800.562.2235 • [FarmCreditEast.com/TaxPlanning](http://FarmCreditEast.com/TaxPlanning)

Our associates love what they do. How about you? Send us your selfie at [FarmCreditEast.com/WeAreYou](http://FarmCreditEast.com/WeAreYou)



**SOIL HEALTH****Building Healthy Pasture Soils***Focus on biology to build resilient soils that sustain production and deliver profitable yields with reduced inputs.*

by Lee Rinehart

Soil fertility in pastures goes well beyond a simple discussion of soil samples, fertilizers, and the nutrients needed to produce high yields. Rather, soil health is an ecosystem concept: it is holistic and complex, and involves regenerative, adaptive management. Managing grazing and harnessing the inherent abilities of living, healthy soil can promote productive pastures and animals.

With this type of management, we are observational and not reactive: we are looking at soil indicators such as aggregation, species diversity, and cover. We are looking for telltale signs of soil ill-health, such as run-off, compaction, and bare ground. Within a regenerative system, we are interested in the fundamentals: what drives the whole system. Soil microorganisms need to be fed with a constant diet of carbon from the sun. These microbes need habitat and a balanced diet, and this is accomplished through plant diversity, living roots, and soil cover all year. The saying 'build it and they will come' applies here, and if we make sure the microbes are fed, they will do the work of building soil health and fertility for us.

Let's consider the farming practices that feed soil microbes and help build healthy soil. In essence, we want to increase aggregation, contribute soil organic matter, increase biodiversity, buffer soil temperature, and minimize soil compaction and disturbance. Sounds like a lot, right? Well, not really, if we break these objectives down into some basic principles. Let's take a quick look at the principles that will define our pasture soil management practices.

**Minimizing tillage** preserves soil structure, encourages aggregation, and keeps soil carbon in the soil profile where it belongs. Tillage brings a flush of oxygen into the soil that spurs microbes into a feeding frenzy on carbon molecules, resulting in carbon dioxide release. We reduce tillage through the use of perennial pasture and minimum-tillage, or no-till, cover crops.

**Maintaining living roots** in the soil for as much of the year as possible feeds soil microorganisms all year. Also, by maintaining living roots and leaving grazing residual, we cover the soil all year long, forming an "armor" to protect the soil from moisture and nutrient loss.

**Maintaining species diversity** is achieved with cover crop mixes and the use of diverse perennial pasture mixes. Try to incorporate warm season and cool season plants; it is a good idea to plant both grasses and broadleaf plants in the same fields.

Manage grazing by **planning for an appropriate grazing recovery period** on your paddocks, keeping in mind that plants need various recovery periods depending on the species, the time of year, and the soil moisture content. Overgrazing (not allowing adequate recovery) reduces root mass, photosynthesis, and sequestered



**Soils that are well aggregated with adequate organic matter are resilient and can sustain crops with minimal input.**

Photo by Robyn Metzger, NCAT

carbon in the soil, thereby decreasing soil life. Proper grazing builds soil.

Finally, **put animal and grazing impact to work for you.** Livestock provides nutrient cycling in pastures, contributing to soil organic matter, and the grazing action on forage plants encourages root growth and root exudation of plant sugars that feed soil microorganisms.

For livestock producers, this boils down to a combination of perennial pasture, cover crops in rotation, and good grazing management. Perennial pastures, because of the lack of soil disturbance and permanent cover, are higher in carbon and organic matter than tilled crop fields. This biological system has a stable habitat to conduct business, and the nutrient cycles can sustain themselves. However, by adding live-



**Diverse cover crops build soil health while providing high quality forage for grazing livestock.**

Photo by Lee Rinehart, NCAT

stock, we get a multiplier effect on soil health, even in systems that are cropped with a cash crop as part of the rotation.

Grazing is known to increase soil carbon and nitrogen in the soil. As an animal grazes, it sends a signal to the plant to pump out sugars through its roots into the surrounding soil. These root exudates, sugars developed by the plant through photosynthesis, are food sources for the microorganisms in the soil. The action of grazing jump-starts the soil food web and increases nutrient cycling, making nutrients available to plants.

Cover crops are known to benefit the soil by feeding soil life, buffering temperatures, and increasing water efficiency. Many crop farmers are familiar with cover crops, but with livestock and cover crops in combination, you have all the tools you need to build soil health. Grazing is often the missing link for crop farmers. By putting animals on cover crops you can close the loop and develop a more resilient system.

Think of livestock as biological "roller-crimpers," or cover crop terminators. Combining the below-ground effects of grazing on root exudates with the biological contribution from animals far exceeds the benefits of cover crops alone. Because the microbes in the rumen are similar to the microbes in the soil, ruminant animals prime the soil with biological life, contributing to the health of the soil.

If you're a farmer who has a predominately cash-crop-oriented income, it may be attractive to graze cover crops in rotation with cash crops. Annual crops can be rotated to perennial pasture every few years. You can also incorporate grazing of cover crops in a strictly cash crop system, as Gabe Brown has demonstrated. His fall biennial crop > warm season cover crop > fall biennial crop > cash crop rotation works well in his system. In this system, you only have one year off from cash crop, but you get three cover crops incorporated, all grazed. This cover crop sequence works very well to "prime" depleted soils.

It seems like there is a lot involved in managing pasture fertility holistically... and there is. The biological processes are complex and they interrelate with weather, moisture, season, crop selection, and livestock. Even soil scientists do not understand everything that goes on in the soil, but we do have a pretty good idea of the processes, and we know that biology is the basis for soil function. We also know that energy drives the whole system.

Transitioning to a biological system from a chemical system is a slow process, and it's important to recognize that it will take several years for soils to turn around. Be patient, and as Ray Archuleta, a soils conservationist with NRCS, says, "Have the integrity to believe that nature will work with you over time, that it's going to work."

This is important, because there are going to be some problems that crop up. It could be anything from decreased weaning weights on calves, to weed problems, to



livestock parasites. Expect these problems to occur, because you're dealing with a biological system that is trying to get back into balance. Don't jump ship at the first obstacle and succumb to the temptation to revert to an input-based system. Resilience and the integrity to stay focused will pay off in the years to come as the biology builds to the point of sustainability.

So, how do you get started? Remember the

three practices we spoke of earlier: perennial pasture, cover crops, and grazing management. These practices build soil carbon, which is the key to fostering soil health and plant fertility. Making the transition takes time and attention, but the benefits are long term. Think of it as an investment in your soil, just like you invest in livestock and equipment. And as you begin this journey of renewal, remember that it's a biological system that is fully dependent on the

almost incomprehensible diversity of life and life processes that happen unseen, among the roots just under the soil surface.

It took decades for your soil to degenerate, so expect several years for your farm to recover. Don't make the mistake of expecting to reverse the tide in one year. As you transition, keep in mind the following concepts: when you feed soil microbes, you feed the plant—productivity is based on the rela-

tionships between plants, soil, and animals. The process of nutrient transfer is kept strong by adding organic matter. Reduce your off-farm inputs to reduce cost, and transition slowly. Have integrity that it will work by staying the course even when the system seems to crash. Observe and adapt. And if your soil is low in carbon, don't expect it to work. To fix it, start by putting in one or two years of cover crops and graze it appropriately to get the system primed. You might be surprised by the results.

Managing for carbon by keeping soils covered with growing plants and with managed defoliation through grazing, builds the organic matter that provides the fertility pastures need to be productive.

Lee Rinehart has been writing and educating on sustainable agriculture for over 20 years. A graduate of Texas A&M University and a Program Specialist for NCAT's ATTRA Sustainable Agriculture program, his work focuses on agronomy, livestock, and grazing. Lee can be reached at 479-587-3474 or [lee@ncat.org](mailto:lee@ncat.org).

The ATTRA program has served as the premier source of information about sustainable agriculture for U.S. farmers and other agriculturists for more than twenty years. Visit the ATTRA website at <https://attra.ncat.org/>.

This article has been adapted from a forthcoming ATTRA publication entitled Building Healthy Pasture Soils, by Lee Rinehart.

Interested in finding out more about how managing your livestock can improve your soil health, your pasture condition, and your bottom line? The ATTRA Managed Grazing tutorial features sessions taught by ATTRA specialists who are also livestock producers. They share years of experience managing their own pastures to inspire you to start wherever you are and build or refine your own managed grazing systems. The tutorial includes detailed presentations and real-world examples including conducting a forage inventory, fencing and water, managing the mature stand, intensifying managed grazing, stockpiling grass, managing fertility, and monitoring. Access the Managed Grazing tutorial free online at <https://attra.ncat.org/tutorials/grazing/index.php>.

# Small Farm Quarterly Magazine

Are you looking for ways to farm profitably without getting bigger?  
Do you like to read about families who are living a good life on a small farm?  
Are you looking for new ideas, tips and resources to help you reach your farm and family goals?

If so, you'll enjoy *Small Farm Quarterly*. It's for full-time and part-time farmers, experienced and beginning farmers, and even folks who are just thinking about getting into farming.

## 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 with our readers



To subscribe, please fill out form below and return with your payment to

Tracy Johnson  
Small Farm Quarterly  
PO Box 121, Palatine Bridge, NY 13428 • 888-596-5329 • [subscriptions@leepub.com](mailto:subscriptions@leepub.com)

- ☐ **Country Folks subscribers** automatically receive SFQ four times a year at no extra cost. Country Folks is delivered weekly for \$50 per year. *\*\*SFQ does not run in the Farm Chronicle paper*
- ☐ **SFQ-only subscribers** receive just the four issues of Country Folks that contain the SFQ insert for only \$5 a year.

Name \_\_\_\_\_

Business Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

Email \_\_\_\_\_

Method of Payment: ☐ Mastercard ☐ Visa ☐ Discover ☐ AmEx ☐ Check/Money Order \_\_\_\_\_

Card Number \_\_\_\_\_ Exp Date \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Total Enclosed \_\_\_\_\_

Make Check Payable to: Lee Newspapers, Inc. • Pay by check or money order DO NOT SEND CASH



**LIVESTOCK & POULTRY****List of Items for a Beginning Sheep Farmer, Part Two**

by Ulf Kintzel

I will continue in this part 2 of the article on individual supplies and tools you will need to get started with Sheep. See the Summer 2017 issue of the Small Farm Quarterly for Part 1. I leave it up to you to research where you get the best price or what combination of items are the most reasonably priced once you include shipping fees.

**Fencing** is a very broad subject, and this article can only point you into various directions where you could go. The question will be if you want to build permanent fencing or if you want to operate with temporary fencing. Perhaps you like to do a mixture of both, as I do. I have a woven wire perimeter fence, and all my interior fencing is electric netting. If you can build fencing yourself, you may have a good source locally for posts and wire. If there is no local supplier, Kencove is likely to have all what you need.

**Electric netting**

Round Southern yellow pine posts would be my personal choice when building a permanent fence. No matter how old you are, each of these posts is likely to outlive you. High tensile wiring, whether it is single strands or woven wire, is in my view the way to go. For interior fencing I find electric nettings the safest. Premier One Supplies has the greatest variety of them, but is not the only supplier. Nettings 35 inches high with double-spiked posts is what I would recommend. Some have successfully worked with electric twine or polywire and reels as interior fencing. In the past, I had to work with it and I find it just too unsafe. Sheep get out. Dogs can get in.

Don't forget your Powerlinks to connect your hot perimeter fence with your interior fence. Also, I tend to go the extra mile to put up electric fence signs. Citing common sense will unfortunately be an unsuccessful defense if someone gets

**Electric fence sign**

entangled in your electric netting, gets shocked, and then complains about it or even sues you. Electric fence signs go a long way in your defense.

I make my **hay feeders** from livestock or cattle panels. They are 16 feet long, which is about the circumference of a round bale and are the same height as such bale that is sitting on its flat side, which is four feet. I cut staggered holes in them that a sheep's head can fit through. The panels, as well as a fork to spread out wasted hay around the feeder, are likely available at any local farm store.

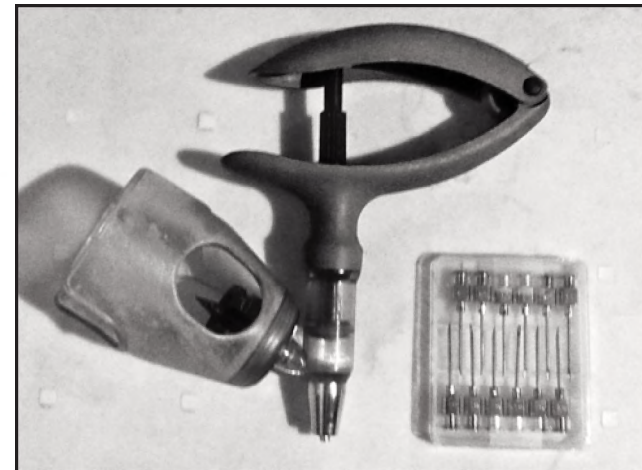
**Lambing season** requires a variety of items. If you will castrate or dock tails, you will need "O" rings and a ring expander. It is advisable to have a tube feeder on hand to feed a new-born lamb that has problems to secure survival. Those who intend to bottle-feed orphan lambs will need bottles and nipples as well as milk replacer. While calf milk replacer is substantially cheaper than lamb milk replacer, it is not recommended because of its copper content. Yet, there are many who raise lambs successfully on calf milk replacer to save money. Colostrum can be purchased as well in dried form, although I freeze cow's colostrum just prior to lambing season. Let's hope you will never need it but if you do, have a prolapse harness and retainer in store when lambing is approaching.

Spray paint specifically designed for sheep, like the brand Sprayline, is a wonderful and easy way to mark sheep during lambing season, giving mothers and lambs a matching number. However, when I mark a sheep for other reasons, i.e. when I cut a ewe's hoof that was limping, perhaps because she stepped on something, I use a twist marker, which is cheaper and handier for casual use. Buckets for the jugs and troughs for the pens will be needed, I expressed my preferences in part one of this article. If you wish to purchase and use your own scrapie ear tags instead of the one the USDA offers for free, you can have them custom-made by Premier One Supplies. Then there are the actual jugs themselves and the panels needed to make pens. I use rough-cut hemlock from a local saw miller to make them myself. I tie them together with bailing twine to five-foot long T-Posts to hold them in place.

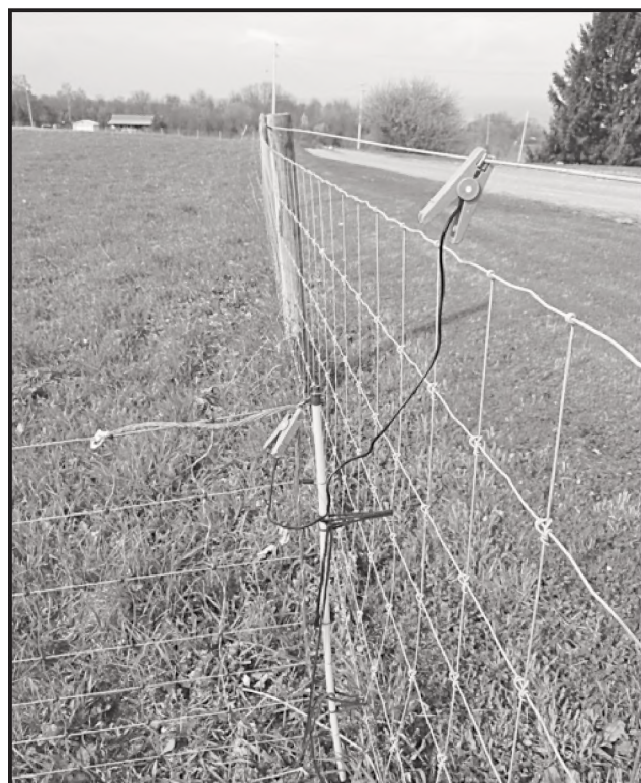
For **hoof care**, you will need a pair of hoof cutters and a sharp knife. How do you catch a sheep? I recommend a leg crook. It comes in handy whenever you

need to catch a lamb. I like using the blue leg crook Premier offers. You can also buy the head of a leg crook and mount it on a stick of your choice. Perhaps you do better with a neck crook. Many suppliers offer those. A foot bath for preventive care or as treatment against hoof rot or foot scald can be made by yourself, if you are handy with tools and lumber. If not, foot baths can be purchased from various suppliers.

Pine tar is a natural **fly repellent** when you have a sheep with a wound. Perhaps the guard dog bit a sheep, or you cut one while shearing – pine tar can be put directly on the wound, and keeps the flies away that might irritate it and keep it from healing. It will stay on much longer than anything else that I am aware of, and therefore doesn't need to be re-applied as often.

**Automatic syringe**

Most of you will end up **deworming** sheep on occasion. You can do that either with a syringe and inject it, or with a drench gun and give it orally. When you have a good number of sheep, I highly recommend the Phillips Auto Drench Gun. For fewer sheep a cheaper or simpler version will do. To inject dewormer or to vaccinate, i.e. against Overeating Disease, you can use an automatic syringe. (see photo) Personally, I use one made by Allflex and attach 18-gauge needles, either 3/4 of an inch or an inch long. Again, for fewer sheep a normal disposable syringe will do. Read the paragraph below for description. Both dewormers like Prohibit or Cydectin qork against the barber pole worm, or

**See List page 15****Powerlink****Sprayer and marker**

**Myers Poultry Farm**  
966 Ragers Hill RD South Fork, PA 15956  
**FREE Catalog**  
Cornish  
Cross Broilers &  
Colored Broilers  
(7 Meat Varieties)  
*Extremely hearty &  
perfect for free range*  
Layer Chicks, Turkeys  
Ducklings, Guinea, Much More  
**(814) 539-7026**  
www.myerspoultry.com

**GREENHOUSE SEEDERS**  
Seeders for the Little Guy  
**impseeder.com**

**Scythe SUPPLY**  
EUROPEAN SCYTHES

"Mow where your tractor can't go."

**ScytheSupply.com**  
496 Shore Road  
Perry, Maine 04667  
(207) 853-4750



LOCAL FOOD & MARKETS

Do Your Products Meet Your Customer Values?

by Brian F. Moyer

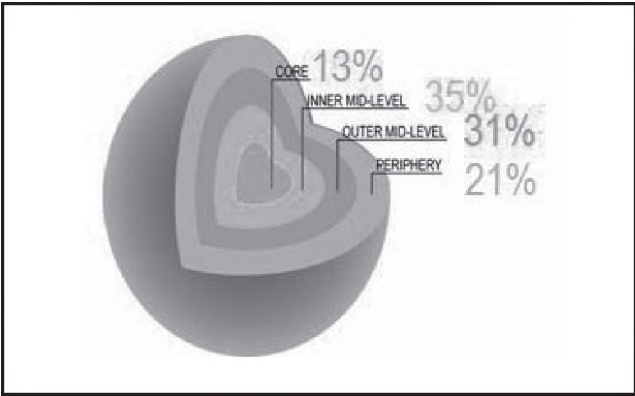
Many times when we introduce our products to the marketplace, we don't always think about how our potential customers will view the product. We may know how special our new product is, but how do we get that information to our customers? An example might be trying to sell freezer beef in the local "Penny-Pincher" paper. Most of that readership are looking for inexpensive purchases and might not respond well to the purchase price of a quarter or half of a beef. On the other side, if your goal is to be the lowest priced sweet corn producer, an up-scale farmers market might not be your best outlet. Those customers might view your product as lower quality simply because you are offering a lower price than your competitors. In both cases, neither is a good product, place match.

The Hartman Group, <http://www.hartman-group.com>, who specialize in researching and understanding how consumer attitudes and behaviors lead to purchases, have a presentation entitled "From Farm to Fork and Beyond; A Consumer Perspective".

Here they asked consumers about their involvement in "sustainability". The "core" are those who are very involved (recycle, purchase local food, conserve energy). The "periphery" reflects those who do not necessarily go out of their way to follow any kind of sustainable practices.

Notice the kind of language these groups use to reflect what they value or what is important to them when making purchases. Words such as "transparency", "greater good", and "authenticity" are the values of the "core" and "inner mid-core" groups. It's very similar to the language of the local food movement, so if you believe your product would be beneficial to this group, then think about where they might make their purchases or get their information and center your marketing efforts and materials on their values and shopping habits.

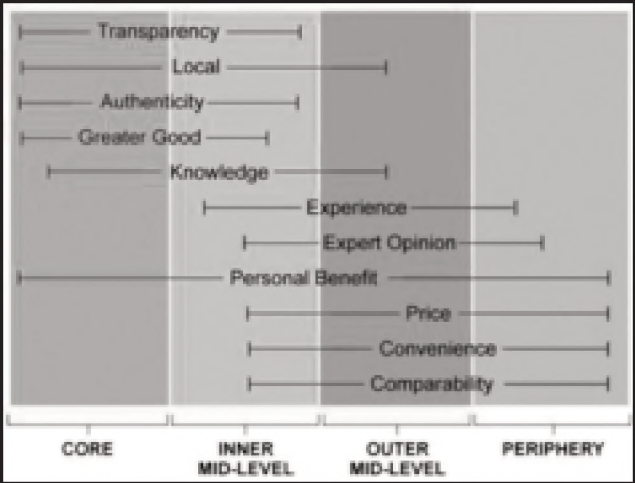
"Price", "convenience" and "comparability" are words that are used here by the "periphery" group and most closely resemble what we might see in box stores and grocery store. If your product's benefits meet those customer needs, then you will need to capture this group where they get their information and where they shop.



Now, think about where you think your product falls in here and consider if promotional materials and language reflect the group of consumers you are trying to reach.

Let's say you raise grass-fed beef. Maybe your customer base will lie within the "core" and "inner mid-level" group of consumers, who are interested in a sustainable lifestyle and would most likely purchase your beef products. We need to show how authentic our products are and that our values of farming reflect their values when making food purchases.

The customer wants a high quality eating experience from beef raised on beautiful pastures. The one thing you will no-



tice that is missing from this ad is pictures of cows. We as farmers are greatly interested in our animals, but the customer may not be.

Whether we share the same values as our customer isn't as important as making sure our products do.

Brian F. Moyer is a Program Assistant with Penn State Extension in Lehigh County PA. He can be reached at 610-391-9840 or [bfm3@psu.edu](mailto:bfm3@psu.edu).

List from page 14

Valbazen against tapeworms can be purchased from various catalogues. You want to stay clear of Ivomectin. The deadly barber pole worm builds resistance against it in record speed.

In case of a sick sheep, i.e. a ewe having mastitis and it needs to be treated, you will need syringes and needles. The 12-cc syringe is handiest size in my view. I use 18-gauge disposable needles for it that are one inch long. Penicillin or oxytetracycline can be used as antibiotics. The most common brand for oxytetracycline is LA-200. However, there are much cheaper brands, like Duramycin or Tetra-Vet, that are the same antibiotic.

I tried to be as comprehensive as possible in these two arti-

cles. Yet, I am afraid I wasn't and there will be items you will need that I did not mention. However, I am confident that I have given you a starting point if you are totally new to this and some pointers if you are exploring ways to manage your flock. I want to end this second part of this article the way I started part one: I did not get into much detail about each item since this would go beyond the scope of this article. However, if you want to read about it in depth you may find your answer in one of the comprehensive articles I wrote for Small Farm Quarterly over the years, which almost certainly address any item or subject I touch in this article; all nicely compiled on my website under "articles" at <http://www.whitecloversheepfarm.com/prl-articles.htm>.

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

**Don's DAIRY SUPPLY Inc.**

*We've got everything your farm needs but the cows...*

**Farmstead & Dairy Supplies**

**New & Used Equipment**

**Service & Installation**

**349 Roses Brook Rd,  
South Kortright, NY 13842**

**(607) 538-9464**

[www.donsdairysupplyinc.com](http://www.donsdairysupplyinc.com)

**Labels for Direct Marketing & Value-Added Products**

**Local Food. Real Food.**

**A good label tells the story.**

We design and print labels for farm products including beverages, cheese, fruit, meat, pickles, salad greens, yogurt and vegetables. Do you need a freezer label or one that is biodegradable? Are you looking for great value and responsive customer service?

To request a quote, fill out the quote request form online.

FREE CATALOG•INFO•SAMPLES  
1-800-693-1572  
[info@growersdiscountlabels.com](mailto:info@growersdiscountlabels.com)  
[www.growersdiscountlabels.com](http://www.growersdiscountlabels.com)

**WELLCROFT**  
FENCE SYSTEMS LLC

*Protection and Containment of Crops and Livestock SINCE 1978*

**Contact us today for all your agricultural fencing needs!**

- Electrified Netting • Fence Energizers
- Poli-conductors wire, tape, rope
- Storage systems & Reels
- Semi-permanent Quick Fence
- Hi-tensile Electric • Fixed-Knot Woven Wire • Poultry & Game Fence
- Tenax plastic deer control mesh
- Kinghitter Post Drivers

[www.wellscroft.com](http://www.wellscroft.com) | **603.827.3464**



**STEWARDSHIP & NATURE****SPDES and On-Farm Construction**

*When planning an agricultural construction project, do not fall into the myth of ag exemption a general permit for stormwater discharge may be required.*

by Doug Kierst, Executive Director, Cayuga County Soil and Water Conservation District and Judy Wright, Senior Ag Resource Educator, Cornell Cooperative Extension of Cayuga County

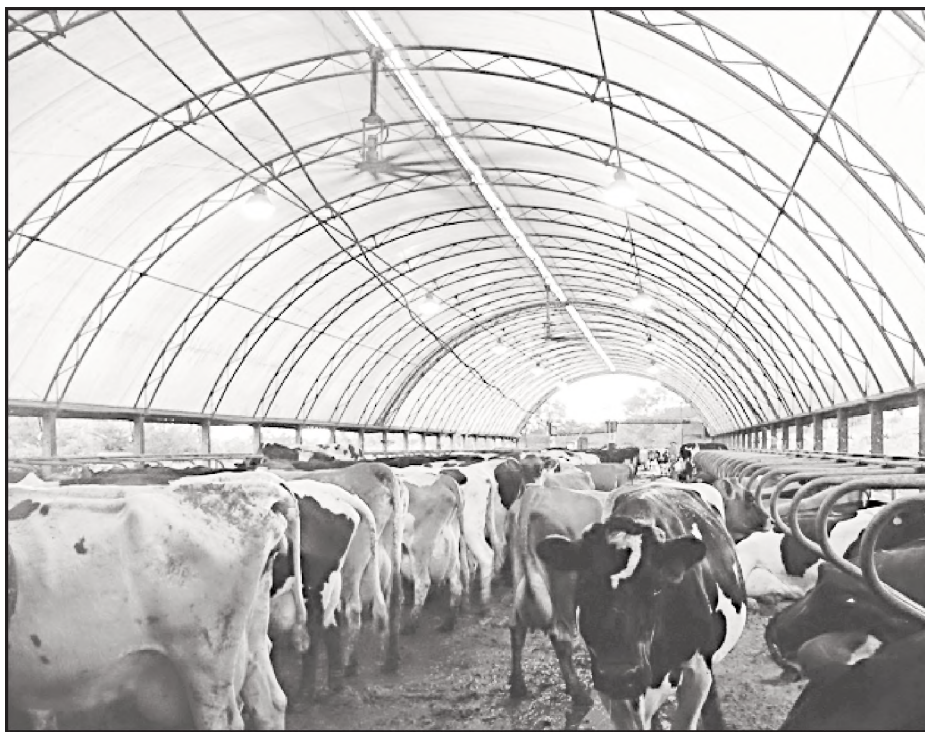
When planning construction in your farmstead or farm area, is one of the first considerations whether you should obtain a NYS Pollutant Discharge Elimination Permit (SPDES) General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002)? Many farms incorrectly assume a SPDES Stormwater Permit is only needed for non-farm construction and incorrectly assume that farm construction is exempt! Do not fall into this easy assumption and potentially suffer fines and penalties.

We have run into farms that are not aware of their need to obtain a SPDES Stormwater Permit and may not be told during the planning process by the project engineer, unless they know to ask. We see and hear of inadvertent violations like this, frequently. So why bring this to your attention now? Many of our rural communities that have been traditionally agriculture are changing. Newcomers to these communities are concerned about their surroundings and are asking questions of their town planning committees and boards.

New York State Department of Environmental Conservation (DEC) views barns and other large farm construction projects including buildings, silos (including bunks), houses, stock yards and ponds, as construction projects that may require a SPDES Stormwater Permit.

How do you know when you need to obtain a SPDES Stormwater Permit? It will depend on the type of construction activity that is proposed. Information can be found on the DEC website at <http://www.dec.ny.gov/chemical/43133.html>; you may also contact the NYS DEC Regional Office, your county Soil and Water Conservation District or county Cornell Cooperative Extension offices for additional assistance.

If you are planning to complete any farm construction, this activity most likely will trigger soil disturbance. The outline below is intended to alert you to the requirements for permitting.



For certain sized projects, a SPDES permit may be a necessary part of the job.

**Soil disturbance of less than 1 acre:** If you are disturbing less than 1 acre, it is not required to obtain permit coverage, however, water quality standards must be maintained to prevent soil from leaving your site and entering a watercourse. The DEC can still issue a fine if a water quality violation occurs on the site, even if no permit is required.

**Soil disturbance is between 1-4.99 acres – “Exempt Activities”:** If you disturb between 1 and 4.99 acres, most (NOT ALL) practices are still exempt from permit coverage. However, exempt projects and activities are still required to implement erosion and sediment controls during construction, but there are no requirements to implement post-construction stormwater controls.

**Soil disturbance is between 1-4.99 acres – “NON-Exempt” Activities:** If you disturb between 1 and 4.99 acres, and the construction activities include the construction of barns, houses, silos (including bunks), stock yards, pens, farm ponds and other farm buildings, a SPDES Stormwater Permit is required. A stormwater pollution prevention plan (SWPPP) that includes erosion and sediment controls is

also required to be developed and implemented.

**Soil disturbance of over 5 acres:** Construction activities involving 5 or more acres of disturbance must obtain a SPDES Stormwater Permit and develop and implement a SWPPP that includes erosion and sediment controls. For sites that include the construction or reconstruction of impervious area, the SWPPP must also address post construction stormwater management practices.

All sites that require a SPDES Stormwater Permit also need a completed Notice of Intent (NOI) form which must be submitted to the DEC prior to the commencement of soil disturbance activity. Soil disturbing construction activities, as defined by the Stormwater Permit, means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal – if site clearing is completed for a non-exempt practice, a stormwater permit is needed.

Clearing completed for a field that will be used agricultural crop production does NOT need a stormwater permit. However, it is strongly recommended that erosion and sediment controls are implemented during large clearing activities. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

It is always easier to ask a question about stormwater control prior to starting a construction project rather than waiting until a potential violation is noticed and then deal with permitting and possible costly fines, increasing the cost of the project. For more information you can consult DEC's website at <http://www.dec.ny.gov/chemical/43133.html> or [http://www.dec.ny.gov/docs/water\\_pdf/introduction.pdf](http://www.dec.ny.gov/docs/water_pdf/introduction.pdf).

*Doug Kierst is the Executive Director of the Cayuga County Soil and Water Conservation District and Judy Wright is a Senior Ag Resource Educator with Cornell Cooperative Extension of Cayuga County*

**RESOURCE SPOTLIGHT****Minority Landowner Magazine**

Minority Landowner Magazine is a national publication that highlights the stories of minority, limited resource, and socially disadvantaged farmers, ranchers, and forest landowners. The mission of the magazine is to support landowners to improve productivity, increase profitability, and maintain ownership of their land.

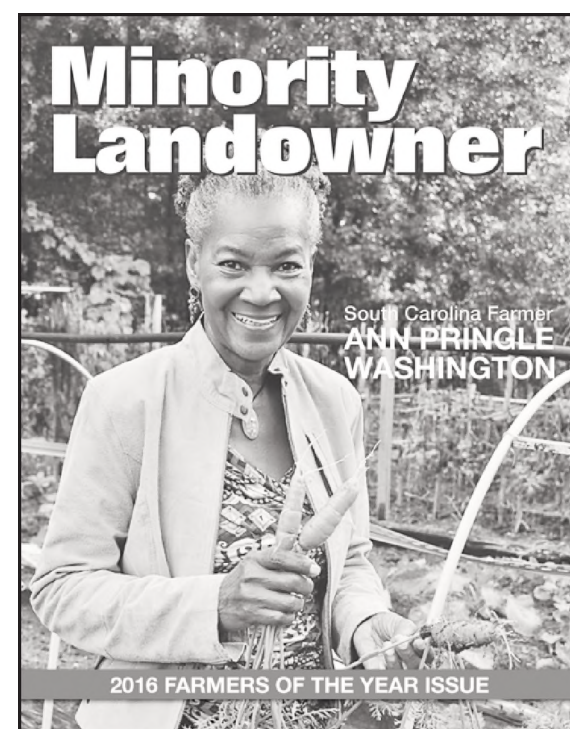
The magazine was founded in 2005 by Victor Harris, a forester with previous appointments in North Carolina and Virginia. In addition to the magazine, he helps organize conferences and educational events in various locations, often in partnership with NRCS and extension offices.

Victor encourages those who work with farmers and landowners to think outside in the box. In a 2016 interview with the National Association of Conservation Districts, he said, “If the landowners you reach are not a diverse representation of your district, then ask the question, “Why?” Often the simple but not always accurate answer is, “There are no minority landowners in my district.” Dig a little deeper into the question and ask: Do I send out press releases to the

same newspaper and radio outlets I've always used? Do I hold landowner meetings at the same restaurants, churches, and community centers that I've always used? ... Seek to expand your outreach efforts and once you connect with minority landowners, both in rural and urban settings, you'll find they seek the same technical and financial assistance and guidance as non-minority landowners.”

In addition to regular issues there is an annual “Farmers of the Year” issue where features are requested from state and federal forestry and agriculture agencies, community-based organizations, universities, non-profits, and others who work with farmers and landowners. This is an opportunity to showcase farmers who are doing great things in their community by representing good agriculture and land stewardship.

For more information, visit <http://www.minoritylandowner.com> or contact the paper at Minority Landowner Magazine P. O. Box 97033 Raleigh, NC 27624  
Email: [ccpublishing@earthlink.net](mailto:ccpublishing@earthlink.net)  
Phone: (919) 215-1632





**STEWARDSHIP & NATURE****The Alfalfa HoneyBees – An Observation**

*In Wyoming County, the drought of the winter, spring, summer, and fall of 2016 was devastating for local honeybee populations.*

by Debra Welch

In Wyoming County, the drought of the spring, summer, and fall of 2016 was devastating for local honeybee populations. Fall nectars and pollens are critical for colony build-up for the winter. If the honeybees cannot get the fats and lipids they need, survival is greatly affected. Though keepers can provide pollen patties and other honeybee feeds, these often are not enough.

Many local hobby and sideline keepers reported partial or total colony losses for the past winter and this spring. The previous summer I had been keeping track of a wild honeybee tree on the edge of an alfalfa field, and wondered, 'if honeybees that are being fed can't survive, how could wild bees?' Of course, a good queen and hive strength are a big factor, but so are food sources. In a completely non-scientific way, I started making trips again to monitor the bee tree, a gnarled old locust. In March I saw no indication of life, though it was sunny and the temperatures were in the 50's. I returned two more times in March, during mild days. Again, nothing.

My fourth trip to the bee tree was on April 17 on a cool, sunny day. I was sure the colony had perished. To my amazement, there were a number of honeybees buzzing in and out of the tree! As an amateur beekeeper, this was fascinating. The colony had sur-

vived, and was now visiting a nearby swamp loaded with pussy willow catkins and lined with henbit and deadnettle blossoms, important early foods for the honeybees.

How had this colony managed to survive the drought? One factor might be the alfalfa field next to this tree. Last summer the local alfalfa fields were in full bloom three times. It's rare to see this happen, because current dairy recommendations are to cut alfalfa at the bud stage to achieve proper nutrients for dairy cattle. All alfalfa fields have some blossoms, but during the drought, the stressed plants put out full blossoms early. Farm owners operate on a set harvest schedule, which allowed these blooming fields to stand uncut for some time. The fragrance was dramatic, and this sea of purple blooms was literally alive with all sorts of pollinators. The alfalfa blossom itself is not easy to access, it literally smacks the honeybee in the head; pollen deposit is the purpose of this tripping mechanism. Nevertheless, there were countless honeybees working the field.

Alfalfa nectar has been reported to be a major food source for honeybees in terms of pounds of honey per acre, when they can get to the blossoms. It seems the deep-rooted plants provided nectar and pollen when other sources may have been dried out, such as clovers and goldenrod.

I will continue to watch this fascinating wild

colony, especially since last year they produced two valuable swarms. I have the great good fortune here in Wyoming County to be able to work with experienced keepers who generously share their knowledge and wisdom on this and many other honeybee subjects. As one keeper said, "Nature finds a way."

*Debra Welch is an Ag & Natural Resources Association Program Educator at CCE*

*Wyoming County in the Agriculture Department. Beekeeping is one of her programs, as well as a hobby.*

'Learn about the NYS Beekeeper Tech Team, which works with beekeepers to improve honeybee health, reduce colony losses, and improve the profitability of the beekeeping industry.' – 2016 NYS Beekeeper Tech Team Report, March 2017. <https://pollinator.cals.cornell.edu>



The Bee Tree in April 2017, alfalfa field in background



## Produce Supplies

- Potting Soil
- Peat Moss
- Greenhouses
- Fertilizers
- Irrigation
- Fungicides
- Pesticides
- Picking Baskets
- Containers
- and much more!



**Call now for your  
Free 2017 Catalog!**

**1.888.381.8641  
(717) 532-5918**

627 Britton Rd, Shippensburg, PA 17257  
Shop online: [www.MartinsProduceSupplies.com](http://www.MartinsProduceSupplies.com)

**RESOURCE SPOTLIGHT****John May Farm Safety Fund Eligibility Requirements Expanded to Help More Farms**

by New York Center for Agricultural Medicine and Health

*What is new?*

We have expanded our eligibility criteria to now include New York State dairy farms with up to 699 mature dairy cattle, as well as increasing the annual gross cash income to \$349,999 for all farms.

*About the program:*

As the first program of its kind in New York State, this cost sharing program allows 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 (JMFsf) 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."

*What kind of projects?*

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

- The purchase and installation of equipment to improve animal handling safety

- Repairing or replacing broken or outdated machinery that poses a safety risk
- Repairing or replacing faulty electrical systems
- Making necessary changes to operations to become OSHA compliant
- Adding or replacing worn out safety signage

*Who can apply?*

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

- Resident of New York State
- Active farmer (part-time or full-time)
- Annual gross cash farm income is \$10,000 - \$349,999 OR dairy farm has fewer than 700 mature dairy cattle.

*Where to apply and how it works:*

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](mailto:info@nycamh.org). The number of awards and the award amount will be determined by NYCAMH on a first-come, first-served basis.



**COMMUNITY & WORLD****In Search of a Peasant Culture in Upstate New York***A researcher from Austria explores surprising similarities between Alpine peasant farms and the farming community of Ithaca, NY*

by Johann Strube

"Pheasants? I love pheasants!" This was just one of many disbelieving reactions I got when I told people I was trying to find traces of a peasant culture around Ithaca, NY.

As a student at the University of Natural Resources and Life Sciences, Vienna (Austria), I was able to visit many small mountain farms in the Alps of Austria and Italy. Many of these farmers proudly referred to themselves as peasants, partly out of tradition, partly to express their opposition to more industrialized farms in the valleys and plains. Back at the university, I learned that sociologists like Alexander Chayanov or Jan Douwe Van der Ploeg defined peasant farming as a sustainable, community-oriented way of farming that was distinctively different from capitalistic as well as socialist agriculture. While that culture seemed to be thriving and alive in the highly developed countries of Austria and Italy, the peasant study literature seemed to be silent about a different one: The United States of America.

In the spring and summer of 2015, I partnered with the Department of Development Sociology at Cornell University to conduct a study to see whether I could find any similarities between the alpine peasant farms that I knew, and the farms around Ithaca, NY. I found many. All farmers that I talked to worked the land because of their love for that lifestyle. For some, having access to fresh and delicious food was a main driver to become a farmer. Others valued the possibility to work outside, alongside the people they loved. Providing for others was also mentioned as a motivation. Many regarded the agrarian lifestyle as the "good life." In fact, most farms grew food for themselves and their families, and additionally

sold or traded food, goods and services.

In contrast to the idea of self-sufficiency, the interviewed farmers valued the possibility to meet each other's needs collectively instead of individually (this concept has been called co-sufficiency). For example, the farmers' markets in the area abound with trading among the vendors, beyond the sale of farm products. Vegetable farms trade produce for meat, or a prepared meal for some fruit. A grain farm traded cover crop seeds for a CSA-share with a vegetable farm. It is common for farmers around Ithaca to help each other out when they can. Often, older and more experienced farmers share their knowledge with new farmers. Many farmers try to use cropping systems that conserve the soil and water to preserve it for future generations.

This strong orientation towards the well-being of the community and nature are characteristics that social scientists associate with peasant farming. Yet, while most interviewees of the study respected peasants and their ways of farming, they did not see how their modern cultivation practices could have anything to do with peasant farming. The farmers highlighted the need to make money and to engage in the capitalist economy as reasons why they did not have anything to do with peasant agriculture. For many, the term peasant has a derogatory ring to it, which seems to be the common understanding in modern English.

This situation left me with a dilemma. On the one hand, I saw these farms doing very similar things that peasant farms in other parts of the world were doing and that social theory would classify as peasant economy. On the other hand, I wanted to respect the will of my research participants to not be identified as peasant farmers. And it is true, most farmers that I visited also produce commodities to sell in exchange for money, often using the latest technologies on an industrial scale that is quite different from peasant farming.

Here is the solution to my predicament: None of the farms engaged in industrial farming and money-based commodity markets because that is what they ultimately wanted to do. In the United States (as well as in Europe), financial capital is needed in order to gain access to the means necessary for farming: land, seeds, fertilizer, fuel, buildings, equipment, and labor. Even a fully self-contained farm that produces its own seeds and fertilizer, owns all its farmland, and runs entirely on family labor has to make a profit to pay property taxes, education for their children, and other expenses. Under these conditions, making money is not an expression of narrow self-interest and growth-orientation, but a necessity imposed by the capitalist economic environment.

Many farmers try to resist this dependency on the market by establishing an alternative economy that is focused on satisfying people's real needs, including the need to be able to continue to farm in the future. This alternative economy comprises the aforementioned informal trading econ-

omy, the reciprocal help, the mentoring, and soil-improving cultivation practices that build up the resource base for more independent farming. The sociologist Jan Douwe van der Ploeg calls this process re-peasantization. From his perspective, peasantness does not mean poverty and drudgery, but self-determination and independence. Despite contradictions that evolve from having to operate in the capitalist economy, the farming community around Ithaca abounds in these pockets of peasantness, even though they might look very different from the cliché postcards of peasant villages and farms across the world.

Consequently, none of the farmers around Ithaca may be a peasant, but neither are they fully capitalist entrepreneurs. Instead, they are farmers who juggle their operations between peasant values of equality, community, reciprocity, and sustainability on the one hand and the constraints of the capitalist environment on the other. Instead of accusing farmers of any scale for unsustainable farming practices, we should try to understand what economic constraints force them to operate in ways that are often in conflict with their inner goals.

*Johann Strube graduated in landscape planning and landscape architecture from the University of Natural Resources and Life Sciences, Vienna (Austria). Now, he is a PhD student in Rural Sociology at Pennsylvania State University. His research focuses on subsistence-oriented livelihoods like peasant farming or indigenous land-use practices in developed countries in Europe and North America. He is also a passionate bread baker, yogurt maker, and musician. He can be reached at jcs80@psu.edu*

Full study available at:  
[https://zidapps.boku.ac.at/abstracts/download.php?dataset\\_id=13172&property\\_id=107&role\\_id=NON](https://zidapps.boku.ac.at/abstracts/download.php?dataset_id=13172&property_id=107&role_id=NON)



While often awkward to make use of, many farmers around Ithaca value the old barns on their farmsteads.

Photos by Johann Strube



Pockets of peasantness might look very different than cliché postcards of peasant villages and farms across the world.



## A Farmer's Perspective – Long Term Soil Health and Fertility in a High Tunnel

*Maintaining and improving soil health and fertility in a high tunnel is difficult and demands an analytical approach.*

by Andy Fellenz

My first introduction to high tunnels was in 1998 at an organic farming conference, when I was still a wannabe farmer and knew little about farming. I eagerly absorbed the presenter's message on high tunnel soil health and fertility management, which in summary was, "a little compost is good, more is better, it is probably impossible to have too much and soil tests won't really tell you much."



Jud Reid, Fallkimmer Farms, Eden NY

Fast forward to 2004, and I had two whole years of farming (well actually, closer to glorified gardening) experience and had erected my first high tunnel – a 26X96 Quonset. For the next few years I continued to add and sometimes subtract tunnels until in 2012, when I had six tunnels at the farm: three 30X96, two 26X96, one 20X48, and three small greenhouses to supply transplants for the high tunnels and field; I was also working to expand my selling and growing seasons to twelve months.

Soil testing established a baseline for where my soil was in terms of nutrients before the tunnels were constructed. Soil pH was in the mid sixes; Calcium was high, greater than 3,000 lbs./acre; soil organic matter was relatively low, at approximately 2%; and other nutrients were within normal ranges. Since a little compost was good and more was better, and because I wanted better soil for the intense growing I planned to do in my tunnels, I added a lot of dairy-based compost and fertilized with a poultry litter compost. A subsequent soil test about two years later showed pH climbing close to 7, significantly more calcium, higher organic matter, and other nutrients ranging from optimum to high levels. With the exception of calcium levels and soil pH, I thought I was on the right track and continued compost applications and the use of a composted poultry litter as a fertility amendment. Two years and another soil test resulted in a soil pH level greater than 7, calcium even higher than before, and all of the nutrients in the high to very high range.

These results were definitely not good, especially the high pH which suggested that plants might be having a hard time taking up nutrients from the soil.

Across my six tunnels, I was happy that organic matter continued to increase, my soil pH's were above 7, calcium was around 10,000 lbs./acre, and the other nutrients were almost all in the very high range. However, I was approaching a tipping point – a point where the soil chemistry was going to significantly limit crop quality and yields. The "a little is good, more is better" approach - especially with compost, the Alfred E. Neuman, "what, me worry?" approach to soil testing, and a laissez-faire approach to nutrient management - turned out not to have been a good one.

It was time for a change and some education – what was I doing that was causing my soil chemistry to change so rapidly, and what would I need to do to get things back in balance? Enter Jud Reid, and the Cornell Vegetable Program. I had been a cooperator with Jud on a previous high tunnel project looking at natural pest control methods for extended season growing – trialing parasitoid wasps and other biocontrols in the tunnel to control pest insects – and had mentioned to him my concerns regarding soil health and fertility. It turned out that my farm was not the only farm facing nutrient challenges; Extension, with support from the New York Farm Viability Institute, began regular soil and foliar testing at farms across the state to see what farms were experiencing.

I was embarking upon a remediation effort, rather than just updating my fertility program. It was also apparent that my previous management scheme had been woefully ineffective and that I needed to pay more attention to soil testing and the expected nutrient demand for the crops I was growing; I



High Tunnel Tomatoes at Slack Hollow Farm, Argyle NY

had to consider the impact of everything being added to the soil. What I needed was to turn the ship around and get my soils back in balance.

What was also needed was the recognition that growing in a tunnel is significantly different than growing in the field, and that the tunnel is a much less forgiving environment than the field. An early epiphany was realizing the impact that irrigation water had on my high tunnel soil. The tunnels never saw rain, were rarely flooded (flooding only occurred when someone forgot to turn off the water or a timer failed), and if drip irrigation was being used, portions of the tunnel would be as dry as a desert for months. I irrigated with well water, which in my case was very difficult, and the minerals in the water (especially the

See Farmer's page 20

## 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!

**That's a BIG market!**



Reach 20,000 readers throughout the northeast US  
4X/yr with Small Farm Quarterly

A publication of Cornell University's Small Farms Program  
[www.smallfarms.cornell.edu](http://www.smallfarms.cornell.edu)

Advertising deadline for Winter 2018 issue is  
December 1. Issue Publishes January 8, 2018.

\*\*\*

To request a media kit or subscribe, call

**518-673-3237**



Tunnel Tomatoes and Cucumbers at Slack Hollow Farm, Argyle NY



**Farmer's from page 19**

calcium) were having a measurable impact on my soil.

So, what to do? Three things were changed – since my irrigation water tended to increase the soil pH, I began to acidify the water and added sulfur directly to the soil to decrease its pH. An injector, a 275-gallon stock tank, and several hundred pounds of citric acid each season enabled me to neutralize my irrigation water. An annual springtime application of sulfur to the soil (when the soil biology is conducive to reacting with the sulfur) has helped to stabilize acidity, and hopefully will reduce the soil pH in the future. I also replaced annual additions of compost with peat moss. The peat moss is acidic, which helps to reduce soil pH and has stable organic matter, which improves my sandy loam soil's water holding capacity and soil tilth.

For nutrients, I shifted from a composted poultry litter (which had significantly increased phosphorus levels in the soil and also had increased salts) to elemental amendments which emphasized nitrogen, the only primary nutrient which was in short supply. Bloodmeal was used to provide immediately available N, and Feathermeal, which releases N through biochemical activity in the soil, was used as a slow-release N source.

Soil nutrient levels in my tunnel soils are stabilizing, but it will be a long road to return them to normal and healthier levels. I've realized the value of annual soil tests and recognized that a high tunnel environment is very different from a field and needs to be managed much more precisely. The next frontier is making effective use of foliar testing to allow for in-season tweaks, especially for the times when the crop's nutrient requirements can exceed the soil's capacity to deliver those nutrients.

My farm's high tunnel experience has unfortunately been duplicated on many farms across the state. Sometimes the only possible correction is to move the tunnel and take the affected area out of production for a few years. Other times, it may be possible to correct the soil's nutrient profile. In work supported by the New York Farm Viability Institute, Cornell Cooperative Extension and NOFA-NY are working together to identify real-world best management practices that will enable farms to maintain soil health and fertility in their high tunnels over the long haul. A large data set from soil and foliar testing at 15-20 farms/year for the last five years, along with production histories in the tunnels, will support devel-

opment of farm-focused best management practices. As the NOFA-NY leads on this initiative, I am excited to be working with Jud Reid, Cordelia Machanoff, Amy Ivy, and Teresa Rusinek from Cooperative Extension on this initiative, and really appreciate all of our cooperating farmers.

*Andy is a 2nd career farmer who recently embarked on a 3rd career with NOFA-NY as their Organic Fruit and Vegetable Coordinator. Andy has grown in high tunnels since 2004 and*

*has been a cooperator on many Extension high tunnel research projects. He is particularly interested in identifying organic practices which facilitate profitable long term high tunnel soil health and fertility.*

*For more information on high tunnel soil health and fertility management contact Andy Fellenz, [andy@nofany.org](mailto:andy@nofany.org) or Judson Reid, Cornell Vegetable Program, [jer11@cornell.edu](mailto:jer11@cornell.edu)*

# EMPIRE STATE PRODUCERS EXPO

TUES. 8AM-5PM • WED. 8AM-5PM • THUR. 8AM-1:30PM

**NEW LOCATION!! SRC Arena • Syracuse, NY**

## January 16-17-18, 2018

**TRADE SHOW EDUCATION AND NETWORKING**

**JOIN THESE EXHIBITORS • MORE COMING IN DAILY**

Adams County Nursery, Inc  
Arctic Refrigeration Co  
Armtec  
BASF - We Create Chemistry  
BDI Machinery Sales, Inc  
Clifton Seed Company  
Cornell Pesticide Mngmt Educational Program  
CropCare  
Dubois Agrinovation Inc  
Evans Manufacturing Co, LLC  
Film Organic  
Food Bank Association of NYS  
Freeman Scale  
FreshQC - VirtualOne Harvest Management Software

Gowan USA  
Growers Mineral Solutions  
Harris Moran Seed Co  
Kube Pak Greenhouse  
Label Gallery  
LeafFilter North of New York, LLC  
Maier Farms  
Mana / Adama  
Monosem Inc  
New York Farm Bureau, Member Services Inc.  
Niagara Label  
N.M. Bartlett • Provide Agro Corporation  
Nourse Farms, Inc  
Nutri Ag USA, Ltd  
OESCO, Inc

Packaging Corp of America  
Paige Equipment Sales & Service, Inc.  
Paradise Energy Solutions  
Rupp Seeds Inc  
Sakata Seed America  
Seedway  
Siegers Seed Company  
Stokes Seeds Inc  
Summit Tree Sales  
TIMAC Agro USA  
Tompkins Financial Corporation  
Trece, Inc  
USDA Farm Service Agency  
Van Ernst Refrigeration  
Wafner Nursery

### 40+ EDUCATIONAL SESSIONS INCLUDING...

Berries  
Cabbage  
Soil Health  
Direct Marketing  
Greenhouse & High Tunnels  
Biopesticides

Hard Cider  
Onions  
Specialty Crops  
Potatoes  
Cole Crops  
Hops

Sweet Corn  
Grains  
Tree Fruit  
Tomato, Peppers, Eggplant  
Weed Management  
Root Crops



### BROUGHT TO YOU BY . . .

The New York State Vegetable Growers Association

Cornell University

New York State Berry Growers Association

Cornell Cooperative Extension

NYS Flower Industries

New York State Horticultural Society  
New York State Farmers'

**For Exhibitor Information, Please Contact:**

**Lee Trade Shows • 800-218-5586 or [dwren@leepub.com](mailto:dwren@leepub.com)**