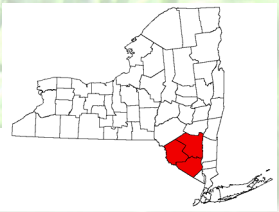
FALL 2019

THE HARVEST EDITION

Livestock 360



Cornell Cooperative Extension | Southeast NY Livestock Team

Orange County
18 Seward Ave.
Middletown, NY 10940
(845) 344-1234


Rachel Moody
Dairy, Equine, Livestock Educator
ram72@cornell.edu


Maire Ullrich
Agriculture Program Leader
mru2@cornell.edu

Sullivan County
64 Ferndale-Loomis Rd.
Liberty, NY 12754
(845) 292-6180


Michelle (Lipari) Proscia
Agriculture Educator
mml249@cornell.edu


Melinda Meddaugh
Agriculture & Food Systems Team Leader
mm2592@cornell.edu

Ulster County
232 Plaza Rd.
Kingston, NY 12401
(845) 340-3990


Jason Detzel
Livestock Educator
jbd222@cornell.edu


Christian Malsatzki
Agriculture Program Leader
cpm78@cornell.edu

Throughout most of the winter and early spring I entertain a variety of phone calls requesting the use of some of my ranches fallow fields to make hay. If there is one thing that a ruminant grower can't stand, it's to see fallow fields and I can sympathize with that notion. At the front of my property, next to the road, there are two 20-acre parcels that were taken out of row cropping systems and allowed to revert back to… well back to weeds. I guess that I shouldn't be surprised that when a monocrop system is removed it will ultimately produce another monocrop system. From corn and soy then to mullein and goldenrod, my cattle have a difficult time finding very much palatable forage in this area of the farm, but converting fallow fields to productive areas is for another article. The focus of this piece is to examine why these producers are out cruising around looking for more hay land.

In the spring and winter, many farmers are actively out scouting for areas to grow more forage and are willing to sign contracts and make required amendments to achieve this goal but in my personal opinion they are going about their expansion all wrong. What if I told you there was an easier way to cut your feed costs? Working ground, bailing forage, and transporting hay require massive inputs of time and money. Through an in depth financial analysis we have found that most ranchers are losing money by selling their hay and baleage for less than it cost to actually make it and when you tack on the extra cost of fertilizer and transportation the numbers quickly become even more unfavorable.

The way to combat this is to simply rely less on stored forages. Any producer who is primarily feeding grass should be working with what they already have to both improve the quality of their sward and to lengthen their grazing season. This process doesn't have to be implemented all in one season but spread out over a couple of years to see what works on your place and what doesn't. If you've got some extra time this winter, why not take some time to work on your grazing plan or figure out which pastures to stockpile for late fall and early winter feeding?

The way to lessen your reliance on stored forages and lower your feed costs is to extend your grazing season. This extended season is directly correlated to less days of feeding stored forages, less time and money spent on harvesting, and overall improved animal health. Of course these techniques are not best suited for your highest performing animals such as dairy or finishing stock but they can go a long way in extending the grazing season on your farm.

Photo: Jason Detzel

Look at your animals-they were born to eat! Ruminants have developed specialized cutting tools to harvest grasses, four wheel drive capabilities to get into places impossible for mowers, and efficient fermentation tanks to break down plants into usable food. Why would we handicap them and ourselves by thinking that we could do a better job of feeding then they could themselves?

My point is simple. Review your grazing plan and start rotating animals to allow your pastures to rest and grow back strong. Let the cow be the cow that it is and use its natural ability to harvest standing feed that you put aside during the productive season. By developing your pastures to be more productive, by selectively harvesting and resting areas, most growers could substantially increase the amount of forage that they have on their property without having to look for additional acreage to manage.

These techniques are not new, nor are they simple. Developing your grazier's eye takes a lot of time and observation. The best way for you to begin to think about these systems is to get together with other like-minded individuals and to tour other ranches that are utilizing this approach. If you are interested in attending our monthly grazing meetings or farm visits please send me an email and I will put you on the list.

09/2018

So I am considering, as I do most years, some frost seeding of my pastures while the conditions are still optimal. I have seeded in this manner in the past and have been pleased with the anecdotal results. In other words, I see more of the legumes I've planted in the stand as I walk around in the spring and summer time (but we all know that our eyes can play tricks so I'm going to put my faith in what the experts tell me and assume that if it's done correctly it's working).

The recommendations for frost seeding are simple. Use the correct plates to distribute the tiny seeds, work your pastures in the fall so that they are grazed or mowed down short to encourage good seed to soil contact, distribute the seeds when the weather is freezing at night and thawing during the day to draw the seed into the soil, and utilize high quality seeds that have been inoculated for high rates of germination and viability. BUT I CAN'T DO THAT!

This year, because I have a lot of thatch on my pastures that was not eaten or mowed down, I'm wondering if it is still possible to frostseed. In spite of this, I have decided to do an experiment where I will meter out four areas, frost seed two areas this week and leave the other two as controls. I will take measurements over the next couple of years to find out if it is possible to add legume seed to pastures that are not clipped short. Here are my thoughts on why this may work for me.

Here is a link to the Northeast Pasture Consortium report on pasture seed banks. We already know that many seeds, and especially legume seeds which are physically harder than most, can persist for many years in the soil. Researchers have found that pasture plant seeds can lie dormant for upwards of forty years in the soil to emerge, waiting for the ideal conditions. So my logic moves like this. If I don't have the ability to ensure seed to soil contact, then I will just push the seed out into the world and measure their success without this advantage. In their natural environment these seeds are released and dispersed in healthy pasture systems and still manage to express themselves. Granted, there is no doubt that there will be less initial germination compared to bare soil, but shouldn't these seeds, as they do in nature, find their way down to soil and either germinate or lie dormant until the conditions are ideal?

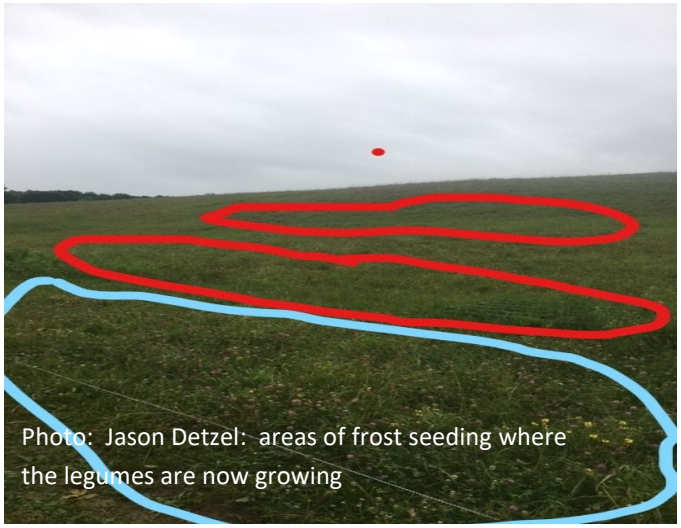


Photo: Jason Detzel: areas of frost seeding where the legumes are now growing

I do not know the answer to this question but I am going to give it a shot based on my intuition and my fondness for mimicking nature's processes. This will take a few years of monitoring as I expect the majority of the seeds that did not make it into the soil to grow this year will eventually pass through the canopy and germinate when the time is right. I'll let you know how it goes and post some pictures this spring and summer as I begin to monitor the stands. In the meantime, here is a very excellent article by Dr. Matt Sanderson, explaining the composition and latency in our natural pasture seed banks.

Seedbank PDF

Update One Year Later 09/19

I can say that this experiment was a complete success. If you need any proof that frost seeding can improve you pasture look no further than picture 1. It is not easy to differentiation, but if you look closely at the photo above you can actually see where I was walking with the spinning seed spreader. The lines that I walked are now full of clover and the areas where I did not seed have far less. So here are the takeaways from this anecdotal experiment.

1. Frost seeding works if you do it in the spring and I suspect that it would also work if we seeded in the fall as Mother Nature does.

2. Despite the heavy thatch that was on the pasture,

Continued on page 5

There are a number of situations where estimates of corn grain or corn silage yields are needed on dairy farms. These could include establishing a price for corn silage or obtaining information to file claims for crop losses. There are a number of methods that have been used to make these calculations. This document will provide a quick overview of these approaches.

Estimating Bushels of Corn Grain/Acre

1. Count the number of kernel rows on 3-5 representative ears.
2. Count the number of kernels/row.
3. Determine the number of ears/acre.d.
4. Multiply a*b*c = (total kernels/acre)e.
5. Divide this value by 90,000 to determine bushels/acre.

Example

-16 kernel rows-
25 kernels/row-
25,000 ears/acre-16*25* 25,000 = 10,000,000 kernels/acre-
10,000,000/90,000 = 111 bushels of corn grain per acre.
Source: Dr. Greg Roth, Department of Crop and Soil Sciences, The PennsylvaniaStateUniversity, (http://cornandsoybeans.psu.edu/pdfs/DROUGHT99.pdf)


Photo: graincrops.blogspot.com

A second method uses the expected bushels of corn grain per acre and the price per bushel of corn grain. The challenge with this approach is that this is a variable number depending on a lot of factors. A better way to use this method is to determine the actual expected bushels of corn grain per acre based on a lab analysis of starch content of the corn silage. The assumption is that all of the starch in corn silage is in the grain portion and not in the stalk, husk and leaves. These calculations require an analytical starch value, dry matter content (DM) and corn silage yield. The calculations are:

DM starch yield =

Tons wet silage yield *% DM *% starch (DM basis)

Example:

Yield = 20 tons/acre
DM, % = 35%
Starch, % = 30
= (20*2,000 lbs. /ton) * .35 * .3 = 4,200 lbs. starch
Grain yield = lbs. starch/ (% starch in corn grain)/% DM of shelled corn/56 lbs. per bushel
= (4,200/.72/.845/56 = 123 bushels of corn grain per acre
A simpler way to calculate this is: lbs. of starch * .0293 = 123 bushels/acre
Source: www.uwex.edu/ces/crops/uwforage/GrainYieldfromCornSilageII.pdf

Continued on page 5

Estimating Corn Silage Yield

This can be done by counting, weighing and sampling the number of corn stalks in 1/1,000th of an acre. Corn plants are chopped at a stubble height of 8 –12 inches and weighed to "estimate" the tons of wet corn silage per acre. This should be done at 3-5 locations in the field. If the plants are chopped and dry matter determined, the tons of silage dry matter yield can be calculated. If the number of ears per stalk is counted, then the ears per acre can also be determined. The number of plants to count and weigh depends on the spacing of the rows. The weight of the plants divided by 2 will provide the estimated silage yield

Row Spacing in Inches	Length of Row to Sample
36	14 feet, 5 inches
30	17 feet, 10 inches
20	26 feet
15	34 feet, 10 inches

Example:
The plants from 17 feet 5 inches with a 30" row spacing weigh 40 lbs. This gives an estimated yield of 20 tons per acre (40/2). If the plant dry matter was 35%, then the calculated dry matter yield per acre would be 7 (20*0.35).

There are also some thumb rule type calculations that can be used. These are:
One estimate of silage yield for corn plants without ears or poorly pollinated ears is 1 ton of dry matter (30%) for each foot of plant height. This does not include the tassel. Corn that is 4 foot high would yield about 4 tons of 30% dry matter corn silage.

Sources of Information:
http://www.uvm.edu/pss/vtcrops/articles/Calculating_Forage_Yields.pdf

Frost Seeding Continued...

the observations would indicate that the seeds able to get to the soil and germinate.

3. Soil conditions must be appropriate for the legumes you are putting down. If you pH is off then the plants will not be able to thrive. Be sure that you have your soil tests completed and are within the tolerances of your selected species.

This method of seeding is relatively cheap and is a project that can be completed when the pastures are wet and machinery cannot access it.

Frost seeding is a great way to get out in the nonproductive season, check up on what is going on in the pastures, and improve the quality and density of your perennial pastures.

DRONES IN AGRICULTURE – WHERE'S THE VALUE PROPOSITION?

BY MIKE HARRIS, FARMER, FOUNDER & CHIEF PILOT - AGROWDRONE

This month, we are pleased to feature Mike Harris of Agrowdrone who has provided us an overview of the practical and future use of drones on area farms. Each year brings further advancements in drone technologies and as the cost of these machines comes down they will become more accessible to all types of operations. We are excited to share news of these nascent technologies but would like to take the opportunity to remind our readers that we are not promoting any particular drone provider. We are interested in introducing producers to these new tools and how they can help them in their businesses.

Rules and Regulations: How Far We Have Come...

It is hard to imagine that just 3 short years ago it was illegal to fly a drone for any commercial purpose! Some companies petitioned the FAA for a special exemption called the "333". This petitioning process took 12 to 18 months. With a "333", pilots could use drones for commercial missions – but usually with many restrictions. Thankfully, in 2016 the FAA created a rule set and a path for anyone who wants to use drones for other than hobby or personal use called the "Part 107." If you want to use a drone on your farm, that is considered a commercial use and requires the pilot of the UAS to have a FAA part 107 commercial UAS certificate. Acquiring this certificate is pretty straight forward. Visit https://www.faa.gov/uas/commercial_operators/ to learn about the process. Essentially a) learn the rules b) pass a test c) register your drone. Most who have obtained the UAS certificate studied for 1540 hours and will tell you the 40 multiple choice questions on the test were tough but they still passed. To use drones on the farm, the rules and pretty accommodating to agriculture (except aerial applications – more on that later)

Advances in Aircraft and Sensors: Look what drone technology can do now…

The technology found in drones keeps advancing exponentially. The flight controllers are getting smaller, faster, and more precise. The electric motors are getting more efficient, bigger, and more readily available.

Photo: Cornell University

Batteries (specifically LiPo batteries) are available in higher capacities, higher voltages, higher discharge rates, and lighter in weight. The air frames (multi-rotor, single rotor, fixed wing, VTOL, etc) are getting bigger and can fly longer with more payload. The cameras are 4K, 60P, greater than 20 megapixels, with broadcast quality that weigh less than 500 grams. The sensors are expanding beyond cameras to thermal, multi-spectral, and more. And the GPS positioning is becoming more and more precise – within centimeters with RTK technology. Alternative power plants such hybrid electric/gas or fuel cells are coming of age and can keep an aircraft in the air for hours not minutes. It is truly amazing how far the technology has come, the types of missions that can be flown, and the vast array of data that can be collected with drones

Reality Check: What Do Farmers think about drones?

But where all the "drones will create a revolution in Ag" hype really meets reality is if you ask farmers about drones. Most farmers that AgrowDrone speaks with are not really impressed by all the technology but instead ask for the economic benefits of introducing drones into their operations. Or in other words – What is the Value Proposition of using a drone in agriculture? And this is where things start to break down with many of the commonly thought of uses for drones in agriculture. For crop inspections (NDVI maps), the data from the drones still needs to be "ground truth-ed" - ie scouted by a professional on the ground up close. There is no way

a color coded map is going to tell a farmer if they have a nutrient deficiency, aphids, or powdery mildew. Furthermore, NDVI maps are available via satellites and/or some chemical providers for free. So why would a farmer either buy a drone or pay a drone operator any amount of money when that information is available without cost? The other types of services also have trouble justifying the cost of the equipment and/or rate needed to pay a drone operator. Is it economically feasible to spend in excess of $25,000 for a thermal imaging drone to capture relative temperature differences in a herd of animals? Or pay a drone operator $500 a visit to fly over the cattle each week?

Maybe – but in most cases, the numbers just don't add up.

One Problem That Drones can Help Solve: Aerial Applications

As we talk with farmers around the country, AgrowDrone sees the most potential to use drones in agriculture in aerial applications on high value crops on small to medium size blocks. Aerial applications can be repellents, foliar fertilizers, fungicides, and insecticides. Examples of high value crops include apples, citrus, nuts, blueberries, strawberries, cucurbits (cucumbers, pumpkins, squash), and hemp. Small to medium size blocks are 5 to 35 acres. The value proposition includes reduced cost compared to traditional equipment (tractor/airblast sprayer), less soil compaction, increased operator safety, and most importantly better coverage (more product on the target). Aerial applications made from drones can also help farmers move away from restricted use to organic chemicals. The issue with organic chemicals, other than the increased cost, is efficacy. Restricted use chemicals are typically applied every 10 to 14 days. Organic chemicals often require 5 to 7 day application intervals.

Applying twice as many applications per season many times makes the organic option not economically feasible. Drones have a much lower cost to operate and help bring the total cost of organic production per acre closer to conventional growing methods.


Photo: newcastlerecord.com

Aerial Applications:

Regulatory Barriers to Entry The challenge: what seems like the best fit for drones also has some very high regulatory hurdles. The FAA part 107 rules prohibit carriage of hazardous materials. The FAA deems fertilizers, fungicides, etc as hazardous material. So a special FAA exemption is required to use drones for aerial applications. To be clear, a farmer can not simply attach a tank with a pump on a drone and spray a field – even with a part 107! The DEC oversees who can apply chemicals and the licenses required to apply even organic chemicals. Each state is different but generally anyone using a drone for aerial applications needs a private or commercial

The Future for Drones In Ag:

It's Bright Although AgrowDrone hears farmers saying that aerial applications on high value crops on small to medium size block are where drones can help them the most, that is not to say that as farmers learn more about what drones can do and drone service providers keep polling farmers for the problems they face, there won't be new value propositions for drones in Ag. But the key will be for drone manufacturers and operators to help farmers find ways to reduce production cost, improve yields, and add operational efficiencies. If per acre profitability remains the focus, the future for drones in agriculture will be bright!

What is deer worm?

Parelaphostrongylus tenuis (abbreviated P. tenuis), also called deer worm or meningeal worm, is a parasitic worm of ruminants. It is very common in white-tailed deer in the Northeast United States (up to 90% of deer harvested during hunting season have been shown to be infected), but does not cause disease in this species. The worm has an indirect life cycle, requiring land snails or slugs as intermediate hosts before being able to infect a ruminant.

What animals are affected by the deer worm?

Although meningeal worm is best suited to white-tailed deer, many other animals that share grazing land with the deer, including sheep and goats, can be infected. In all species except the white-tailed deer infection with meningeal worm can cause serious neurologic disease.

What is the life cycle of P. tenuis/How do sheep and goats become infected?

Immature deer worm larvae are shed in the feces of white-tailed deer and are either ingested by or burrow into a passing intermediate host (land snail or slug); over 2-3 months, they develop into a more mature, infective larval form. They will either remain in the snail or slug or can be left behind in its mucus trail. Sheep and goats that eat forage contaminated with the snail/slug or their mucus trail can become infected.

Once ingested, the mature larvae migrate out of the true stomach into the abdomen and follow nerves in the body wall until they reach the spinal cord. In the definitive host (white-tailed deer), the larvae then follow an orderly pattern of maturation in the grey matter of the spinal cord before migrating up to the head where they live, reproduce, and lay eggs in the tissues surrounding the brain. However, in small ruminants (because they are not the definitive host) the larvae are unable to 'orient' themselves and follow an unpredictable and erratic course around the spinal cord and nearby nerves. This, in conjunction with the body's inflammatory response, causes damage to the central nervous system and leads to the external signs of disease discussed below.

Photo: CCE

What are the signs of infection with deer worm?

There are two common types of signs that an infected sheep or goat may show. Many affected animals will have trouble moving around; early signs of deer worm infection include mild stumbling, knuckling and/or dragging the toes of one or both hind limbs, and general weakness of the hind limbs. In more advanced cases the sheep/goat may suffer total paralysis of the hind limbs, leaving it sitting in a dog-sitting posture or down and Figure 1. In more advanced cases, the animal may experiencer paralysis of the hind limbs unable to get up. The front limbs are less commonly affected, but can have the same problems as the hind limbs. Even in a case of total limb paralysis, animals may still recover fully given proper treatment and/or time. Another common sign associated with deer worm infection is excessive itching and rubbing of one area on the side of the body. Migrating larvae can irritate an individual nerve where it merges with the spinal cord, making the animal rub and/or bite incessantly at the area where the nerve runs. This leads to hair loss and occasionally a wound in the skin. Less commonly, infected animals will show signs of brain disease such as a head tilt, walking in circles, rapid eye flickering, and difficulty chewing. Appetite and body temperature typically remain normal in animals affected with the deer worm, which is not often the case with other common diseases of the brain in sheep and goats. It is important to note that not all affected animals will show all these signs. There can be a wide range of manifestations of deer worm infection, so it is important to be vigilant in watching for any problems with your animals.

How do we know that one of our animals is infected with deer worm?

To make the diagnosis of deer worm, we rely heavily upon the grazing history of the animal as well as the signs of disease it is showing. The fluid that surrounds the brain and spine (cerebrospinal fluid) will also often have characteristic changes to it when viewed microscopically. An absolute diagnosis is made by examining the spinal cord of an affected animal after a necropsy has been performed.

How do we treat?

There exist many approaches to treatment of P. tenuis, largely because no studies have previously been conducted to demonstrate what is most effective. Many have used ivermectin to treat migrating larvae, but this is thought to only be effective when the larvae are traveling in the stomach or abdominal cavity and not once they have reached the spinal cord. Ivermectin should not have the ability to cross the blood-br ain barrier into the cerebrospinal fluid and thus may not have any effect on larvae already in the central nervous system (CNS). Fenbendazole (Safe-guard, Panacur) is often used because it can penetrate into the CNS, killing larvae already in the spinal cord or brain. To help reduce inflammation and further damage to nervous tissue, steroids such as dexamethasone, or NSAIDs such as flunixin meglumine (Banamine), are also commonly utilized in treating infected animals. Some animals recover without any treatment, and not all treated animals inevitably recover. Drug withdrawal periods indicating the number of days before the animal can be used for meat or milk vary widely for different drugs and need to be considered when deciding on a treatment.

Can infection be prevented?

Regular, frequent deworming to prophylactically treat for deer worm is costly and time-demanding; perhaps more importantly, it inadvertently selects for stomach and intestinal worms resistant to the drug, rendering that dewormer ineffective at controlling these damaging parasites.The most effective way of preventing infection from deer worm is to reduce exposure of sheep and goats to infected snails and slugs and to limit deer access to grazing pastures. Pastures bordering woodlands are more likely to be frequented by deer and low, moist areas provide a more conducive environment for deer worm larval development. Fields the first year after forest clearing are especially high risk. Avoiding these areas especially in wet seasons or after the leaves have fallen in the fall will help reduce exposure and may decrease the chances of deer worm infection in your animals. Daily patrolling by guardian dogs during the winter and grazing season and other deterrents such as human activity and/or deer-proof fencing, to discourage deer from bedding down in pastures, will also reduce the incidence of disease

Thank you to the Beakman Fund for Research in Meat Goat Health for funding to prepare this fact-sheet.

This article has been edited to fit in this newsletter.
For the full article and more information click here

To learn more about how Cornell is researching Deer worm and many other issues facing small ruminant producers please visit the Cornell Sheep and Goat Management Page.

Photo: Cornell Sheep and Goat Program
Typical ambulatory distress due to deer worm infection

UPCOMING EVENTS

For more upcoming events and information about our programs, contact your local county CCE office (on front page)

October

UHT and HTST Course FSMA Qualified Individual Training, October 8th-10th 2019 , Cornell University, 148 Stocking Hall Conference Center, Ithaca, NY, Pasteurizer Operator Workshop

Farmland for a New Generation — Ask the Experts, Series runs October 15th-November 26th 2019 , CCE of Columbia and Greene Counties, 479 Route 66 Hudson, NY, New Generation Event

The Science of Cheese and Vat Pasteurization, October 22nd-23rd 2019 , Cornell University, 148 Stocking Hall Conference Center, Ithaca, NY, Vat Pasteurization Series

4-H Regional Horse Conference, October 26th 2019 , 18 Seward Ave., #300 Middletown, NY, Horse Conference

2nd Annual Fall Round-Up Grazier Meeting , October 29th, 2019 , Lime Kiln Farm, 523 Lime Kiln Rd West Coxsackie, NY, Fall Roundup

November

Horse Fun Day, November 2nd, 2019 ,Northwind Horse Farm 2496 Bruynswick Road Wallkill, New York, Horse Fun Day

Poultry Production 6 Week Web Series, November 5th– December 10th 2019, online course via Cornell Small Farms. Poultry Production Course

Getting Started with Pastured Pigs 6 Week Web series, November 6th– December 11th, online course via Cornell Small Farms. Pastured Pig Course

Forest Pests and Diseases, November 7th 2019, Agroforestry Resource Center (Business Office) 6055 Route 23 Acra, New York Forests Pests

Kids and Goats, Series Starts November 16th, 2019 , Extension Education Center 64 Ferndale-Loomis Road Liberty, New York, Kids and Goats Series

December

Holistic Pasture Management and Soil Health Snack and Chat, December 12th, 2019 , Hudson Valley Lab 3357 US Highway 9W, Highland, New York, Pasture Health Snack Chat

January

12th Annual Winter Green Up Grazing Conference , January 25th, 2020, The Century House 997 New Loudan, NY, Registration Available Soon

Helping you put knowledge to work