Cornell University Cooperative Extension

Capital Area Ag Report
January 2015

“The highest reward for a man’s toil is not what he gets for it, but what he becomes by it.” — John Ruskin

Announcements

Soil Health: The Key to Consistently Good Yields and Crop quality
All meetings are from noon to 2 pm
Bring a few bucks for a pizza lunch
PLEASE RSVP to
Aaron Gabriel (adg12@cornell.edu, 518-380-1496) or Sandy Buxton (sab22@cornell.edu, 518-380-1498)

Albany/Schenectady Counties - Wednesday, January 21st, at Ken Saddlemire home, 169 Becker Rd., Berne
Greene County - Thursday, January 22nd, at CCE Columbia/Greene Agroforestry Center, 6055 Route 23, Acra
Columbia County – Tuesday, January 27th, at Reoliff-Jansen Community Library (Community Room), 9091 Route 22, Hillsdale
Washington County – Wednesday, January 28th, at Proudfit Hall, 181 South Main St (Rte 22 at traffic light), Salem

CCE Ag Exchange
BUY SELL RENT
http://agexchange.cce.cornell.edu

Building Strong and Vibrant New York Communities
Cornell Cooperative Extension provides equal program and employment opportunities
Friday, February 6, 2015 10 am—3 pm—1st Annual CCE Regional Hudson Valley Value-Added Grain Systems School—at Anthony’s Banquet Hall, 746 Rte 23B, Leeds (Greene Co.), sponsored by CCE. Also a Trade Show for networking among growers, maltsters, brewers, and bakers. Featured speaker Dr. Ken Hellevang, North Dakota State Univ. will address post-harvest management of small grains. Thor Oechsner, of Oechsner Farm, Newfield, NY, (1200 acre certified organic farm) and partner in “Farmer Ground Flour” and “Wide Awake Bakery” will discuss his rotations that help produce quality grain. Justin O’Dea, CCE Ulster Co., will explain what it takes to get into grain production for malting and human consumption. Aaron Gabriel, CCE CAAHP, will explain the growth stages and physiology of small grains. Register through CCE Ulster Co. at 845-340-3990 by Feb 2nd. $40 pre-registration and $55 at the door, but we really need a head count. Walk-ins will be taunted. DEC and CCA credits requested. For full agenda and event details see flier at https://cornell.box.com/s/mk1ynkepq7hdy9z1ua4. To register by mail: Mail the printable flier and registration form at https://cornell.box.com/s/mk1ynkepq7hdy9z1ua4. To register online: Register with a credit card at https://pub.cce.cornell.edu/event_registration/main/events.cfm?dept=251. Additional support for this program comes from a grant from the NYS Department of Ag. and Markets and Local Economies Project.

FYI

Cornell Field Crop Faculty and Extension Educators have a website, www.fieldcrops.org, that is your up to date source of field crop information. Find variety trials, pest management information, events and more. Check it out.

Help the Capital Area Agriculture and Horticulture Program (CCE) measure the impact of our programs. Please take a survey and tell us what programs you would like us to conduct. Go to: https://cornell.qualtrics.com/SE/?SID=SV_eXOHmhhQwiQlrvf

Webinar - Mobile Manure Apps. January 16, 2015, 2:30 pm (eastern)
Have you ever wondered if your business, educational programs, or outreach program would benefit by developing an app? This webcast features a developer who has worked extensively with university extension as well as many other clients in sports, journalism, and agriculture. Two manure management apps will be demonstrated followed with a panel discussion that will feature more manure-related apps and discuss challenges, opportunities and lessons learned when creating those apps. An application for continuing education credit for Certified Crop Advisors (CCAs) and members of the American Registry of Professional Animal Scientists (ARPAS) has been submitted. How Do I Participate? On the day of the webcast, go to www.extension.org/58813 to download the speaker’s power point presentations and connect to the virtual meeting room. First time viewers should also follow the steps at: www.extension.org/8924.

Field-Scale Studies Show Significant Year X Location X Seeding Depth Interactions for Plant Populations and Corn Yields is the latest article posted to the “What’s Cropping Up?
Aaron’s Comments

2015
International Year of Soils

Healthy soils for a healthy life

The 68th UN General Assembly declared 2015 the International Year of Soils (IYS) (A/RES/68/232).

The Food and Agriculture Organization of the United Nations has been nominated to implement the IYS 2015, within the framework of the Global Soil Partnership and in collaboration with Governments and the secretariat of the United Nations Convention to Combat Desertification.

The IYS 2015 aims to increase awareness and understanding of the importance of soil for food security and essential ecosystem functions.

The specific objectives of the IYS 2015 are to:

- Raise full awareness among civil society and decision makers about the profound importance of soil for human life;
- Educate the public about the crucial role soil plays in food security, climate change adaptation and mitigation, essential ecosystem services, poverty alleviation and sustainable development;
- Support effective policies and actions for the sustainable management and protection of soil resources;
- Promote investment in sustainable soil management activities to develop and maintain...
healthy soils for different land users and population groups;
- Strengthen initiatives in connection with the SDG process (Sustainable Development Goals) and Post-2015 agenda;
Advocate for rapid capacity enhancement for soil information collection and monitoring at all levels (global, regional and national).

“Soil Health is the Key”
Aaron Gabriel, Capital Area Agriculture & Horticulture Program

“Soil health is the key” for Mark Anderson at Landview Farms, Inc. The realization came when they took over some rented land that was “dead” and low-yielding. Just one year of a rye cover crop brought the field back to life. Soil organisms need to eat, and organic matter is what it takes. Feeding your organic matter to soil will improve all three aspects of soil health: physical properties, chemical properties, and biological properties. A healthy soil is porous and has good tilth. It has a proper pH and adequate plant nutrients. The soil organisms are thriving to cycle nutrients, aggregate the soil particles, and create humus to hold onto water and nutrients. A healthy soil is key because it produces high yields more profitably and it helps crops endure adverse weather.

Consider the 2013 growing season. Fortunately, after a very wet start and then a dry spell, crops turned around and overall were pretty good. What did it take to turn around those fields? Fields with healthy soil will had good drainage so water did not pond and rot the seed. Adequate organic matter promoted good soil structure and pores, so that seeds could get air to germinate and grow. Several inches of rain will leached nutrients, but organic matter held a good supply and microbes recycled nutrients once water-logging had ended. A healthy soil was less susceptible to erosion, because organic matter and surface residues protected the soil from pounding rain drops. If your soil did not have those advantages, then more seed rotted. It took longer for crop roots to get air and resume growth. It took more fertilizer to replace what was lost. And, in the end, yields were lower in a less healthy soil. It all adds up. Mark took me to one of his fields with clay soil. Despite all the rain (we walked through puddles in the roadway), the corn still grew well throughout the field and produced full ears. Improving soil health is the first line of defense for combating adverse weather when growing crops. Plus, it is the way we will get our next bump in crop yields.

Books (and several good websites) have been written on soil health, but I would like to share a couple points I think are important, along with some new tools for soil health. First, while fertilizer is for feeding our crops, it is organic matter that feeds the soil. Feeding your soil organic matter will improve all three aspects of soil health (chemical, physical, biological). We feed the soil with manure, crop residues, mulches, cover crops, ag wastes and sometimes non-ag waste products. Rather than trying to raise the soil organic matter percentage, just keep feeding the soil organic matter each year.

Picture 1 – Despite challenging weather and clay soil, you can still get fields to consistently give good yields when you focus on soil health.
Protect the soil surface from rain drops. Rain drops should not fall onto bare soil – that is the beginning of erosion. And it is always the best part of the soil that erodes – high organic matter, nutrient-rich silt and clay. Recently I soil sampled an eroded field. I sampled the soil that eroded off the field at the bottom of the slope. Then I went up slope and sampled the top two inches and also a full eight inch profile in several locations. The results in Table 1 show that the lost soil carried off the field has almost twice the organic matter and calcium as the other two soil samples and much more phosphorus. Potassium is not much different than the whole profile, since it is fairly mobile in soil. *Erosion takes the best soil.* As organic matter decomposes, bacteria and fungi secrete substances that glue soil particles together and give it strength to hold together. This not only prevents erosion, but also prevents crusting and helps maintain pore space. You can keep the soil surface covered with crop residues, sod, cover crops, and winter forages. A simple method to plant rye seed is to add it to the manure spreader in the fall and cover your corn fields. In my cover crop trials with Washington County SWCD, we found that running an aeration tillage tool before or after the manure/seed application improved establishment. If you plan to harvest the forage in the spring, the field should be rolled to smooth it for the harvest machinery. While rye usually does not need tillage at planting, triticale needs aeration tillage or some other way to plant the seed 1 ½” deep for good winter survival.

A layer of organic matter can be a problem for germinating seeds. No-till soybeans covered in corn stalk residue may be completely eaten by slugs. Let’s remember that corn, soybeans, wheat, and other crops are annuals. Their ecological niche is a disturbed environment. That is why I think that row cleaners and variations of “strip-tillage” make a lot of sense. Landview Farms has a one-pass corn planting system that really focuses on soil health. First it takes a gutsy tractor to pull a zone-builder. This breaks up any hard layers so roots and water can go down. During dry spells, water wicks up from the subsoil for roots to get and keep the plant growing. Behind the shank are two disks set to pull soil into a four inch high ridge, followed by a rolling basket for firming. We have tillage in the row, but the soil and crop residues between rows stay in place. The corn planter

<table>
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<th>Table 1. Erosion takes the best soil. Analysis of lost soil and soil left behind on an eroded slope of one field.</th>
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<tr>
<td><strong>Lost Soil</strong></td>
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<td><strong>Organic Matter</strong></td>
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One-pass tillage & corn planting. Zone-builder rips and forms a 4” ridge creating a good surface and subsurface environment for the corn plant.
follows and places the seed in the four-inch ridge, so that it is raised two inches above the field surface. This helps the soil warm up faster and drain better – a good germination environment. Mark told me that this year, the fields that did grow, were all quite even. Fields that did not grow were simply completely flooded. This is risk management by *thoughtful management*, before buying an insurance policy.

It is time to consider how to reduce erosion when we plant hay fields. If primary tillage is not needed to remove ruts or take out compaction, then we should consider a seedbed preparation that will leave some crop residue on the surface to protect it from erosion. A field cultivator, aeration-tillage, or a no-till seeder may be the answer.

Once you have established good tillage and crop rotations to reduce compaction, it is time to seriously consider tile drainage. When you consider our limited land base, your investment in machinery, the cost of inputs, and the wild weather, tile drainage seems like an obvious choice to improve profitability, increase yield, and reduce risk. It is expensive, so one field at a time. Deep-rooted perennials and cover crops will also help you manage the soil profile and should be your first management strategy.

As our cropping systems become more complex, so does the machinery. Penn State has developed a machine that will side-dress nitrogen, apply herbicide, and seed a cover crop at the same time (details at [http://extension.psu.edu/plants/crops/soil-management/cover-crops/interseeder-applicator](http://extension.psu.edu/plants/crops/soil-management/cover-crops/interseeder-applicator)). The purpose is to establish the cover crop early along with other field operations, since time is limited after corn harvest.

Dr. Ketterings, Cornell Univ., has a prototype manure injector for solid manure. A YouTube video is at [http://www.youtube.com/watch?v=V6IHAS4Ng6o](http://www.youtube.com/watch?v=V6IHAS4Ng6o). The purpose of this machine is to prevent runoff of solid manure.

Lastly, Dr. VanEs, Cornell Univ., has developed a soil health test. Rather than just measuring the chemical aspect of soil, test of the physical and biological soil health are evaluated. You can find information of the Cornell Soil Health Test at [http://soilhealth.cals.cornell.edu/](http://soilhealth.cals.cornell.edu/).

For the future, we need consistently high crop yields in the face of wild weather and high expenses. The foundation of any strategy needs to be excellent soil health. Please call me if you have any questions.
Think of Your Neighbors
By Sandy Buxton, Capital Area Agriculture and Horticulture Program

The smell of manure drifted across the local school parking lot and caused a homeowner planning a big event to have a “heart attack” thinking – “have you covered every base to make sure your party is a hit? Did you contact your local farm to have a conversation about what is fast approaching?”

With more and more people becoming further removed from the realities of production agriculture, farmers of all kinds need to realize the importance and value of communicating with their neighbors and the general public.

Some dairy farms have begun a campaign of sending out annual or quarterly newsletters to their neighbor landowners – either by sending to a local zipcode, mailroute, or actual known addresses. The newsletter provides a chance to inform people about what the farm is doing to be a good neighbor. In addition to changes or investments the farm has made, it can also be a chance to provide education about why certain things are happening on farms.

Many people in the general public view farming through a romantic filter feeling everything still looks like Whistler’s picture of a farm couple holding a pitchfork outside a hip roof barn.

Even though a purchaser may sign the paperwork acknowledging their location within an Agricultural District, most have absolutely no idea what that means. Modern agriculture has many other issues that bring them into conflict with rural neighbors.

Lights and equipment allow for machinery operation far beyond the hours of daylight. Sometimes interactions happen near the main farmstead while other situations with equipment, manure or mud on roads may happen miles away. It is important to stop and think regularly about what kind of negative impact might be happening.

Some of the topics that can be issues:
- Chemical drift – pesticides, herbicides,
- Noise – extra hours of equipment operation, bird control,
- Pests – birds, flies,
- Viewshed – junkyard of equipment, piles of used plastic material, aging temporary Structures
- Run-off – manure, silage effluent, mud,
- Animal comfort – in barnyards and for humane treatment
- Odors – manure, burning,

Winter Limestone Application

Applying lime during winter months has some limitations. Regular liming is critical to good crop production in our soils. However, of all of the soil test results, pH is the only one that is consistently below optimum in our annual soil test summaries for Pennsylvania. We need to give our liming programs the same priority as our fertilization and pesticide programs.

A common question producers ask is “When is the best time to lime?” Basically, liming can be done anytime the soil conditions are appropriate for heavy spreading equipment and when the current crop does not limit spreading. However, there are some helpful considerations
for when to apply limestone.

First, lime on a regular basis. If soils are regularly limed so that the pH never gets too low, then the timing of maintenance liming is not very critical. Thus, regular liming provides maximum flexibility to lime when you have time and the conditions are right. In our soils, liming every 3-4 years will usually meet this goal. This also fits with our normal soil testing frequency.

Second, plan ahead. Even very high quality limestone takes some time to react and correct the acidity in the soil. Applying limestone at least 6 months ahead of when the desired pH is needed is a good guideline. This is especially important if the soil pH is very low. For example, if a new alfalfa seeding is planned liming should be considered the year before seeding or at least the fall before seeding.

Finally, consider the soil conditions. The main concern here is compaction from heavy lime trucks. For timing a limestone application within the year, the ideal would be to apply limestone on a dry soil. Another alternative is to apply limestone on a frozen soil to minimize compaction. There are no problems with applying limestone on a frozen soil as long as the limestone stays where it is applied. The main thing here is not to apply limestone on a frozen soil where it might be directly washed off of the field by winter rains or snow melt. This would be sloping fields, especially with little or no cover. Actually, if limestone is applied to a frozen soil or on a dry soil in the fall, there will likely be some shallow incorporation due to freezing and thawing action throughout the winter. This can be helpful in no-till or perennial crops where there will be no tillage to mix the limestone with the soil.

One other issue is that, just like fertilizer and pesticides, limestone must be spread evenly to be effective. This can be a problem for field dumped limestone that might be spread by farmers. First, manure spreaders generally are not very good at uniformly spreading limestone. Also, if these piles freeze, the limestone can be very lumpy resulting in non-uniform application and uneven pH across the field. The bottom line is that liming must be a priority in crop management, and anytime is a good time to lime, including winter, as long as you pay attention to a few important details.

Shelf Life of Silage Inoculants
By: Marvin Hall, Posted: January 6, 2015
http://extension.psu.edu/plants/crops/news/2015/01/shelf-life-of-silage-inoculants

Ways to preserve viability of silage inoculants during storage on the farm.

Some farmers have already or soon will be purchasing and taking delivery of the silage inoculants they will be applying this year. Proper storage of inoculants is crucial to maintaining their viability and effectiveness. The “working parts” of an inoculant are the bacteria that it contains. These bacteria are alive and relatively fragile organisms. Here are two things to remember about keeping bacteria alive and inoculants viable.

1. Excessive heat and moisture during storage decreases viability.
Repeated freeze thaw cycles decrease viability
One simple option is to store inoculants in a refrigerator where they are kept cool and dry but do not repeatedly freeze and thaw.
Preserving Dry Hay Baled at a High Moisture
Aaron Gabriel, Cornell Cooperative Extension

In preparing to give a talk on producing certified organic hay, I was asked to discuss hay additives approved for organic production. I am mostly familiar with propionate-based additives which inhibit mold growth for a few months. Propionate is not approved for organic productions. Other products are approved for high moisture hay harvest (15—25% moisture). These products may contain naturally mined sulfur compounds (sulfites), enzymes, and fermentative bacteria.

I am somewhat of a skeptic on products that promise great benefits (especially when brochures do not explain exactly what they contain or how they work). How are bacteria supposed to be active at such low moistures. What is an enzyme going to do to stop mold growth? So, I spent some time searching for research using these additives for preserving high moisture hay. I found eight research studies. In six of the studies, a clear benefit was observed by using bacterial inoculants and enzymes (as well as the propionate and ammonia used in the comparisons, which are not approved for organic production). In some of the treatments and circumstances, dry matter was retained to a greater degree, bale temperature was cooler, mold spores/dustiness/hay appearance were improved. In one study, dustiness from mold spores was reduced, but they measured chitin (a component of fungal cell walls) to measure mold growth, and found no decrease in mold growth among the control and other treatments. Running an experiment and understanding exactly what is happening and why, can be tricky.

Two of the eight studies found no beneficial effects from hay inoculants, although some of that ineffectiveness was on hay at greater than 25% moisture.

Another study looked at the best place on a round baler to place the spray nozzles for applying the inoculant. They tested in front of the pick-up head, over it, and behind it (just in front of the compression chamber). Best results were observed when the nozzles were at the rear of the pick-up head/in front of the compression chamber.

How do these hay inoculants work? What I have learned is that sulfites bind oxygen and make it unavailable to molds and aerobic bacteria. Enzymes break down cell walls to make the cell contents more available to the naturally occurring (or added) fermenting bacteria. The various fermentative bacteria that may be used (some strains more effective than others), do their job by producing acids that inhibit molds, just like the typical fermentation process.

My thoughts? A lot of hay can be ruined by moisture at baling. These additives have worked when properly used. I do not know anyone using inoculants for high-moisture hay in our region. So, I think we need some demo projects to learn how and when to use these products to save our hard-earned harvest. If you use hay inoculants, or have a applicator and want to try them, please contact me (518-380-1496).