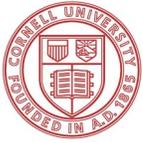


Cornell Cooperative Extension

Central New York Dairy, Livestock and Field Crops



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Winter 2021

Happy New Year!

As I reflect on the past year and more specifically the last 10 months we look at how overwhelming and mentally exhausting our lives have become. Many times, folks look to the New Year for making resolutions. Maybe this year we need to change our mindset and look at creating memories with our family and friends. Continuing to stay grounded and aware of what is most important will see us through to the other side. Take time to be present, whether its with the family or in the barn. Just be present in the moment. Finding time to be present daily will always bring a smile to your face. The sound of the milk pump, smell of feed, or maybe even the sights of stock coming to the bunk after fresh feed was laid down or pushed up. It's the little things we seek in our daily life that make us proud of our heritage and profession. So, be present, enjoy the feeling. Sometimes we are so busy that we need the gentle reminder.

Our team is continuing to work with farms though the same methods we have been utilizing as well as some on-farm visits. Each week, the team has begun sending out a weekly newsletter giving information in a neat package. We hope this will alleviate multiple emails from the team. If you are not receiving this, please let us know!

Finally, by the time this goes to publication, Baby McFarland will be here! Congratulations to Ashley and her husband Adam on the birth of their first child. Ashley will be on maternity leave until Spring 2021. If you have a livestock question, still continue to reach out to the team. We can assist you. If someone cannot answer your question, we will connect you with someone who can.

Wishing everyone a Joyous New Year. Be Well and Be Safe.

Nicole

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How Healthy is Your HR Department?

By: Nicole Tommell, CNYDLFC Farm Business Management Specialist

For many farm businesses, the end of harvest and the weeks leading up to the New Year signify the impending tax season. Accountants, lenders and financial advisors are connecting with farms to assess their current year, review past financial history and plan for the year ahead. Yet many times, all this planning doesn't take into consideration the human resource component of the farm business. Assuring the business is checking all the boxes for the labor side of a business is just as important. Rules and regulations from New York State are ever changing and not maintaining proper paperwork, trainings and other items can create a liability issue for the farm.

Please use the following bullets as a guide to assessing the health of your HR department. Each item will provide a brief description and links to a wealth of resources compiled by the Cornell Agricultural Workforce Development Team.

1. **NY Forward Business Safety Plan** - 2020 brought us COVID-19, the Pandemic and shut-downs all across America. In the summer of 2020, NYS designed a re-opening plan for all businesses. This included essential businesses like farms. The plan was created to help businesses decrease their liability risk due to COVID. A team of Cornell Farm Business Management Educators along with the Cornell Ag Workforce Development team developed a series of webinars, plans and modified safety plans for agricultural businesses. If the business does not have a NY Forward Plan in place information can be found here:

<https://agworkforce.cals.cornell.edu/ny-forward-business-safety-plan/>

2. **NYS Sick Leave Regulation** – January 2020 farm businesses were introduced to overtime pay past 60 hours worked for certain farm employees. January 2021 will usher in minimum sick leave requirements for private businesses which includes farm businesses. All businesses were required to begin accruing hours of sick time beginning September 30, 2020 with official use of sick time beginning January 1, 2021. There are a few caveats to sick time accrual dependent on number of employees and net income. Rich Stup, Cornell Agricultural Workforce created two documents detailing the specifics of this new regulation. It is important to read the original and also the FAQ's from Stup as "The new law has detailed requirements about sick leave that your policy must also meet, including some that you might not expect" (Richard Stup, Ph.D. Agricultural Workforce Development, New York Sick Leave Requirement: What We Know, Still Don't Know, and Action Items).

Original Article can be found at: <https://agworkforce.cals.cornell.edu/2020/09/29/new-york-sick-leave-requirement-what-we-know-still-dont-know-and-action-items/>

Frequently Asked Questions from Farm Employers: <https://agworkforce.cals.cornell.edu/category/compensation/>

Continued on next page...

How Healthy continued...

3. **Paid Family Leave/ Disability Insurance/ Unemployment Insurance** - this was to be in place for January 2020. All farm owners are required to provide each type of insurance to their farm employees. Please refer to this flyer from NYS Department of Labor for more information: <https://www.labor.ny.gov/formsdocs/dipa/p748.pdf>

NY FLFLPA Labor Law Changes from 2020:
<https://agworkforce.cals.cornell.edu/regulations/2019-new-york-flflpa-labor-law-changes/>

4. **Minimum Wage** - December 31, 2020 minimum wage increases to \$12.50 for all employees in NYS except minimum wage employees in NYC and Long Island/ Westchester County. Their minimum wage will now be \$15.00 and \$14.00 respectively.

5. **NYS Sexual Harassment Prevention Renewal Update** - Fall of 2019 and early Winter of 2020 many folks were still scrambling to complete the Sexual Harassment Prevention training to be fully compliant with the NYS mandate from October 2019 compliance date. As farm businesses, we sometimes forget that we need to renew training with our employees. Now is the time to have employees get their training complete for the year. Although COVID makes it difficult to currently have large farm training sessions, there are ways to deliver content with videos and materials that have been previously created by the Ag Workforce Development Team. The materials are in both English and Spanish for the convenience of the farm business. There is a wealth of information again on the Ag Workforce Development website to help navigate through the various steps to document compliance.

<https://agworkforce.cals.cornell.edu/regulations/sexual-harassment-prevention/>

6. **Farm Pay Notice (LS 309)** – The Farm Pay notice is one document that tends to get overlooked. The LS 309 notice is required by law to given upon hire, when there is a pay rate change or change in information. New York has provided an excellent fillable form for employers to utilize. Remember that farm payroll records are required to be retained for six years. NYS does allow a farm to use their own farm pay notice so long as it has all the necessary components however, most use the NYS form. A fillable copy of the NYS LS 309 Pay Notice and Acknowledgment for Farm Workers can be found here: <https://labor.ny.gov/formsdocs/wp/LS309.PDF>

7. **Required Notifications for Agricultural Employers** - Each farm business must have a series of posters clearly displayed in common areas. Check out this link to determine which posters are applicable to your farm business.

<https://labor.ny.gov/immigrants/agriculture-labor-program/services-for-agriculture-employers/required-posters-for-agricultural-businesses.pdf>

There are so many moving parts to the human resource component of the farm business that it can be overwhelming to maintain compliance. The Cornell Agricultural Workforce Development website is a convenient place to find up to date information in an easy to use format. Take a moment and subscribe to the Ag Workforce Journal to receive news about important labor related topics and seminars. The journal will be a key to keeping human resource compliance at the farm level up to date. So, join today! <https://agworkforce.cals.cornell.edu/>

Better Genetics Pay at the Feedyard

By Larry Stacup, *Beef Magazine*
(reprinted from 2/13/20 *Beef Magazine*)

The better the genetics, the more the profit potential. That's what Cactus Feeders has learned from historical data on hundreds of thousands of cattle, which allows the feeding company to closely project the value of cattle headed to one of its 10 feedyards.

Justin Gleghorn, Cactus Feeders director of value management at the company's Amarillo, Texas, headquarters, outlined the benefits of feeding better quality cattle during his presentation to ranchers and stocker operators at the recent Southwest Beef Symposium in Amarillo.

"Cattle with a good brand of genetics usually work better at the feedyard," he said.

Cactus regularly ships about 20,000 fed cattle per week from its feedyards in Texas and Kansas. Close to one out of every 25 head fed in the U.S. is from a Cactus yard. Its database includes steers and heifers, native cattle, those with a Mexican origin, multiple weights and high- and low-risk animals.

Deliberate genetic focus results in quality boost

Detailed records enable Cactus to project breakevens for all cattle. "We don't determine success of an animal by its average daily gain," Gleghorn said. "We look at what we paid for it and how much we spent for every day it was on feed.

"With our historical data, we can typically put value on cattle and develop a breakeven. From that projection, we can hedge them and determine what we can pay for them."

David Anderson, Texas A&M AgriLife Extension livestock marketing economist, points out that a ranch's reputation for producing quality calves gets around – and can lead to better prices. "Feedlots look for cattle that have better feed efficiency in the feedlot," he said. "Also, calves that don't get sick are worth more.

"When a cattle feeder knows who produces those calves that are feedlot profitable, there will be demand for that ranch's calves. That produces premium prices over everyone else.

"Those strong genetics get proven in feeding through repetition. To get those better prices may involve the rancher and feeder getting together to make a deal based on evidence."

Better calves will also bring better-than-average prices at a market. "But again, information has value and being able to communicate that to buyers has value through premium prices," Anderson says.

Gleghorn says Cactus works to sort cattle with the better genetics to assess what they can do at different weights. "They usually have better uniformity, which makes it easier to predict how they will perform and grade," he says. "Cattle that are more plain have more variability and are harder to project."

Genetic potential has helped cause an increase in hot carcass weight. Carcass weights were about 700 pounds in 1974 compared to about 900 pounds now. "Carcasses are above 70% Choice now, compared to about 35% Choice 20 years ago," Gleghorn says. "That goes back to more genetic potential."

Gleghorn said the value of higher-quality cattle was highly illustrated the last half of 2019, when the Choice-Select spread took a wide turn upward from the five-year average.

The spread had been in the \$3-\$6 range until mid-June, when it was near \$20. But while the spread has typically narrowed from June through mid-November, it widened substantially.

Continued on next page...

Better Genetics continued...

It approached \$25 by July, compared with about \$15 for the norm. By mid-August, it was near \$28, compared to about \$12 for the five-year average. In mid-October it pushed \$29, compared to about \$13 for the norm. The spread remained above \$20 from mid-June through Dec. 1.

AgriLife Extension notes that there is no way to guarantee cattle will always bring top market prices, but with proper management and marketing procedures, discounts can be prevented.

AgriLife suggests that ranchers produce the kind of calf that is in demand, use management practices that will prevent discounts and spend ample time marketing the calves they worked all year to produce.

“I think it has to start with a herd that is well fitted to its environment and conditions,” Anderson says, “a cowherd that is developed to maximize ranch profits — productive, high weaning rates, low winter feed costs, good weaning weights, etc.

“To realize the value of higher grading cattle, the rancher may have to own those cattle through finishing, or partner in the feeding, while selling on a grid. Cattle with high feed efficiency may not be the same ones that grade the best. There are tradeoffs that require some analysis of what cattle are most profitable at the ranch, feedlot and packer.”

Anderson says there is value to good genetics, “but we ought to think about our production system and what genetic traits are most profitable to select.

“It’s a real balancing act across all those different values,” he says. “Part of our problem is that the market signals across all those segments aren’t always very clear.”

Gleghorn stresses that animal health issues are higher with cattle that are not on a vaccination program. “We don’t see a lot of issues with cattle on a good vaccination protocol,” he says, but issues can also unexpectedly hit cattle with better genetics. “We’re seeing more BRD in low-risk cattle and working to find out why.”

Original article: <https://www.beefmagazine.com/feedlots/better-genetics-pay-feedyard>



A ranch’s reputation for producing quality calves gets around -
and can lead to better prices.

Soybean Cyst Nematode: The Greatest Threat to NY Soybean Production is Here to Stay. Now What?

By J. Cummings, K. Wise, and M. Zuefle, NYS Integrated Pest Management Program;
E. Smith, M. Hunter, M. Stanyard, A. Gabriel, K. Ganoë, J. Degni, J.L. Putman, K. O'Neil, J.A. Putman, J. Miller,
and M. Lund; Cornell Cooperative Extension
M. Dorgan, NYS Department of Agriculture and Markets

The soybean cyst nematode (SCN) is the number one pest of concern in U.S. soybean crops, causing an estimated \$1.5 billion in annual losses. Considered a 'silent' yield-robber, SCN can cause 10-30% yield loss without any obvious, above-ground symptoms. SCN hadn't been considered a pest of concern for NY soybean growers before it was first confirmed in Cayuga County in 2016. Even then, it wasn't a priority consideration. However, based on recent findings, NY soybean (and dry bean) growers can no longer afford to ignore this threat.

The NY State Integrated Pest Management Program, in collaboration with Cornell Cooperative Extension field crops specialists, and funded under a grant from USDA-APHIS Plant Protection Act section 7721 administered by NY State Department of Agriculture and Markets, coordinated a statewide SCN survey in 2019 as part of a soybean commodity survey to test 25 fields. This testing revealed an additional six counties with fields positive for SCN. Those results prompted a continuation and expansion of a SCN survey in 2020 with additional funding from the NY Soybean Checkoff dollars to provide testing for 100 fields statewide. The 2020 survey identified an additional 22 counties with fields positive for SCN. These surveys, along with shared observations from individual testing efforts have now confirmed SCN in a total of 30 counties across NYS, and it is safe to assume that SCN will likely be identified in all soybean producing counties in NYS with continued testing in future years.

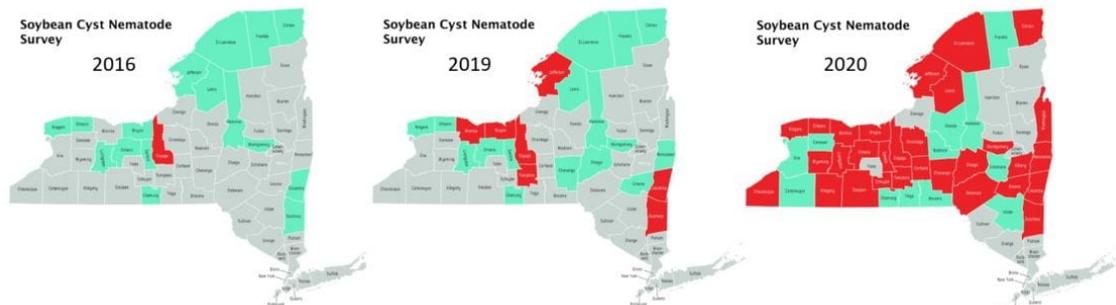


Figure 1. The progression of confirmation of the soybean cyst nematode throughout NY State. Counties shaded in green had fields tested with negative results, and counties shaded in red have at least one field confirmed positive for soybean cyst nematode. (All testing was conducted by the SCN Diagnostics Laboratory at the University of Missouri in 2019 and 2020)

Now that we know that SCN is here, and is widespread across NYS, what's next? Unfortunately, eradication is not an option, but reduction and maintenance of low populations is. Management strategies depend on SCN population levels, which can vary significantly from field to field. Regular testing for this nematode will help you determine your best plan of action for management. Fortunately, most of our positive SCN detections have been in the "low" category, but we found four fields with "moderate" levels and one field with "high" levels of SCN. For reference, based on test results (according to University of Missouri SCN Diagnostics Laboratory), "An egg count of <500 eggs is considered low. An egg count of 500-10,000 is considered moderate. An egg count >10,000 is considered high". Those egg counts are based on what they find in one cup of soil. Finding a field in NYS with an egg count of 20,000 was quite surprising this year, and it translated to measurable yield loss for the grower. This means we can't afford to ignore this pest, and we need to start actively managing SCN before our "low" results all become "high" results.

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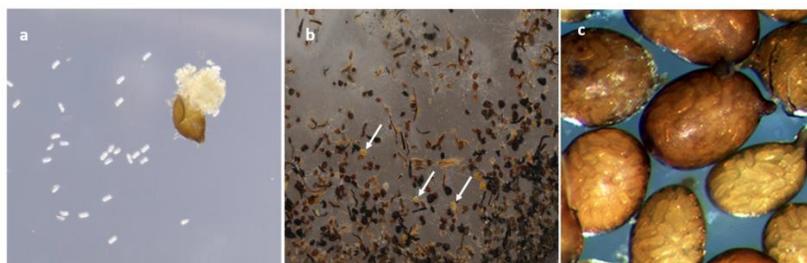
Soybean Cyst Nematode continued...

Figure 2. Female SCN nematodes produce ‘cysts’ on soybean roots, which contain the eggs (a). These cysts, when dislodged from the roots, are distributed within the soil (b). The cysts contain approximately 200 eggs each (c). (Images courtesy of G. Yan, S. Markel and E. McGawley, via the SCN Coalition)

It’s much easier to stay ahead of this pest than to try to manage high numbers. Fortunately, our number one management strategy is crop rotation. Once you know you have SCN in a field, the worst thing you can do is grow soybeans continuously. We are lucky to have a number of non-host crops available for rotation, including corn, small grains, clover, alfalfa, and forage grasses. Studies have shown that a one-year rotation to corn may result in up to a 50% reduction in SCN populations the following year. The next best option for managing SCN is by selecting and planting SCN-resistant soybean varieties, and rotating those varieties that you plant. More on that later. For dry beans, however, resistance is not an option, and rotation is even more critical. The third management option is the use of nematode-protectant seed treatments. There are a number of these products available, and most have shown promising results. However, those seed treatments will be most cost-effective in situations where there is high SCN pressure. So, for the vast majority of acreage in NY, based on our current survey results, the seed treatments can be an expensive option with limited benefits for many of our growers. But, that may change as SCN testing expands and we find more moderately to highly infested fields. Of course, an integrated pest management (IPM) approach will provide the best management results, by combining all available management tools.

It's impossible to talk about SCN management without mentioning resistance. I said previously that you should consider selecting and planting SCN-resistant varieties, and that you should rotate those varieties. Unfortunately, SCN has been evolving and developing resistance to the traits most commonly available in commercial soybean varieties for decades. Slowly, SCN has developed different races that can overcome the resistant soybean varieties. This pest is highly adaptable. That’s why it’s important not to plant the same soybean variety, even if it’s labeled as ‘resistant’, in the same field repeatedly. Similar to chemical modes of action (like herbicides), it’s critical to rotate your tools to avoid, or minimize, resistance development. For more information on this topic, please visit the SCN Coalition website, where they have an abundance of resources available on this topic. Luckily, a number of major seed companies have soybean varieties in the pipeline with novel sources of SCN resistance, and we look forward to the new options.



Figure 3. SCN cysts are tiny, but can be seen on soybean roots with or without magnification. Much smaller than nodules, the cysts appear as whitish-yellow specks along the roots. (Images courtesy of G. Tylka via the SCN Coalition)

Moving forward, we hope to continue providing statewide SCN-testing services to growers through funded surveys. Please contact your local Cornell Cooperative Extension specialist if you suspect you might have SCN on your farm. Continued monitoring through testing will help us understand our populations of SCN, to help make the best management decisions. Let’s work together to maintain mostly low to moderate populations of this potentially devastating pest.

Additional Resources and Related Articles:

[Soybean Cyst Nematode Now Confirmed in Six Additional Counties in NY](#), [Soybean Cyst Nematode Now Confirmed in NY](#), [Sudden Death Syndrome and Soybean Cyst Nematode in Soybeans](#), [Fall is the Time to Test for Soybean Cyst Nematode](#), [SCN Coalition website](#), [Cornell’s SCN Web Page](#), [Soybean Cooperative Agricultural Pest Survey: Vigilance Against Potentially Invasive Species](#)

Cold Stress: Reduce and Prevent

By Margaret Quaassdorff, AG Focus January 2019

With temperatures dipping into the single and double digits below zero in the months to come, dairy producers should consider the effects of cold stress, and be prepared to reduce the effects of cold weather conditions on calves, youngstock, and cows.

Calves and Youngstock

Calves entering the world go from a warm wet environment of 101.5 - 103 degrees Fahrenheit (body temperature of the cow) to the ambient winter temperature of the calving pen. Think about how it would feel to walk straight out of the shower in the morning, and out of the barn with no towel. (Just to be clear, I'm not recommending this, but if you need to drive the point home for yourself, try it on your own time.) In single digits, calves can easily freeze, or die, within minutes in these conditions. To ensure the survival of calves, move the calf to a warming box, and assist in drying and fluffing the hair with a towel, as well as make sure colostrum is warmed and ready for new calves to ingest as soon as possible. If a calf's body temperature drops below 100°F, it is in immediate danger, and needs to be warmed immediately.

Cold stress for calves less than three weeks of age can start at temperatures as high as 60°F, and 42°F for calves older than six weeks of age. Most January temperatures are well below these markers. To ensure calves maintain body temperature and continue adequate growth consider the following:

- Bed calves deeply with straw. No feet or legs should be showing when they are laying down. Kneel down in the area where the calves lay. If your knees get wet, then it is too wet for calves as well.
- Calf blankets are a great investment in that they are reusable and provide an extra layer of protection and warmth for pre-weaned calves. (Make sure the calf is dry and the hair is fluffed before putting a blanket on.)

- Proper ventilation is important, but tricky. Prevent direct drafts on calves, but set up adequate air exchange to reduce pneumonia-causing airborne pathogens, and ammonia from urine and manure buildup. Seek advice from professionals and other resources if need be.
- Talk with your nutritionist about increasing caloric intake when on milk, or include an additional feeding per day to maintain proper energy intake.
- Don't forget warm water! Providing warm water keeps calves hydrated, as well as promotes higher starter intake.

Mature Cows

It is important to keep mature cow housing dry and free of manure. If the cow and teats remain dry and out of direct winds and draft, most lactating cows in decent health should withstand cold conditions. Make sure teat dip has dried for at least one minute before allowing cows to go back to the barn, or out to a dry cow area. Prevention of chapped teats and frostbite is key to maintaining the health and performance of lactating cows. A chapped or frostbitten teat is much more susceptible to allowing infection into the udder, and the risk of bacterial mastitis is increased due to damaged teat ends. Teat dipping should be a practice that is continued during cold weather, but it may be beneficial to change teat dips to a winter formula that includes skin conditioners. Prevention is key, as the treatment of a chapped and frostbitten teat is difficult.

Stay warm out there everyone! Most importantly, take care of yourself so that you may best take care of the animals.

Looking at Leases: Part 2 (of a 3 part series)

By Anna Richards, PRO-DAIRY, May 2018

Liability Risk Management

A written lease can help secure land access and lease terms with outside landlords, but many are unaware of how a lease can help manage liability risk. Between operating activities that come with higher than average risk, and large land bases that have high values, liability protection is an ever-growing concern for farm businesses. Without proper planning and documentation, a minor accident could leave a farm vulnerable to a costly, or even crippling, lawsuit.

A popular strategy to mitigate liability risk on farm operations is to separate land ownership from operations. Operating assets that have a higher liability risk, such as cows, equipment, vehicles, and employees, are kept in one entity, while the majority of the land ownership is either owned in one or more separate entities, or by individuals. This method has become common practice among dairy farms. For this protection to be maintained, however, it is crucial that the two entities demonstrate that they are truly separate businesses, and operate independently of each other.

A good litigation attorney will attempt to “pierce the corporate veil” in a lawsuit, meaning that they will attempt to argue that the two entities are “one and the same,” said Steve Walker, an attorney with Scolaro, Fetter, Grizanti & McGough PC, who specializes in agricultural businesses.

If this argument is successful, then the land will be brought into the lawsuit and the equity in the land can be tapped into. In a lawsuit the suing party wants to find the deepest pockets. Therefore, a well written lease is the first step to establish the separate identities of the two entities and to show that “corporate formalities” are respected.

Cash Flow Management

Beyond just having a written lease in place, the way money is managed between the entities is also important. The land holding entity or individual has certain cash flow needs, including property taxes, and possibly debt payments. This entity or individual should maintain its own checking account, and rents should be paid from the operating entity to the land owner, rather than the farm paying those expenses directly.

This is particularly true with respect to the debt payments, Walker said. If the entity (or individual) that owns the land doesn't make debt payments because it is servicing debt out of the milk check, then a future disgruntled exiting member of the operating entity or heirs, in the event of a death, can argue that they own a portion of the land, since they helped make payments on the land out of the milk check. The solution is to pay rent so that the owner of the land has the cash to service the debt.

The exception to this payment rule is certain property taxes if applicable, as addressed in Looking at Leases: Part 1.

This three-part series can be found on the Cornell Pro - Dairy Farm Business Management website.

<https://cals.cornell.edu/pro-dairy/our-expertise/business/business-resources>

Original article: <https://cals.cornell.edu/pro-dairy/our-expertise/business/business-resources>

Are Persistent Biocontrol Nematodes (Entomopathogenic) an Economic Benefit?

By Elson Shields and Tony Testa, Dept of Entomology, Cornell University, Ithaca

What are Biocontrol Nematodes?

Biocontrol nematodes are microscopic round worms in the soil which only attack insects in the soil or on the soil surface. Biocontrol nematodes are different from the plant parasitic nematodes which attack crops. The biocontrol nematodes discussed here are native to our Northern New York (NNY) soil where they were original collected. The nematode insect infective stage (called the Infective Juvenile or IJ) moves about in the soil in search of insect hosts, finding the insect using CO₂ gradients and other chemical attractants. When an insect host is located, the IJ enters the insect through a breathing opening called a spiracle and enters the insect body cavity. Once inside, the nematode releases a bacteria which kills the insect. The nematodes then molt to adults and produce offspring on the nutrition provided by the dead insect. When the insect resources are consumed, a new set of IJs are released into the soil to search for additional insect hosts. An average sized insect larvae will produce between 100,000 and 200,000 new IJs.

What do these biocontrol nematodes attack?

This entire technology was developed to reduce snout beetle (ASB) populations to sub-economic levels in NNY. ASB is costly to the dairy farmer, commonly killing alfalfa stands in a single year. The economic costs of ASB on dairy farmers is very high and often hidden. Dairy farms are impacted by the high cost of replacing alfalfa fields and the high cost of purchasing replacement feed to replace the loss of alfalfa production. Estimates of these dual costs exceed \$30,000 per 100 cows on the farm annually. To date, more than 150 NNY farms have applied biocontrol nematodes to >25,000 acres to successfully reduce snout beetle to a sub-economic level and increase stand life back to 3-5 years.

Corn Rootworm: During the research developing the use of native persistent biocontrol nematodes to reduce ASB populations in NNY to sub-economic levels, it was discovered that biocontrol nematodes applied in alfalfa for snout beetle control also carryover to attack corn rootworm when the field is rotated to corn. Not only are the biocontrol nematodes completely compatible with all of the Bt-RW traits, killing the Bt toxin survivors, but in NY, the biocontrol nematodes appear to be

capable of being used alone if the farmer chooses to grow non-Bt-RW trait corn. Research has shown that after 4 years of corn, the populations of biocontrol nematodes in the field are high enough to attack alfalfa soil insects when the field is rotated back to alfalfa.

Wireworm and White grubs: Since NY alfalfa culture usually incorporates grass into the mix, NNY fields usually have a population of wireworms and native white grubs in the field when the field is rotated to corn. Often, these insects then cause stand problems in 1st year corn. If the field has been inoculated with biocontrol nematodes for control of either snout beetle or rootworm, the biocontrol nematodes also attack these insects and reduce their impact on seedling corn when rotated to corn.

Seed corn maggot: With our corn and soybean insecticide seed treatments under attack, the questions arises whether biocontrol nematodes present in the soil will be effective against seed corn maggot under NY spring conditions. Seed corn maggot is killed by biocontrol nematodes in the laboratory, but the question is whether the biocontrol nematodes can work fast enough in the field under the cool spring soil temperatures.

Does the soil type influence the species of biocontrol nematode applied?

NY research data indicates a mix of biocontrol nematode species gives better control of soil insects than a single species alone. The reason for these results is each nematode species has a preferred section of the soil profile where it is most effective. For example, *Steinernema carpocapsae* prefers the top 2-3" of the soil profile and dominates this region. If *S. carpocapsae* is the only nematode used, insect larvae below the 2" level escape attack. The addition of a second nematode species which prefers the low portions of the soil profile compliments the presence of *S. carpocapsae* and gives more complete control of soil insects throughout the plant root zone.

Continued on next page...

Persistent Biocontrol Nematodes continued...

If *S. carpocapsae* is the only nematode used, insect larvae below the 2" level escape attack. The addition of a second nematode species which prefers the low portions of the soil profile compliments the presence of *S. carpocapsae* and gives more complete control of soil insects throughout the plant root zone. In sandier soils, the top 2" often become too dry for a biocontrol nematode to move and attack insect larvae. In these soils, a nematode species mix which include *S. carpocapsae* would be ineffective and requires a different mix of nematode species.

Our recommendations for biocontrol nematode species mixes for soil types:

- Clay loam – silt loam soils: *S. carpocapsae* + *S. feltiae*
- Sandy loams – sand soils: *S. feltiae* + *Heterorhabditis bacteriophora*.

What are the differences between the entomopathogenic (biocontrol) nematodes purchased on the web from the Persistent NY strains mentioned here?

Biocontrol nematodes purchased from commercial sources have lost the ability to persist in the soil after application for a significant length of time. Many commercial strains persist in the soil for only 7-30 days and require application timing to be closely match with the presence of their target host, requiring an annual reapplication. In contrast, the NY persistent strains of Biocontrol Nematodes are carefully cultured to maintain their evolutionary ability to persist across hostile conditions such as the lack of available hosts and temperature extremes (dry soil conditions, winter). Additionally, NY persistent strains are re-isolated from the field every two years so the nematode cultures do not become "Lab strains", but remain adapted for NY agricultural soil conditions. New York persistent strains are applied once and persist in the field for many years following application. Not surprising because they were isolated from NY soils where they have evolved for a few million years. If the NY persistent strains are cultured carelessly, they also quickly lose their ability to persist and are no better than the commercial strains purchased off the web.

How are biocontrol nematodes applied?

There are two major ways to apply biocontrol nematodes to NY fields.

Commercial Pesticide Sprayer: Thousands of acres have been inoculated using slightly modified pesticide sprayers of all sizes from 30' booms to 100+' booms. To use these sprayers, the following guidelines need to be followed.

1. A good washing of the sprayer (similar to changing pesticides)
2. All screens and filters removed (nematodes cannot pass through them)
3. Nozzle change to a stream type nozzle to shoot a concentrated stream of water to the soil surface through any vegetation.
4. 50 gpa minimum
5. Application in the evening or under cloudy/rainy conditions (nematodes are sensitive to UV)

Liquid Dairy Manure: This method was recently developed and offers some advantages over using a pesticide sprayer. The biggest limitation is the time between adding the nematodes to the liquid manure and field application. After adding the nematodes to the manure, the manure needs to be spread in the field within 20-30 minutes. Longer intervals results in the nematodes dying from the lack of oxygen.

The advantages of using liquid dairy manure as the carrier are 1) no extra trips over the field, 2) can be applied any time of the day and 3) no extra costs.

Application timing:

Biocontrol nematodes which are persistent, can be applied anytime during the growing season when soil temperatures are above 50 F. Ideally, nematodes should be applied when there are host in the soil so they can immediately go to work and reproduce. However, the NY persistent strains have the ability to sit and wait for months before needing to attack hosts and reproduce. We request that no nematode applications be made after September 15th due to cooling soil temperatures and limited time to find hosts before winter. Applications are made to the soil surface under conditions of low UV exposure (late in the day, rainy/overcast days, in cover crops where there is adequate ground shading). Field tillage has no impact on biocontrol nematodes. In addition, if nematodes are applied before field tillage, the movement of soil during tillage helps the nematodes redistribute throughout the field and help them fill in the gaps which may occur during application.

Where can I get Biocontrol Nematodes which are adapted to NY and will persist across growing seasons?

Currently, there are two sources to purchase biocontrol nematodes adapted to NY growing conditions with their persistent genes intact to persist across growing seasons (and winter) in NY. Mary DeBeer, Moira, NY. cell: 518-812-8565 email: md12957@aol.com Shields' Lab, Cornell University: Tony Testa email: at28@cornell.edu cell: 607-591-1493

Older Cows Are More Profitable

By: David R. Balbian, CNYDLFC Area Dairy Management Specialist

It's not uncommon for dairy producers and their advisors to discuss culling rates and how many heifers need to be raised to maintain or grow the milking herd. The conversation at times leads to discussions about how long it takes a first calf heifer to pay for herself. In other words, how long does she need to be in the milking herd to pay for her rearing costs?

Many variables come into play here. There have been times when market prices for dairy replacements were very similar to typical dairy cull prices. That is a rare occurrence. That is not to say that those replacement prices reflected the cost to raise those animals. They did not. A recent study published by Karszes and Hill (published in August of 2020) at Cornell showed that the total investment for dairy replacements entering the milking herd for 26 above average herd size farms was \$2,505. This included a value of \$150 placed on a heifer calf entering the heifer raising program. This total cost may seem high to many people but it includes some costs that many people do not consider, such as labor, building depreciation, interest on the investment in these animals prior to them entering the milking herd, and non-performance expense. Non-performance covers the expense of raising heifers that die or are culled.

Today there is certainly a variety of approaches herds take when it comes to their replacement program and lactating herd culling protocols. One thing is certain. Our older cows (3rd and greater lactation) typically make more milk than their younger herdmates. Even though we normally expect our younger animals to have greater genetic potential, our older cows are not putting nutrients into growth and because of their size advantage, their feed intake potential is much higher. Both of these factors increase their milk production potential when compared to their younger herdmates. A quick and dirty rule of thumb goes like this. We expect our 2nd lactation animals to produce around 10 lbs. more milk/cow/day than 1st calf heifers. We also expect our 3rd and greater lactation cows to produce around 10 lbs. more milk/cow/day than our 2nd lactation cows. This of course assumes that the comparisons represent groups of animals with similar average days in milk.

From an economic standpoint, we can safely assume that these older cows are generating greater economic returns than younger cows if their daily milk output conforms to typical expectations. There is no doubt that achieving high levels of milk output per cow per day across the herd is much more difficult when 50% of the herd is made up of 1st calf heifers. The questions I want to pose are as follows. Can you increase the percent of cows in your herd that are 3rd lactation and greater without holding on to problem cows and lower producing cows? How can you manage your lactating cows so that the makeup of your herd includes a greater proportion of older cows that remain healthy and productive?

If your herd is not in a growth mode and your 1st calf heifers make up more than 35% of your total herd (milking & dry) it is time to ask yourself why. If you need all of those heifers to maintain your cow numbers, what is going on with your cull cows? What are the primary reasons they are being culled? Is it repro? Is it mastitis? Is it foot & leg problems? Zero in on the main culprits and determine if improvements can be made. An older cow making 90 lbs. of milk/day will likely generate greater returns than a 1st calf heifer making 70 lbs. of milk/day.

Services Available to You

As we continue to navigate through these unprecedented times, the CNYDFLC team would like to offer you a list of services that may be of help to you. Remember, our entire team is only a phone call, email or video conference away. Please do not hesitate to contact us if a need arises, we will do our best to assist you in the ways previously mentioned.

New York State Department of Health: <https://www.health.ny.gov> 1-888-364-3065

County Offices:

Chenango: 607-337-1660 <https://www.co.chenango.ny.us/mental-hygiene-services/behavioral-health-services/>

Fulton: 518-736-5720 <https://www.mentalhealthassociation.org>

Herkimer: 315-867-1176 <https://www.herkimercounty.org/services-and-departments/mental-health.php>

Madison: 315-366-2361 <https://www.madisoncounty.ny.gov/1534/Mental-Health-Clinic>

Montgomery: 518-853-3531 <https://www.mentalhealthassociation.org>

Otsego: 607-547-4200 https://www.otsegocounty.com/departments/mental_health/index.php

Saratoga: 518-584-7460 <https://www.saratogacountyny.gov/departments/mental-health-center>

Schoharie: 518-295-8365 <https://www4.schohariecounty-ny.gov/departments/community-services>

Prevent Worker Exposure to Coronavirus (OSHA): 1-800-321-6742

<https://www.osha.gov/Publications/OSHA3989.pdf>

Center for Disease Control COVID-19: 1-800-232-4636

<https://www.cdc.gov/coronavirus/2019-nCoV/index.html>

NY FarmNet: 1-800-547-3276, <https://www.nyfarmnet.org>

Farm Stress Management page: <https://www.nyfarmnet.org/farm-stress>

National Suicide Prevention Lifeline: 1-800-273-8255

<https://suicidepreventionlifeline.org/>

NYCAHM: <https://www.nycamh.org/> **Farm Partners:** 1-800-343-7527

USDA (Farm Service Agency): <https://www.fsa.usda.gov>

County Offices: **Chenango:** 607-334-3231

Fulton/Montgomery: 518-853-4031

Herkimer: 315-866-2520

Madison: 315-824-9076 ext 2

Otsego: 607-547-8131 ext 2

Schoharie: 518-295-8600

Saratoga: 518-692-9940 ext 2

NYS Ag and Markets: 1 800-554-4501

<https://agriculture.ny.gov>

US Small Business Administration (Disaster Relief Program): 315-471-9393

<https://www.sba.gov/page/coronavirus-covid-19-small-business-guidance-loan-resources>

FDA Food Safety:

<https://www.fda.gov/food/food-safety-during-emergencies/food-safety-and-coronavirus-disease-2019-covid-19>

Empire State Development: <https://esd.ny.gov>

The Importance of Colostrum Management

*By Dr. Cassandra Plummer, DVM, Small Ruminant Veterinarian,
Iowa State University College of Veterinary Medicine*

As we find breeding season winding to a close it is time to start making preparations for lambing season to begin. When preparing for lambing, one thing to consider is your plan for colostrum management. How are you going to get colostrum into your lambs? What if a ewe doesn't have colostrum? How will you handle orphan lambs or bottle lambs? All of these things need to be considered prior to the start of lambing.

To start out with, what is colostrum? Colostrum is defined as the first milking after lambing and contains high levels of antibodies to provide a source of immunity to the lamb. All lambs are born without a functional immune system and it takes about 30 days for their immune system to become fully functional. During that time, they rely on the antibodies from their dam that they receive through colostrum to help protect them from infections. During the first 24 hours of life the lamb is able to absorb antibodies from the intestinal tract, however the absorption starts to decline after about 12 hours. After the initial 24 hours, the intestinal tract no longer allows absorption of antibodies. Without colostrum being consumed during the first 24 hours, the lamb will have very little immune function, and therefore will be highly susceptible to infections. As you can see, colostrum plays a vital role in the health of your newborn lambs.

Nature's method for a lamb to get colostrum is to suckle the colostrum from their dam. There are several important things to think about here. Is the lamb able to suckle? Is it able to stand and find the teat? Is there colostrum in the udder? Do the teats work? Another thing to check is if there are plugs in the ends of the teats. In some ewes there are plugs that form in the ends of the teats to help prevent the colostrum from leaking out prior to lambing. Sometimes these plugs can be hard for the newborn lamb to remove via suckling. It is a good practice when you have a ewe that has just lambed, to check her udder, make sure there is

colostrum in the udder and strip a couple drops out of each teat to make sure that there are no plugs present and that the teats are functional. Also, as we increase prolificacy and see a higher number of triplets and quads, we need to consider if the ewe has enough colostrum for all of her lambs. With a set of triplets or quads, you may need to consider pulling 1-2 lambs for bottle raising, as well as to ensure adequate colostrum intake for all the lambs. Not all ewes will be able to produce enough colostrum to supply 3 or 4 lambs. Then the next step is going to be to observe the lamb for suckling and making sure that it is filling its belly.

If you have determined that a lamb is unable or unwilling to suckle its dam, then you may need to intervene to ensure that that lamb gets adequate colostrum. First we need to consider where we are going to get the colostrum from. We have several possible sources to consider. The best source of colostrum is from the lamb's ewe. If the issue is a weak lamb that is unable to suckle or stand, then consider milking the ewe out for some colostrum and feeding that to the lamb. If the ewe's colostrum supply is the issue then we will need to consider a colostrum donor. When looking at a colostrum donor, your best donor will be older animals that have lambed previously because they will produce higher quality colostrum than nulliparous ewes. Another thing to consider is the health status of your donor. There are several diseases that can be spread through colostrum such as OPP, Johne's, and mycoplasma.

Continued on next page...

Importance of Colostrum continued. . .

Therefore, if you know the health status of your ewes, it is important to select a colostrum donor that is negative for these diseases if possible. If you do not have access to ewe colostrum, then goat or cow colostrum are good alternatives. If you have a dairy down the road, they may be willing to give you some colostrum from their cows or goats. With cow or goat colostrum, you do still need to be concerned about disease transmission. Disease's such as Johne's disease can be transmitted to sheep through cow or goat colostrum. In regards to disease transmission, there are heat treatment protocols for colostrum that are practiced in some cow and goat dairies. Heat treatment of colostrum decreases the risk of disease transmission through colostrum and may be something to consider in valuable animals with any donor colostrum whether ewe, goat, or cow colostrum.

Once you have colostrum, we need to consider colostrum storage if the colostrum is not going to be used immediately. Colostrum can be stored in a standard refrigerator if it is going to be used within 24 hours. If it is going to be over 24 hours before it is used, then it is recommended to store colostrum in the freezer. Prior to freezing, colostrum should be double-bagged in freezer bags and labeled with the donor's ID, date of collection, and any disease status information that you have. Once frozen, colostrum can be stored in the freezer for up to 1 year. When feeding colostrum to a newborn, it is recommended to warm the colostrum to body temperature. Therefore, stored colostrum will need to be warmed prior to feeding. The recommended method to thaw frozen colostrum and warm colostrum is to place the bags or bottles in lukewarm water. Do not heat colostrum in the microwave or use hot water. These methods will destroy all of the important antibodies in the colostrum.

Now that we have colostrum and have it warmed up, we need to consider how to get that colostrum into the lamb. The best method to get the colostrum into the lamb, aside from suckling from their dam, is via a bottle. The act of suckling increases the antibody absorption. There are several different lamb nipples available and each lamb has their preferences. We find that that the Prichard nipples are the nipples they are most likely to suckle, but if the lamb won't suckle from a Prichard nipple it is worth trying another style nipple. Ideally we want to get 10% body weight of colostrum into a lamb in the first 12-24 hours. Therefore for a 10 pound lamb, we would want to get approximately 16 fl. oz. of colostrum into them in the first 12-24 hours. Of course this needs to be spread out over several feedings. While the bottle is best, if a lamb has not taken any colostrum within 2-3 hours of birth, we recommend tubing them with several ounces of colostrum and trying the bottle again at the next feeding.

As you can see, colostrum management is an important factor in the overall health of your lambs. Research has shown that failure of passive transfer from lack of colostrum intake has long-term effects. Research in cows and sheep has shown decreased average daily gains and increased mortality in feedlots associated with failure of passive transfer. Ensuring adequate colostrum intake in your lambs will increase the overall health of your lambs and the added work will pay off with lots of healthy lambs.

Horizontal Silo Feedout Safety Protocols

By James Carrabba, Agricultural Safety Specialist, NYCAMH

Removal of feed from a bunker silo or a drive over silage pile is a daily task on the farm that has a lot of potential for serious injuries. The dangers include falls, engulfments, run-overs and entanglements, which can result in serious injuries or death. There have been cases where feeders have fallen from the leading edge of a silage face and dropped 15 to 20 feet to the concrete pad below. Another very serious safety hazard is silage face collapse which can happen without warning. Even the most meticulously maintained silage faces can collapse suddenly. Unfortunately, for producers, there are no universal industry standards that can be referred to for horizontal silo feedout safety. The following list summarizes key safety guidelines that could be followed to ensure safety in a silage feedout program.

Initial Filling and Packing

- To prevent overfilling, horizontal silos need to be adequately sized for the amount of silage to be stored.
- If the silo has walls, inspect the integrity and condition of the walls prior to filling.
- Develop written safety protocols for horizontal silo feedout safety and train workers on the protocols periodically. Document all training sessions with a sign-in roster.
- Silage should be packed in a progressive wedge shape. Packing tractors should aim for spreading and packing silage in 4-6 inch layers to achieve proper packing pressures. Silage that is properly packed in this manner may be less prone to face collapses during feedout.
- To prevent overhang conditions, silage should never be piled higher than the reach of the unloading equipment.
- If new silage has been added to existing old silage in a horizontal silo, mark that transition point. The new silage will not be interlocked with the old silage and large sections can collapse unexpectedly when feeding out.
- Do not pile new silage on top of existing silage that has a plastic covering in place; although this may seem in the best interest in forage quality, it can result in an increased hazard of face collapse during feedout. Extra caution is warranted with any activity in these areas.
- Nitrogen dioxide and carbon dioxide are generated after initial filling. Highest amounts of these gasses occur in the first 2-3 days after filling, but can be present for up to three weeks afterwards. In most cases, these gasses will be contained underneath the covering. Use caution around silo during this period, particularly if removing plastic to add additional forage to freshly piled silage.

Feedout Safety Protocols

- Only authorized personnel should be in the silo area. Keep visitors and children away and post appropriate warning signage such as “Authorized Personnel Only” and “Danger, Keep Out, Silage Can Avalanche”. Post bilingual signs if necessary. Consider fencing off the horizontal silo area.
- Workers should wear high visibility clothing or vests.
- Use the “buddy system” and have a second worker present whenever working around silage. Workers should maintain communication and visibility with each other while working in or near silos.
- Never walk up to the face of the silage. Stay back a distance that is three times the height of the face. Document the face height so that workers can more accurately gauge this distance. You could mark the safe distance from the silage face with safety cones.
- Use a loader bucket to collect silage for samples. Collect the sample from loader bucket when it is a safe distance from the silage face.

Continued on next page...

Horizontal Silo continued. . .

Preventing Falls, Face Collapse and Entanglements

- When working on top of the silage, stay back from the leading edge at least 8-10 feet. Wear footwear with non-slip tread. Some guidelines have suggested staying back from the edge as far as the face is tall. Use long handled tools to pull back the tires and plastic from the leading edge. If possible, throw tires and plastic off the sides of the silo.
- Remove tires, sidewalls, gravel bags and plastic or coverings in the daylight. If this must be done at night, there should be adequate lighting provided.
- Minimize spoilage and manage it safely. Make every effort to minimize it through best management practices for maintaining forage quality (inoculants, high density, oxygen limiting plastic, plastic along walls, etc.). If spoilage has to be removed, use equipment operating from the ground level to do so rather than manually removing it by hand.
- Shave down the silage face when removing silage. Keep the silage face as smooth as possible. The silage face could be angled back slightly towards the pile to further reduce overhang situations. To prevent potential overhang situations, don't engage a loader bucket at the bottom of the silage face.
- Do not drive parallel and in close proximity to the silage face with loaders or other heavy equipment.
- Never park vehicles or equipment close to the silage face.
- Always shut off equipment, such as a silage defacer, prior to servicing or adjusting.

Evaluate your current silage feedout procedures. Are you following the safety protocols listed in this article or are there areas where you can make improvements to keep everyone safer? Take the time throughout the year to regularly train family members and employees on these safety protocols so that you can prevent silage feedout mishaps and injuries.

Information in this article was retrieved from the Silage Safety Foundation, <https://silagesafety.org/> Also, thanks to Karl Czymmek and Joe Lawrence of Cornell PRO-DAIRY who reviewed and shared information used in this article.



For more information on this topic, and for safety resources such as personal protective equipment, retrofit PTO shields and SMV emblems for sale, visit our website at: www.nycamh.com, or call 1-800-343-7527. NYCAMH, a program of Bassett Healthcare, funded in part by the New York State Departments of Labor and Health, is enhancing agricultural and rural health by preventing and treating occupational injury and illness.

Managing Corn Rootworm in NY to Delay Bt Resistance (& Save Seed Costs)

By Elson Shields, Entomology, Cornell University, Ithaca

Across the US and within NY, corn rootworm (CRW) is developing resistance to the Bt-RW traits in our GE corn varieties, causing increased root damage and decreasing yields. Yield losses from CRW root feeding can surpass 10% without any above ground symptoms, making this type of losses difficult to detect. In addition, corn grown for silage is more sensitive to yield losses from CRW feeding than corn grown for grain. As CRW resistance increases to Bt-RW, the damage becomes more apparent and easier to detect, but losses have been occurring in the field in prior years, going undetected. Increased damage has been reported in NY for all of the Bt-RW traits regardless of company.

Important points about CRW biology: There are two important points about CRW biology which need to be remembered when managing this pest and reducing its potential for developing resistance to any of our management tools. 1) In NY, all eggs are laid in existing corn fields during August, and 2) if the newly hatch CRW larvae in the spring do not find a corn root, they die. Since CRW eggs are laid in existing corn fields in August of prior year, crop rotation is our best resistance management tool. Since the majority of the corn grown in NY is in rotation with alfalfa for our dairy farms, NY trails the rest of the nation in the development of CRW resistance to Bt-RW.

For our dairy farmers, that grow corn in rotation with alfalfa, corn is typically grown in a field for 3-5 years. The longer corn is grown continuously in a field, the higher risk the field has for economically damaging CRW root feeding and yield losses. After rotating out of a non-corn crop, first year corn does not need any CRW management (or expensive Bt-RW trait costs). A non-Bt-RW corn variety should be planted with a seed corn maggot/wireworm effective seed treatment. This choice in year 1 saves \$15-\$20 per acre in seed costs. In year 2, the risk of CRW loss increases to 25-30% in NY. To offset this risk, a farmer has several options. Many farmers will assume the risk and plant a non-Bt-RW corn variety without any additional protection such as a soil insecticide. A second option in year 2 is to use either a 50% rate of soil insecticide (if insecticide boxes are available), high rate of neonic seed treatment or an insecticide added to the liquid popup fertilizer. The CRW pressure in year 2 is not high enough to recom-

mend the use of Bt-RW in most cases and the option of an insecticide is often a less expensive route to reduce production costs. The deployment of different modes of toxicity in year 2 from Bt-RW significantly reduces the selection for Bt-RW resistance by CRW. In continuous corn years 3-5, the risk of economic loss from CRW is high enough to merit the use of Bt-RW corn varieties. A second option in years 3-5 of continuous corn is the use of a full rate of soil insecticide, if insecticide boxes are available. Adding insecticide to the popup fertilizer during years 3-5 is not recommended due to unreliable efficacy with the higher CRW populations and increased risk for economic damage.

Strategy 2 for our dairy farmers: Incorporating biocontrol nematodes into their rotation and crop production. By using the biocontrol nematode technology developed to combat alfalfa snout beetle in NNY, our dairy farmers can reduce their corn seed costs by eliminating the purchase of the Bt-RW traits in their corn varieties. A single inoculation of each field with native persistent NY biocontrol nematodes provides protection from corn rootworm larval feeding by attacking these insects before they damage the corn roots. NY research data indicates a single soil inoculation (\$50-\$60/acre) establishes these NY adapted biocontrol nematodes in the soil profile for many years, where they attack a wide range of pest soil insects across a wide variety of crops. During the corn years, these biocontrol nematodes attack rootworm larvae and during the alfalfa years, attack wireworms, white grubs, clover root curculio feeding on the alfalfa and grass in the field.

If the biocontrol nematodes are inoculated into the field during the alfalfa portion of the crop rotation, the farmer can use corn varieties without Bt-RW for the entire corn rotation. Biocontrol nematodes take until the second growing season after application to become fully established in the soil profile and when applied to the alfalfa crop, become fully established before corn is planted.

Continued on next page...

Managing Corn Rootworm continued...

If the field is inoculated with biocontrol nematodes during the first year of the corn rotation, the corn variety planted in year 1 can be without the Bt-RW trait because rootworm is never a problem in 1st year corn in NY. By the second year, the biocontrol nematodes are fully established and corn varieties can be planted without Bt-RW for the remaining years of the corn portion of the rotation.

However, if the corn field is inoculated with biocontrol nematodes during the 2nd-4th year when rootworm damage risk is higher, the corn variety planted during the year of inoculation needs to have the Bt-RW trait to provide some additional protection while the biocontrol nematodes become fully established in the field. If the cost of establishing biocontrol nematodes in a field is a one-time cost of \$50-60/acre and the Bt-RW trait adds \$20/acre/year to the seed costs, the breakeven point for the nematode application is year 3 when the Bt-RW trait is not purchased or used. In the years beyond 3-years after application, the seed cost savings will continue to be the cost of the Bt-RW which is an unnecessary expense

For our cash grain farmers, an annual rotation of corn and a non-host crop like soybeans completely eliminates the need for any CRW management tools. During the corn years, non Bt-RW corn varieties can be safely planted without risk of losses from CRW. The elimination of the Bt-RW trait in the corn planted reduces the seed cost \$15-\$20 per acre and the use of a Bt-RW trait is completely unnecessary. However, a seed treatment for seed corn maggot to protect plant emergence is recommended due to our typically wet cold soils. The enhanced adoption of cover crops to protect our soil from erosion and any history of animal manure application significantly increases the risk of plant stand losses from seed corn maggot.

Long-term continuous corn fields: The culture of corn continuously in the same field for multiple years using only Bt-RW to control CRW places tremendous selection pressure for the insect to develop resistance to the Bt-RW toxins. This widespread practice across the corn belt has resulted in the documented CRW resistance to all Bt-RW traits and the insect is causing economic losses for farmers adopting these continuous corn practices. Closer to home, Bt-RW failures have been reported in Central NY corn fields, multiple corn growing areas of Ontario, Canada and to the south in Pennsylvania. With no new technology

against CRW available for the next few years, these growers have a real challenge on their

hands to minimize losses from this adaptable insect, if these farmers continue with long-term continuous corn production without breaking the CRW cycle with crop rotation. Farmers with fields producing corn continuously for multiple years need to seriously consider working a crop rotation into their farming practices. There are well documented agronomic yield advantages/responses from crop rotation over continuous corn, even without considering the reduction in CRW root feeding damage.

However, if farmers insist on growing continuous corn in field without interruption, there are several issues to consider. The continued use of Bt-RW accelerates CRW resistance and the single field failure becomes the source of highly resistant beetles moving into neighboring fields, causing significant yield losses even in neighboring fields where farmers are utilizing crop rotation to minimize CRW-Bt-RW resistance development and yield losses. The farmer growing continuous corn and producing highly resistant beetles becomes “a neighborhood social problem” for his neighbors. Some farmers add a soil insecticide over the top of the Bt-RW trait, think this is a solution to the resistance issue. While the corn stands better with less damage at the plant base, selection for CRW Bt-RW resistance continues to accelerate within the root system in areas outside of the soil insecticide treated zone.

The addition of biocontrol nematodes to the continuous corn culture is a way of introducing an independent mortality factor to help the Bt-RW trait control rootworm larval populations. However in these high CRW pressure systems, biocontrol nematodes should not be used alone. CRW has developed resistance to every other management strategy used to manage its damage, biocontrol nematodes used alone will also select for CRW resistance. If farmers are interested in incorporating biocontrol nematodes into their continuous corn production, farmers should continue to use varieties with the Bt-RW trait to continue to kill the susceptible CRW larvae or match the use of biocontrol nematodes with a full rate of soil insecticide.

Central New York Dairy, Livestock and Field Crops Team

Nicole L. Tommell, M. Ag.Ed

Team Leader
Farm Business Management Specialist
Cell: 315-867-6001
Email: nt375@cornell.edu

David R. Balbian, MS, PAS

Area Dairy Management Specialist
Phone: 518-312-3592
E-mail: drb23@cornell.edu

Ashley McFarland, PAS

Area Livestock Specialist
Cell: 315-604-2156
E-mail: am2876@cornell.edu

Erik Smith, Ph.D.

Area Field Crop Specialist
Phone: 315-219-7786
E-mail: eas56@cornell.edu

Resources

CNYDLFC Team Website: <https://cnydfc.cce.cornell.edu/>

CNYDLFC Facebook page: <https://www.facebook.com/cnydlfc>

NYCAHM: <https://www.nycamh.org/> Farm Partners: 1-800-343-7527

NYS Ag and Markets: 1-800-554-4501, <https://agriculture.ny.gov>

COVID-19

Need information? View the following Cornell CALS and CCE Resource Pages Updated Regularly:

General Questions & Links: <https://eden.cce.cornell.edu/>

Food Production, Processing & Safety Questions:

<https://instituteforfoodsafety.cornell.edu/coronavirus-covid-19/>

Employment & Agricultural Workforce Questions: <http://agworkforce.cals.cornell.edu/>

Cornell Small Farms Resiliency Resources: <https://smallfarms.cornell.edu/resources/farm-resilience/>

Financial & Mental Health Resources for Farmers: <https://www.nyfarmnet.org/>

A program and funding partnership between Cornell University,
Cornell Cooperative Extension and the Cornell Cooperative Extension Associations of
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