

Cornell Cooperative Extension

South Central NY Dairy and Field Crops Program Broome * Chemung * Cortland * Onondaga * Tioga * Tompkins

DAIRY & FIELD CROPS DIGEST April 2020

Cover Crop Termination- Agronomic Crops Network

By Alyssa Essman, Ohio State University https://agcrops.osu.edu

The 2019 growing season came and went and left many fields in a state of disarray heading into 2020. Many growers that were unable to plant decided to use cover crops, to reduce soil erosion and provide some weed suppression during the extended fallow period. Terminating these cover crops using the right methods at the right time will be critical to ensure timely planting and prevent the cover crops from competing with cash crops. The three main methods of cover crop termination are natural (species that winter kill), chemical, and mechanical. Cover crops may also be bailed, grazed, or harvested as silage. Most species require some sort of management decision for termination. Cover crop species, growth stage, weather, and cover cropping goals should all be considered when planning termination method and timing. These decisions require a balance between growing the cover long enough to maximize benefits and terminating in time to prevent potential penalties to the following cash crop.

Natural Termination Summer and fall planted cover crops that die naturally over the winter in Ohio include: oats, sorghumsudangrass, tillage and oilseed radish, turnips, and winter pea (if planted after August). The use of these species can simplify spring management. However, they provide a shorter period of soil protection, especially if planted after a late harvest. For this reason, they are often included in some sort of species mixture with other grass or legume species that over winter to provide weed suppression and soil

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protection in the spring. Producers have also started to experiment with interseeding and broadcast seeding in the late summer or early fall. Doing so can maximize benefits from winter killed species and



species mixes, and avoid the risk of not being able to plant cover crops in the event of a late harvest.

Chemical Termination Termination with herbicides is reliable if applied at the appropriate herbicide rate and growth

stage. Refer to the label for rate and surfactant recommendations. Glyphosate has proven to be an effective means of control. In general, grass species including wheat, barley, rye, oats, and annual ryegrass can be controlled with glyphosate alone or mixes that include glyphosate. Recent research shows that for these grass cover crop species, glyphosate alone or glyphosate plus 2,4-D, saflufenacil, or clethodim was most effective (Whalen et al. 2019a). Use caution when considering annual ryegrass as a cover crop species, as it is especially aggressive and can quickly turn weedy and escape chemical control. Systemic herbicides, such as glyphosate, are most successful when applied on warm, sunny days when plants are actively growing. Termination treatments should be applied before the boot stage of grasses. Control of grasses with paraquat and glufosinate often declines 4 weeks after application, relative to the longerterm effectiveness of glyphosate (Pittman et al. 2019). It is often recommended that cereal rye be terminated 10 to 14 days before corn planting to reduce the effects of allelopathy on the germinating corn crop. Soybeans are generally less susceptible to this effect from cereal rye, and some growers have had success planting into a growing stand of rye. As with all new practices, it is important to start experimenting on a small scale and work with your crop insurance agent regarding termination requirements.

Non-selective contact herbicides such as paraquat and glufosinate can also be used in the termination of cover crops, and can be

(Continued on page 3)

The **South Central New York Dairy and Field Crops Program** is a Cornell Cooperative Extension partnership between Cornell University and the CCE Associations in 6 Counties.



Cropping Notes from Janice...

And they're off! Wow this a record spring! It's the earliest plowing that I've ever seen. It's nice to have workable fields early, but I just want to remind you to not get too far ahead. We are very likely to have a cold snap or two. During the last early spring, which started about the 3rd week of March, people put in alfalfa seedings at the end of March- early April. We started off dry, then we had a pretty good snow and cold after the seedlings emerged and it ended up thinning our stands. Establishing alfalfa mid to late April is still early and possibly a bit safer to avoid freeze and dehydration kill of small seedlings.

I have heard that some oats are in the ground. They should be fine and since oat acreage has dropped dramatically in the last several years, they might have some value. Things are greening up already which is crazy since it was almost May when things greened up last year. Don't delay applications of early nitrogen for small grains or grassy hay stands and pastures to boost yields. Consider adding a sulfur containing N source in the fertilizer mix.

I included the article about corn chilling damage. I know it's sometimes hard to predict what change we'll see in the day to day weather, but I recommend erring on the side of caution. Some hybrids can handle colder temps better. Check with your seed rep about yours. We all know corn can recover if its frozen off when the growing point is below the ground and we saw that several years ago, but it does require additional energy from the plant and some farmer's observed that the fields that recovered did not do as well as those planted later and were not injured.

Beginning in 2020, a screening effort to describe the distribution of herbicide resistance in the state will be begun. This coming summer and fall, growers, crop consultants and allied industry personnel who suspect they have herbicide resistance are encouraged to contact Dr. Lynn Sosnoskie (<u>lms438@cornell.edu</u>, 315-787-2231) to arrange for weed seed collection. Please visit <u>http://blogs.cornell.edu/whatscroppingup/2020/03/23/statewide-herbicide-resistance-screening-to-start-in-2020-help-us-to-help-you/</u> to find out more.

We are pleased to provide you with this information as part of the Cooperative Extension Dairy and Field Crops Program serving Broome, Cortland, Chemung, Onondaga, Tioga and Tompkins Counties. **Anytime we may be of assistance to you, please do not hesitate to call or visit our office.** Visit our website: <u>http://</u> <u>scnydfc.cce.cornell.edu</u> and like us on Facebook: <u>https://www.facebook.com/SCNYDairyandFieldCropsTeam</u>.

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We put knowledge to work in pursuit of economic vitality, ecological sustainability, and social well-being. We bring local experience and research-based solutions together, helping our families and our community thrive in a rapidly changing world.

Building Strong and Vibrant New York Communities

"Cornell Cooperative Extension is an employer and educator recognized for valuing AA/EEO, Protected Veterans, and Individuals with Disabilities and provides equal program and employment opportunities" beneficial in particularly cool springs. The key to successful termination with contact herbicides is complete coverage and including other herbicides in the mix that improve effectiveness. Legume species such as Austrian pea, crimson clover, and hairy vetch are best controlled using a mix of actives that include either paraguat or glyphosate (Pittman et al. 2019). Hairy vetch and crimson clover can also be controlled with 2,4-D. Recent multi-state research on cover crop termination shows that chemical applications which include glyphosate are more effective compared to applications that included paraguat or glufosinate. This study showed that for broadleaf cover crop species, glyphosate, paraquat, or glufosinate applied with either 2,4-D or dicamba were most effective (Whalen et al. 2019a). When making your spray plan keep in mind that some antagonism can occur if glyphosate and glufosinate are applied together, and also for grasses where a growth regulator herbicide is added to glyphosate. A follow up POST treatment of growth regulator herbicide and/or glyphosate in corn and certain soybean trait systems can complete control of covers that partially survive a burndown treatment.

Residual herbicides can be integrated into cover crop termination applications to reduce additional field passes. Preplant and POST termination applications that include a residual can provide effective cover crop termination and residual weed control. There is generally more weed control benefit from including the residual in preplant applications compared with inclusion in the POST application. Timing of termination and levels of biomass are often determined by the goals of the cover crop, and will impact the amount of residual product that reaches the soil. If high biomass is the goal, then later termination and inclusion of the residual with the POST application is recommended (Whalen et al. 2019b).

Recommendations for using herbicides to terminate a cover crop: Cereal rye

- Generally easy to kill
- Glyphosate up to 18 inches
 - Base rate: 0.75 lb ae (22 oz PowerMax)
 - Increase the rate on taller rye
 - Antagonism with residual herbicides possible, increase rates or apply separately
- Gramoxone can be effective
 - Use high rates on tall plants
 - Coverage is essential, 20 GPA
 - More effective with atrazine or 28%

Winter wheat

- Tougher to kill than cereal rye, more issues with antagonism, weather, and rate
- Glyphosate up to 18 inches
 - 1.1 to 1.5 lb ae (33 to 44 oz PowerMax)
 - Increase rate on taller wheat, possible antagonism with residual herbicides

- 28% a concern, most effective when applied alone in water
 - Most easily controlled when plants are small
- Gramoxone not consistently effective

Annual ryegrass

- Ryegrass should be less than 6 inches tall
- Control is faster in warm weather, cold weather slows herbicide activity
- Glyphosate is most effective
 - 1.5 lbs ae/A minimum (44 oz PowerMax)
 - Can use a higher rate if plants are large or in cold weather
 - Can add Select, Assure II
- Gramoxone is variable, possibly high cost
 - Terminate small plants at high rates
 - More effective with atrazine
- 20 GPA is preferable, aim for medium spray droplets **Hairy vetch, winter pea**
 - Fairly easy to kill, large vetch especially
 - Glyphosate plus 2,4-D or dicamba
 - Glyphosate: 0.75 to 1.1 lb ae (22 to 33 oz PowerMax)
 - Gramoxone is effective on larger hairy vetch
 - Add 2,4-D and/or atrazine

Clover, alfalfa

Not necessarily easy to kill

•

- Glyphosate plus 2,4-D or dicamba
 - Glyphosate: 1.1 to 1.5 lb ae (24 to 44 oz PowerMax)
- Clopyralid is very effective on these species S
 - Surestart, TripleFlex, Hornet, Stinger
 - Gramoxone is generally not a good choice
 - Can kill larger crimson clover with 2,4-D

Mechanical Termination Mechanical means of cover crop termination include tillage, rolling/crimping, or mowing. Tillage from field cultivators can terminate a cover crop by burying the plant residue and cutting the roots. Vertical tillage is a less effective termination option, and many types of tillage may require multiple passes to achieve the desired level of control. Strip-tillage can be performed to break up residue and increase soil warming in the row. Termination via tillage speeds up the breakdown of residue and incorporates it into the soil. In general, this method of termination can negate some of the benefits associated with using cover crops.

A roller-crimper can be used to control a number of cover crop species, but doing so at the right stage based on species is critical for complete termination. Cereal rye can be rolled after pollen shed to form a dense mat of residue. This can be an effective option, as this residue is capable of choking out weeds and conserving soil moisture in the hot summer months. Hairy vetch can be rolled in full bloom just before corn planting. This termination method might be suitable for organic operations looking for less soil-intensive means of weed control. The use of multi-species mixes can complicate termination via roller-crimping, as the different species often require termination *(Continued on page 6)*

By Kristina Ferrare, Forestry Program Specialist, CCE Onondaga

In these March and April days, we may not be thinking about ticks as we spend more and more time outdoors. It is important to remember that ticks are active on the landscape when the temperatures begin to approach 40°F. When we consider the blacklegged tick, the vector for Lyme disease, that means we may encounter adults this time of year – males and females that have been lying low in the leaf litter or ground cover waiting for warmer temperatures to come out and feed. They were looking for a large blood meal last fall in order to mate and lay eggs, but were not successful.

Here are some reminders about staying safe from tick bites all year long:

- Dress appropriately! Long pants and long sleeves, and tuck those pants into your socks! Wear light colors to easily see ticks on the outside of your cloths and remove them.
- Use repellents according to label directions:

- ⇒ Repellents containing DEET are very effective when used according to label directions;
- ⇒ Oil of Lemon Eucalyptus containing products are the only "natural" repellent approved by the EPA;
- ⇒ Permethrin, which is for treating clothing and gear and NOT skin, is incredibly effective at repelling ticks when used according to label directions;

• Do a tick check of your entire body, EVERY DAY. Ticks feed for several days. If you don't find the tick on the first day, you have several more chances to find and remove it.

• Remove an attached tick according to <u>CDC</u> <u>recommended methods</u>, and save it. Mark the date you found it on the calendar. If you feel ill later, you can share this information and the tick with your physician. It can help

For more information and resources about tick bite prevention visit the NYS IPM website, Don't Get Ticked NY <u>https://</u>nysipm.cornell.edu/whats-bugging-you/ticks/.



Left to right: Asian Longhorned Tick (ALT, H. longicornis adult, nymph, larva. Photo: Manigandan Lejeune, Cornell Animal Health Diagnostic Center

Be Vigilant in Checking Livestock for Asian Longhorned Tick (ALT)

facilitate a diagnosis.

This tick has been identified in New York State. Livestock on pasture are particularly vulnerable to infestations. Check pastured animals regularly.

Impact: ALT damages livestock health and impairs milk production

- Severe infestation causes anemia or death from blood loss
- ALT feeding can transmit bovine theileriosis and parasites that cause babesiosis
- Theileriosis can significantly reduce milk production and kill calves

ALT Biology

- One parthenogenic female (reproduces without males) can produce 100s-1000s of offspring
- Cold temperature tolerance creates potential for establishment in the northeast
- Broad host range, but prefers cattle
- Attaching to birds and wildlife allows ALT to quickly spread over an increasing area
- Preferred habitat: pastures, meadows

Distribution

- Native to Eastern Asia
- Invasive ALT became the highly problematic 'cattle tick' on Australia and New Zealand livestock
- Since the 2017 discovery in New Jersey, ALT is now in New York and many Northeastern states

Management: Monitor livestock regularly for ticks.

Carefully collect and submit suspicious ticks for identification to: Cornell University Animal Health Diagnostic Center, 607-253-3900, ticks@cornell.edu. Call ahead for cost.

Source: NYSIPM



First Cutting Updates – Coming to a Field Near You!

The SCNY team is planning to monitor alfalfa heights again this spring to help predict quality and %NDF if there are no restrictions for COVID 19 containment. Alfalfa height has been proven to be a reliable indicator of NDF values in the field for alfalfa, alfalfa/grass mixed and all grass stands. The team wants to identify fields that can be measured on a weekly basis. If you have fields that we can come out and measure, please let Janice or Betsy know! Results will be compiled on a weekly basis – to receive weekly email/text updates, please contact us at 607.391.2673 with your email address/cell phone number.

The numbers that are indicators for using alfalfa heights for NDF content are as follows:

- 100% grass stands should be cut when nearby alfalfa is 14 inches tall, to achieve 50% NDF
- Begin cutting 50/50 mixed alfalfa/grass stands when nearby alfalfa is 22 inches tall, to achieve 44% NDF
- Begin cutting 100% alfalfa stands when alfalfa is 28 inches tall, to achieve 40% NDF

Predicted days to cut are based on daily NDF increases for grasses of 1.0% point, 50/50 mixed alfalfa/grass stands of 0.8% points, and alfalfa of 0.5% points. Predictions are adjusted for the coming week's weather.

Typically NDF increases about 0.8 to 1.2 per day for grasses, with cooler weather being the lower end of the range and warmer weather being the higher end. For alfalfa, NDF increases about 0.4 to 0.7 per day, also dependent upon warm/cool weather.

The weekly email features a table of the locations in the region where alfalfa heights are measured, including elevation, and target date for harvest. Even if your fields aren't measured, you can use the location and elevation as a guide to conditions that may be similar to your own. *

Farm Business

NYSERDA Offers No-Cost Farm Energy Audits

Energy use is a big expense for New York farms, but farms can control this cost by improving their energy efficiency. The New York State Energy Research & Development Authority (NYSERDA) continues to offer farms and onfarm producers no-cost energy audits. Over 1,000 NY Farms have participated and received energy audits that provide recommendations for energy efficiency and renewable measures through the <u>Agriculture Energy Audit Pro-</u> <u>gram</u> (AEAP).

Typical systems evaluated include lighting, motors, pumps, dairy milking equipment, ventilation, and refrigeration. In general, a farm can expect an energy audit to identify savings representing between 10% and 35% of their total energy use. The program is open to all types of farms and on-farm producers, including but not limited to: dairies, orchards, greenhouses, vegetables, vineyards, grain dryers, maple and poultry/egg. To be eligible, farms must be customers of a New York State investor-owned utility and contribute to the System Benefits Charge (SBC).

Two audit levels are offered to address the differing needs of New York farms.

- **Comprehensive:** The comprehensive audit report provides a list of recommended measures with associated energy and cost savings and anticipated payback. This detailed energy audit analyzes the farm's previous 12 months of utility bills along with equipment specifications and run-time information. This information is used to calculate estimated energy savings for energy efficiency upgrades. This audit level is the most popular choice for farms.
- **Target:** This energy audit focuses on a specific complex energy system or renewable energy production. This report is ideal for operations with a complex system to be analyzed beyond standard energy efficiency upgrades, or if the farm is interested in pursuing renewable energy.

Once your audit report is complete, technical assistance is provided through EnSave, Inc to select the most appropriate measures to implement and accessing funding, including programs through the utilities and federal government.

Call 800-732-1399 or email <u>aeep@nyserda.ny.gov</u> for more information or to request an application. Apply online at <u>https://www.nyserda.ny.gov/All-Programs/Programs/Agriculture-Energy-Audit</u>



NYSERDA

(Continued from page 3)

at different times due to varying maturation rates. In these instances it is best to roller-crimp according to the latest maturing species. Mowing is generally less effective than tillage or roller-crimping, with often unpredictable effectiveness and regrowth of some species.

As you plan for the 2020 season and decide on methods to terminate your cover crop, contact your crop insurance agent to know your

options and requirements.

References:

Pittman K, Cahoon C, Bamber K, Rector L, Flessner M (2019) Herbicide selection to terminate grass, legume, and brassica cover crop species. Weed Tech 34: 48–54

Whalen D, Bish M, Young B, Conley S, Reynolds D, Norsworthy J, Bradley K (2019a) Herbicide programs for the termination of grass and broadleaf cover crop species. Weed Tech 34: 1–10

Whalen D, Shergill L, Kinne L, Bish M, Bradley K. (2019b) Integration of residual herbicides with cover crop termination in soybean. Weed Tech 34: 11–18





Growing Great People: Expectations Training Skills for Dairy Farmers Become an Effective On-The-Job Trainer

Effective trainings contribute to success of employees and the farm business. With training employees learn how to effectively complete their task and why it is important to the farm. When employees have the knowledge, skills, and attitude needed to do the job right and understand why it should be done this way it:

- saves time and avoids problems
- makes people feel important and involved, which keeps them engaged and reduces employee turnover

Develop your training skills following a system of:

TELL: Describe the procedure and why it is important

SHOW: Demonstrate the procedure and emphasize key points

DO: Allow the learner to try and answer any questions

REVIEW: Are the steps in the procedure done correctly?

After the workshop you will be able to:

- 1. Plan for organized and effective trainings
- 2. Train in a way that works for most people
- 3. Measure and follow up to make sure learning happened

BRING A STANDARD OPERATING PROCEDURE (SOP) FROM YOUR FARM

WEDNESDAY, APRIL 14 ZOOM WEBINAR MEETING Offered in English TIME: 6:30 PM - 8:00 PM

THURSDAY, APRIL 16

ZOOM WEBINAR MEETING Offered in Spanish TIME: 12:00 PM - 1:30 PM

NO REGISTRATION NEEDED Join Us Online:

agworkforce.cals.cornell.edu

* We will plan to hold our live, bilingual sessions in the Fall.





These workshops are supported by a grant from the New York Farm Viability Institute.

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The NYS hemp industry is a rapidly growing network of growers, processors, manufacturers and market. Like any new and not-yetmatured industry, it is unstable, unbalanced and beset with risks. In 2017 and 2018, processors competed aggressively to purchase raw hemp materials from growers. In 2019, raw hemp production far outpaced processing capacity and many Northeast growers are still left with unsold biomass. Many fields were not even harvested in 2019. The hemp industry surely offers opportunity for NY farmers and entrepreneurs, but be aware and cautious. Attend some of the many conferences and workshops offered on hemp methods and regulations around the state and learn everything you can. Line up a buyer contract and apply for a permit before any farming begins. Lastly, Cornell is actively researching many aspects of all types of hemp production and processing and shares results on a website listed below. Among the info available at the Cornell website are variety trial results, economic and cost-of-production analyses for different types of hemp, hemp industry news and upcoming events around the state.

Additional resources:

- Smart, L. and M. Ullrich. 2019. Beginning Hemp? Keys to Successful Production in New York State. <u>https://cpb-us-e1.wpmucdn.com/</u> <u>blogs.cornell.edu/dist/a/7491/files/2019/08/Beginning-hemp.pdf</u>
- NYS DEC Bureau of Pesticides Management Information Portal <u>http://</u> <u>www.dec.ny.gov/nyspad/products?2</u> Click the 'Advanced Search' button then select 'Hemp (Industrial)' on the list under Pesticide Use and click 'Search' button.
- New York State Department of Agriculture and Markets, Plants & Natural Resources Division, Industrial Hemp website. <u>https://agriculture.ny.gov/industrial-hemp</u>
- New York State Department of Agriculture and Markets, Plants & Natural Resources Division, List of Authorized Research Partner Growers, Processors and Grower-Processors. <u>https:// agriculture.ny.gov/system/files/documents/2020/02/</u> <u>authorized_research_partners.pdf</u>
- Cornell University Hemp Research Projects, Results, News and Events. https://hemp.cals.cornell.edu/resources/our-research/

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Dairy News

Stress & Cows – How do we attain our "200 Pound Cow"? Part 1 of 2: Birth, Neonates, Milk Feeding & Weaning

By Betsy Hicks, Dairy Specialist - SCNY Dairy and Field Crops Team

I once attended a calf health meeting a few years back where Dr Mike VanAmburgh was speaking. He related a concept in which each calf that is born is essentially born with the genetics to produce very high quantities of milk. The caveat to this is that we as producers lose bits and pieces of this genetic potential each time we fail to provide the animal with the best management, feed and environment possible. In essence, our management of our herd dictates fundamentally the amount to which she is able to reach that genetic potential, or adds to the deterioration of the maximum production she can reach. We can think of this cow as being our "200 pound cow" if you will: the cow that always produces, always breeds back and never gets sick, the cow we wish we could have several daughters from and can't quite put our finger on why she is the best cow in the barn.

At each stage of life, cows can experience stress that impacts their growth and production, and lead to the deterioration of maximum production. This series of articles strives to outline each stage and give ways to minimize the loss of maximum production. In this article, I talk through birth and neonatal stages through milk feeding and weaning. The next article will deal with heifer growth, transition to lactation, production & reproduction, gestation and dry period.

Birth & Neonatal Stage

Calving can be a stressful time for both the dam and the calf, especially in times of dystocia (hard calving). Producers are very familiar with the after effects a cow experiences when she's had trouble calving: pinched nerves, lack of appetite, and metabolic diseases to name a few. Calves, too, also experience after effects of a hard birth: these calves are more susceptible to disease and in times of disease challenge, will often get sick before calves from normal births. Many producers are tracking heifer calves that had a hard birth, marking their tags or hutches, and watching for early signs of trouble.

Colostrum, the first "C" of calf care, is often the easiest way for producers to stave off neonatal and calf disease issues, and also holds one of the keys to closer attain a cows' genetic potential. <u>There are four critical components for successful colostrum</u> <u>feeding: 1) timing – how quickly a calf receives colostrum after</u> <u>birth, 2) quantity – how much colostrum she receives, 3) quality –</u> <u>the concentration of immunoglobulins in the colostrum, and 4)</u> <u>cleanliness - the lack of pathogens in the colostrum.</u> In terms of feeding colostrum, the faster the calf receives colostrum, the

better absorption of immunoglobulins (IgG) she will have. At six hours of life, only 66% of IgG fed are absorbed, at 12 hours, 47% and 24 hours only 12% can be absorbed by the calf. (Selk, 2002) Quantity of colostrum alone has been shown to achieve higher milk production: Faber et al (2005) showed that calves receiving 4 L of colostrum at birth showed over 2000 lb of production through their second lactation when compared to calves receiving only 2 L of colostrum. These calves also had better rates of gain as calves, lower age at first conception and better survivability or longevity in the herd, with the only difference in life being amount of colostrum fed at birth. In terms of guality of colostrum, NAHMS studies have shown that calves that receive adequate colostrum at birth survive better. Cleanliness of colostrum handling, storage and feeding ensure that calves are given ensures calves get the best start possible. Colostrum contains antibodies, but is not antibacterial itself. Poor sanitation and handling will harm the effectiveness of good colostrum and great care taken to maintain its cleanliness (the second "C" of calf care) and its effectiveness.

Milk Phase

The other 3 "C's" of calf care include calories, consistency and comfort. In a Cornell study, Soberon et al (2012) showed that for every about two pounds of growth pre-weaning, milk yield increases ~1870-2500 lb in first lactation, and for every about two pounds of additional growth before puberty, milk yield increases 7281 lb in first lactation. Pre-weaning average daily gain alone accounts for 22% of variation in 1st lactation milk yield! We must also remember that a calf's thermoneutral zone is far different from a cow's, and she uses nutrients to stay warm. In terms of nutrient portioning (Figure 1), her maintenance of normal body functions is first priority, secondly her immune system. Growth is the first thing to suffer, and if calves are showing signs of illness, you can be sure they aren't growing. In attaining our 200 pound cow, simply feeding calves more in the milk phase absolutely allows her to achieve the production she was genetically programmed to achieve.



If Care Meeting PURINA

Speakers: Dr. Ranatta Young & Felix Soriano

This meeting is designed for calf managers and their team members. It will be in both English and Spanish. The main focus of this meeting will be identifying sick calves and making treatment decisions. A necropsy will be performed to show how diseases, tube feeding, navel dipping, injection sites, etc. impact a calf.

We Are Rescheduling! Tenatively Last Week in April Megan Wildman 607-345-8530 Betsy Hicks 607.391.2673

Online at: https://scnydfc.cce.cornell.edu/event.php?



Where: Venture Farms 6978 State Route 8 Tully, NY 13159 When: **TBD**

11:30 AM- 1:30 PM

Lunch will be provided for those that RSVP. Lunch will be served at 11:30 AM, with the meeting starting at Noon.

(Stress & Cows; Continued from page 8)

When talking about consistency, time of feeding without t devia tion is critical for young calves. For feeding larger quantities of milk Dr Sam Leadley shares best practices: 1) deliver individualized feedings to calves/pens and bump up quantities when they are ready for it, 2) consistent volumes - strive to be within 1 cup of intended volume, 3) consistent concentration - use an accurate scale to weigh calf powder, not just volume, 4) consistent temperature - goal of 100-105 minimum, especially in cold weather, and 5) diagnose scours promptly - back down volume of milk for a few days if nutritional scours are seen. NAHMS studies lists digestive disease as one of the most common diseases affecting preweaned heifers, which impacts her growth as a calf. NAHMS studies list respiratory diseases the second most common pre-weaned heifer disease, and as such, producers should take steps to ensure the comfort of calves to maintain disease-free environments. Positive Pressure Systems - minimum of 4 interior air exchanges per hour, and calves should have adequate resting space - an absolute minimum of 30-35 square feet of resting space per calf. Clean, dry bedding packs should be evaluated daily to maintain the comfort of growing animals.

Cleanliness (the second "C") in feeding deserves attention as well. The goal is to minimize exposure, as young calves are less able to tolerate pathogens. For example, calf feeders and managers should work with young calves first, then older calves. Often, calf managers will wear gloves and change them if they must return back to young calves or after working with a sick calf. In an article

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from Dairy Herd Management recently, Taylor Leach shared five clean kitchen rules for how and where you clean calf feeding equipment: 1) Use a detergent, disinfectant and sanitizers, 2) Rinse, soak, wash & repeat, 3) Allow pails & bottles to dry between uses, 4) Dehumidify - keep humidity in wash area low to discourage microbe growth, and 5) Set up a regular cleaning schedule to deep clean milk mixing area.

In all, the goal for calves in the milk phase to achieve high growth rates while eliminating disease. I'd wager that any "200 pound cow" probably did not have a calf-hood disease!

Weaning

Weaning and the transition to a fully solid food diet is probably one of the most stressful times in a calf's life. The attention to detail and management of calves during this period is key to setting a heifer up for growth after weaning. In short, the age of calf shouldn't be only criteria for weaning, and starter intakes should be taken into consideration. Many farms institute a step-down milk feeding to ease the transition, or minimize feeding to only 1x/day. In this way, calves gradually increase their starter intake so that by the time they are fully weaned, their nutritional needs are being met by starter intake alone. Keys for this time are to minimize changes, and only make one change at a time. For instance, if a diet or feed change is made, calves shouldn't be moved. When we change pens, calves should keep the same diet. If calves are being vaccinated, they shouldn't be regrouped at that time. If your calves are getting sick in the transition through weaning, you're throwing too much at them. Remember, calves that are ill aren't growing and maintaining × growth is key to achieving lifetime productivity!

Newborn Calf Immunity: How Well Is Your Colostrum **Management Program Working?**

By Sam Leadley and Kazzie Nero from Calving Ease February 2020 article

Test, Don't Guess!

This dairy calves at three locations. Colostrum is fed at each location. The Failure rate (5.5 or below) in January 2020 at the same location Then, all the calves go to one place to be reared. Once a month they bleed the youngest calves. This is what the blood serum total protein values revealed the last two months in 2018. "Passive Transfer Failure" (PTF) was defined as Blood Serum Total Protein (BSTP) at or below 5.5.



The workers at Location Three (yellow) had 13% PTF. Not great but the best of the three. The lowest value was 5.4 with the average at 6.1.

Oops, not so good at Location Two with 33% PTF. The average BSTP at this Location was 6.0 and only three of the calves tested were at 5.0 or below – so, while the results do not look good, calf immunity was not a disaster. The issue here may have been inconsistency with 33% failures. Some calves were near or at 5.0 while fully 57% were at 6.0 and above.

Was it lack of instruction? Was colostrum being warmed in excessively hot water? Was worker overload causing first feeding to be delayed? Did lab cultures of colostrum show high bacteria counts? All the calves were not being treated the same, somehow.

Given the high standards for this dairy for passive transfer failure (values of 5.5 and lower were considered failures) improvements were needed at Location One. While the average BSTP was 5.7 here, too many of the calves tested in the low 5.1-5.4 range. Sounds as if the colostrum management protocols needed to be reviewed and the workers needed re-training. Not a disaster but lots of room for improvement.

For comparison, I obtained the Blood Serum Total Protein values from January 2020. Locations One and Two had 100% of calves above 5.5! Whoo Hoo!!! It must be that training and attention to detail paid off with average BSTP's at Location One at 6.2 and Location Two at 6.4 with one-hundred percent above 5.5 at both locations. However, success is not always guaranteed. Recall the

most successful performance in the fall of 2018 at Location Three? was 32 percent even though the average BSTP was 6.0. Picking up this kind of failure helps management focus on finding a "fix" to the problem. Test – don't guess.

Sampling vs. blanket blood drawing

If you choose to sample (vs. drawing blood on all the calves) we recommend sampling until you get at least 12 calves. For more on drawing blood, handling samples, etc. enter this URL http:// atticacows.com/library/newsletters/TestPassiveTransferR2080.pdf. The best time to draw blood is between 24-48 hours after first colostrum feeding. However, blood sampling once a week or even up to 9 days after birth will still give useful information.

Sam chose to draw blood all of his calves (the blanket-draw approach). His experience with passive transfer failure was highly variable with seasonal peaks during spring planting/haylage harvest and fall harvest. Kazzie's experience was more stable and she chose to do monthly samples [10 samples a month. Three to five days oldnot long after a feeding.].

Use the Results

Go back to what happened on my sample dairy. Back in Fall 2018, it was clear that an overhaul of procedures and training was needed at Location One. In January 2020 that seems to have been successful. What is going to happen at Location Three? It is too soon to know for sure. What do Sam and Kazzie recommend?

- \Rightarrow Continue sampling. Collect five or more "as-fed" colostrum samples, culture in a lab to be sure high bacteria levels can be eliminated as a cause.
- \Rightarrow If not already done, push a rapid-read thermometer through the nipple vent hole on bottles of colostrum that are being warmed to prevent over-heating.
- \Rightarrow Check all the colostrum with a refractometer to be sure only high quality colostrum is being fed for first feeding.
- \Rightarrow Keep a record of when a calf is born and when she receives her first colostrum feeding - sooner is better set a goal (for example, 90% less than 4 hours), and who fed the calf.
- Keep a record of the volume of colostrum \Rightarrow received for first feeding or first 24 hours.

Reference: Wilm, J and Others, "Technical Note: Serum total protein and immunoglobulin G concentrations in neonatal calves over the first 10 days of age." Journal of Dairy Science 101:6430-6436. 2018.

Time of Seeding for New Alfalfa

By Fara Brummer, Area Extension Specialist, Livestock Systems, Central Grasslands Ext

Timing of seeding for new alfalfa establishment is critical to the success of the emerging crop and for the future success of the stand. Factors to be considered when planning are **temperature**, **rainfall pattern**, **weed pressure**, **and time of year when environmental conditions are optimum for the seedling germination and crop emergence**. Unfortunately, no single time period will fulfill all these conditions satisfactorily. Benefits and drawbacks of each time period need to be considered by the producer.

Alfalfa is extremely cold tolerant at emergence and this can give a false sense of security, but as the plant develops to two trifoliate leaves, frost sensitivity becomes greater and it may be killed by exposure to 26 degrees F for as little as 4 hours until it reaches the three trifoliate leaf stage.

SPRING PLANTING

In general, a spring planting for alfalfa establishment is more likely to be successful than a late summer planting. This is because moisture is adequate in the spring and cool but not freezing conditions can support good germination and growth (germination begins at 40F degrees soil temperature). Fields may be difficult to enter into due to wet soils, but alfalfa may be planted as soon as danger of spring frost has passed. August plantings typically have lower weed pressure.

MIDSUMMER PLANTING

Planting during the summer is not recommended due to the potential for increase of weeds, heat and dry conditions.

LATE SUMMER PLANTING

Planting in the first two weeks of August is a possibility IF soil moisture is sufficient. PLANTING AFTER AUGUST 15TH IS NOT RECOM-MENDED DUE TO THE LIKELIHOOD OF FROST CONDITIONS THAT CAN DAMAGE EMERGENT YOUNG PLANTS.

Alfalfa requires a minimum of six weeks after germination, and before a killing frost to ensure survival. At least four trifoliate leaves and the formation of a crown are necessary for winter survival.

Advantages of a late summer planting are a decreased competition with weedy species and an increased yield the following year when compared with spring planting. However, late summer plantings come with higher risk due to unpredictable rainfall and early frost.

Visit https://www.ag.ndsu.edu/crops/alfalfa-articles/time-of-seeding-for-new-alfalfa-establishment for additional references.

(Crop Chilling, Continued from page 11)

A key point to consider is that chilling injury is likely to be greater if soil temperatures were cold (conservatively, less than 50°F) at planting rather than becoming cold 24 or more hours after sowing. (The 50°F threshold is a change from previous CropWatch articles that listed 40°F as the injury threshold for soybeans during the imbibition stage.) The longer the seed is in the ground at warm soil temperatures before cold temperatures occur, the less likelihood there is of chilling injury. The bottom line is: You can consider

Report Seedcorn Maggot and Wireworm Damage:

WE NEED YOUR INPUT



Given the recent controversy surrounding the proposed legislative bans on some pesticides in NY, Cornell researchers and extension specialists are working to provide necessary data on the efficacy, usefulness and perceived need for these products in our agricultural systems. To do this, we need

your help with identifying, documenting and quantifying losses to early season pests, such as seedcorn maggot and wireworm in your corn and soybean fields.

In 2020 a collaborative effort between the NYS Integrated Pest Management program and CCE field crop specialists will begin with the goal of monitoring for and documenting losses to pests that the neonic seed treatments are intended to protect against. Given the sporadic distribution of damage caused by seedcorn maggot and wireworm, it can be challenging to quantify losses to these pests in research plots alone. Therefore, we need assistance from farmers, crop consultants, agribusiness associates, and crop insurance claim adjusters to report fields with damage from these pests across NY State.

Your valuable input would require nothing more than a phone call or email to Janice, to report the specific location of damage soon after planting, while pests are still active and can be confirmed (by V2 stage). Janice will then visit the field to confirm pest activity, and may conduct plant stand counts to estimate potential yield losses. Location and farm identity will remain anonymous, as we are only interested in quantifying losses across NYS, not where they occur.

Claims on the value (or lack thereof) of these insecticide seed treatments in NY field crop production cannot be validated or quantified without this sort of data, and we can't obtain this statewide data without your assistance. Therefore, whether you grow corn for silage or grain (or even sweet corn), soybean or dry beans, conventionally or organically, we need to hear from you! Please contact Janice at 607-391-2672 or jgd3@cornell.edu to report damage from seedcorn maggot or wireworm in your fields this spring. ★

planting soybeans if you think soil temperatures won't get cold (less than 50°F) for at least 24-48 hours after planting. If you planted two or more days before the cold rain, there should be no imbibitional injury due to cold temperature.

If the results of a soil temperature test indicate soil temperatures are currently below 50°F or are expected to drop for much of the 48 -hour imbibition period, consider delaying planting. Wait until you feel confident that soil temperatures will be above 50°F for the 48 hours after planting.

Organic News

Transitioning On and Off Pasture By Karen Hoffman Resource Conservationist - Animal Science USDA-NRCS

One challenge with grazing is how to help the cows adjust to a new feed source in both the spring and fall. Changing from lowerquality stored feeds to high-quality pasture is much like changing silos. If the change is made too quickly, milk production drops until the cows and the rumen microbes become accustomed to the new feed. The rumen microbes are especially sensitive to protein and NFC levels should be checked to make sure they are in balance, and at this time the TMR may need to be reformulated.

After 10 to 14 days of transitioning, the ration should be comprised of less than 10 pounds of dry matter from stored forage, and pasture dry matter intake should be greater than 15 pounds. Also, grain mixes should be below 16% protein (or

sudden changes, because it takes time to shift their numbers and types to those that are more adapted to higher quality forage.



The first day of grazing should be when the grass is only 3 or 4 inches tall, usually in mid to late April for most of NY or early to mid-May for Northern NY, and the length of time cows are let out should be relatively short (1-2 hours). If left out for longer than that, they will likely eat too much and when they return to the barn they may refuse quite a bit of the ration. Another option is to "flash graze" a large area of pasture, such as a large paddock with any temporary or semi-permanent fencing removed. This is useful in cases where the ground is still wet and the potential of pugging up the pastures with too much animal pressure is a concern.

Over the next few days, the length of time the cows spend on



pasture should be gradually increased until they are out full time. At this point there will also be a gradual increase in the amount of feed they refuse in the barn. Depending upon what the "final" pasture ration is going to look like, protein forages such as haylage, baleage, and dry hay should be reduced first (unless the ration will be based on one of those forages). Next the amount of protein from grain or concentrate should be cut back, because the cows will be increasing their intake of protein from pasture.

If feeding a TMR, the easiest way to make the transition is to mix for 5 to10 fewer cows (depending on herd size) each day as they are refusing it anyway. When the TMR is being fed at a rate that is less than 70% of the full ration, begin reducing protein levels by 1 pound every 3 days. When the TMR is below 50% of normal,

United States Department of Agriculture

protein concentrates should be fed at a rate of less than 2 pounds per cow).

In the fall, the concerns about changing to new feeds are

essentially the same. However, there are a few new challenges. The stored forages to be fed are most likely from the new growing season. Since no two growing seasons are the same, the quality of the forages will be different from what was being fed earlier in the spring. It is hard to predict how the cows will respond to the new forages, in terms of both intake and performance. Also, determining when the grazing season will end can be difficult to predict. If transitioning begins too early, the opportunity to capture cheap, high quality feed may be lost. Likewise, if it is begun too late, the grass could run out before the stored forages have been introduced.

Predicting the end of the grazing season will be different every year depending on the weather and management of the pastures. In most of NY this will be in late October or early November, and in Northern NY it will be earlier in October in most years. Regardless of location or averages, it is important to try to predict the last day of grazing by using some simple planning techniques. Paddocks should be walked at least once a week beginning in mid-September, and the total amount of the grass dry matter available on the farm should be measured. Once the total "cover" on the farm is known, that number should be divided by the total amount of grass dry matter needed per day. The resulting number is an indication of approximately how many more days of grazing remain if the feeding program stays the same. When there is a significant difference in total grass available from week to week, a transition plan should be put in place.

Strategies for transitioning in the fall will be similar to spring – except things will happen in reverse. Stored forages should be introduced or increased in the barn. Cows should be kept in the barn at night once the temperatures begin to fall below 35 degrees (unless the plan is to outwinter). Eventually the amount of time the cows spend on pasture will be gradually diminished, especially after a frost has killed the grass and there is little to no new growth. At this point the winter ration should be developed, because the majority of intake will be provided in the barn.

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The NYS Hemp Industry – 2020 Update

by: Kitty O'Neil, Ph.D, Field Crop Specialist, CCE North Country Regional Ag Team

The hemp scene in NYS is a big, awkward, 4-year old. To date, the hemp industry has been a rapidly changing system of growers, processors, buyers, customers, researchers and regulatory agents – each with growing pains. As a whole, the NYS hemp industry is administered and regulated by the Plants and Natural Resources Division of Ag & Markets and they've done an excellent job of quickly translating dynamic political progress into order, regulations and guidance. Hemp first became a legal research crop in the US as a result of the 2014 Farm Bill. NYS changed its rules to permit hemp

partially dried stems for fiber processing, or dried grain for food uses – and the grower can then backwards-plan site selection, growing methods and sourcing seeds, equipment and correct input materials. Hemp prefers fertile, well-drained soils with pH 6.5 to 7. A good hemp crop needs high fertility, similar to wheat or corn. Seeding rates range from 1500 to 1.2 million seeds per acre. Many insect pests and pathogens cause problems for hemp. Some common pests are armyworm, Japanese beetles, European corn borer, *Sclerotinia* white mold, *Botrytis* gray mold and *Fusarium*. Hemp also attracts

more widely in 2016. The 2018 Farm Bill made further improvements by removing hemp from the list of federally controlled substances and providing a framework for states to begin handling hemp as an agricultural commodity.

First, a bit about hemp, the plant. Industrial hemp (*Cannabis sativa*, L., ≤0.3% THC) is a very close relative of marijuana (³0.3% THC). It's an annual herbaceous flowering plant native to eastern Asia but is found worldwide. Wild types are even found in NYS. Humans have used cannabis for many purposes throughout our history – its fiber, seeds, oils, and psychoactive properties. Thousands of years of selective breeding has produced varieties with widely different traits

and which are suited for widely different parts of the world and for distinct uses. Many varieties of hemp are dioecious - with distinct male and female individual plants. Other varieties are monoecious, meaning one plant has both male and female flowers. Differences between male and female plants and flowers are important - male plants are often smaller and their flowers do not produce grain. Because of this impact on growth and yield, some varieties have been developed to be 'all female' with just a few male plants for pollination. For high CBD yield, unpollinated, bushy, widely spaced female plants with many flowers are desired, while grain and fiber hemp crops include both male and female plants and are planted much more densely, producing tall slender plants. Pollination of a CBD crop reduces CBD yield, so attention to male plants, wild plants and neighboring crops is necessary because hemp is wind-pollinated. Seed set on grain crops is typically indeterminate, meaning that seeds continue to develop and mature over an extended period of time - resulting in both mature and immature seeds on the same seed head at time of grain harvest. Typically, hemp is a short-day plant, meaning flowering is triggered when hours of daylight shorten to a critical point regardless of plant size, though some autoflowering, or day-neutral, varieties are available.

Recommended cultivation practices for hemp production vary as widely as the preceding details, therefore the best place to start with hemp production is with a buyer contract. We always recommend starting with a contract before planting any hemp because there is not a reliable open market for hemp. Processors and buyers can specify their requirements – whether biomass for CBD extraction or *South Central NY Dairy & Field Crops Digest*



New York State is committed to being a global bank in this factor is remerging a temporary support of the second o



unique and new pests. Currently, 86 pesticides are approved for hemp in NYS, all are unrestricted, and most are fungicides and insecticides. There ZERO selective herbicides on the list. For all types of hemp, beginning with a weed-free field is recommended, which requires good weed management for a 2-3 years prior to hemp crop. If planted in a timely manner, hemp can suppress weeds well, however weeds are often problematic for late-planted crops or in weedy fields. To look up approved products for hemp in NYS, access the NYSPAD database compiled on the NYS DEC website. Link is listed at the end of this article.

Harvesting methods are also specific to the type of crop grown and its intended use. Specifically tuned or designed grain combines, mowers, chopping heads, balers,

grain dryers and other equipment is commonly used. And CBD crops are often manually cut, transported and dried in open sheds or by large fans. Harvesting methods and timing as well as storage and drying requirements and methods may be specified by processors or buyers and should be very carefully researched before planting a hemp crop. Many hemp buyers will gladly provide guidance and advice to contracted growers for all these details.

Before buying seed or planting any hemp in NYS, a permit application must be submitted to and approved by NYS Ag & Markets Plants and Natural Resources Division. A link to this application information is included at the end of this article. This Ag & Markets website is also the best access to up-to-date changes to the NYS Industrial Hemp program, which has changed frequently as the federal laws and application submission rates have changed. Currently, applications are being accepted for growing hemp for any purpose. The application and agreement is called a 'Research Partner Agreement' under the present system. Once your application is submitted, along with \$500, and approved, your permit allows hemp production, per the details in your agreement, for 3 years. Your agreement will list background checks, inspection, testing, auditing and reporting requirements. Provisions for sub-contracting may or may not be available. A list of 617 already-permitted growers and processors is also available on the Ag & Markets Industrial Hemp website and is also linked below. This list may be a good way to start to find a potential buyer for any planned hemp crop.

Alfalfa Stand Assessment: Is This Stand Good Enough to Keep?

Written by Dan Undersander, Craig Grau, Dennis Cosgrove, Jerry Doll, and Neal Martin

As alfalfa stands age and thin, the primary question becomes: is this stand good enough to keep? Alfalfa stands are often assessed in the spring, but our research shows that evaluating stands in the fall is better because it allows more lead time for planning. Fall evaluations help you identify less profitable fields and those likely to suffer winter injury in time to allow for fall tillage and alternative cropping strategies before fall fertilization and spring herbicides are applied for other row crops. Checking fields in the fall also helps you anticipate weed control needs. Spring evaluations are still necessary but only to assess the extent of winter damage.

Wisconsin research has shown that stem count is a much more accurate method of estimating the yield potential of an alfalfa field than plant count. Plant density is a poor estimator of yield potential because an individual plant may have few shoots and contribute little to yield.

Therefore, we recommend using a two-step process to evaluate stands:

- 1. Use stem count to estimate *current* yield potential of the field.
- 2. Assess root and crown health to determine *future* yield potential.

Estimating Yield Potential From Stem Count

The relationship between stem density and yield potential is constant, regardless of stand age, making this a reliable method for estimating yield potential. To use this method, select three or four representative areas of the field, marking off a 2-square-foot section in each area. You may find it useful to build a square measuring 17 inches x 17 inches using $\frac{1}{2}$ -inch PVC tubing or weld a cable into a ring that is 19 inches in diameter. Count only those stems that are tall enough to be harvested by the mower (over 2 inches tall). Remember to divide your count by 2 to get stems/square foot. Calculate the average stem count for the field and use the graph to estimate yield potential (Figure 1).

With practice, stem density can be visually estimated very accurately. Visual estimation works best when stands are 6 to 10 inches tall. Stem density estimates yield potential not actual yield. Actual yield will be less than the yield potential to



Figure 1. Alfalfa Stem Count and Yield Potential

the extent that management is not optimum, fertility is low, water is limiting, and disease or insect pressures exist.

Assessing Crown and Root Health

Assessing the health of the stand will help you estimate future yield potential as well as anticipate which fields are likely to suffer yield loss due to winterkill. Dig the plants from three or four representative locations in the field being sure to include the top six inches of the root. Examine the crowns for size, symmetry, and the number of shoots present. Then cut the root lengthwise and check for rot or discoloration in the crown and root. Use the photos and the chart below to help categorize each plant. Determine the percentage of plants in each category. Healthy stands have fewer than 30% of the plants in categories 3 and 4 (Table 1).

Deciding Whether to Keep or Replace a Stand

Fields with good stem densities (>55 stems/square foot) can suffer some plant loss and still yield well the following year. Plant health becomes a major consideration in marginal stands. For example, healthy stands with 40 stems/square foot may be worth keeping while fields with more than 30% of the plants in category 4 will yield significantly less next year.

| Table 1. Rating alfalfa crown and roots rating condition |
|--|
| winter survival |

| rating | condition | winter survivial |
|--------|--------------------------------|---|
| 0 | healthy | excellent |
| 1 | some discoloration | excellent |
| 2 | moderate discoloration/rot | good |
| 3 | significant discoloration/rot | good for mild winter; poor for hard winter |
| 4 | greater than 50% discoloration | poor |
| 5 | dead | — |

Evaluating Weed Infestations

As you check fields this fall for stand density and plant health, make note of the weeds present and their abundance. While we have no specific thresholds for individual weeds, you can classify the infestations as light, moderate, or heavy. Fields and areas of fields with light infestations probably do not warrant treatment. Marginal stands with moderate infestations could be treated and those with heavy infestations need to be treated. Older, heavily infested stands should probably be rotated to corn for one or two years.

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– – Assessing Crown and Root Health – – –

Off-white roots with few signs of discoloration. Excellent winter survival.

Off-white roots beginning to show signs of discoloration. Excellent winter survival.

Evidence of crown rot, vascular discoloration 3 to 4 inches deep. Roots may show

Significant crown rot and root discoloration. Good survival in mild winters;

one or both symptoms. Good winter survival.





Large crown, symmetrical, many shoots.





Large crown, less symmetry, many shoots.



Smaller crown, poor symmetry, fewer shoots.







A

Complete lack of symmetry, few shoots.



Root rot affects more than 50% of the root's diameter, significant vascular discoloration. Not likely to survive winter.



Chilling Injury in Corn and Soybeans by: Jim Specht, , Jenny Rees, Patricio Grassini, Nathan Mueller, CROPWATCH–U of Nebraska

If you're considering going to the field this week to start planting, be sure to check predicted temperatures for the critical 48 hours after planting as well as <u>average soil temperatures</u> for the previous seven days to avoid germination problems.



Soil temperatures taken Monday afternoon at 4 inches below the surface were 54°F under soybean stubble and 50° under corn stalks in a field near Fremont. (*Photos by Nathan Mueller*)

Corn Cold Stress

Corn seed is very sensitive to soil and soil water temperatures below 50°F during the first 48 hours after planting. This is when water rushes into the seed to rehydrate the cells through a process known as imbibition. If temperatures are below 50°F, cells can rupture, which can lead to nonviable swollen kernels and aborted growth of the radicle (root) and coleoptile (shoot). Cold temperatures will interfere with proper hydration of cell membranes and could lead to chilling injury and reduced yield.

When temperatures remain above 50°F for the first 48 hours after planting, seeds can be expected to germinate. If the soil temperature dips below 50°F after the imbibition period, it usually isn't an issue as the seed will be taking in water through a slower process known as osmosis. With cooler temperatures germination will be delayed, but should occur. For more information:

Imbibitional Chilling Injury of Corn (UNL CropWatch) Cold Temperatures and Corn Chilling Injury (SDSU iGrow)

Soybean Cold Stress

Cold stress also can occur in soybean if the soil temperature falls below 50°F during the first 48 hours after planting.

The germination stage of soybean consists first of a very fast uptake of water (imbibitional phase) followed by a much slower uptake of water (osmotic phase). Chilling during the first phase can cause severe problems because the imbibed water is needed to rehydrate the cotyledons and embryo to the point that cell membranes become functional. Cold temperatures interfere with proper hydration of those membranes. The imbibitional phase typically is not very long (less than 24 hours) and can occur with relatively little soil moisture since the seed is dry. Thus, getting a cold rain 0-24 hours after you plant can lead to chilling injury in soybean and lower stands. A study by UNL researcher W.J. Bramlage et al. showed that when the soybean seed coat was removed, imbibition injury occurred within 30 minutes. With a seed coat, imbibition is slower and a longer exposure would be needed before chilling injury occurs.

(Continued on page 11)

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Our Current Reality

Wow. It's amazing how quickly our whole world can change when we are hit with a serious crisis. As we all do our part by social distancing to reduce the speed of the spread of the virus so that the medical profession can keep pace with the disease it's not an easy adjustment to deal with the shutting down of many normal activities and interactions.

I want to assure you that we are available even though its remotely. We are working from our homes but are only a phone call, email or text away. Please contact us with any questions or concerns. We know that you are busy with the needs of your animals, businesses and family. I imagine that in some ways it is a relief to have a reliable routine. There is no shut down on a farm, animals must be tended to every day and with the arrival of an early spring there are many things to occupy your attention. Plowing and planting are already underway on dryer soils.

I would like to share with you a message of encouragement that Martha Pollack, President of Cornell University sent to us last week.

"I am a bridge player—not a very good one, but I do enjoy the game. In bridge, you are sometimes dealt a great hand: lots of high cards, distributed across the suits in an advantageous way. Other times, you are dealt a terrible hand. The great hands are unquestionably more fun to play, but every bridge player knows that you have to play the hand you're dealt. Sometimes, doing an outstanding job with a terrible hand can be incredibly rewarding.

Right now, we've all been dealt a bad hand—and we have to play it, and play it to the best of our abilities. So many of our plans have been disrupted, leaving us frustrated and disappointed. But we can rise to meet this challenge, just as previous generations of Cornellians (and farmers) have when they faced huge and unexpected challenges, whether it was a World War, or the Great Depression, or the scourge of AIDS."

As we follow the dictates of the day to help us manage and overcome this pandemic of COVID-19, we send our best wishes for your health and overall wellness. -Your Cornell Cooperative Extension Dairy & Field Crops Team