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

DAIRY & FIELD CROPS DIGEST
Aug/Sept 2020

Beekeeping: Protecting Honey Bees from Pesticides

By Christian H. Krupke, Gregory Hunt and Rick E. Foster, Extension Entomologists
Purdue University, Extension Entomology

Honey bees are a vital part of our agricultural system, as are many other species of pollinators. The annual value of honey bee pollination in the U.S. has been estimated at $14.6 billion dollars. Although this (or any such estimate) is approximate at best, the value of bee pollination is staggering. Honey is a secondary product that is quite important in its own right.

Honey bees are our key pollinator and saddled with a range of challenges to colony health. Most bee researchers believe that Varroa mites and the viruses that they transmit to honey bees are the biggest single mortality factor for honey bees. Honey bees are also affected by diseases such as American foulbrood, European foulbrood and dysentery, caused by a microsporidian parasite. Moving bee hives long distances for pollination or to overwinter them in warmer climates can add stress, often resulting in up to 5% colony losses in a single move. Bees can also suffer from poor nutrition when few floral sources are available or when there is too much competition from other hives. In addition, pesticides are an ongoing concern and can kill bees outright or bees can receive sub-lethal doses that may reduce the colony population or cause the bees to succumb to diseases. Remember that bees won't encounter any of these mortality factors in isolation; usually two or more are present at any given time. This is the main reason that working out a single "solution" to honey bee declines is an unrealistic expectation.

When Pesticide Poisoning May Occur

Bees consume pollen, nectar and water to survive. All are potential sources of pesticide exposure. In addition, bees may be exposed to pesticides en route to collect these resources, in dusts or liquids suspended in the air as they fly through it. Indiana is a heavily agricultural state, and bees may be attracted to a crop that is in bloom, or may be attracted into treated crop fields by the presence of blooming weeds even though the crop itself is not in bloom. Dandelion, wild mustard, white clover, yellow rocket, sweet clover, milkweed, goldenrod, and aster blossoms all attract bees and are often present in areas beside crop fields, ditches, or roadsides. Planting of corn and soybean seed, typically treated with neonicotinoid insecticides, can lead to bee kills as well when bees fly through the dust that arises during planting with pneumatic planting equipment. Bees will sometimes forage in field crops when these are producing pollen, including field corn and soybeans.


Social insects, such as honey bees, can quickly spread harmful organisms through the colony.


Honey bees often prefer stagnant pools for drinking water.

When bees are killed by pesticides it is often because the product drifted directly onto the bees or onto flowers that the bees are feeding on. The recent popularity of systemic insecticides, primary neonicotinoids, however, have led to new exposure routes. Uptake

(Continued on page 12)

Inside this Issue:

CCE Dairy Educators and PRO-DAIRY Offers Podcast, "Dialing into Your Best Dairy"

This podcast is a series about management practices and tips to reaching your herd's full genetic potential. It features PRO-DAIRY and CCE Dairy Specialists who over the course of 8 episodes discuss the different life stages of the dairy cow, including episodes focusing on raising calves through the milk phase and weaning; managing weaned heifers up to freshening; making decisions about which replacements to keep including talking about inventory, disease prevention, and culling decisions; feeding and nutrition management during lactation; facilities, time management, and ventilation considerations throughout lactation; and management factors around reproduction, gestation, and the dry period. This series also features interviews with Cornell's Dr. Mike Van Amburgh, the owners of Selz-Pralle Dairy in Wisconsin, and Paul Fouts, a NY dairy producer. Check out the podcast on the PRO-DAIRY website (https://prodairy.cals.cornell.edu/events/podcasts/) where you can find each episode along with additional resources and speaker contact information. You can also listen via SoundCloud on the CCE Dairy Educators channel, and check back for future podcast series. For more information, contact PRO-DAIRY's Kathy Barrett (kfb3@cornell.edu) or Betsy Hicks, your CCE Regional Dairy Specialist.

Check Out Our New Online Platforms!

YouTube

Search for

CCE South Central NY
Dairy & Field Crops Team

and

twitter

https://twitter.com/SCNYDFC

Visit us there for all the up to the minute industry news!

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: http://scnydfc.cce.cornell.edu and like us on Facebook: https://www.facebook.com/SCNYDairyandFieldCropsTeam.

The views and opinions reproduced here are those of the authors and are not necessarily those of the SCNY Area Dairy and Field Crops Team of Cornell Cooperative Extension. We strive to provide various views to encourage dialogue. The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by Cooperative Extension is implied. Permission is granted to reproduce articles from this newsletter when proper credit is given. Electronic copies are available upon request. If we reference a website that you cannot access and would like the information, contact Donette Griffith, Administrative Assistant at 607.391.2662 or by email: dg576@cornell.edu.

Janice Degni
Team Leader &
Field Crops Specialist
607.391.2672
jgd3@cornell.edu

Betsy Hicks
Area Dairy Specialist
607.391.2673
bjh246@cornell.edu

Mary Kate Wheeler
Farm Business
Management Specialist
509.294.6073
mkw87@cornell.edu

Fay Benson
Small Dairy Ext. Educator
607.391.2669
afb3@cornell.edu

Melanie Palmer
Ag Business Specialist
315.424.9485 Ext. 228
mjp232@cornell.edu

Donette Griffith
Main Office
Administrative Assistant
607.391.2662
dg576@cornell.edu

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

Can Farm Employers Require Employees to Wear Face Coverings / Masks?

By Richard Stup, Cornell Ag Workforce Development

The science about wearing face coverings/masks to reduce the spread of novel coronavirus is increasingly clear; wearing a mask dramatically reduces the amount and range of virus particles that an infected person emits into the air to potentially infect other people. Wearing a mask to protect our family, co-workers, and community seems like a small individual sacrifice considering COVID-19 has already killed over 127,000 Americans. Farm employers need to know that both federal and state authorities recommend face coverings in the workplace *in addition to* social distancing (keeping at least 6 feet apart). At the federal level CDC Guidance for agriculture contains a whole section on wearing face coverings. New York's Interim Guidance for Prevention and Response of COVID-19 at Farms contains clear directives at the top of page 2 requiring face coverings.

EEOC Guidance

Farm employers, working closely with government and Extension, have put new procedures in place to provide face coverings at work and require their use. Unfortunately, there are some farm employees who, for whatever reason, refuse to wear face coverings. Employers have asked: "Can I require an employee to wear a face covering/mask at work?" Fortunately, the U.S. Equal Employment Opportunity Commission (EEOC) answered this question, see quote below and full details here: https://www.eeoc.gov/laws/guidance/pandemic-preparedness-workplace-and-americans-disabilities-act.

> **12. During a pandemic, may an employer require its employees to wear personal protective equipment (e.g., face masks, gloves, or gowns) designed to reduce the transmission of pandemic infection?**
>
> *Yes. An employer may require employees to wear personal protective equipment during a pandemic. However, where an employee with a disability needs a related reasonable accommodation under the ADA (e.g., non-latex gloves, or gowns designed for individuals who use wheelchairs), the employer should provide these, absent undue hardship.*

Note the second half of the answer mentions "reasonable accommodation" for an employee with a disability. Reasonable accommodation is a legal term under the Americans with Disabilities Act (ADA) that requires employees to make modifications or adjustments to a job to meet the needs of an employee with a disability, within reason. For example, an employee with asthma or other breathing issues might have a legitimate problem with wearing a mask, an employer's reasonable accommodation for that employee might be to limit him or her to only job activities that can be completed outside in the open air and further than 6 feet from other employees. If the person's job is a milker, which requires working indoors and closer than 6 feet to other people, then the employer might not be able to make a reasonable accommodation for the employee unless other work can be found.

Employer Best Practices

Farm employers need to make mask wearing a policy for every employee (your business safety plan might be a good place for this) and be clear about when it is required. For example, anytime two or more employees are together indoors or anytime employees are within 6 feet of each other outside. The policy should apply equally to all employees and be enforced consistently and without bias. Importantly, all farm owners and managers must diligently follow the face covering policy themselves in order to lead with the right example and to establish the right culture in the workplace. Similarly, employers should train employees about *why* the farm has a face covering policy and *why* it is important to protect the health of everyone. See these multilingual resources: CDC, New York, Cornell, and this farm-focused COVID-19 Video in Spanish (English subtitles) If an employee still fails or refuses to wear face coverings appropriately, then the employer would have to use discipline. Discipline should start with a calm, verbal conversation between the employee and the supervisor: describe the employee's behavior, describe the policy and expectation, discuss how the employee's behavior does not meet expectations and needs to change going forward. Most problems will stop after the verbal conversation. Next steps might include written warnings and eventually, termination. If an employee simply refuses the employer's direct instructions then that would be insubordination and could be grounds for immediate termination. As always, documentation of any employee disciplinary actions is a critical part of effective human resource management.

Common Sense

Let's keep a little common sense in the equation whenever possible. Most of the coronavirus guidelines are written with office, retail, and manufacturing type work in mind…all mainly indoor activities where the exchange of fresh air is limited by the structure and ventilation systems. Farming certainly includes indoor activities (shop, office, milking parlor, inside the pickup truck, etc.), but it also includes times when employees are outside (fields, orchards, vineyards) or entirely alone (as in a tractor cab alone). Employees don't need to wear a face covering when they are working entirely alone and don't expect to encounter anyone else. Similarly, employees working in the fields and orchards (where the air volume and exchange is massive), and spread out from others well more than 6 feet, don't need to wear face coverings either. It's a good idea for everyone to carry a face covering on their person for those times when they come in close contact with someone else.

The post Can Farm Employers Require Employees to Wear Face Coverings/Masks? appeared first in The Ag Workforce Journal

Appraising Forages with Dollars and Sense

By Alex Tebbe, Bill Weiss |Feb. 25, 2020| Reprint from Hay & Forage with permission

Source: https://www.hayandforage.com/article-2887-Appraising-forages-with-dollars-and-sense.html

Whether you are in the business of growing and selling forages or feeding cattle, correctly assigning the economic value of forages can impact profitability. Forages obtain their economic value when fed to animals, and a forage appraisal system should reflect the ability of that forage to support growth and milk production.

That ability is a function of the nutrient composition of the forage and its effect on feed intake. Relative feed value (RFV) and relative forage quality (RFQ) are often used to appraise forages; however, they put no value on protein, they consider fiber only as a negative factor (higher fiber equals lower RFV and RFQ), and they are not good when comparing across forage classes (for example, alfalfa, grasses, or corn silage).

Forage nutrients

The major nutrients needed by cattle are energy, protein, and fiber. Because dairy is a major user of forages and essentially all labs provide net energy for lactation (NEL) values, NEL will be the basis of this article. The NEL concentration depends mostly on fiber (higher equals lower NEL), fiber digestibility (higher equals higher NEL), and ash (higher equals lower NEL).

Lab results usually include crude protein (CP); however, not all CP is created equal. Most ruminant nutritionists balance diets for metabolizable protein (MP) rather than CP. The concentration of MP depends on the digestibility of the rumen undegradable (or bypass) protein and on the proportion of rumen degradable and undegradable protein in a feed.

The problem with using MP is that it is calculated for diets and not individual feeds. Labs usually do not provide an MP concentration. However, if we assume that the forage will be fed in a balanced diet and has typical rumen degradability, then its MP equals CP times 0.56. If alfalfa hay had 22% CP, it will have approximately 12.3% MP. The CP in other common feed ingredients have different conversion factors to MP. Because feed evaluation software uses several different feeds, MP, rather than CP, must be used.

Most dairy nutritionists use neutral detergent fiber (NDF) in ration formulation. The NDF from all feeds provide energy, but NDF from forages is needed for rumen health, which translates into better animal health and improved milkfat production. For this reason, NDF from forages is worth more than NDF from other feeds such as distillers grains. By dividing NDF into two fractions, effective and non-effective NDF (eNDF and neNDF), we can give more value to the NDF that promotes rumen health. The NDF from forage can be considered 100% eNDF.

What are nutrients worth?

Routine lab analyses provide nutrient composition data, but we need to translate those numbers into dollar values. Software programs are available to compare feed prices based on nutrient composition. Sesame, which was developed at The Ohio State University, estimates the dollar value of nutrients (Table 1) using a statistical method that relates prices of a host of different feeds to their nutrient concentrations. These values are also available from various sources such as Buckeye Dairy News (dairy.osu.edu).

Table 1. Estimated value of different nutrients for the Midwestern and western U.S., December 2019.

Nutrient	Midwest	West
NEL, $/Mcal	0.06 + 0.013	0.09 + 0.010
MP, $/lb.	0.37 + 0.040	0.33 + 0.039
eNDF, $/lb.	0.09 + 0.027	0.15 + 0.020
neNDF, $/lb.	0.02 + 0.023	0.02 + 0.018

The Sesame software is available free of charge at dairy.osu.edu/node/23 (user name = sesame; password = open).

The calculated prices are specific to a given market and may not reflect historical or future prices. Note that estimates for nutrients are not absolute and include a plus/minus term (Table 1). The plus/minus terms mean that those four nutrients alone are not the only factors affecting feed prices. The uncertainties associated with nutrient prices need to be reflected in the calculated total value of feeds.

As an example, let's say we have a truckload of alfalfa hay sold in the Midwest that is 85% dry matter (DM). Its nutrient composition on a DM basis is 0.62 Mcal of NEL per pound, 40% NDF, and 23% CP. Because alfalfa is a forage, eNDF equals 40% and neNDF equals zero. First, we convert CP to MP by multiplying by 0.56 so that MP equals 12.9%. Second, we calculate how many nutrients are in a ton of hay.

One ton of this hay has 1,700 pounds of DM (2,000 times 0.85).

That DM contains 1,054 Mcal of NEL (1,700 times 0.62), 219 pounds of MP (1,700 times 0.129), and 680 pounds of eNDF

(Continued on page 5)

(Appraising Forages - Continued from page 4)

(1,700 times 0.4). Next, we put a value on those nutrients using Table 1.

The 1,054 Mcal of NEL has a value of $63 (1,054 times 0.06), MP is worth $81, and the eNDF is worth $61. Summing those values equals $205 per ton (63 plus 81 plus 61). Because all feed prices were put into the program on an as-delivered basis, that is the average delivered value of the hay. However, when it comes to valuing forages, it is not that simple.

Consider intake, too

Nutrient intake by cows profoundly influences productivity, and forage quality has a major effect on intake. Unfortunately, the nutrients discussed above do not adequately account for differences in potential intakes among forages. For forages, the best single lab assay to estimate differences in intake is in vitro NDF digestibility (IVNDFD).

Within a forage class (for example, legume or corn silage), a 1% unit increase in IVNDFD on average boosts intake by 0.26 pounds per day and milk yield by 0.47 pounds per day. This is based on Michigan State University research from Masahito Oba and Michael Allen, which was published in the Journal of Dairy Science in 1999.

Those values are only appropriate for a change in IVNDFD. For example, if a forage with 50% IVNDFD was replaced with a forage with 55% IVNDFD (within the same forage class), milk would be expected to improve by 2.4 pounds per day (5 times 0.47). The same response would be expected if IVNDFD increased from 35% to 40%.

Since intake and milk are associated with change in IVNDFD, a base IVNDFD value is needed. The base values used here are the mean IVNDFD for alfalfa, grass, and corn silage from a publicly available feed library; in this case, it comes from DairyOne Laboratory, Ithaca, N.Y. It does not matter if you use a 30- or 48- hour incubation, but the incubation time must be consistent within a comparison.

Table 2. Average NDF concentrations and in vitro NDF digestibility (as a % of NDF).

		Mean IVNDFD, % of NDF	
Forage	Mean NDF, % of DM	30-hour	48-hour
Alfalfa	39	41	47
Corn silage	43	53	62
Cool-season grass	57	61	65

To calculate the quality adjustment, the difference between IVNDFD of the forage sample and base value (Table 2) is calculated: IVNDFD (sample) minus IVNDFD (base). The value is then multiplied by 0.26 to estimate change in intake and 0.47 to estimate change in milk yield. The dollar value of "forage quality" depends on the milk price and diet cost (Table 3).

Ration cost can vary

The cost of diet varies depending on the production level of the herd and the ingredient costs, but in most cases, it will range between 8 to 12 cents per pound of DM. If available, actual farm-derived feed costs should be used, but if not, we suggest using 10 cents per pound. If the corn price is more than 10% or 20% above the historical price, use 12 cents, and if corn grain is 10% or 20% less than historical average, use 8 cents per pound. The studies summarized by Oba and Allen had an average forage inclusion rate of 31 pounds, so that value was used in our calculations (Table 3).

Table 3. Intake adjustment ($/ton of forage DM) per 1 percentage unit change in IVNDFD.

	Milk Price, $/cwt.				
Diet cost, $/lb. of DM	14	16	18	20	22
0.08	2.9	3.5	4.1	4.7	5.3
0.10	2.6	3.2	3.8	4.4	5.0
0.12	2.2	2.8	3.4	4.1	4.7

As an example, let's assume alfalfa hay has a 48- hour IVNDFD of 54%. We will also assume a milk price of 19 cents per pound and a diet cost of 8 cents per pound of dry matter.

1. Difference in IVNDFD from standard: 54 – 47 = 7 units
2. Expected increase in milk yield: 7 x 0.47 = 3.3 pounds per day
3. Expected increase in DM intake: 7 x 0.26 = 1.8 pounds
4. Expected gain in income over feed cost: (3.3 x $0.19) – (1.8 x $0.08) = $0.49
5. Converting to a ton basis: 0.49/31 = $0.016 per pound = $32 per ton of DM or about $27 per ton of hay at 85% DM.

That value is added (or subtracted) from the nutrient value calculated as described above. Therefore, alfalfa hay in our example has a total value of $232 per ton ($205 plus $27).

To simplify these calculations, Table 3 has quality adjustments for various diet costs and milk prices. A user selects the most applicable diet and milk prices, finds the quality adjustment, and adds (or subtracts) it from the nutrient value. If a forage had 3 percentage units less IVNDFD than the base, the milk price was $20 per cwt., and the diet costs 10 cents per pound of DM, the quality adjustment would be 4.4 x (-3) = $(-13.2) multiplied by the DM percent as a decimal, or about $11 per ton on an as-fed basis if the hay was 85% DM.

The value calculated using this method has uncertainty associated with it, and the nutrient value should actually be considered as a range. A good benchmark for this range is plus or minus 12.5% of the calculated value.

In the example above for $232 per ton alfalfa, a reasonable range is $203 to $261 per ton. Prices at the low end of the range would be considered a bargain for the buyer, and prices at the high end would be overpriced. Prices near the calculated value of $232 per ton would be considered the break-even price. Using this method gives growers an idea of what improved nutrient quality is worth, offering buyers the ability to make more informed purchasing decisions.

This article appeared in the February 2020 issue of Hay & Forage Grower on page 31.

Stress & Cows – How do we attain our "200 Pound Cow"??

Part 2 of 2: Heifer Growth & Transition, Lactation & Reproduction, Gestation and Dry Period

By Betsy Hicks, Area Dairy Management Specialist

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 the first article, I talk through birth and neonatal stages through milk feeding and weaning. This article deals with heifer growth, transition to lactation, production & reproduction, gestation and dry period.

Heifer Growth

If producers track growth through the heifer phase, pinpointing the time frames in which heifers are not growing, or growing more slowly, will key in to spots that need tweaking in their replacement program. In a Cornell Study, researchers found that for every additional ~2 lb of growth in average daily gain (ADG) before puberty, heifers yielded over 7200 lb additional 1st lactation milk. The key to this is focusing on pre-puberty growth, as heifers utilize nutrients differently pre-puberty vs post, making pre-puberty gains very important for lifetime production. Playing catch-up for weight post-puberty is not as effective, and can be costly in terms of feed dollars.

Overcrowding is often an area where producers try to cut facility costs, but can actually cause unintended consequences. Indeed, heifers are usually the last group to get adequate resting space, and feed bunk space is usually minimal as well. Overcrowding of heifers results in greater aggression, greater competition, younger/timid calves falling behind, and more heifers lying in alleys.

As with many other life stages, ventilation is a key for achieving proper growth. According to NAHMS Data, the disease most frequently treated during the weaned heifers phase is respiratory illness. Paying close attention to stocking density and proper ventilation will ensure adequate fresh air for growing replacements. Proper ventilation includes adequate air exchange at the heifer level, minimal buildup of dust & pathogens in the air and minimal moisture/humidity accumulation in the air.

Transition to Lactation

The growing heifer, in the final weeks pre-calving, has to endure many changes including body and udder transformation, social changes, and acclimation to new facilities and procedures. How producers introduce heifers to these changes can impact how successfully they transition.

Nutritional needs of the first calf heifer grow greatly in last 3 weeks before freshening. The heifer is not only growing her mammary system, but the nutritional requirements of growing calf increase greatly, as well adding the nutritional requirements of milk production.

Socially, when first calf heifers are grouped with mature cows, they experience greater competition at feed bunk, competition for stalls, and competition/ guarding of waterers. Overcrowding can exacerbate these social needs, which can hurt heifers' production more. How first calf heifers are acclimated to new things: new facilities, new sounds, new contact with humans, new diet and new experiences, absolutely impacts her production.

Lactation

Lactating cows have many needs that need to be met in order to reach her genetic potential for milk production. When thinking

(Continued on page 7)

(Stress and Cows: Continued from page 6)

about her diet and nutrition, several things need to be in balance: feed availability - both amount available & times fed, and can she reach it when she wants to eat, feed quality - both fiber/NDF and mycotoxins/fermentation, and competition - crowding at bunk, and grouping mature with first lactation cows. In terms of first lactation cows, it has been shown that they will produce 10% less milk when co-mingled with mature cows. First lactation feed intake also drops when there is less than 24" feed bunk space available. In addition, water availability, the taste and the cleanliness of trough can impact consumption, as well as the number of troughs. Cows have been known to guard waterers, and so offering multiple locations to drink can be a means to offset this behavior.

Cow comfort, an all-encompassing buzz word, can be broken down into measurable items. Comfortable stalls, aggressive neck rails, adequate bedding, cleanliness of bedding and slippery surfaces are all factors that can be assessed and re-measured after changes have been made. The question that producers should ask is, "Do my cows have the ability to express normal behaviors?" Normal behavior includes feeding behavior, social behavior, and resting behavior. If any of these are compromised, there is an opportunity to improve cow comfort. Heat stress can be one of these times where normal behavior is compromised. Ventilation in both summer & winter is important, as well as air quality and air exchange. Producers should not confuse ventilation with cooling, as they are two separate and important topics, and cooling with fans and/or sprinklers in the summer is just as important as clearing the air of moisture and stale air. Fly pressure in the summer can also exacerbate cooling sins, as cows will bunch, worsening any heat stress they're encountering.

Lastly, management of the herd can trump facility shortcomings in many situations. Keeping on top of trim schedules and control of contagious pathogens can ensure cows stay sound and healthy. Practicing good stockmanship while moving and working animals keeps stress levels down. Minimizing radios and sudden noises in the parlor can also help with this. Regular milking system maintenance and proper milking procedure safeguards against teat end damage and other problems caused by poor management at milking.

Reproduction & Gestation

Two things come to mind when aiming for reproductive success: nutrition and management of the reproductive cycle. In terms of nutrition, does the diet support adequate nutrients:
for the cow to cycle regularly?
to achieve pregnancy?
to maintain/gain BCS during gestation?
to maintain milk production after achieving pregnancy?

Remember, one pound of milk at peak yields over 200 pound in her lactation. One point increase of Preg Rate is worth quite a bit too: $22-$60 per cow increased income has been shown, as well as the cost of days open over 115 DIM to be worth $2-$5 per cow in a herd.

In terms of management, is enough time spent with cows:
to watch for heats?
to see changes in nutritional needs?
to get cows pregnant fast enough to keep the herd at a low Days in Milk?

Having another set of eyes who doesn't see the cows every day can be helpful at seeing the minute changes a herd or group of cows can show. Documenting body condition score in a group or pen regularly can help with watching these changes to make sure things don't get off track.

Dry Period

Again, maximizing a cow's genetic potential often comes with recognizing the differences between first lactation cows and mature cows and managing them differently. First Lactation animals need at least 7 weeks in their dry period, but 2nd+ lactation cows can have a reduced 45 d dry period length with minimal negatives. With this shorter dry period, often cows will show increased feed intake, improved ruminal function, reduced metabolic disease and a shorter calving interval.

Heat stress is a real issue with dry cows, and can impact well beyond that cow's subsequent lactation. When a cow is heat stressed during her dry period, it not only negatively affects milk production in cow's subsequent lactation, and the quality of colostrum produced, but also affects the calf that was in utero during heat stress. Colostrum absorption by the calf, susceptibility of the calf to disease pre-weaning, fertility of calves as heifers, and milk production of calves in their first lactation are all effects of heat stress of the dam during the dry period.

Summary

In summary, every cow is born with the genetics to attain high milk production. The more attention producers can pay to key areas in management and transition help maintain that productivity. Conversely, failing to minimize stressors can hurt productivity. How we manage those areas is key for keeping our "200 Pound Cow".

Crop News

Cropping Notes

By Janice Degni, Extension Field Crop Specialist

Thankfully abundant rain fell across our region after the 4th of July weekend. From one to four inches in a single event have been reported. The effect of the dry conditions varied from mild to poor color to curled leaves. Corn on the edges of fields with compaction look like pineapples. Soybean growth has been slow. I have also seen several fields of both corn and soybean showing potassium defiency, which I attribute in part to the dry conditions. No doubt soil levels are low but the dry conditions compounded availability of the nutrient. Corn takes up .3 lbs potassium (K_20) per bushel and between .8-1.2 #N/bu. Hay crops are big potassium feeders and grasses enjoy "luxury consumption" of potassium which means they will take up K in excess of the crop's needs. Each dry ton of dry alfalfa or grass is estimated to take up 50 lbs of potassium. If you are farming ground that has had crops removed with little to no fertilizer input returned whether manure or fertilizer you are likely to see these symptoms.

"Potassium deficiency symptoms in corn appear first on the lower leaves because K is easily moved within the plant from older to younger leaves.

Leaf symptoms are a yellowing to necrosis (tissue death) of the outer leaf margins. These symptoms begin at the leaf tip and progress down the margin toward the leaf base." – Iowa State Extension

"Symptoms can appear even though soil K is adequate for crop production. How can this occur? Uptake of K by plants requires an active root system, especially in the soil zone where plant-available K is located. When this soil zone is dry, uptake is limited. Anything that exerts additional stress or limits root growth--compacted soil layers, root pruning, dry soil, side-wall smearing--further reduces K uptake, especially when root growth is restricted in the zones of highest available K. Also, if the subsoil supply of K is low, and this is the zone with most active roots, K uptake is reduced relative to plant need as growth continues." [1]

Potassium (K) deficiency symptoms occur when plants cannot extract K from the surface soil. Symptoms for both corn and soybean are yellowing of the leaf margins, and in severe cases, leaf edges may become brown.

Many have reported that second cutting yields are well below normal which can be attributed to the lack of moisture. Potato leaf hopper (PLH) a pest of alfalfa (and sometimes soybean), added to alfalfa stress and damage. We do not see damage from leaf hopper every year. I do not encourage prophylactic treatments (preemptive with no evidence of insect presence at over threshold populations). The insecticides used for control, most commonly Warrior™ or generic versions, are highly toxic to bees and other beneficial insects that are present in or next to the field. For precautions to protect our all-important pollinators please see the cover article. Scouting for PLH is the recommended approach. Once it is found you can assess the numbers to predict economic damage or not. As alfalfa grows it tolerates higher populations of the insects. One of the problems with the dry conditions is that the alfalfa is growing very slowly if at all, while the insect numbers grow. PLH arrives here each spring on storm fronts. It is rarely a pest in first cutting so sweeping can start in the early 2nd cutting growth. Every farm should have a sweep net. It is a modest investment that can impact the yield and quality of many tons of feed. You can order nets from Gemplers ($78) or an economic version from forestry-suppliers.com ($27).

Reduce treatment thresholds in half for PLH damage in new seedings in times of severe drought stress. For details on sweeping see Alfalfa Scouting Procedures Growing Alfalfa the IPM Way available at https://nysipm.cornell.edu/sites/nysipm.cornell.edu/files/shared/alfalfa-scouting-proc.pdf

Base PLH management decisions on the chart below. If the average number of leafhoppers per sweep exceeds the threshold in the right column, control is recommended.

Average Stem Length (in.)	Leafhoppers per Sweep (Threshold)
less than 3 in. (new seedings)	0.2
3 to 7 in.	0.5
8 to 10 in.	1.0
11 to 14 in.	2.0
15 in. or above	If PLH numbers exceed 2.0 per sweep, and if regrowth is within 1 week of harvest, no action is needed. If not, use a short-residual insecticide.

Planting PLH resistant alfalfa varieties is an additional strategy and without question is effective for minimizing damage. When the 1st generation of PLH resistant varieties were introduced there was some yield drag but that is no longer the case.

Other Pests

We seemed to have bypassed any armyworm damage this year. There were reports of presence to our west. I have not seen infestations of soybean aphid, but it is something to be on the watch for. Its also time to be on the watch for diseases. In corn, if you are in an area that

(Continued on page 15)

PRO-DAIRY Forage Management; Perennial Forage Cutting Height

By Joe Lawerence, Cornell Pro-Dairy

In a recent farm visit, the farmer had just purchased a nice new discbine. On the day I was there, he and the equipment dealer were replacing the shoes on the cutter bar with thicker ones. This farm has predominately grass forages and the farmer recognized that this new machine was cutting much shorter than his former haybine, and he knew this was not good for the grass.

This topic has been written about several times over the last decade, but warrants a refresher. Recommended cutting height is not a "one size fits all" scenario. Consider the crop species, field conditions, ash content of the harvested forage, time of year and age of the stand. As this scenario demonstrates, new machines may not be set up appropriately for your forage stands.

The prevalence of discbines over the last few decades allows a closer cut to the ground (if you choose) without as much risk of costly damage that often occurred with traditional sicklebar mowers. This makes it very tempting to lower the cutting height a few inches to get extra yield.

Research from Miner Institute indicates that up to ½ ton DM/season (three cuttings) can be gained by lower cutting height from 4 inches down to 2 inches, without a sacrifice of quality.

So if increased yield is the benefit, what are the issues? From a mowing standpoint, there is a risk of scalping an uneven field and increasing the ash content (amount of dirt and debris) in the forage. Tom Kilcer, Advanced Ag Systems refers to this as "minimum-till haylage."

Nutritionists indicate that the presence of ash in forages is becoming a chronic problem on many dairies. It has been reported that a 2 percent increase in ash (from 9 to 11 percent) can reduce milk by 1.9 lbs/cow/day (Sniffen, Fencrest, LLC.). That is certainly significant.

In addition to the connection between cutting height and ash content, improperly set up rakes can add to this issues as well. While rakes need to be able to pick up all the hay, they are often set closer to the ground than needed.

Crop species is a critical factor in determining an appropriate cutting height. Because alfalfa generates new shoots from the crown of the plant after each cutting, it can generally tolerate a very low cutting height. Conversely, a low cutting height on grass can be very detrimental. Grasses have to re-grow from the stubble left in the field. Therefore, if grasses are cut too short, the plant is robbed of the energy reserves it needs to re-grow.

In research conducted at Miner Institute, the effect of cutting height on orchard grass and reed canary grass was measured in a greenhouse experiment. This work showed that first year reed, canary grass was completely killed at a 2 inch cutting height. The orchardgrass did regrow, but at a much slower rate. The 2-inch orchardgrass required 38 days to reach a height of 16 inches. In contrast, at the 4 inch cutting height, both grasses responded quickly after cutting and measured 16 inches of regrowth in just 21 days.

Alfalfa

- Manage cutting height based on field conditions, time of year and considerations for ash content in forage
- Consider higher cutting height in fall to help capture and retain snow cover

Grass

- A minimum of 3-4 inches stubble is critical
- Grass stands are even more sensitive in the seeding year
- The loss in grass stand productivity from cutting too low far outweighs any yield boost you might get from harvesting a few extra inches in that one cutting

Mixed Stands

- In mixed stands cutting height could actually be used as a management tool for stand composition by choosing a cutting height that either favors grass or alfalfa

Influence of Drought on Corn and Soybean

By Mark Licht, Assistant Professor & Sotirios Archontoulis, *Associate Professor of Integrated Cropping Systems*

Water is extremely important for crop production. When water becomes limiting to the plant it is important to understand how plants use water. We often hear the term evapotranspiration (ET) in relation to plant water demand. ET is a combination of soil water evaporation (E) and water used by the plant during transpiration (T). Soil evaporation is the major loss of water surface and typically is higher after rain and under high temperature conditions.

Plant transpiration increases as corn leaf area increases. Transpiration is the mechanism by which water moves from the soil through the plant into the atmosphere. The greatest water demand for corn occurs from the late vegetative stages through the blister stage and for soybean from the early pod set through the mid seed fill stages. In other words, the greatest demand for transpiration occurs during periods of rapid growth.

Evapotranspiration demand that exceeds soil water supplies will result in yield reductions at any time during the crop life cycle. When plant water uptake by the roots is limited so is nutrient availability, uptake, and transport. Additionally, water stressed plants are more susceptible to insect and disease pathogens and have diminished stem integrity.

Iowa soils hold 1.5-2.5 inches per foot of effective rooting depth. The importance of proper early root development cannot be underestimated. Crops with deep root systems explore a greater volume of soil are able to withstand drought conditions better.

Drought symptoms in corn

Corn leaf rolling is the primary symptom of drought. Greying of leaf tissue will occur under extremely severe conditions. The earlier leaf rolling occurs in the day or the longer the duration of leaf rolling the greater the stress the crop is under. Yield loss estimates are assumed when drought stress occurs for four consecutive days or more.

Drought stressed corn

Effects on vegetative corn

Drought stress during vegetative stages results in reduced stem and leaf cell expansion (shorter plants with less leaf area). The effect of drought stress on leaf morphology is much larger than that of photosynthesis. When drought stress is combined with heat stress vegetative development will progress more rapidly. Any stress that occurs during the sixth to eighth leaf stage (V6-V8) can result in fewer kernel rows, whereas stress from eighth leaf to seventeenth leaf stage (V8-V17) can result in fewer kernels per row.

Effects on pollinating corn

Drought stress 7-10 days ahead of silking can result in delayed silk development. When combined with heat stress this delay could result in poor anthesis silking interval (ASI). Water stress during pollination (tasseling through silking) not only delays silking, but also reduces silk elongation, and if severe, impedes embryo development. With temperatures greater than 95^0F, low humidity, and low soil moisture level, silks will desiccate or become non-receptive to pollen. Pollen grains may also be damaged from desiccation when they are released for tassel anthers. When temperatures greater than 100^0F , pollen grains are killed. Drought stress during pollination ultimately results in poor pollination and fewer kernels per ear.

Effects on corn during grain fill

During grain fill drought stress results in premature death of leaf tissue, shortened grain fill periods, increased lodging, fewer kernels, and light kernel weights. Kernel abortion near the ear tip will occur in the two weeks following pollination. Continued drought into the milk stage will result in further kernel abortion and smaller, lighter kernels. Drought that occurs in the mid to late grain filling period (milk, dough, and dent stages) results in decreased kernel weights and premature physiological maturity. Once physiological maturity occurs additional drought stress will have no impact on grain yield. Because drought stress typically coincides with higher than normal temperatures the grain fill period is often reduced.

Corn management and yield loss

Management depends on the remaining yield potential. Each field provides a unique combination of soil, management, hybrid, and water supply so not all the fields will have the same yield reduction. After pollination a key is to determine how successful pollination was; that is how many kernels per ear were attained. This can be determined by performing a shake test to see if silks are still attached to the ovules (unfertilized kernels); silks will easily drop from fertilized ovules (kernels). Or wait until seven to ten days after pollination when the ear is in the blister stage

(Continued on page 11)

(Influence of Drought on Corn—Continued from page 10)

(plump kernels with watery liquid inside) to see how many kernels are expanding.

If pollination is good, manage the field as normal. If pollination is poor, those kernels will develop normally with reduced yield potential. These fields may be considered for forage or silage harvest. If there is no pollination, there are two options; (1) harvest as near to pollination as possible for the highest quality forage possible or (2) leave the crop as a living cover crop until the fall before mowing or chopping. Continual leaf rolling of the plant in the weeks leading up to pollination can result in a yield loss of 1-5 percent per day. During pollen shed and silking severe stress can reduce yields by up to nine percent per day. In the weeks following pollination drought stress can reduce yield by up to six percent per day.

Corn Development Stage	Estimated Yield Loss per Day of Stress
Early vegetative (VE - V12)	1 – 3
Late vegetative (V12 to VT)	2 – 5
Pollination to Blister (R2)	3 – 9
Milk (R3)	3 – 6
Dough (R4)	3 – 5
Dent (R5)	2 – 4
Maturity (R6)	0

Table 1. Example corn yield loss estimates when stress occurs for four or more consecutive days. Adapted from Classen and Shaw, 1970; Rhoads and Bennet, 1990; and Shaw, 1988.

Drought stressed soybean.

Drought symptoms in soybean

Soybean respond to drought stress by flipping their leaves over so the underside of the soybean leaf is turned up. A less obvious sign of drought stress in soybean is diminished vegetative growth which normally occurs prior to leaf flipping. In severe drought conditions, the leaf trifoliates will close or clamp together with the center leaflet being sandwiched between the outside leaflets.

Effects on vegetative soybean

Vegetative growth of soybean during drought is diminished. Drought stressed soybean are often shorter with smaller leaves due to a lack of water, nutrient availability, and nutrient uptake. Soybean root growth increases during drought conditions because plant carbohydrates are shifted to root growth. When adequate rainfall or soil moisture returns, vegetative growth will resume until the mid-seeding filling stage (R5.5). Under severe drought stress, soybean flowering may occur earlier than normal in an effort to produce seed before premature death.

Effects on soybean during grain fill

Drought effects on soybean are generally not as severe as corn. This is a result of overlapping of development stages. When short-term drought stress results in flower or pod abortion, new flowers and pods will set when conditions improve. During prolonged drought stress, or when the stress occurs during pod set and seed filling stages, the compensatory ability is not as likely to occur. Drought can reduce pod number by up to 20 percent as a result of flower and pod abortion. Seeds per pod and seed size can also be affected by drought stress but to a lesser extent than the number of pods. Drought stress often results in earlier maturity or shortening of the grain filling period resulting in lower seed weights and yields. Soybean yield loss from drought stress is compounded by the lack of nitrogen mineralization and nitrogen fixation. In dry conditions, nodules cease nitrogen fixation because of a lack of soil moisture and lack of carbohydrate supply from the soybean plant. If water deficits are short lived, nodule nitrogen fixation can resume.

Resources

Weather Stress in the Corn Crop (NCH-18)
Utilizing Drought-Damaged Corn (NCH-58)
Making Quality Silage (IBC)
Soybean Response to Drought (PM 3046)
Soybean for Forage (Recovery 19)
Alternatives for Drought-Damaged Soybeans (ICM News)

References

Abendroth, L.J., R.W. Elmore, M.J. Boyer, and S.K. Marlay. 2011. Corn growth and development. PMR 1009. Iowa State University Extension, Ames, IA.

Pedersen, P. and M. Licht. Soybean growth and development. PM 1945. Iowa State University Extension and Outreach, Ames, IA.

Classen, M.M. and R.H. Shaw. 1970. Water deficit effect on corn. II. Grain components. Agronomy Journal. 62:652.

Rhoads, F. M. and J.M. Bennett. 1990. Corn. In Stewart, B.A. and D.R. Nielsen (editors). Irrigation of agricultural crops. p. 569-596. ASA-CSSA-SSSA, Madison, WI.

Shaw, R.H. 1988. Climate requirement. In Sprague, G.F. and J.W. Dudley (editors). Corn and Corn Improvement. p. 609-638. American Society of Agronomy, Madison, WI.

(Continued from page 1)

of contaminated soil water by both crop and non-crop plants is a new and important route for exposure as well – many types of pollen from crops and non-crops alike has been found to be contaminated with pesticides. Contaminated water sources are also a culprit, as bees seem to favor ponds, wheel ruts and mud puddles for their drinking water.

Reducing the Hazard (Growers and Homeowners)

Pesticides are often over-applied because applications are made prophylactically. Ensure that there is a pest problem before applying any insecticide. If insecticides must be used, several steps may be taken by the grower to reduce the hazard to bees. Avoid using dusts wherever possible. Dust may be unavoidable in some cases, such as during the planting of treated corn and soybean seeds – small amounts of these chemicals mixed and forced into dust plumes by planters is very highly toxic to bees. Use chemicals with reduced risk to bees whenever possible (see Tables below). Apply insecticides in the late evening, night, or very early morning when fewer bees will be foraging, and when spray drift and volatilization due to extreme heat are at a minimum. Do not spray when winds favor drifting, and use ground applications instead of air where possible. Avoid spraying when the crop or other plants in the field or nearby (including weeds) are in bloom.

Finding dead honeybees does not always indicate a pesticide kill, check the symptoms of dying bees closely to narrow down the cause.

Reducing the Hazard (Beekeepers)

If a highly toxic insecticide to bees is to be used in an area of your hives, be prepared to take steps to reduce risk of poisoning. One of the most important steps in protecting your bees is the selection of an apiary location with low pesticide risk. This may not often be feasible, so be sure to notify growers and applicators in the area, the county extension agent, and the State Apiary Inspector of the location of your hives.

Insecticides applied to the agricultural field could drift onto the dandelions where honey bees forage.

Learn as much as you can about the chemical under consideration before making a decision on how to protect your bees. If the insecticide to be used has a long residual life and is being applied to a plant where bees are foraging, it may be best to move your bees out of the area. Remember that the new site must be at least 3 miles away to prevent bees from returning to the old one. Make sure the new site is safe and notify the growers and applicators in that area of your intentions. If the insecticide has a short residual life, you may be able to confine your bees until the danger has passed. Be sure the hive does not overheat if you choose this method.

Community Communication and Cooperation

Many bee poisoning problems could be prevented by better communication and cooperation among the grower, pesticide applicator, and the beekeeper.

Because bees forage far beyond the colony, all beekeepers within 2 to 3 miles of the area to be treated should be notified at least the evening before the insecticide is to be applied. If the beekeeper is to move or confine his bees, he must do so the night before the treatment. Keep your hives away from potential sources of pesticides. Corn planting has been associated with honey bee mortality, so you may want to screen off the entrances during planting time so that the bees cannot fly. If you only have one or two hives you might even turn on the water sprinkler to keep the bees at home – they will behave as if it is raining and not forage for the day, reducing their chances of exposure.

Since many decisions to use an insecticide are made only a few hours before the application is made, growers and applicators should be aware of the location of all hives within 3 miles of their crops and know how to contact the beekeeper who owns them. If this information is not available from a resident of the area, local county extension personnel may be of assistance. Most beekeepers register the location of their hives with the State Apiary Inspector. Increasingly, beekeepers are using the website located at http://www.fieldwatch. com where there are resources for both beekeepers and crop producers. The names of beekeepers in your area can also be obtained by writing: State Apiary Inspector, Department of Natural Resources, 420 W. Washington St., Indianapolis, IN 46204, PH: 317-232-4120.

Diagnosing Unexpected Bee Kills

Despite all of the safeguards outlined above, pesticide related bee kills do happen occasionally. A bee kill from pesticides usually appears quickly. You may see many dead bees in front of the hive one day that were not there the day before. You may also see trembling bees because most insecticides are nerve toxins. A pesticide kill can be confused with bee mortality caused by Varroa mites, which usually occurs late in the summer or fall when mite populations are highest. When this happens, bees are more vulnerable to viral infection and may be seen dead in front of the hive or crawling and trembling in the grass. This is a more gradual, subtle process that usually occurs over a period of weeks (see below for more details). A colony that dies as a result of Varroa mites may also just dwindle without the appearance of dead bees because the sick bees do not return to the hive. This can even happen in early winter, refer to “Mites of Honey Bees” <https://extension.entm.purdue.edu/publications/E-201.pdf>. If you suspect that your

(Continued on page 13)

Profitability vs Cash Flow

by Pauline Van Nurden *Source:* https://finpack.umn.edu/news/profitability-vs-cash-flow/

Profitability and cash flow are two important business concepts that can be confused by many small business owners. Just because a business is profitable, doesn't necessarily mean it cash flows. Alternatively, a business can have positive cash flows and not be profitable. These are topics that are often difficult to understand, so let's dig into how these statements are possible. First off, let's take a deeper look at profitability and cash flow.

What is Profitability?

Profitability is the ability of a business to earn a profit, meaning business revenues exceed business expenses. The income statement is used to analyze business profitability. This seems simple and straightforward, but one needs to remember that not all checkbook debits are business expenses. One common example of this are loan payments. Specifically, principal payments on loans are not business expenses. Remember, a loan payment is comprised of two components – principal and interest. Interest paid on business loans qualifies as a business expense. Principal payments do not. Principal payments made on loans impact the balance sheet and statement of cash flows but do not impact the income statement. What replaces principal payments on term loans as deductions on the income statement? Depreciation. Depreciation is a deductible expense on the income statement. But, depending on tax management strategies, these two items may not align. If "fast depreciation" strategies are used for tax management, like Section 179 expensing and Bonus Depreciation, and loans are taken out to finance capital purchases; principal payments may be a cash flow detriment beyond the depreciation expense.

What is Cash Flow?

Cash flow is cash utilization by the business or the flow of money through the operation. The cash flow statement measures how well a business manages its cash. Can it generate enough cash to pay back debt and fund operations? Cash flow encompasses the flow of money to three places for business activities – operating, investing, and financing. Therefore, all sources and uses of cash are taken into account when considering cash flow – including income, expenses, capital purchases, capital sales, money borrowed, and loan payments.

How can a business be profitable and not cash flow?

Back to the original questions, "Can a business be profitable and not cash flow?" and "Can a business have positive cash flow and not be profitable?" The answer to both is yes. Money borrowed has a positive impact on cash flow, but does not provide profitability. Also, a business strapped with large loan payments may turn a profit, but not provide enough cash for loan payments. Additionally, owner withdrawals or family living expenses in excess of profits would be a detriment to cash and another opportunity for a business to show profits and not cash flow. The timing of cash is also important. On a day to day basis, a business may not have adequate cash available, but over time has adequate profits. A classic example of this would be a grain operation. There is typically a large portion of the year with little income or cash inflows, but expenses incurred. Cash is needed to pay expenses to put the crop in the ground months before any cash revenue from grain sales is available. If a farm doesn't have adequate cash going into the year, an operating loan will be needed to get to the end of the year, when grain is sold, and profits are turned.

Summary

Helping business customers understand profitability versus cash flow is key to business management. Profitability does not necessarily equal positive cash flow. Alternatively, positive cash flow does not necessarily mean the business is profitable. To be financially successful over time, profitability should provide enough funds for the investing and financing needs of the business.

(Beekeeping—Continued from page 12)

bees died from pesticide poisoning you can contact; Joan Mahoney, State Apiculturist, NYSDAM, (518) 457-2807 or Joan.Mahoney@agriculture.ny.gov to make an incident report. Without having this essential first step performed promptly, you will be unable to document the cause of the mortality properly.

Large numbers of dead and dying bees outside the hive entrance is often due to encounter with pesticides.

Classes of Pesticides

The type of pesticide and how bees are exposed determines the risk to bees. Their toxicity is measured by the LD50 (Lethal Dose, 50%), which is the dose that would kill half of the bees that contact the pesticide. There are a range of potential exposure routes (oral, contact are two common examples), and bees are typically exposed to multiple pesticides at once. Bees are insects, and most poisoning problems are attributed to insecticide exposure, but some other pesticides (eg. fungicides) may occasionally cause problems for bees. Be sure to read all labeling with any pesticide, especially any specific warning pertaining to bees.

To learn more about specific pesticides and their properties please reference the tables published with this article that include Highly Toxic, Moderately Toxic and Relatively Nontoxic Pesticides.

https://extension.entm.purdue.edu/publications/E-53/E-53.html

Contact Donette or Janice if you need printed copies.

Ag and Markets has a website with information and resources covering beekeeping and pollinator conservation: https://agriculture.ny.gov/plant-industry/honey-bee-health

Penn State's Business Transitions Online Course is a Convenient Tool to help You Begin Planning for the Future of Your Farm

By Carolyn Wright, 2020 SCDFC Summer Intern

I have been learning a lot about the different aspects involved in succession planning this summer while looking into farmers' needs surrounding this topic. One of the big things I have discovered is that succession planning involves gathering and organizing a lot of information about your farm business, and with that comes a lot of time: time to gather farm documents and records, time to have important conversations with family and non-family, and time to draft and finalize the transfer documents. Frankly, just thinking about all of this can be overwhelming and leave you wondering where to start.

Fortunately, many state extension programs have resources to help you start to learn about and navigate the process of planning for farm succession. I recently completed an online course through Penn State Extension called *Business Transitions: Family Farm and Business Succession Planning* and would like to share my thoughts not only as a student but also as the junior generation on my family's 50-cow dairy farm.

It can be difficult to initiate a discussion on succession planning with the partners and potential future partners of a business. I would recommend this online course as a great starting point for farm families who are thinking about beginning a transition plan or have recently started one. The course is taught by John Berry, a Penn State Extension educator and former dairy farmer, and Matt Kaplan, a professor of Agriculture and Extension at Penn State with a focus on family communication strategies.

The instructors break the course down into eight sections that provide a basic understanding of components and considerations that should go into forming a plan, such as:

- Determining family and business goals
- Creating an accurate record of farm assets
- Understanding different strategies and options
- Considering the people (professionals and family) that should be involved

This course is not a substitute for legal advice and professional council, but is does provide an understanding of the transition process and steps to consider before involving a professional to get the most for your money.

What I Liked

The introduction clearly laid out how to navigate the course. It showed you where everything was on the course page and how to find the course outline, which was broken down into clearly labeled sections and sub sections for easy navigation.

The order of each section. Overall, the layout of each section followed a logical order that started with developing an understanding of the different types of planning (business, retirement, estate, and succession) before considering communication and goal setting strategies and ending with the components of a succession plan.

The course combined both videos and reading into short, easy to follow sections that built on your understanding. Each sub-section could generally be completed in around 10 minutes and typically contained a few paragraphs of reading and a video that ranged from 3 to 5 minutes in length. I enjoyed this because it provided convenient places to stop and think about what I had just learned. This structure makes it easy for farmers to work through the material as they have time.

There were no deadlines. Once you register for the course, you have access to all the materials for 60 days, so you are free to work through the course when you want and at your own pace, an aspect helpful for busy farmers and families.

It followed the journey of a farm family as they worked through each section of the process. I found this helpful because it portrayed an application of the topic discussed in each section as well as revealed the thoughts of the family members involved as they moved through the process.

Activities and handouts were available to stimulate discussion among the family. Many of these are available to download so they can be used after the course ends to continue working through the process as you make time.

Each section ended with review questions to see what you learned. This was helpful for understanding the different terms and concepts discussed within each section.

What I Would Improve

Having an option to interact with the instructors. All of the videos that were a part of the course were pre-recorded so there was no way to ask questions if you wanted. I think incorporating a way to submit questions would have been helpful and enhanced the course, making it more interactive.

Moving Section 5: Establishing Goals. While the majority of the course is laid out quite well, the section on establishing goals would have fit better after the discussion on family dynamics and communication, since goal writing ties closely with communicating across the family.

Making sure all the links in the resource page are up to date. While this does not take away from the value of the course, I did notice a couple links that did not work like they should, so updating them would be helpful in case anyone wants to look deeper into information on certain topics.

Final Thoughts

Overall, this course provides a balanced set of information and strategies to consider that can help frame how you approach and think about moving forward with the succession planning process. These considerations breakdown the process into steps you can start working on with your family now and provide basic tools to organize decisions that are made after talking with family members and other business partners. This course would be a great tool for engaging the entire family and all business partners in conversations that are important to have before making a plan for the future. It also provides a strong foundation to begin conversations with a local extension agent who may be able to provide additional resources and support. I would highly encourage any family farm or business thinking about planning for the future to explore online course options like this because starting to plan now can prevent a lot of headaches in the future.

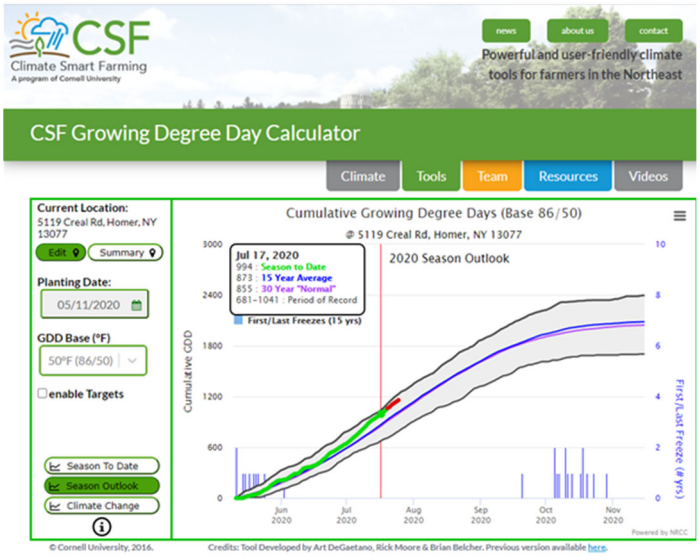
(Continued on page 15)

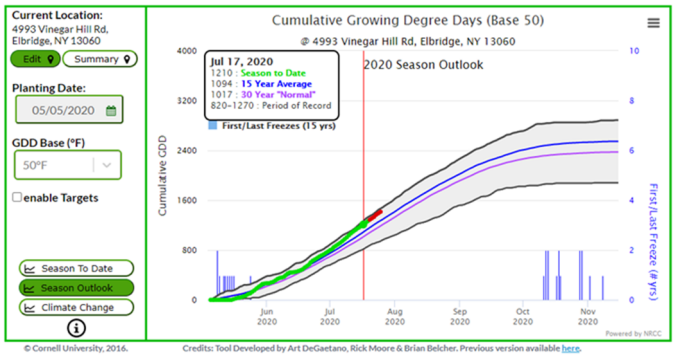
(Cropping Notes—Continued from page 8)

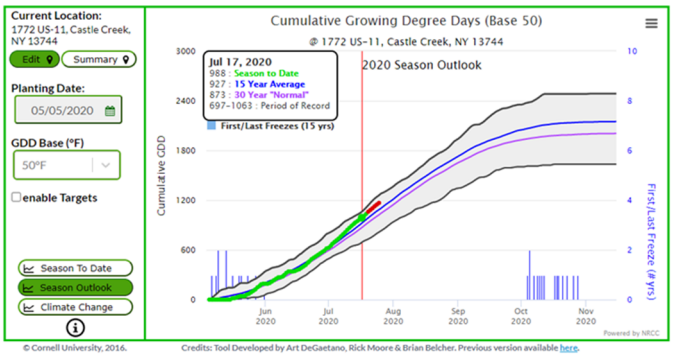
typically has Northern Corn Leaf Blight or Grey Leaf Spot you want to be checking your fields. Fogs and heavy dews can contribute to incidence even when we are on the dry side weather-wise.

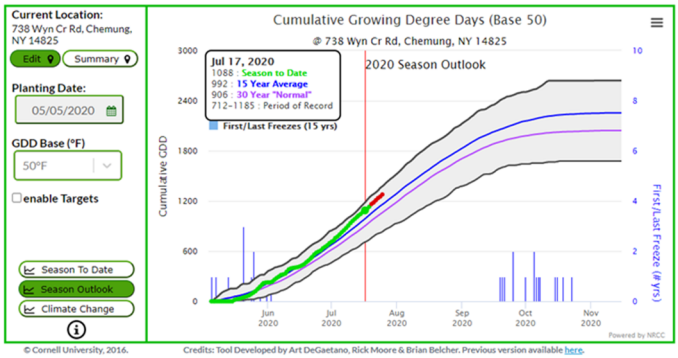
In response to less than ideal planting conditions, particularly cold and dry many fields show uneven growth. Additions of nitrogen have helped equalize some of that but not entirely. Some varieties are tasseling now and are short because of the dry period in May and June. Silage yields may be lower than normal. Grain is harder to predict, ear size may have been affected or we may have just snuck by in some areas (See Influence of Drought on Corn p. 10). Even though the season got off to a slow start in terms of growing degree days (GDD), where are we now after several weeks of above normal temperatures and several stretches of heat waves defined as 3 consecutive days of 900 or above temperatures? Looking at base 86/50 GDDs for corn and using the Cornell Climate Smart Farming Tools you can compare the current season to 15 and 30 year averages. The following pictures represent locations across our 6 counties. This tool is available at http://climatesmartfarming.org/tools/csf-growing-degree-day-calculator/. Use the satellite view and you can check your own fields.

See **Influence of Corn Maturity on Grain Yield, Whole Plant Silage Yield and Moisture Content** on back cover.









(Business Transitions —Continued from page 14)

Resources

Business Transitions: Family Farm and Business Succession Planning, Penn State Extension, *https://extension.psu.edu/business-transitions-family-farm-and-business-succession-planning*

About the Author

I have spent most of my life working on my family's 50-cow dairy and 8,000 tap maple operation in WNY. I currently have an AAS in Agricultural Business from Alfred State College and am working on completing my BS in Agricultural Sciences with a focus on education at Cornell University. This summer I have had the privilege of working with Mary Kate Wheeler as an intern on a succession planning project focused on examining the needs surrounding the financial, legal, and human aspects of the process. In the future, I hope to pursue a career in agricultural education and be a part of my family's farm.

Cornell Cooperative Extension
South Central NY Dairy and Field Crops Program
60 Central Avenue • Cortland • 13045 • 607.391.2660 • http://scnydfc.cce.cornell.edu

Influence of Corn Maturity on Grain Yield, Whole Plant Silage Yield and Moisture Content

			% Max Yield		% Moisture	
Maturity Stage	Avg. Cal Days To Maturity	GDU to Maturity	Grain	Whole Plant	Grain	Whole Plant
Silk	50-55	1100-1200	0	50-55	---	80-85
Blister	40-45	875-975	0-10	55-60	85-95	80-85
Late Milk	30-35	650-750	30-50	65-75	60-80	75-80
Early Dent	20-25	425-525	60-75	75-85	50-55	70-75
Full Dent (1/2 Milkline)	10-15	200-300	90-95	100	35-40	65-70
Blacklayer	0	0	100	95-100	25-35	55-65

Assumes 20 GDU/day to maturity. Adapted from Carter, P.R. 1993. Pioneer Hi-Bred International, Inc.