Campbell County Extension Service

University of Kentucky
College of Agriculture, Food and Environment
Cooperative Extension Service

The FARMACY

Agriculture & Natural Resources Newsletter

Summer 2023

Consideration for Weed Control in Dry Conditions

Dr. Travis Legleiter, Assistant Extension Professor - Weed Science

The rainfall patterns across Kentucky have been variable with some parts of the state receiving timely rain while other regions have missed the major rain events over the past 4 weeks. The lack of rain has caused droughty conditions in several spots of the state. Those facing these droughty conditions will have to consider the following when planning post emergence weed control. Although many of these considerations also apply to those who have been fortunate enough to receive timely rainfalls.

Scout field fields early for weed escapes.

Late planted corn or soybean fields that received a preemergence herbicide application that has not received significant rainfall need to be scouted for early weed escapes. The lack of an activating rain-fall on these fields means there likely already are weed escapes that need to be controlled. Scout all your fields to check for emerging weeds to make plans for post emergence applications. Some fields this year may require multiple post emergence applications due to the lack of residual activating rain-falls and slowed crop and canopy development due to the current weather patterns.

Drought Stressed Weeds are Hard to Kill

The dry conditions also lend to weeds being tougher to kill with post emergence herbicides. All plants that are exposed to droughty conditions develop thicker leaf cuticles. The cuticle is the waxy layer on plant leaves that keeps water in the plant, when a plant experiences dry conditions the cuticle becomes thicker to protect the precious water the plant needs to survive. Unfortunately, the thick cuticle not only helps keep water in, but also keeps spray carrier water and any herbicide contained in that water out. The best way to help overcome this barrier is with the use of appropriate adjuvants for the herbicides being sprayed. Make sure to read your product label to determine the correct adjuvant and adjuvant rate to use in your application. Table 1 and 2 contain post emergence products for corn and soybean and the recommended adjuvants.

(article continued on page 2)

Thank You District Board Member Jim Krift

Jim Krift, was recognized for his years of service to the Campbell County Cooperative Extension Service District Board. Thank you for all of your effort and dedication, Jim!

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Consideration for Weed Control in Dry Conditions

(article continued from page 1)

Spray When Weeds are Small.
This should not be new information, but in a year when crops and weeds alike are stressed due to dry weather it is especially important. Excessive weed growth, even at low densities, can contribute to additional drought stress to already struggling crops. Thus, eliminating weeds when they are small can reduce the competition for water and stress on the crop. Additionally, smaller weeds in general are easier to control with all post emergence herbicides in all weather conditions. This is why we emphasize the need to scout fields often and early for weeds escaping a residual herbicide that did not get activated. When you are scouting, start making plans to spray whenever weeds first emerge to assure you can get a sprayer across the field prior to the weeds reaching four inches in height.

Be Aware of Crop Growth Stage Restrictions.
Our corn and soybean across the state are at various stages of growth, with some of the early planted corn well beyond growth stages for post emergence herbicide applications. Although many of our acres will be ready to spray in the very near future. When making your post

Table 1 - Postemergence corn herbicides with recommended adjuvants and crop growth stage restrictions.

Herbicide	Adjuvant[1]	Crop Stage
Accent Q	COC, MSO, or NIS + UAN or AMS	Broadcast up to 20" tall corn or that exhibits 6 or fewer collars (V6); Use only drop nozzles for corn between 20“ to 36" tall. Do not apply to corn that exceeds 36" tall or that has 10 or more collars (V10).
Acuron Flexi	NIS. Consult label for use of COC	Apply before corn emergence until plants reach 30 inches or up to 8-leaf stage of corn growth.
Acuron GT	NIS + AMS	Corn emergence up to 30” height or the 8-leaf (V8) growth stage.
Armezon PRO	MSO or COC + UAN or AMS	May be applied preemergence up to 30” tall corn, but 45 days prior to harvest. Use directed applications when corn is 12–30” tall.
Atrazine	COC or Crop Oil	Apply before corn reaches 12” tall
Callisto	COC + UAN or AMS	Broadcast on corn up to 30" tall or up to the 8-leaf stage of corn growth.
Callisto Xtra	COC or NIS + UAN or AMS	Apply after crop emergence but before corn exceeds 12” in height
Capreno	COC + UAN or AMS	Broadcast apply from the 1 leaf collar (V10 to 6-leaf (V6) growth stage. Use directed applications when corn is V6 to V7 growth stage
Dicamba [Clarity, Sterling Blue, Vision, etc]	NIS UAN or AMS may be added. Consult label for use of COC	Apply 8 to 16 oz/A (0.5 to 1 pt/A) from emergence through 5th leaf stage or until corn reaches 8" tall, whichever occurs first; Apply 8 oz/A when corn is from 8" to 36" tall, if 6th true leaf is emerging from whorl, or 15 days before tassel emergence.
DiFlexx or DiFlexx Duo	NIS, COC, MSO + UAN or AMS may be added (consult label)	Broadcast from spike through V6 (6 leaf collars) or 36" tall, whichever occurs first. Directed applications may be made from V7-V10 crop growth stage (7 to 10 collars), up to 36” tall, or 15 days before tassel emergence, whichever occurs first.
Enlist Duo	None	Broadcast on corn no larger than V8 growth stage or 30 inches, whichever occurs first. For corn 30 to 48 inches apply using drop nozzles to avoid whorl of corn plants.
Halex GT	NIS + AMS	Corn emergence up to 30” height or the 8-leaf (V8) growth stage.
Impact / Armezon	MSO or COC + UAN or AMS	May be applied anytime after corn emergence up to 45 days prior to harvest.
Impact Core	MSO (NIS) + AMS or UAN	After corn emergence up to 11” corn height
Katagon	MSO, COC, or NIS	Apply up to the 5 leaf collar (V5) or 20 inches tall
Laudis	MSO or COC + UAN or AMS	Corn emergence up to the V8 growth stage (exhibits 8 collars)
Liberty [glufosinate]	AMS	Apply from corn emergence until V-6 growth stage. Can be applied with drop nozzles until LL-corn is 36" tall.
Permit	NIS or COC (may add 28% Liq N)	Apply from the spike through layby stage of field corn.
Realm Q	COC or NIS + UAN (27-32%) or AMS	Apply to corn up to 20" tall. Do not apply to corn taller than 20" or exhibiting 7 or more leaf collars.
Resolve Q	NIS + UAN (28-32%) or AMS	Apply postemergence to corn that is up to 20” tall. Do not apply to corn taller than 20” or exhibiting 7 or more leaf collars.
Glyphosate	Adjuvant requirements vary with product used	Apply broadcast over-the-top from corn emergence through V8 corn stage or 30 inches, whichever occurs first. For “Roundup Ready 2 Corn” and other hybrids designated as Glyphosate Tolerant drop nozzles can be used to direct applications on corn 30 to 48 inches.
Shieldex	MSO, COC, or NIS	Apply to corn up to the 6 leaf collar (V6) stage or up to 20” tall.
Sinate	MSO or HSMOC + AMS	Apply from corn emergence up to 24 inches (V-7 growth stage). Use drop nozzles for corn 24 to 36" tall.
Spirit	COC or NIS (may include 28% to 34% Liquid Nitrogen)	Apply to corn between 4" to 24" tall; Drop nozzles recommended when corn is >20" tall or exhibits more than 6 collars (V6), whichever comes first. Applications to popcorn are more restrictive.
Status	NIS, COC, or MSO + UAN (28-34%) or AMS	Apply from 4-inch tall (V2) to 36-inch tall (V10) corn. Do not apply if corn is more than 36”, or within 15 days before tassel emergence.
Steadfast Q	COC, MSO, or NIS + UAN or AMS	Apply to corn up to 20" tall. Do not apply to corn >20" tall or exhibiting 6 or more leaf collars (V6), whichever is more restrictive.

[1]COC - Crop Oil Concentrate; NIS - Non-Ionic Surfactant (at least 80% active ingredient); AMS - Ammonium Sulfate; UAN - Urea Ammonium Nitrate (28% to 32% nitrogen fertilizer); MSO - Methylated Seed Oil; HSMOC – High Surfactant Modified Oil Concentrate.

emergence applications be aware of growth stage restrictions. These restrictions are in place to protect the crop from herbicide injury and/or to protect the end product from illegal herbicide residues. Make sure you know the growth stage restrictions of the products you plan to apply. If using multiple products, use the most restrictive (or earliest) growth stage. **Table 1** and **Table 2** list the crop stage restrictions for the majority of post emergence herbicide applied in corn and soybean.

Continue to watch weather conditions.

We received several complaints this spring about herbicide drift onto commercial specialty crops and homeowner landscapes from burndown applications. Make sure you are aware of surrounding crops and landscapes and avoid applications to fields when winds are blowing at excessive speeds towards those sensitive crops. In some cases, such as dicamba applications in dicamba-resistant soybean you are not allowed to spray at all if the wind is blowing towards a sensitive crop. Depending on your post emergence products being used you can also use drift reducing nozzle that produce larger spray droplets to mitigate drift potential. Although larger droplets can drift as well in high enough winds and large droplets are not appropriate when using contact herbicides.

Table 2 - Postemergence soybean herbicides with recommended adjuvants and crop growth stage restrictions.

Herbicide	Adjuvant[1]	Crop Stage
Assure II	COC or NIS + (Liquid N or AMS optional)	Before pod set and 80 days prior to harvest.
Cheetah Max	AMS Optional	From emergence up to but not including bloom stage. Do not apply within 70 days of harvest.
Classic	NIS or COC + (Liq N / AMS optional)	After first trifoliate leaf has expanded but 60 days before maturity.
Cobra	COC or NIS (Liq N optional)	Normally when plants are in the one to two trifoliate leaf stage; Do not apply within 45 days before harvest or after stage R6 (full seed).
Extreme	NIS + AMS	Before bloom and prior to 85 days of harvest.
Enlist One or Enlist Duo	---	Emergence to R2 (full flowering)
FirstRate	NIS or COC + Liq N	Before 50% flowering stage & 65 days before harvest for 0.3 oz/A rate
Flexstar	NIS or COC + (Liq N optional)	Do not apply within 45 days of harvest.
Flexstar GT	AMS NIS , COC, or MSO optional	Do not apply within 45 days of harvest.
Fusilade EX	COC or NIS + (Liq N optional)	24 oz/A before bloom stage. 6 oz/A after bloom 60 days before harvest
Fusion	COC or NIS + (Liq N or AMS optional)	Before bloom stage.
Glyphosate	NIS varies with product used. (AMS is optional)	Cracking throughout flowering.
Harmony SG	NIS or COC + Liq N	After first trifoliate leaf has expanded until 60 days before harvest
Intermoc	---	After emergence up to but NOT including bloom stage and 70 days before harvest.
Liberty 280SL	---	After emergence up to but NOT including bloom stage and 70 days before harvest.
Phoenix	NIS	Normally when plants are in the one to two trifoliate leaf stage; Do not apply within 45 days before harvest or after stage R6 (full seed).
Poast	COC (Liq. N optional)	Do not apply within 75 days of harvest.
Pursuit	NIS or COC + Liq N or AMS	Before bloom stage and prior to 85 days of harvest.
Prefix	(Consult label)	Apply at least 90 days before harvest
Raptor	NIS or MSO+ Liq N (COC for certain situations)	Before bloom stage.
Resource	COC + (Liq N optional) (Consult label for using NIS for certain mixes)	Do not apply within 60 days of harvest.
Select MAX & other clethodim products	NIS or COC (Consult label for using AMS)	Do not apply within 60 days of harvest.
Sequence	AMS	From cracking through 3rd trifoliate for Roundup Ready soybean
Synchrony XP	COC + Liq N (Consult label for using NIS for certain mixes)	After first trifoliate has expanded until 60 days before harvest.
Ultra Blazer	NIS (Consult label for using Liq N, AMS, and /or COC for certain mixes)	Do not apply within 50 days of harvest.

[1] COC = Crop Oil Concentrate; NIS = Non-Ionic Surfactant (at least 80% active ingredient); Liq N generally involves Urea Ammonium Nitrate or UAN (28% to 32% nitrogen fertilizer) or 10-34-0. Consult label for specific type of adjuvant and rate.

PLAN. EAT. MOVE.

College of Agriculture, Food and Environment

Tuscan Chicken and Pasta

Servings: 6 Serving Size: 2 cups Recipe Cost: $11.52

Ingredients:

- 1 pound boneless and skinless chicken breasts
- 2 pints cherry tomatoes, halved
- 3 tablespoons olive oil
- 1/4 cup balsamic vinaigrette or Italian dressing
- 1 tablespoon dried basil
- 1 teaspoon garlic powder
- 1 teaspoon onion powder
- 1/2 teaspoon salt
- 1/2 teaspoon black pepper
- 1 bag (6 ounces) spinach, chopped coarsely
- 8 ounces whole-wheat pasta or spaghetti
- Parmesan cheese (optional)

Nutrition facts per serving:
350 calories; 13g total fat; 2g saturated fat; 0g trans fat; 55mg cholesterol; 350mg sodium; 35g total carbohydrate; 3g dietary fiber; 4g total sugars; 0g added sugars; 24g protein; 0% Daily Value of vitamin D; 6% Daily Value of calcium; 15% Daily Value of iron; 15% Daily Value of potassium.

Directions:

1. Wash hands with warm water and soap, scrubbing for at least 20 seconds.
2. Wash produce under cool running water and dry before preparing for the recipe.
3. Preheat the oven to 400 degrees F. Line a large baking sheet with parchment paper or aluminum foil.
4. If using thick chicken breasts, slice crosswise into thinner cutlets. Place the chicken breast and halved tomatoes on the baking sheet. Drizzle with the olive oil and balsamic vinaigrette (or Italian dressing). Sprinkle with basil, garlic powder, onion powder, salt, and black pepper.
5. Wash hands after handling raw chicken.
6. Place baking sheet in the preheated oven and cook for about 30 to 40 minutes or until the chicken reaches an internal temperature of 165 degrees F using a meat thermometer. Note: The thickness of the chicken will impact the cooking time; always use a meat thermometer to check for doneness.
7. While the chicken and tomatoes cook, prepare the pasta according to package directions.
8. Once done, remove chicken and tomatoes from the oven. Add chopped spinach to the baking sheet. Cover and allow the spinach to steam and the chicken to rest for about 10 minutes or until the spinach wilts.
9. Cut the chicken into thin strips or bite-sized pieces. Combine cooked pasta with the chicken, tomatoes, and juices from the baking pan. Sprinkle with parmesan cheese, if desired.
10. Refrigerate leftovers within 2 hours.

Source: Brooke Jenkins, Extension Specialist, University of Kentucky Cooperative Extension Service

A 4-month-old stand of big bluestem and Indiangrass.

Native warm season grass forages are growing in popularity across the Midwest and South in recent years. Native warm season grasses (NWSG) include species like switchgrass, indiangrass, big bluestem, eastern gamagrass, and little bluestem. They are well adapted to our climate and yield an enormous amount of forage throughout the summer months (June-August). The timing is convenient to many grazing operations, because it compliments existing cool season grass forages. Cool season grasses are active in the spring and fall but experience a deficit in the summer (referred to as the summer slump). Converting a percentage of pasture ground to NWSG is an economic win, because native grasses are at their optimum growth June through September. NWSG can offset the summer slump and allow cool season forages, like

No Fertilizer? No Problem! – Establishing Native Warm Season Grasses for Haying and Grazing

Jason Jones, Ohio Grasslands & Grazing Coordinator, Pheasants Forever, Inc. and Quail Forever

fescue, to be stockpiled for more grazing days.

In addition to the rapid forage production and high yields, one of the greatest advantages of native grasses is the lack of fertilizer needed to produce those high yields. NWSG are very long lived and have massive root systems – these adaptations allow them to be dependable producers year after year without expensive inputs. Many producers who have planted NWSG consider it to be a great long-term investment for their farm.

The most common myth I hear amongst livestock producers is that NWSG take three to five years to establish. After working on many projects throughout the state, I have found this not to be true at all. *In fact, most producers are growing good stands of NWSG that can be grazed within one year after planting.* See examples to the right.

NWSG seedings today use well-developed preemergent herbicides, grazing varieties of NWSG, and post seeding maintenance to develop a dense stand much more quickly. Furthermore, we understand the ecology of these grasses much better to advance seedings and maintain them with suitable grazing management. The take home message is – if producers are interested in grazing native warm season grasses, they can have a good stand within a year of seeding. Although offsetting grazing on newly seeded acres still presents a challenge, it is much more achievable than once thought.

This is a one-year-old stand of big bluestem and indiangrass. The photo was taken in June in western Ohio.

This image is a 5-month-old stand of big bluestem, indiangrass, and little bluestem. This photo was taken during a grazing workshop in August of the first growing season in southern Ohio.

Blister Beetles can make for a bad Hay Day

By Mike Rankin, Managing Editor

There are lots of insects that cause alfalfa plant damage and yield loss. The list is much shorter for those insects that have negative impacts on animals that actually consume the alfalfa — and blister beetles top that list.

Photo: North Dakota State University

In the Northern Plains, blister beetle sightings are already being reported in alfalfa fields, according to James Rogers, an extension forage crops production specialist with North Dakota State University (NDSU).

Blister beetles produce a naturally occurring toxin called cantharidin. If the beetle is crushed, this toxin is released and causes blistering on the skin. Horses are especially sensitive to hay that is contaminated with crushed blister beetles. Several years ago, a Wisconsin horse ranch reported losing 17 animals to blister beetle-infested hay that they had purchased from a Western hay producer.

The potential for lethal consequences that blister beetles pose to horses and other livestock has been widely known and chronicled for many years. Actual occurrences are rare, but that provides little solace to the unknowing horse owner who experiences a catastrophic loss.

Adult blister beetles are attracted to blooming alfalfa fields and weeds such as goldenrod and dandelion. They feed on nectar and pollen and can also devour leaves, stems, and flowers. Blister beetles produce one generation per year and will be active from June to September, laying eggs in the soil from late summer to early fall. There are several species of blister beetles, including black, ash gray, and striped.

"Cantharidin from blister beetles can cause severe inflammation and even death in horses," says Rogers. "Depression, inflammation and ulceration of the mouth, irritation of the gastrointestinal tract, and painful urination are common symptoms of sublethal doses of cantharidin. Cattle and sheep are much more tolerant of cantharidin ingestion," he adds.

The forage specialist notes that blister beetle toxicity levels are higher in males but also vary by species and by the region in which the beetles are found. The 1/2- to 1-inch-long adult beetles are easily identified among other beetles as the "neck" region located behind the head is narrower than the head when viewed from above.

"Blister beetles are mobile and tend to swarm in large numbers in small areas of a field," says Miranda Meehan, a NDSU extension livestock environmental stewardship specialist. "They can move into alfalfa fields from field edges that have a host plant such as sweetclover, which blooms earlier than alfalfa. Once alfalfa begins to bloom, they may move into a field and feed for a short period of time before migrating to other areas of the field or to new fields."

The NDSU specialists recommend the following practices to reduce the risk of crushed blister beetles contaminating hay:

1. Use equipment such as a disc mower without hay conditioners or crimpers that may crush blister beetles and release toxin into the hay. This also encourages beetles to move out of the hayfield.
2. Allow cut hay to fully dry before raking to allow beetles to move out of the hay. Raking may dislodge dead beetles from hay; however, the potential still exists for cantharidin in the hay.
3. Control blooming weed hosts near or in alfalfa fields.
4. Cut alfalfa at less than 10% bloom.
5. Check fields 24 hours prior to cutting to ensure that new swarms of blister beetles have not reinfested the field.
6. Scout harvested hay and underneath windrows closely for blister beetles and allow beetles to move out of the drying hay before baling. Turning the windrows may be helpful to get blister beetles to move out.
7. If large numbers of blister beetles are observed in spots during baling, quit harvesting and allow blister beetles to move out or harvest around them.
8. If blister beetles are suspected in harvested hay, do not feed it to horses.
9. If blister beetle toxicity is suspected, a lab test of the animal's plasma or urine can be done to confirm the diagnosis.

Beef Custom Harvest Agreement Considerations

Lashmet, Tiffany. "Beef Custom Harvest Agreement Considerations." Southern Ag Today 3(19.5). May 12, 2023. Permalink

Many cattle producers utilize a custom-exempt processing facility in their direct-to-consumer businesses. In this scenario, the producer sells a live calf (or fractional share thereof) to the consumer and then delivers the live animal to the custom-exempt facility, where it will be processed for the purchaser.

Anyone using this approach should have a custom harvest agreement to memorialize the contractual agreement between the producer and purchaser.

The following topics should be considered when drafting a custom harvest agreement:

- **Description of product being sold.** Be clear in the agreement that it is the live animal being sold to the consumer, not the processed beef. Be clear on what percentage of the animal the customer is purchasing. If selling a specific animal, be sure to include the ear tag number or other description of the animal.
- **Educational information.** Include information a purchaser may not realize, such as the difference between the live animal weight and boxed beef weight, the amount of freezer space needed for a full, half, or quarter beef, and a sample cut sheet.
- **How will payment be calculated?** Describe how the price for the animal will be calculated, such as a flat fee or price per pound. If per-pound, will it be calculated on the live weight or hanging weight of the animal?
- **When and how will payment be due?** Detail any required deposit amount. Set payment deadlines. Identify allowable payment methods.
- **Processing fees.** Typically, the purchaser pays the processor directly, and this should be spelled out in the agreement.
- **Reselling/donating meat from the animal is prohibited.** Make clear in the custom harvest agreement that due to federal law, the beef from this animal may not be resold or donated.
- **Point at which animal is property of the buyer.** Make clear at which point in time the animal officially becomes the property of the buyer. Certainly, this has to be done at least by the point in time when it is delivered to the custom processing facility but could be as early as when the initial deposit is made. This is important in the event of the death of an animal prior to delivery to a processing facility.

A custom harvest agreement provides important information to the purchaser and ensures both parties are on the same page about the sales transaction.

Strategies for Corn Silage Success: Focus on Management

Kimberley Morrill Technical Service Manager / Chr. Hansen Animal Health & Nutrition
Keith A. BryanTechnical Services Manager / Ruminant DFM and Silage Inoculants / Chr. Hansen Animal Health & Nutrition

A successful harvest and excellent forage quality are not the results of a single discussion or a few good days in the field. It is a year-long, continuous team effort. From the previous year's harvest, feedout, planning future crop needs, nutrient management, inventory management and Mother Nature, the efforts to produce the best quality feed are truly a year-round team effort **(Figure 1)**.

It's important to take some time to focus on strategies for silage success. While it can be easy to focus on the negatives and things we cannot control (i.e., Mother Nature), it's important to take a step back and focus on what we can impact. From a management standpoint, are we doing everything in our power to ensure a successful harvest and put up the best quality feed?

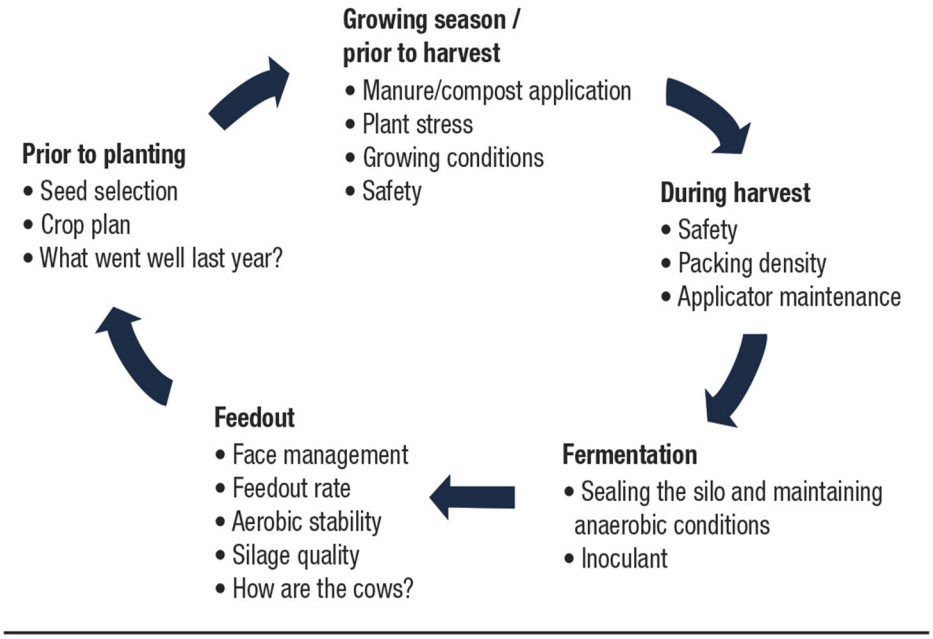
The basis of quality silage is proper management from chopping to sealing

Achieving good silage requires good management. Focus on what you can impact or start from the foundation, and work your way up. The first two items on the list have zero to do with the crop. They focus on the people: communication and safety. Once those topics have been covered, we can focus on the silage. Harvest at the optimum dry matter (DM), correct chop length, proper compaction and sufficient sealing.

Maturity

The maturity of the crop reflects the antagonism between quantity (yield) and quality (digestibility). When determining optimal maturity for chopping, you must consider the balance between the total neutral digestible fiber (NDF) and the total starch versus NDF digestibility and starch digestibility. Knowing the needs and goals of your farm allows you to make the best decision for you versus what might be best for your neighbor.

FIGURE 1 Strategies for silage success: A year-round conversation



Source: Chr. Hansen

Optimum dry matter

Hitting the target DM is critical for reducing the risk of undesirable fermentation, minimizing effluent, maximizing packing density and excluding oxygen from storage. The target DM for corn silage is 34%, with an ideal range of 32%-36% DM, and a realistic range of 30%-38% DM at harvest. As the DM moves outside of this range (wetter), you are at a greater risk of clostridic fermentation and higher effluents. As DM increases outside this range, there is a greater risk for yeast and molds, longer aerobiosis and more compaction problems. As DM increases, there can also be a negative impact on quality and digestibility. As DM increases from the 35%-40% DM range to the 40%-45% DM range, ruminal starch digestibility and total tract NDF digestibility (TTNDFD) decrease.

Correct chop length and KPS

Don't rely on the machine settings! Periodically check chop length and kernel processing score (KPS) to ensure target achievement. The target KPS at chopping is more than 70% of the starch passing through a 4.75-millimeter sieve.

Compaction

When making any type of silage, oxygen is the enemy. Packing is

required to remove as much oxygen as possible to facilitate and support the anaerobic fermentation process. A key factor to focus on when packing: Match the delivery rate to packing tractor weight – exceed the rule of 800.

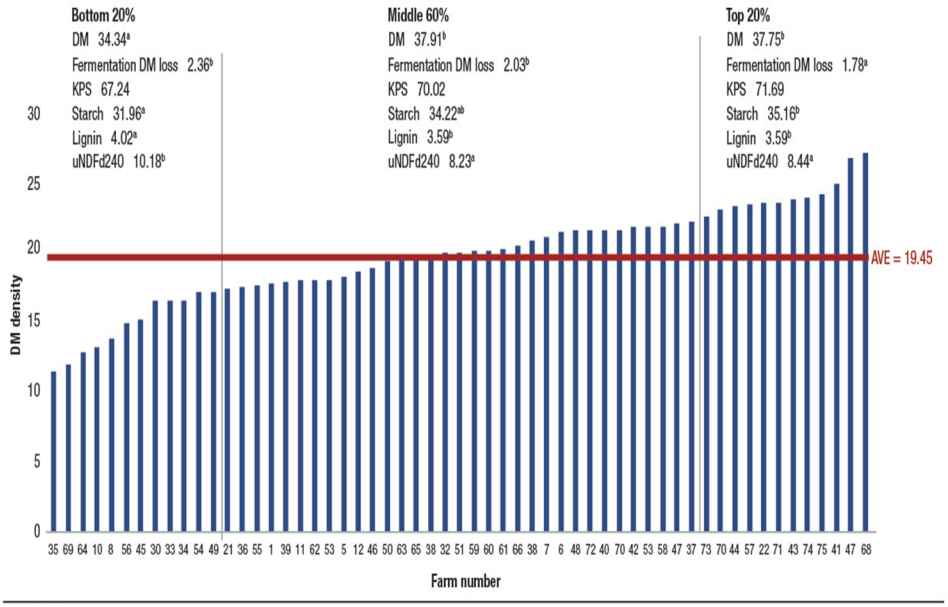
> ***Rule of 800:*** Packing tractor weight = 800 x tons of forage delivered/hour

Thin layers spread and packed in a progressive wedge formation will facilitate higher densities for bunkers and piles. Packing is complete when every square foot of the top layer has tire tracks, has been run over twice and is smooth. Focusing on and increasing packing increases your storage space, without impacting the footprint. Well-packed bunks are set up for better fermentation and nutrient preservation and are easier to deface. A DM density goal of greater than 18 pounds of DM per cubic foot is achievable for many farms **(Figure 2)**.

Sealing

Likely the least favorite and dirtiest – yet most valuable – activity on the farm is covering the pile. Once packing is complete, a top-layer inoculant can be applied to increase protection against spoilage. Covering the bunk should occur quickly, safely and efficiently. Using oxygen-barrier plastic, paired with traditional black/white plastic, and properly weighing everything down ensures the silage is sealed and oxygen cannot enter. It also protects the forage from moisture (rain and snow) and other contaminants.

FIGURE 2 Corn silage density across farms in New York



Source: Chr. Hansen

When you are focused on best management practices, the use of a science-based, research-proven inoculant will be the icing on the cake. The proper silage inoculant for your specific needs helps ensure speedy fermentation, DM and nutrient preservation, aerobic stability and reduces top-layer spoilage.

Having a successful silage program is truly a year-round team effort. Lots of planning and decision-making occurs prior to planting and harvesting a high-quality forage. Once harvest is over, the conversations and management don't stop. The next conversation to have with your team? Feedout management.

Don't rock the boat while breeding heifers

– Steve Boyles, OSU Extension Beef Specialist

Nutrition during the 21 days post breeding

Maternal recognition of pregnancy takes place around days 15-17 post-insemination and that transporting animals near this time compromises conception. However, moving heifers within the first 5 days post-insemination does not cause this reduction. Although, research suggests that conception rates are compromised when heifers are placed on early growth pasture forages. Researchers hypothesized that feeding this high moisture pasture forage at turnout is limiting dry matter intake which in turn causes a temporary energy deficiency that results in temporary heifer weight loss during the critical stages of early embryonic development and maternal recognition of pregnancy. Therefore, it is beneficial to ensure heifers maintain the same plane of nutrition after breeding, at least until day 25 when the embryo should be completely attached to the uterus. If this is true, maintaining a positive plane of nutrition on heifers after breeding will increase 1st service conception rates, improving herd fertility and longevity.

Some spring-born heifers are developed from weaning to breeding in a dry-lot pens. Estrous synchronization and AI may be conducted while in the dry-lot to take advantage of proximity to corral/breeding facilities. Following AI, heifers are may be moved to pastures to expose them to clean-up bulls. The researches hypnotized (Lake et al. 2013) this shift in diet quality and quantity of nutrients, may negatively impact metabolism, body weight gains, and ultimately reproductive efficiency.

Investigators at Purdue University and the University of Wyoming jointly examined the role of post-insemination nutrition on AI pregnancy rates in beef at two locations (Purdue; n = 53, Wyoming; n = 99) heifers were fed at 125% of NRC maintenance requirements (approximate ADG of 1.5 lbs/d) from weaning until estrous synchronization and AI. Immediately following estrous synchronization and AI, feed delivery to heifers was tightly controlled as heifers were specifically fed diets formulated to:

1. 125% of maintenance requirements
2. 100% of maintenance requirements, or
3. 80% of maintenance requirements

Heifers remained on these diets for 21 days following AI. Heifers that returned to estrus during the 21-day dietary treatment were inseminated and following the conclusion of the dietary treatment all heifers were comingled and placed with fertile bulls. Pregnancy diagnosis was conducted at 30 days post-AI to determine pregnancy success following the initial AI and 30 days after the breeding season to determine 2nd service AI pregnancy rates and overall breeding season pregnancy rates.

Analyses revealed that heifers that were fed to continue their pre-breeding plane of nutrition (125% maintenance) for 21 days post-AI had greater ($P = 0.04$) AI pregnancy rates compared to both groups of heifers that had a decrease in dietary plane of nutrition (100% maintenance and 80% maintenance). In addition, heifers in the 100% NRC and 80% treatments had decreased ($P < 0.05$) 2nd service AI pregnancy rates and decreased ($P < 0.05$) overall breeding season pregnancy rates. If heifers are transitioned to pasture immediately following AI are supplemented with a concentrated feedstuff such as distillers grains to prevent post-AI weight loss, pregnancy rates are not negatively impacted.

Embryo Quality

It was hypothesized that day 6 embryos collected from heifers that were fed restricted, sub-maintenance diets would have poor embryo quality. This study was conducted at the University of Minnesota and South Dakota State University (SDSU). All heifers were on a common diet during development. Estrus was synchronized and timed-AI was conducted. On the day of AI, heifers were placed in one of two nutritional treatments:

At UMN

1. 120% maintenance requirements
2. 80% maintenance requirements

At SDSU

1. 125% maintenance requirements)
2. 50% maintenance requirements

Dietary treatments were fed until embryo collection was done using non-surgical embryo flush techniques six days after AI. Recovered embryos were microscopically evaluated and graded on a 1 to 5 scale (1 = excellent, 2 = good, 3 = fair, 4 = poor, and 5 = degenerate) to evaluate embryo quality.

Results across both locations were combined to illustrate the effects of nutrient restriction on early embryonic development. Nutrient

restriction immediately following AI resulted in poorer quality embryos that were developmentally retarded as indicated by being at an earlier stage of development and having fewer total blastomeres In addition, embryos from nutrient restricted heifers had a decreased (P = 0.01) percentage of live blastomeres.

These results suggest that the early embryo, oviduct, and uterus are sensitive to immediate changes in nutrition. Nutritional inputs to reproducing beef cows must be managed to allow for the animal to be in a positive energy balance. However the researchers indicated caution is warranted as over-nutrition may also compromise various reproductive parameters.

Be wary of surface water quality

By Amber Friedrichsen, Associate Editor

Water quantity may be top of mind as drought conditions persist across a large part of the country, but water quality issues deserve attention as well. Grazing livestock that drink from surface water sources may be at risk of toxicity this summer as temperatures rise and water levels fall.

In a news release from North Dakota State University Extension, Miranda Meehan writes that water quality is one of the limiting factors for many grazing operations. The livestock environmental stewardship specialist notes yearlings and calves can have improved gains of up to 0.24 and 0.33 pounds per day, respectively, when they have access to good-quality water.

With that said, surface water sources like creeks and ponds naturally contain salts comprised of dissolved solids and minerals. These components become much more concentrated when it is hot and dry because they do not evaporate with water.

Elevated concentrations of total dissolved solids (TDS) and sulfates can be toxic to livestock. Symptoms of toxicity include lower animal performance, abortion, blindness, central nervous system disorders, and possibly death. Meehan

Photo: Hay & Forage Grower

recommends monitoring TDS and sulfate levels throughout the grazing season with handheld TDS meters and sulfate test strips to ensure surface water is safe for animals to drink.

Total dissolved solids must be below 5,000 parts per million (ppm) for most classes of livestock. This value includes sulfate concentration, which must be less than 500 ppm for calves and less than 1,000 ppm for adult cattle. Submit water samples to a lab for additional analysis if screening indicates TDS exceeds 4,500 ppm and/or sulfates are greater than 800 ppm.

Beware of blooms

Cyanobacteria blooms, or blue-green algae blooms, also become problematic when it is hot and dry. They can be toxic to livestock as well as other wildlife and humans. Toxicity depends on the type and concentration of cyanobacteria, the amount of water ingested, and the species of animal consuming the water.

Visual observations are the best way to monitor cyanobacteria blooms. Meehan also suggests using cameras to monitor water sources since these blooms can develop quickly. If a bloom occurs, immediately move livestock away from the water source and send water samples to a lab to determine if the type of cyanobacteria present is toxic.

The consequences of drought conditions can go beyond a water shortage. Regularly monitor TDS and sulfate concentrations this summer and keep an eye on cyanobacteria blooms in surface water sources. Doing so will help prevent livestock from ingesting a dangerous amount of toxic components.

Finding the Cause for Abortions and Stillbirths in Cattle- Why is it still so Difficult?

Dr. Michelle Arnold, UK Veterinary Diagnostic Laboratory

Determining the cause of abortions and stillbirths in cattle remains a significant challenge for veterinary diagnostic laboratories, despite vast improvements in the tests used to detect infectious organisms. Most studies find that only 20-50% of abortion cases submitted are "solved", meaning the first initiating event resulting in the death of the fetus was discovered and answered "why" the calf died. Diagnosis of the cause of an abortion is exceptionally challenging because characteristic visible clues in the fetus rarely occur, sample tissues are often rotting and unsuitable for examination, and the most important tissue for analysis, the placenta, is seldom submitted. Instead, veterinary diagnostic laboratories can often recognize the final mechanism resulting in death of a fetus or calf, such as anoxia (lack of oxygen) or trauma, that answers "how" the calf died instead of "why".Veterinarians understand the limitations of abortion diagnostics and are best suited to help the producer determine if and when an investigation is warranted and how to collect and submit the appropriate samples. Abortion outbreaks can cause serious economic losses, so it is of value to identify potential causes and how to reduce or eliminate them. For some producers, a single pregnancy loss may trigger an investigation while for others, multiple losses need to occur before calling a veterinarian. A loss of 2% for abortions is often quoted as "acceptable" but this percentage usually does not include any unobserved early losses. Most often, a cluster of cases within a short time span is the most important tipping point to begin an investigation. No matter the situation, the chances of a successful diagnosis increase with the right input from the producer, veterinarian, and the diagnostic laboratory.

"Reproductive failure" is a term used when a cow fails to get pregnant, loses a calf during pregnancy, or the calf dies within 48 hours after calving. Unfortunately, there is a lot of variation in the vocabulary used by scientists, veterinarians, and producers for the events that make up "reproductive failure". For clarity in this article, "embryonic death" is defined as death of the embryo up to 45 days but, with pregnancy detection now possible much earlier, this may be classified into early and late embryonic death. These early losses often go unnoticed and result in open females or an extended calving season. "Abortion" is defined as expulsion of a fetus between day 42 and day 260 of gestation, a timeframe defined as when the developing fetus could not survive outside the uterus (the limit of fetal independent viability). Females that abort from day 42–120 generally return to estrus either without a fetus being expelled because it was resorbed, or the expelled fetus was too small to observe. Abortions within the 120–260-day timeframe are sometimes referred to as "observable abortions" because they are more likely to be noticed by the producer. "Stillbirth" or "premature delivery" is expulsion of a near-term to full-term fetus that is considered "viable", so it is developed enough to survive outside the uterus. A "stillbirth" is generally defined as death of a full-term fetus before or during calving while a "perinatal mortality" is death immediately before, during or within 48 hours after calving. Although these distinctions may seem unimportant, they are diagnostically essential. Abortion investigations include gathering a thorough case history, and collecting samples from the dam, fetus and placenta for examination and testing. Stillbirth investigations include these elements but must also address non-infectious management issues such as how long the cow was in labor before assistance was given or potential trauma that occurred during or after birth.

The causes for abortion in cattle can essentially be divided into non-infectious and infectious. Examples of non-infectious causes may be physical (trauma), nutritional deficiencies, genetic abnormalities that result in fetal death, and toxic agents such as nitrates. Infectious causes include bacterial, viral, protozoal and fungal agents such as the BVD virus, IBR virus, the protozoan *Neospora caninum* and the bacterium *Leptospira borgpetersenii serovar Hardjo* type hardjo-bovis, among many others. These agents either directly damage the fetus or, more commonly, damage the placenta resulting in suffocation of the fetus from lack of oxygen or starve it from lack of nutrients crossing to the fetus from the dam. Infectious organisms may arrive at their destination in the fetus and placenta through the bloodstream from the dam, known

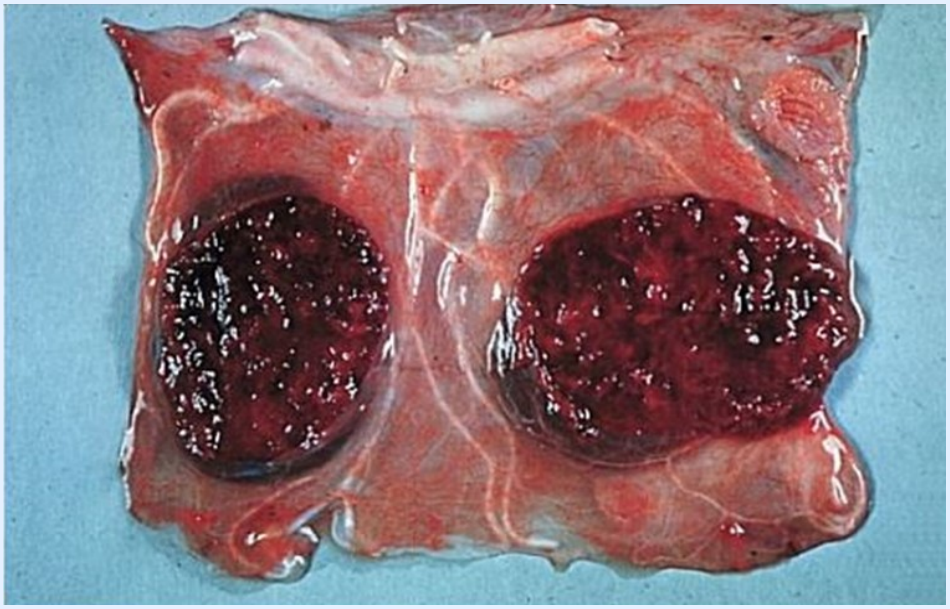


Figure 1: Normal Bovine Placenta (Accessed from the Drost Project on 5/16/2023 at https://visgar.vetmed.ufl.edu/en_bovrep/normal-placenta/normal-placenta.html)

as the "hematogenous route", or may ascend through the dam's vagina and cervix to reach the placenta. If the infectious organisms colonize the placenta (called "placentitis") and penetrate the amniotic fluid, the infected fluid is then swallowed by the fetus or inhaled into the lungs, resulting in fetal bronchopneumonia, gastroenteritis, and, in the case of fungi, a fungal dermatitis may develop. In addition, hematogenous spread may take the infectious organisms through the umbilical vessels and into the fetal liver then out to other organs by the vascular system, resulting in widespread organ infections such as hepatitis (liver infection), interstitial pneumonia (infection within the lung tissue) and nephritis (infection of the kidneys) in the fetus. If the fetus is not yet viable, abortion occurs. If viable (>260 days gestation) yet weak due to lack of oxygen and nutrients or is suffering from infection, the outcome may be a premature, stillborn or weak calf that dies shortly after birth.

Successful diagnosis of abortion involves evaluation of the case history, submission of usable samples and accurate interpretation of laboratory results. Gathering relevant information to assess the extent of the problem and to provide possible diagnostic clues is exceptionally important. The ages of the dams affected, the gestational age of abortions, the estimated abortion rate, any illness or disease problem in the dams, current diet, any recent changes including movement to a different location, new herd additions or feed changes, vaccination status, and any history of previous disease in the herd may help guide testing and aid in the diagnosis. The entire fetus with the placenta and a serum sample from the dam are the best specimens to submit to a veterinary diagnostic laboratory for analysis at the time of the abortion. A complete necropsy examination on the fetus and placenta will then be performed to determine any visible abnormalities present and possibly establish the time of death (before, during or after birth) for the full-term calves found dead. Tissues from the placenta and fetal organs are then submitted for histopathology, an examination at the cellular level under the microscope. Fresh placenta and organ tissues as well as fetal stomach contents and fetal heart blood are tested for bacterial, viral, protozoal and/or fungal agents by various methods. The blood sample from the dam may help determine exposure to a pathogen (infectious organism) by measuring her antibody levels but usually cannot differentiate between antibodies produced due to previous vaccination or a natural exposure. To improve interpretation, a second blood sample from the dam may be drawn 3-6 weeks later (the convalescent sample) to help identify a rising number of antibodies to a particular organism. In the same way, measuring antibody levels in fetal fluids can be indicative of an active immune response, *if* the fetus was old enough to produce antibodies.

By far, the most important reason for failure to diagnose an infectious cause of an abortion is the lack of placenta submitted for analysis. It is the most significant tissue involved in abortion and without it, the odds of success go down dramatically. As mentioned previously, infection in the placenta ("placentitis"), disrupts oxygen transport, nutritional support, and the hormone and

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Finding the Cause for Abortions and Stillbirths in Cattle- Why is it still so Difficult?

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growth factors needed by the fetus. A normal placenta is thin and transparent in the areas between the dark, red-brown cotyledons (see **Figure 1**). Placentitis may cause cotyledons to appear discolored or rotten, with areas of hemorrhage and the tissue in-between may be opaque, reddened, and thickened (see **Figure 2**). Although the placenta may be found in the pasture dirty, covered in mud and manure, frozen, and half-eaten, the superficial contamination can be rinsed away in the lab and the placenta spread out to look for any abnormal areas. Unfortunately, if the fetus and placenta were retained in the uterus for an extended time after death, the tissues may be macerated (soft), mummified (dried), or autolytic (rotten), making them difficult to impossible to use for testing. Ideally, every sample would be tested for every possible infectious agent, but financial considerations dictate selective ordering of appropriate tests, based on the case history and sample quality.

Beyond the diagnostic problems presented by poor sample quality and lack of placenta, what is often overlooked is that sometimes a diagnosis can't be found, even from good samples. There are numerous causes of perinatal mortality that are not related to a certain organism, or the organism is long gone due to the lag time between infection and death. Most final abortion/stillborn necropsy reports from a vet diagnostic lab include language regarding signs of "fetal stress" or "fetal anoxia" in the submitted animal, meaning the fetus was not

Figure 2: Placentitis. Cotyledons are tan with hemorrhages and the intercotyledonary portions of the placenta are opaque and thickened. (Photo obtained from http://www.askjpc.org/wsco/wsc_showcase2.php?id=451)

getting enough oxygen and began struggling, breathing harder and faster, resulting in aspiration of any fluid type present in the nose or mouth down into the lungs.

"Meconium staining" is another sign of fetal stress due to meconium (the first feces) being expelled early, usually during a delayed birth, mixing with the uterine fluids and staining the calf yellow. These signs of fetal stress may be due to prolonged stage 1 or stage 2 of labor, a very large calf, a malpresentation, premature placental separation, and many other possibilities. Fetal anoxia may also be due to maternal hypoxia, meaning the dam's blood is low in oxygen from a disease such as an active case of anaplasmosis or from a toxin such as nitrate so there is not enough oxygen from the dam to support fetal life. Remember that working with your veterinarian, submitting a fresh fetus and placenta to a veterinary diagnostic laboratory, and providing as much information as possible to the lab is your best chance to determine an underlying cause of why a calf died.

Preventive Practices to Decrease the Risk of Reproductive Failure:

1. Always provide good nutrition- Providing forage, supplemental feed, trace mineral and clean water to meet nutritional needs and of sufficient quality and quantity to always maintain good body condition scores.
2. Vaccinate for diseases known to cause abortion, including BVD and IBR viruses, Leptospirosis and Vibriosis.
3. Prior to breeding season, test for venereal disease in bulls and have a breeding soundness exam performed. Veterinarians will check scrotal circumference and the reproductive tract for any signs of abnormalities, and the semen for motility and defects. Bulls should be monitored for excessive weight loss and illness. Heat detection, breeding attempts, and semen quality will

be reduced in bulls that are under-conditioned or sick. Lameness and pinkeye can be important causes of poor pregnancy rates on pasture as bulls are less likely to seek out cows in heat. Frequent observation of bulls during the breeding season is important to detect any inability to mount or successfully breed that might be caused by injuries to the bull's legs, back or penis. This is particularly vital in single bull breeding pastures. Injured bulls, if detected, can be replaced before too much time is lost from the breeding season.

4. Avoid contamination of cattle feed and water sources with feces or urine from other cattle, wild animals, dogs, cats, and waterfowl. This includes surface runoff into water sources such as ponds.

5. New Purchases:
   a. Buy from someone you trust- Ask for health records and a complete herd history of any disease problems. Ask questions regarding preventive health measures such as what and when vaccines and dewormers were given and how they were administered.
   b. Quarantine all new additions away from home herds for a minimum of 30 days. Blood test for Johne's, BVD PI, Neospora, and possibly Anaplasmosis; consult your veterinarian for appropriate recommendations. Vaccinate and deworm while in quarantine. Best to not mix new cattle in cow-calf herd until calving season is over. If new additions are pregnant when purchased, strongly recommend testing their calves for BVD-PI shortly after birth.

6. Frequent monitoring of the calving process is the first step in early identification of calving difficulty. Checking the cows that are close to calving at least twice daily and heifers three times per day at minimum is recommended. It is best to separate the heifers from the mature cows and keep heifers in an area where there are working facilities close by to allow restraint and assistance. Pregnant females close to calving will show enlargement of the vulva, the pelvic ligaments at the hips will "sink in", there is enlargement of the udder, and the teats will become engorged with colostrum.

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Campbell County Extension

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What's Wrong with My Taxus?

By Cheryl A. Kaiser and Nicole A. Ward Gauthier, Plant Pathology, Lee H. Townsend, Entomology, and Richard E. Durham, Horticulture

Taxus (yew) is an evergreen shrub commonly found in Kentucky landscapes. Numerous conditions can cause these shrubs to exhibit yellowing and browning symptoms. While diseases (Figure 1) and insect pests (Figures 2, 3, and 4) can result in damage, Taxus troubles are often the result of adverse growing conditions. Pinpointing the specific cause requires a thorough examination of the affected shrub, an investigation of the surrounding area, and knowledge of possible stress factors.

The following questions and supplementary information are meant to assist homeowners and consultants in determining the cause of Taxus decline. Answering "yes" to one or more of these questions should suggest a possible cause to the shrub's troubles.

Click HERE to read complete article from UK Publication ID-52.

Figure 1. Needle dieback resulting from root loss. Phytophthora root rot (shown here) and "wet feet" can both cause similar symptoms as a result of root damage.

Inside this issue...

Welcome 2023! Thank you for your interest in receiving the Campbell County Extension Horticulture Newsletter. Our horticulture staff; David Koester, Terri Turner, and Sarah Imbus, along with our plant-minded Master Gardener Volunteers, plan to provide you with gardening information in hopes to inspire you to grow your knowledge! We look forward to having you join us bi-monthly.

If you, or know of someone who would like to be included on the newsletter distribution list, please call our office, or scan the QR Code to register.

Save the Date!
Saturday, September 9th
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Land Rental Agreements

Author(s): Jennifer Rogers

Land rental agreements can come in many shapes, sizes, parameters, and stipulations. Typically, we see three basic land rent types: cash rent, share rent, and the increasingly popular, flex rent. Each rental agreement is likely to be different. This article will just touch on the basics, realizing that each landlord and renter can develop their own individual agreement.

Cash rent is typically the easiest and most straightforward rental type. The landlord has a set number of acres to rent. An agreement is made with the renter to pay a set amount per acre for the use of that land. In the agreement, there may be other stipulations such as fertilizer management, crop rotation, and waterway and crossing management included in the agreement. Cash rent gives the landlord a set revenue per year and the renter a set cost per year. The landlord gives up any upside due to prices and yields. Likewise, the renter bears the full risk in a down year, no matter the revenue generated from the land, the same rent is due. Determining the cash rental rate is a science in and of itself. Rental rates are dependent upon the soil productivity level, size of the tract of land being rented, location, competition among potential renters, and many other factors. It helps the negotiation process if both parties are somewhat familiar with current cash rents in the area. Sometimes the landlord has a particular renter in mind that they want to rent their ground to. This requires the two parties to come to an agreement. Other times, a closed or open bid process is used to rent the ground to the highest bidder.

Crop share rent can be equally as popular as cash rent. One of the attractive qualities of crop share is that it helps to spread the risk and reward between the landlord and the renter. Again, crop share agreements vary among areas, producers, and individual land tracts. Crop share agreements can also vary based on the crop planted. A crop share rent works just like it sounds. An agreement is made between the parties that the landlord will receive a certain percentage of the crop. This percentage can be anything but are typically somewhere between 20% and 50% of the crop. Sometimes the landlord receives a percentage of the crop "clear of expenses", meaning that the landlord pays none of the costs of production. Other times landlord may receive a higher percentage of the crop in exchange for paying a portion of the expenses. Under a crop share agreement, the landlord owns a portion of the crop. This requires an agreement on how and when the landlord will be paid for their crop. The landlord could market their own crop. Sometimes an agreement is made for the producer to haul the crop at the time of harvest and sell the landlord share at the current market price on the day of harvest. Again, these agreements can vary from one rental agreement to another. Under a crop share agreement, the landlord now bears part of the revenue risk associated with crop production and market prices. In many situations, the landlord in a crop share agreement may find it wise to purchase crop insurance for their pair of the crop. Likewise, the

landlord may have the opportunity to experience the upside of revenue increases due to crop production and market rallies. The renter in a crop share agreement gets to share the risk of a down year with the landlord. Crop share rental agreements typically require the landlord to be slightly more involved and knowledgeable about crop production levels and crop markets.

In recent years, a hybrid rental agreement seems to have gained popularity. This is referred to as a Flex Lease. The flex lease combines some attributes from the cash rent and crop share agreements. Like all rental agreements, the flex lease can vary widely. Typically, a flex lease sets a minimum cash rent. This cash rent might be lower than a traditional cash rent, this helps to protect the renter in the case of decreased revenues, but locks in a minimum for the landlord. A flex lease also has a component to allow the landlord to gain in the case of increased revenues. This might be through a percentage of the crop when revenue hits or exceeds a predetermined threshold. Flex leases require more communication and knowledge of both the landlord and the renter. Many details must be worked out to determine the parameters that trigger increased rental payments. One of the most difficult parameters is what price to use and where and when to obtain that price to calculate revenue. It is important that both parties have a full understanding of the agreements and how increased payments are triggered and calculated.

As mentioned many times in the article, rental agreements can be different in a variety of ways. One of the most important points around rental agreements is that all parties fully understand what has been agreed upon. While many rental agreements are made verbally and over a handshake, it is highly recommended that any rental agreement be put in writing. A written rental agreement allows both parties or their representatives to refer back to the parameters of the lease. A written rental agreement also helps protect both parties in the case of death or other unexpected tragedy. Written agreements allow outside parties to know what the agreement was and how long it is in effect. Sample rental agreements to get you started can be found through a quick online search. If desired, an attorney can be contacted to review your rental agreement to be sure that your interests are protected.

Managing Pastures During Dry Times

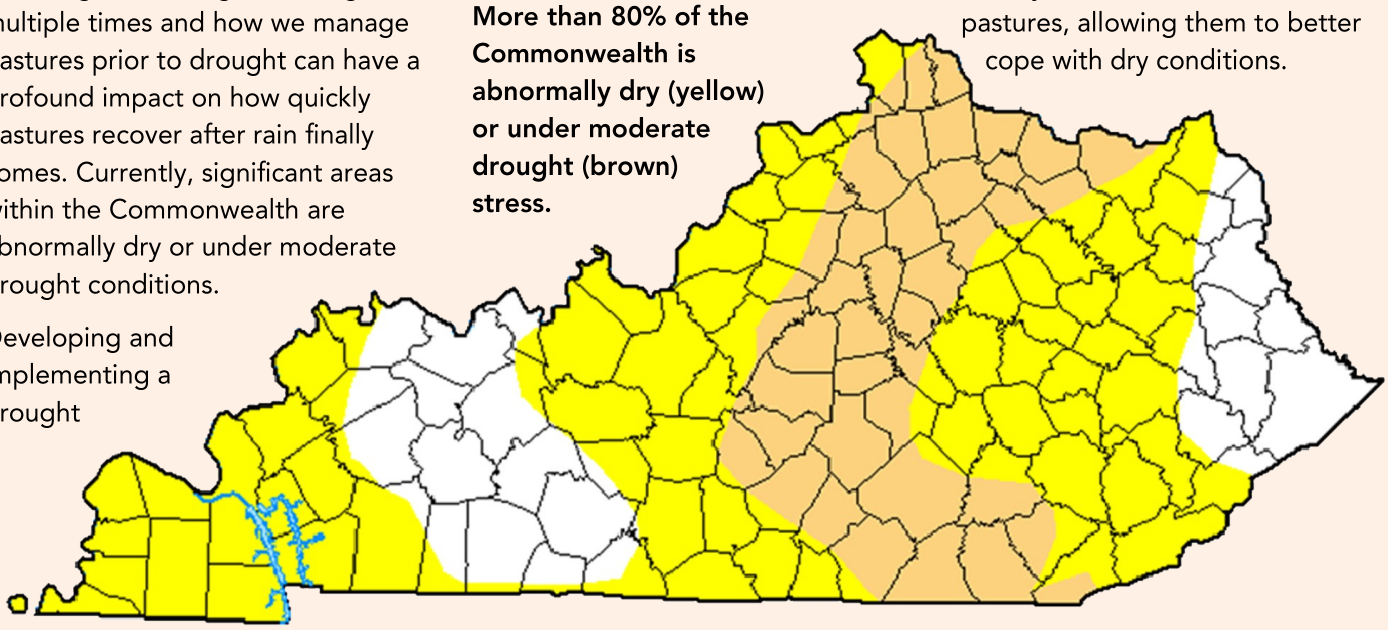
Chris D. Teutsch, UK Research and Education Center at Princeton

My farm old manager at the Virginia Tech's Southern Piedmont Ag Research station used to say that "the difference between a flood and drought is about two weeks. Truer words have never been spoken. In most summers we find ourselves teetering on the edge of drought multiple times and how we manage pastures prior to drought can have a profound impact on how quickly pastures recover after rain finally comes. Currently, significant areas within the Commonwealth are abnormally dry or under moderate drought conditions.

Developing and implementing a drought management plan will reduce the economic and emotional impact of drought on your operation and significantly speed up recovery of drought stressed pastures. The time to develop and implement this plan is before it gets dry. The strategies that are used will depend on the resources you have on your farm and your long-term goals. The remainder of this article will outline some strategies that could be used either alone or most effectively in a combination.

Ensure that livestock have access to adequate amounts of clean water. Water is the most important nutrient for livestock. During drought, the water requirement of livestock increases due to higher temperatures and the consumption of dry forage material and hay. In addition, naturally occurring water sources such as ponds, streams, springs, and seeps often have limited flow. So, it is important to make sure that livestock have unfettered access to clean water.

Soil test and adjust fertility. Maintaining soil test levels in the medium and high range and soil pH in the range of 6.0 to 6.4, will optimize the growth of pastures and hayfields prior to and during conditions. Maintaining proper soil fertility removes a stress from pastures, allowing them to better cope with dry conditions.



More than 80% of the Commonwealth is abnormally dry (yellow) or under moderate drought (brown) stress.

Water requirements of various livestock species and classes at 50 and 90°F.

Livestock Species	Water Requirement at 50°F	Water Requirement at 90 °F
	gallons/head/day	
Calf, beef, 400 lb	4	10
Feeder, beef, 1000 lb	8	17
Cow, beef	8	20
Cow, dairy	15	30
Heifer, dairy	6	15
Sheep and goats	1.5	3.5
Horses and mules	8	12

Adapted from Southern Forages, Fifth Edition.

Temporary fencing is powerful for managing grazing before, during, and after drought.

Set a sustainable stocking rate. Having a perpetually light stocking rate that underutilizes pastures in most years but gets you through drought years is a viable drought management strategy. However, this strategy requires that you have a lot of land area and will tend to reduce profit per acre. In most cases this probably is not the best long-term drought management strategy. There is no better way to lose money than under or overstocking your pastures. The best approach is to set a sustainable stocking rate and focus on other drought management strategies. In Kentucky and neighboring states, a sustainable stocking rate will be 2 to 3 acres per cow-calf unit.

Implement rotational grazing. Although this does not sound like much of a drought management strategy, the first thing that people notice when they switch from a continuous to rotational grazing system is that pastures grow longer into a drought and recover faster after the rain finally comes. The reason for this is that rotationally grazed plants have larger and healthier root systems that can go deeper into the soil for water. In addition to a larger and healthier root system, not grazing closer than 4-5 inches modifies the microclimate (conditions) near the soil surface, keeping the plants growing point (crown) cooler and reducing evaporation of water from the soil surface. Good grazing management is not just a drought management strategy, but probably one the best ones.

Incorporate deep-rooted legumes into pastures. Interseeding deep-rooted legumes into pastures increases pasture quality, supplies nitrogen that is shared with grass, dilutes the toxic endophyte, and extends grazing during a drought. The most commonly used legume would be red clover. The primary advantage of red clover is that it has great seedling vigor and can be easily frost seeded into pastures. Alfalfa possesses a deeper tap root and is more drought tolerant than red clover, but requires higher soil fertility and well drained soils. Alfalfa mixes well with a variety of grasses like orchardgrass and tall fescue, but can be difficult to get established into a well managed sod. The most drought tolerant legume and our only truly perennial warm-season legume is sericea lespedeza. Its major limitation is poor seedling vigor making it difficult to incorporate into an established sod. Once established, sericea has amazing drought tolerance, however palatability can be low. Making sure it does not get too tall before grazing is key to maintaining palatability.

Weaned calves grazing a brown midrib sorghum-sudangrass at the UK Research and Education Center at Princeton.

Incorporate warm-season perennial grasses into grazing system. During the summer months, warm-season grasses will produce about twice as much dry matter per unit of water used when compared to cool-season grasses. There are several perennial warm-season grasses that can used, but in western Kentucky the most productive, persistent, and tolerant to close and frequent grazing is bermudagrass. Bermudagrass requires

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Managing Pastures During Dry Times

(continued from page 19)

management to be productive, which means it needs to be grazed frequently to keep it vegetative and it needs nitrogen. Other perennial warm-season grasses include the native grasses such as big and little bluestem, Indiangrass, switchgrass, and eastern gamagrass. These grasses can be productive parts of grazing systems, but will require a higher level of grazing management to persist. The last perennial warm-season grass that I want to mention is johnsongrass. I am going on record to make clear that I am NOT encouraging anyone to plant johnsongrass, but sometimes it just shows up. Johnsongrass occurs on many farms in Kentucky and could provide high quality summer grazing when managed. Because johnsongrass is extremely palatable, it needs to be managed under rotational stocking to persist. Otherwise it will be selectively grazed and eventually grazed out of the pasture.

Incorporate warm-season annual grasses into grazing system. Warm-season annual grasses like pearl millet, sorghum-sudangrass, sudangrass, and crabgrass can provide high quality summer grazing. The primary disadvantage with summer annual grasses is that they need to be reestablished every year, which costs money and provides the chance for stand failure. The exception to this is crabgrass that develops volunteer stands from seed in the soil. Although most people don't realize (or want to admit it) crabgrass has saved many cows during dry summers in Kentucky. Research has shown that crabgrass responds well to improved management and can produce 2-4 tons per acre of highly digestible forage. The best use of annuals in grazing systems is as a transition crop when pastures are being renovated.

Irrigate pastures. Irrigating your pastures can increase dry matter production by about 50% in a normal year and much more than that in a dry year. The best grass to irrigate is warm-season perennial and annual grasses such as bermudagrass and sorghum-sudangrass. One common misconception is that irrigating a cool-season grass will make it grow in the summer. Cool-season grass growth is limited by not only moisture, but also temperature. Once temperatures exceed 70 F, cool-season grass growth greatly slows and even stops when nighttime temperatures remain above 80 F. In contrast, warm-season grasses do not even reach peak growth until 90 F.

Feed hay. The most efficient way to harvest forage is with the animal. In Kentucky we should strive to reduce hay feeding in our grazing systems. This doesn't mean that we will not ever need hay. Drought is certainly one of those cases that hay will likely be required. A common problem with the hay feeding strategy is that when you need it, everybody needs it and there is little to go around. In addition, the price of hay during a drought can be high. One thing to think about is buying hay when it is plentiful and the prices are low and storing it under cover. It is kind of like having money in the bank. Hay that was well cured will keep for years if it is kept off the ground and out of the weather.

A key to successfully using hay as part of managing drought stress is to start to feed it before pastures have been overgrazed. If you work through your rotation and the rested pastures have NOT regrown, it is time to feed hay. Your neighbors will look at you like you are crazy because your still have some grass, but what they don't understand is that you are managing for rapid recovery when it does rain. Hay feeding should be done in one paddock so that damage from overgrazing is confined to this area.

Utilize commodities to extend pastures. Commodities such as brewer's grain, corn gluten, and soybean hulls can be used to supplement and extend hay and pasture during drought periods. Things to consider are the availability, storage, handling, feeding, and price of commodities. The ability to readily get and store commodities and efficiently feed them is critical if they are going to be a key component in your drought management strategy.

Wean and sell calves early. This has a two-fold effect, first it reduces the number of grazing units and the total forage needed, and second it reduces the nutritional requirements of the brood cows. A dry cow has an energy and protein requirement that will be 15% and 30% lower than a lactating cow (Table 1). If this a drought management strategy that you are going to employee, make sure and sell calves before markets are flooded and prices drop.

Nutrient requirements of various livestock classes.

Animal Class	Total Digestible Nutrients (%)	Crude Protein (%)
Growing steer, 450 lb, gaining 1.5 lb/day	65	12
Growing steer, 650 lb, gaining 1.7 lb/day	68	10
Beef cow, lactating	60	10
Beef cow, mid-gestation	50	7
Lamb, finishing	70	12
Ewe, lactating	65	13
Ewe, mid-gestation	55	9
Meat goat, lactating	66	15
Meat goat, growing	62	13
Pleasure horse	70	10

Adapted from Southern Forages, Fifth Edition.

Sell cows. This could be a good time to get rid of those older cows that you have been meaning to cull. However, selling your better animals is probably one of the least desirable drought management strategies. If you have invested time and money developing a superior herd, you are probably not eager to sell those animals when prices could be low. In addition, if you sell off a considerable portion of your herd it may take years to build back up to that level. However, if this is the management strategy that you have chosen then you need to sell at the set time. By doing this you may limit losses by beating the flood of animals that typically enter the market as the drought worsens.

Managing Pastures in the Short-term

This article layouts a series of practices that together will improve drought tolerance of grazing systems in the long-term. In the short-term, the best thing that we can do to mitigate the impact of drought is to close the gates and feed hay in a sacrifice area BEFORE pasture become overgrazed. The worst possible scenario is that we simply open all the gates and allow cows to damage our entire grazing platform. So, keep the gates closed and feed hay on your weakest paddock. This will ensure that the remaining paddocks will be protected and ready to grow when rain finally comes! Last thing, it never hurts to ask the Good Lord for a little rain!

Managing Drought at a Glance

Ensure that livestock have access to adequate amounts of clean water.
Set a sustainable stocking rate (2 to 3 acres per cow-calf unit).
Soil test and apply lime and fertilizer as needed.
Implement rotational stocking prior to and during drought.
Incorporate deep-rooted legumes into pastures.
Incorporate warm-season perennials into grazing systems.
Incorporate warm-season annuals into grazing systems.
Feed hay in a sacrifice area BEFORE pastures become overgrazed.
Feed commodities to extend pasture and hay.
Sell calves and in some cases cows before markets are flooded.

How Much Can I Sell This For?

Kevin Burkett - Southern Ag Today 3(15.5). April 14, 2023. Permalink

Part I

Burkett, Kevin. "How Much Can I Sell This For? Part I." Southern Ag Today 3 (15.5). April 14, 2023. Permalink

Photo by Erik Scheel: https://www.pexels.com/photo/person-giving-fruit-to-another-95425/

How much can I sell this for? This is a question producers often ask us. It is an important question and one that is not always easy to answer. Usually there are many factors to consider in pricing your farm products. In Part I of our series on product pricing, we discuss factors that may affect what you want to reflect in your product's price.

Cost – It can be a challenge to hone in on this number, but it is important to know how much has been invested. The first step is capturing ALL costs associated with carrying on a farming activity. Over time these can be broken down by categories and segmented into individual crops/enterprises. Capturing product cost(s) is done through a chart of accounts and the books and records of the business. Oftentimes at the beginning of the season you may not know exactly how much you will spend. Enterprise/crop budgets are farm management tools that can help fill in the gaps.

Price Comparison – Referencing other markets can tell you what comparable products are selling in area markets. Comparable product prices is helpful information to know, but it is not advised to simply match your price to what you see elsewhere. It is better to develop a range for what is acceptable. If you determined that you are profitable at $5.00 per lb. (based on your costs) but you see that a grocery store is selling for $7.00 per lb., that may help you understand what customers are willing to pay. Other places to reference would be farmers markets, grocery stores, USDA reports, market bulletins, and other places where similar products are sold.

Customers – Evaluating your customer segment is important because you may know what your price needs to be, but you have to find buyers that will support that. That means your customers must be willing and able to pay the set price for your product. Some questions to ask:

Do the customers have the means and willingness to pay? If you have premium products, who will be willing to pay for that and where are they located?

Is your market local or will you have to travel to reach them? If there are additional costs associated with that market, consider the additional revenue you will need to make it worth it.

What's the capacity of the market? If you and several others are growing similar items but there are a small number of customers, it may be hard to make enough sales to cover your cost. Some markets may even put restrictions on what you can bring to discourage duplicate offerings. At that point, it is not a price problem but having enough buyers available.

Price for products can be quite variable and experience large variations throughout a season. Farmers can influence the price their customers are willing to pay through successful marketing and branding efforts. However, other factors such as perishability may add additional market pressure. Knowing your cost, a range of acceptable prices, and opportunities to reach buyers can help net an acceptable return for your crop.

Part II

As a continuation of part 1 of our "How Much Can I Sell This For?" series, we dive deeper to determine how to set our price targets.

It is important to know how much has been invested in order to recoup the cost. Next is to generate revenue greater than the investment in order to be profitable. Capture ALL costs of carrying out a particular activity, often referred to as production or variable costs. This varies according to how much is produced of a certain item. Think of inputs like fertilizer, seeds, irrigation, labor, etc. that will go up as you produce more. Not all crops will have the same inputs or amount of inputs so it is specific to what you are growing. Generally, total cost will go up but the cost per unit produced will go down as you produce more.

Second, there are various costs of operating a business such as insurance, rent, property taxes, utilities, and depreciation. They are not specific to a particular crop but an overall cost to the business. It is important to know these too and then allocate them in a reasonable method. This is where it can be part art and part science. How much of the electricity bill do you charge to the tomato crop for instance? One method would be segmenting the production of your farm, and if tomatoes are roughly 20% of your farm production, you will allocate total general overhead expenses at 20%. Perhaps some costs are allocated completely if it only applies to one enterprise. Another method would be charging a percentage, 10% for example, on top the direct production expenses, as an estimate of overhead costs for the crop. With the second method, a way to check for accuracy is totaling the estimates charged from all crops and seeing if it is close to the actual overhead for the year. If so, the estimate is suitable. Otherwise, you may need to change your percentage or use a different method.

We have done a quick calculation on 1 acre of tomatoes to demonstrate both the art and the science needed to set price targets. The examples and numbers have been simplified and do not reflect actual production costs (Table 1).

Table 1. Example: Total Costs (Allocated and Estimated) for Field-grown Tomatoes (one acre)

Direct Costs (plants, fertilizer, chemicals, labor, etc.)	$10,000		$10,000
Indirect Costs (utilities, taxes, depreciation, insurance)	**Allocated**		**Estimated**
	Total:	$7,500	
	% of Farm	20%	10%
	Allocated	$1,500	Charge
Total Cost:	**$11,500**		**$11,000**

Expected Yield:		38,000 lbs. per acre 38,000 lbs. / 25 lb. box = 1,520 boxes
Direct Costs:	$10,000	/ 38,000 = $.27 per lb. / 1,520 boxes = $6.58 per box
Total Costs:	$11,500	/ 38,000 = $.31 per lb. / 1,520 boxes = $7.57 per box

To be conservative, we'll use the allocated method which estimates a greater cost, $11,500. This starts to give targets for marketing the product. The $10,000 of direct cost is the first revenue goal. But ultimately $11,500 or greater needs to be generated for long term profitability. Meaning we are covering the production costs and a portion of the operating expenses for the business.

For further analysis, this can be broken down by yield or expected yield (Table 2). The price per lb. and price per box end up being the same number in the end, but it is a different way to evaluate the information depending on how you plan to sell.

An additional piece of the puzzle is the cost associated with participating in a specific market. If you know there is a market fee, there is mileage, and labor hours, that must be factored in as well. In Part III of "How Much Can I Sell This For?", we will discuss how to evaluate your marketing expenses.

Monitoring for Important Corn Diseases in 2023

By Kiersten Wise, Plant Pathology Extension Specialist

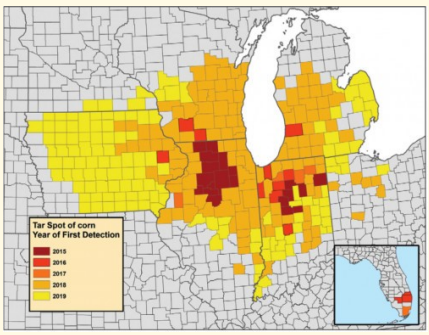
Farmers are annually concerned about corn disease, and this year will be no exception. Corn is moving through growth stages quickly, with much of the early April-planted corn approaching the ten-leaf stage, or V10. This growth stage has become a popular stage for a fungicide application timing with high-clearance ground sprayers, and there have been questions about what diseases are prevalent and how to monitor for disease presence to determine if a fungicide application is needed in 2023.

To date, weather across most of Kentucky has not been conducive for foliar disease development. Most of the state has experienced low rainfall and low humidity for several weeks, and this combination slows or prevents disease development. Even with spotty rainfall over the weekend, most areas will still be at reduced risk for foliar disease at this time.

This said, it is never too early to scout for disease and monitor your resources to determine where and when disease has been reported so you are ready for action, if needed.

One of the most important corn diseases to monitor in Kentucky is southern rust. The fungus that causes southern rust does not overwinter in Kentucky, but spores of the fungus move north on wind currents and weather each summer. You can track the movement of southern rust by watching the map on the cornipmpipe website here: https://corn.ipmpipe.org/southerncornrust/ On the map, red counties/parishes indicate that southern rust has been confirmed by university/Extension personnel. To date, no counties have confirmed southern rust that has been reported on the corn.ipmpipe, but I have heard from my Extension colleagues that the disease is likely in the Florida panhandle. Southern rust typically arrives in Kentucky in mid-July, and whether a fungicide will be needed to manage southern rust at that time will depend on the crop growth stage at the time it is detected in your area. Fungicide applications may be needed to manage southern rust through the milk (R3) growth stage. More information on southern rust can be found here: https://cropprotectionnetwork.org/publications/an-overview-of-southern-rust

Another disease that can be monitored on the cornipmpipe website is tar spot. Tar spot is a new disease in Kentucky, with only two counties having confirmed disease in 2021 and one county with confirmed disease in 2023. In all cases, tar spot was not observed until mid-September and did not impact yield. This is a disease of concern in states to the north, and you can monitor real-time confirmations at https://corn.ipmpipe.org/tarspot/ No tar spot has been confirmed in the United States in 2023 to date. More information on tar spot can be found here: https://cropprotectionnetwork.org/publications/an-overview-of-tar-spot



If considering a fungicide application in 2023, remember to scout fields first and check hybrid resistance ratings prior to fungicide application. Hybrids that are moderately resistant or resistant to foliar diseases (like gray leaf spot) are less likely to demonstrate an economic response to fungicide application.

Scouting over the next few weeks and just prior to tasseling can help determine if fungicide applications are needed. Although disease levels will continue to build over the course of the season, University research indicates that foliar fungicides applied at tasseling or early silking (VT-R1) provide optimal foliar disease control for diseases like gray leaf spot compared to applications that occur earlier or later in the season. For southern rust, a fungicide application may be needed through milk (R3). Management of tar spot will be on a case-by-case basis at this time. Always check with your county agent for updates on the diseases present in your specific county and for their help determining if management is warranted.

Timely Tips - "Off the Hoof- Kentucky Beef Cattle Newsletter"

Dr. Les Anderson, Beef Extension Professor, University of Kentucky

Spring-Calving Cow Herd

- Consider removing bulls from the cow herd by the end of the month and keep them away from the cows. A short calving season can concentrate labor during the calving season; group calves by age so that it is easier to find a convenient time to vaccinate, castrate, dehorn, etc.; and provide a more uniform group of calves at market time.
- Mid-July is an ideal time to deworm cattle. Use a product that is effective against inhibited ostertagia. Re-implant calves which were implanted at birth if the type of implant and amount of time indicate. Calves which have not been vaccinated for blackleg should be. Spraying or using a pour-on for flies while cattle are gathered can supplement other fly control methods. Remember to work cattle early in the morning when it is cool and handle them gently to minimize stress.
- Watch for pinkeye and treat if necessary. Minimize problems by clipping pastures, controlling face flies, and providing shade. Monitor the bulls' activity and physical condition as the breeding season winds down.
- Fescue pastures tend to go dormant in July and August, so look for alternatives like warm season grasses. Try to keep the young calves gaining weight. Go to pastures which have been cut for hay to have higher quality re-growth when it is available.
- Consider cutting warm season grass pastures for hay if reserves have not been restored yet.
- Heat stress can lead to low conception rates, low libido in bulls, and embryonic loss (abortion) between days 6 and 45 of pregnancy. Keep a close eye on your herd. Plan to diagnose your herd for pregnancy early this fall to identify open cows for future planning.

Fall-Calving Herd

- De-worm calves in mid-July with a product that is effective against inhibited ostertagia.
- Fall-calving cows should be dry and pregnant now. Their nutrient needs are minimal, and they can be maintained on poor pasture to avoid over fattening. Keep a good free-choice mineral mix available. You can use a lower phosphorus mineral supplement now if you want to save a little money. These cows are regaining body condition after a long winter-feeding period.
- Get ready for fall calving and plan to have good pasture available at calving and through the breeding season.

Stockers

- Sell heavier grazing cattle before rate of gain decreases or they get into a heavyweight category. This will also relieve grazing pressure as pasture growth diminishes. They can be replaced with lightweight calves after pastures recover.
- Lighter cattle kept on pasture need to be rotated to grass-legume or warm-season grass pastures to maintain a desirable level of performance. Re-implant these calves and deworm with a product that is effective against inhibited ostertagia.

General

- Check pastures for downed wild cherry trees after storms (wilted wild cherry leaves are toxic to cattle).
- Be sure that clean water is always available, especially in hot weather. Make routine checks of the water supply. Cattle need 13 to 20 gallons of clean water in hot weather. Cattle should have access to shade.
- Maintain a weed control program in permanent pastures and continue to "spot-spray" thistle, honey locust, etc.
- Have forage analyses conducted on spring-cut hay and have large, round bales covered. Begin planning the winter-feeding program now. Most of the hay was cut late due to a wet spring.
- Start soil testing pastures to determine fertilization needs for this fall.
- We are finishing June in the middle of an extremely hot and dry period. Begin planning now for drought. If this weather continues, you may need to begin feeding hay/supplement August-October to allow for fall stock piling of fescue.

From: THE KERNEL

How Does Wildfire Smoke Impact Corn Growth?

Story by Dan Quinn— July 11, 2023

In recent years, Indiana has experienced an increase in air quality concerns during the summer due to elevated incidence and severity of wildfires in Canada and the western U.S. In late-June of 2023, air quality warnings were issued throughout Indiana due to smoke caused by Canadian wildfires, which resulted in a noticeable haze and reduction in direct sunlight. Therefore, not only is this a concern for human health, the question that is also asked by many farmers is "how is the smoke impacting crop development?". And, as you may have guessed the answer to this question can be tricky and often results in the quintessential extension answer of "it depends".

Haze and reduced air quality from wildfire smoke can result in both negative and positive impacts on crop growth. The first negative impact is a reduction in light availability, which can reduce crop photosynthesis. For example, during the week of June 26, 2023 (when air quality concerns were the greatest), average weekly solar radiation was decreased by 32% as compared to the week prior (June 12) and the week after (June 31) in West Lafayette, IN (Purdue Univ. Mesonet). Wildfire smoke in the atmosphere can reflect portions of incoming sunlight, thus reducing the total amount available to plants. Reductions in light availability from wildfire smoke are more likely to impact corn than soybean. This is due to corn being a C4 photosynthesis crop and having a higher light saturation point (the point at which further increases in light do not increase photosynthesis). Soybean is more susceptible to changes in CO_2. The second negative impact caused by wildfire smoke is an increase in ground-level ozone. Ground-level ozone can be both harmful to human health and crop growth. Wildfires can emit various air pollutants which can form ozone when reacted with sunlight. Ozone can cause harm to both corn and soybean by entering the plant through the stomata and causing harm to plant tissue during respiration. Since both reductions in sunlight and increases in ozone can cause photosynthesis reductions, corn may also be inclined to remobilize carbohydrates from the stalks later in the season to satisfy grain fill requirements, thus increasing the potential for weak stalks and lodging prior to harvest.

In contrast to negative impacts caused by reduced sunlight and increased ozone, wildfire smoke in the atmosphere can also have positive effects on crop growth. One positive effect is that not only can wildfire smoke reflect sunlight, it can also scatter sunlight. By scattering the light, this can allow light to penetrate deeper into the crop canopy and increase plant photosynthesis. Furthermore, when light is scattered and direct sunlight is reduced, this can also lower leaf surface temperatures which can benefit crops under drought stress.

Lower leaf temperatures can reduce the amount of transpiration (water movement and evaporation from the plant) needed to cool the plant and reduce overall water stress.

Overall, corn is more susceptible to the negative effects of wildfire smoke during the grain fill stages and the good news is that the majority of corn in Indiana was in the vegetative stages during the smoke presence in 2023. Therefore, minor or no yield loss is expected throughout the state. However, much is still needed to be learned about the impacts of wildfire smoke on crop growth, and as these events become more frequent, it will be important to pay attention to them in the future.

Additional Resources:

Archontoulis, S., and M. Licht. 2023. Wildfire smoke impacts on crop production. Integrated Crop Management Blog. Iowa State Univ. Ext. https://crops.extension.iastate.edu/blog/mark-licht-sotirios-archontoulis/wildfire-smoke-impacts-crop-production

Jeschke, M. 2021. Is Smoke from Wildfires Affecting Crop Yields? Pioneer Agronomy. https://www.pioneer.com/us/agronomy/wildfires-crop-yields.html

Lindsey, A., L. Lindsey, and O. Ortez. 2023. How could the haze of wildfires affect crop growth? C.O.R.N. Newsletter. Ohio State Univ. Ext. https://agcrops.osu.edu/newsletter/corn-newsletter/2023-21/how-could-haze-wildfires-affect-crop-growth

UK Specialist Urges Horse Owners to Plan for Future Hay Needs Now

Aimee Nielson—Agricultural Communications Specialist
UK College of Agriculture, Food and Environment

As the first hay cutting is wrapping up around the state, a University of Kentucky extension specialist is urging horse owners to begin planning for future hay needs.

"The recent rains have provided some relief, increasing hopes for a successful second cut," said Bob Coleman, equine extension specialist for the UK Martin-Gatton College of Agriculture, Food and Environment. "While some horse owners feed hay year-round, others need to prepare for a specific duration, particularly during winter."

Coleman said owners may determine the amount of hay their horses need using a simple calculation based on 2% of each horse's body weight per day. For instance, a 1,200 lb. horse would need approximately 24 lbs. of hay daily.

"It is important to note that the amount of hay required per day can be adjusted if a forage analysis is available," Coleman said. "Such analysis provides insights into the hay's nutritional value and helps determine necessary supplementation. I encourage horse owners to contact their county extension agent for assistance in obtaining a proper sample and getting it analyzed. The cost of sample analyses typically range from $20 to $35 per sample, depending on the required level of analysis."

Horse owners who purchase hay by the bale need to pay attention to bale weights. For instance, a $5-bale weighing 40 pounds costs approximately 12.5 cents per pound, while a 50-pound bale is 10 cents per pound. Over the feeding period, this difference can significantly add up.

It's crucial to have adequate storage space for purchased hay. Coleman said to choose a well-drained storage area that protects hay from the elements.

"While a building is the ideal storage option, it's not always an option," he said. "At the very least, consider tarping hay stored outdoors to prevent spoilage. Losses due to poor storage can easily surpass the expenses associated with developing a proper system."

Minimizing feeding loss or waste is another important consideration. Simply tossing hay on the ground can result in significant waste, ranging from 15% to more than 50%. Preventing waste saves feed and reduces the overall cost of feeding. Investing in hay feeders can be a cost-effective solution, as the savings from reduced waste often offset the initial investment.

Coleman emphasized that hay is a mobile commodity.

"Although hay may be readily available in some areas, regions experiencing a shortage will require hay to be transported across the state or county," he said. "Making hay purchasing decisions early can ensure buying at a reasonable price when the supply is abundant. Waiting until later in the feeding season might lead to reduced availability and significantly higher costs."

Campbell County

SAVE THE DATE!

Landowner Expo

The Landowner Expo is designed to help landowners understand some of the management options that are available to them.

University of Kentucky
College of Agriculture, Food and Environment
Cooperative Extension Service

SOIL CONSERVATION DISTRICTS of KENTUCKY — The Soil is in our Hands

Partners & Information

- **The Campbell Conservancy** – Land Preservation
- **Campbell County Conservation** – Ag Sales Tax Exemption, Local Cost Shares
- **Campbell County Extension** – Grants, Soil Testing & Technical Assistance
- **Campbell County Planning & Zoning** – Planning, Zoning, Building Permits, and Flood Plain Management
- **Campbell County Property Valuation Administrator (PVA)** – Land Assessment and Mapping
- **Kentucky Division of Conservation** – Ag Water Quality Plans, KY Nutrient Management Plans
- **Farm Services Agency (FSA)** – Farm Serial Numbers
- **Natural Resources Conservation Service (NRCS)** – Federal Farm Bill Programs, Nutrient Management Plans

Saturday, November 4, 2023

OPEN HOUSE

10:00 a.m. - 1:00 p.m.

Location: Campbell County Environmental Education Center

1261 Race Track Road | Alexandria, KY 41001

For more information:

Campbell County Cooperative Extension
michelle.simon@uky.edu
(859) 572-2600

Campbell County Conservation District
patti.dischar@campbellkyconservation.org
(859) 635-9587