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OHIO STATE UNIVERSITY EXTENSION

# NORTHEAST OHIO AGRI-CULTURE NEWSLETTER

Your Weekly Agriculture Update for Ashtabula and Trumbull Counties

August 27, 2024

*Soybeans dropping leaves in Trumbull County.*

## In This Issue:



## *Hello Northeast Ohio Counties!*

The dry, hot weather has returned here at the end of August. Dry weather has been the topic of discussion for many OSU Extension professionals this summer. We have a couple articles this week to help you make decisions for drought stressed crops. While we are dry in most areas of NE Ohio, we are still fairing better than other places.

Locally, dry conditions have helped to keep crop diseases to a minimum. White mold has been notably absent this growing season. Now if only we could get a few inches of rain to fill out the beans.

Stay safe!


**Lee Beers**
**Trumbull County**
**Extension Educator**

# *Forage Nitrate Toxicity a major concern as drought worsens*

By Jason Hartschuh
Source: https://agcrops.osu.edu/newsletter/corn-newsletter/2024-29/forage-nitrate-toxicity-major-concern-drought-worsens

Weather conditions across Ohio have been challenging this growing season with some areas of the state reaching a D3 drought status. Other areas of the state may not currently be under drought status but are drier than normal and at risk of quickly experiencing a flash drought. These adverse growing conditions can cause unforeseen challenges with forages. We have had multiple reports of high nitrate levels this year in early harvested summer annual forages as producers needed feed.

Plants readily take up nitrates from the soil, even under dry or cool conditions. Once in the plant, nitrate is converted to nitrite, then ammonia, and finally into amino acids and plant protein. Any environmental stress that significantly slows down plant photosynthesis and metabolism can lead to excessive nitrate levels in the plant because the nitrate uptake from the soil will be faster than its metabolism into plant protein. Such stresses include drought, frost, extended cold weather, cloudy conditions, or hail damage. While frost is a concern for increasing nitrates in forage a few months from now, the sorghum family also has prussic acid concerns when plants die quickly because of a frost. Prussic acid and nitrate poisoning are not the same.

The highest level of nitrate accumulation in corn occurs from V6 through pollination. While all drought-stressed corn can be at risk of high nitrate levels the greatest risk is in corn that was not drought-stressed from V6 through pollination and then became drought-stressed. This corn took up much of the nitrogen that was applied to the field but did not produce grain to utilize that nitrogen.

When ruminants consume excessive levels of nitrate in their diet, the nitrate is converted to nitrite by rumen microbes faster than it can be converted to ammonia, amino acids, and eventually plant protein. Accumulated nitrite in the rumen is then absorbed into the bloodstream where it prevents oxygen transport, which leads to death. Livestock sensitivity to nitrates ranked from highest to lowest is: pigs > cattle > sheep > horses. Older or sick animals are generally more sensitive than young healthy animals. The fetus in pregnant animals is very sensitive to high nitrates ingested in the diet.

One of the common solutions for forages that have slightly elevated levels of nitrates is to mix them with another forage source that is low in nitrates. The best way to do this is to truly mix the two forages so that your cattle eat both at once as a balanced lower nitrate diet. When this is not possible, feed the low nitrate forage first, allowing them to

fill up on it, then offer the higher nitrate forage keeping them full for the day alternating forages each feeding. This year it may be important to test those dilution forages to be sure they are truly low in nitrates. Nitrate levels in forage are commonly reported in 3 different ways, ppm $NO_3$ DM, percent $NO_3$, and ppm $NO_3$-N (DM). Table 1 below summarizes how to interpret the results.

**Table 1: Interpretation of nitrate forage test results.**

| ppm $NO_3$ (DM) | Percent $NO_3$ | ppm $NO_3$-N (DM) | Interpretation of results |
|---|---|---|---|
| 0-3,000 | 0-0.3% | <350 | Generally safe for all cattle. |
| 3,000-5,000 | 0.3-0.5% | 350-1130 | Generally safe for non-pregnant beef cattle. Low risk of reduced breeding performance and early-term abortions. Total ration for dairy cattle should be less than 2500 ppm $NO_3$. |
| 5,000-9,000 | 0.5-1.0% | 1130-2260 | Some risk for all cattle. May cause mid to late-term abortions and weak newborn calves. May decrease growth and milk production. |
| >9,000 | >1% | >2260 | Potentially toxic for all cattle. Can cause abortions, acute toxicity symptoms, and death. |

Any time forage growth has been significantly slowed due to dry conditions, extended cold nights, cloudy weather, or premature plant death, nitrates may be an issue. All these stresses can lead to higher nitrate levels in plants due to slowed growth. Nitrogen fertilizer or manure applications made to forages increase the risk for higher nitrate levels in plant tissue, especially if excess nitrogen is available and forage growth is slow.

Nitrate accumulation is possible in many forage species, including all cool-season perennial forage grasses, alfalfa, all cereal forages (oat, rye, triticale, wheat, barley, spelt, etc.), and brassicas (might be present in cover crop mixes). Nitrates can also accumulate in warm season annuals (corn, sorghum species, millet, and many weeds). Weed species are heavy nitrate accumulators, including lambsquarter, pigweed, dock, some mustard species, johnsongrass, horse nettle, nightshade, quackgrass, and jimsonweed. Heavy infestations of those weeds when harvested with the forage will increase the risk of nitrate toxicity.

Nitrate levels are generally higher in younger than more mature growth. Delaying forage harvest to the dough stage and other forages to flowering/heading stages can significantly reduce nitrate levels. Cutting height can also affect levels as nitrates accumulate in the lower one-third of plants more than in the upper two-thirds.
Plant nitrate concentrations are higher in the morning than later in the day (plant metabolism during daylight drives the conversion of nitrate to plant protein). Mowing hay

late in the afternoon on a sunny day can reduce nitrate levels in forage. Once hay is mowed, nitrate levels do not change much during the drying process, so dry hay levels will be similar to levels at the time you mow. Prior to mowing, nitrate levels vary across the field based on plant growth and variable soil nitrogen. This variability increases even more in a field based on mowing time. If we start in the morning and mow all day, the evening mowed forage should have lower nitrate levels.

However, ensiling can reduce nitrate levels from 10-65% provided fermentation is good. But if the forage is initially very high in nitrates, the silage could still contain toxic nitrate levels, so this is not an automatic fail-safe option. Be very cautious as high nitrate forages ferment, the bacteria break down the nitrate and release deadly nitrogen gas. Nitrogen oxide gases are heavier than air, may be reddish or yellow-brown in color, and have a bleach-like smell. Nitrogen oxide gases will accumulate in low-lying places, such as around the base of a silo or in the feed room below a tower. When ensiling forage that may have high nitrate concentrations, do not enter the silo for at least three weeks after harvest. If you must enter the silo to level or cover the silage, do it immediately after filling and leave the blower running while anyone is in the silo. If you usually run the blower for an hour prior to entering the silo, it may be necessary to run it for 2 hours to be sure the gas is cleared and fresh air is present.

Silage must be harvested at the proper moisture for complete fermentation (Table 2). When forages are harvested too dry, they do not ferment properly and nitrate reductions will be less. Baleage is often harvested on the drier side, and even when it is harvested in the ideal moisture range, reductions will not be as much as well-packed silage. Baleage densities are much lower than properly packed silage, so the additional oxygen slows fermentation. If nitrate levels are reduced in silage in about 3 weeks, it will take 6 or more weeks for levels to be reduced in baleage. Since nitrate levels can vary across a field, the harvested forage can be quite variable in nitrate concentration.

**Table 2. Ideal moisture content for forage stored as silage or baleage.**

| Type of Silo | % Moisture Content | % Dry Matter Content |
|---|---|---|
| Horizontal (bunker) silo | 65% - 70% | 30% - 35% |
| Bag silo | 65% - 70% | 30% - 35% |
| Tower silo | 62% - 67% | 33% - 38% |
| Oxygen-limiting tower silo | 55% - 60% | 40% - 45% |
| Baleage | 50% - 60% | 40% - 50% |

The bottom line is that if you suspect the forage could be high in nitrate, the safest thing to do is to sample the forage and have it tested before it is harvested, because if levels are high, you can delay harvest to reduce the levels. You should certainly sample the stored forage before feeding it if you suspect higher levels! Call your forage lab and follow their guidelines closely for sampling the forage, packaging, and shipping the sample to them.

## *Dry Conditions in Corn – Implications and Recommendations*

By Osler Ortez, Alex Lindsey, and Aaron Wilson
Source: [https://agcrops.osu.edu/newsletter/corn-newsletter/2024-29/dry-conditions-corn-–-implications-and-recommendations](https://agcrops.osu.edu/newsletter/corn-newsletter/2024-29/dry-conditions-corn-–-implications-and-recommendations)

Environmental conditions across regions have been a concern recently with regards to crop growth. It is important to understand what potential implications these conditions may have on the crop and yields. The U.S. Drought Monitor and recent reports from several areas across the state have reported abnormally dry or worse conditions this month (Figure 1).

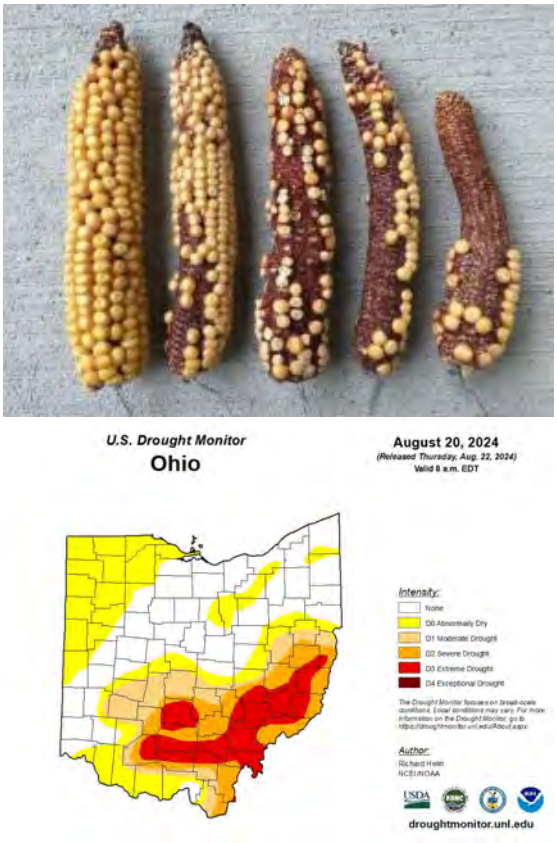


Figure 1. U.S. Drought Monitor for Ohio as of August 20, 2024. Source: droughtmonitor.unl.edu.

Corn yields can be affected by drought; among cereals, corn is one of the most sensitive crops. Weather extremes, particularly drought and heat, pose significant challenges to farmers. Seasonal air temperatures and precipitation may explain about 30% or more of the year-to-year variability of crop yields in the largest crops, including corn. Corn has shown a negative yield response to higher air temperatures. These lower yields have been offset (at least partially) by introducing new genetics, agronomic strategies, and technologies.

Current weather forecast are not very optimistic, and we can continue to see some crop stress in fields. It is expected (and has been observed) that many fields, especially

Drought and High Temperature Effects

across western and northern Ohio, are still okay given good soil moisture levels below the surface from past rains. Most of our corn fields in Ohio are at the dough (R4) and dented (R5) stages. The highest water use in corn is around the tasseling (VT) and silking (R1) stage with about 0.3 inches of water per day. The corn water use rate between dough and dent stage is estimated at about 0.20-0.24 inches per day. Water use decreases from this point forward as corn gets closer to maturity. Learn more about corn water use here.

Implications in Corn Yield

If prolonged heat and drought conditions exist, crop yields can be affected primarily by:

1. Reducing number of kernels per ear (kernel set issues and kernel abortion). The success of pollination, kernel fertilization, and kernel retention determines the actual number of harvestable kernels through about R3 (milk stage). Normal ears have the potential to produce about 800 to 900 kernels. However, pollination issues or kernel abortion during grain formation will lead to lower numbers. By the R3 stage, the kernels that will continue to fill will increase in depth and those that were pollinated but aborted will appear yellow and will begin to shrivel. Large issues with unpollinated ovules or aborted kernels suggest stress during the VT/R1 (tassel-silking) to R2 (blister) growth stages.
2. Reducing kernel weight (or so called lower test weight). Kernel weight is determined during the latter half of the season from about R2 (blister stage) through to R6 (right before physiological maturity or black layer). Ears with low kernel weight would reflect conditions during the second half of the reproductive stages (R3 to R6). At this time, moisture in the grain is going down, while dry matter accumulation is going up. Approximately 40-45% of grain weight is gained during the first half of the dent stage (R5) alone. By R6 (physiological maturity), kernels have no longer milk line and have reached maximum dry matter.

Final Considerations

In the absence of drought/heat stress, other considerations include that modest increases in temperatures can increase growing degree day accumulation, which positively affects crop growth, development, and yields. An example of that is the more rapid progress seen in 2024. Given crop progress over this season plus the dry conditions faced in some areas now, it is expected that crops will mature and be harvested earlier this 2024 season.

The shift toward longer growing seasons (warmer temperatures) provides corn growers with an opportunity to increase yield and profits by selecting hybrids with later relative maturities or greater growing degree day requirements, particularly in northern US. Some resources that can help to sort out the management or stress and timing that can impact corn yield are available here 1) Assessing yield-limiting factors in corn, 2) troubleshooting abnormal ears, 3) incomplete kernel set and tipped-back, 4) arrested ears, and 5) other ear abnormalities.

Agronomic decisions that could be used to lessen the effects of drought and high temperatures in corn production in future years are summarized in Table 1. One caveat is that these decisions need to be made prior to or at planting and cannot be implemented later in the season. These practices may be worth examining in future years to help offset some of the stress and potential yield loss caused by drought and heat conditions.

Table 1. Drought and high temperatures in corn production - summary of potential management decisions and challenges with their implementation. Source: Ortez et al., 2023.

| Management Decisions | Challenges with their Implementation |
|---|---|
| Minimize the occurrence of stress during the kernel set period to optimize plant growth rate and ensure kernel numbers are preserved through varying hybrid-relative maturities or planting date variations. | It is unclear when stress occurrence will appear within a season, and the critical period is long (one week before to three weeks after silking). |
| Drought-tolerant hybrids can produce a 15–45 bushels-per-acre yield increase relative to drought-sensitive hybrids if drought conditions exist. On the other hand, drought-tolerant hybrids can have 5–15 bushels-per-acre lower yield relative to the standard hybrids when hybrids are grown under adequate moisture. | Higher yields for drought-tolerant hybrids have not been consistent or have been negative at times. Yield advantage of drought-tolerant inconsistencies have been partly attributed to different yield levels or actual water availability. |
| Conservation tillage has been largely recommended for goals related to soil conservation, water management, and building soil organic matter, which are all critical aspects of crop production. | Yield advantages have been reported in no-till systems (relative to conventional tillage) in southern areas of the United States. Less consistent results have been reported in the northern US (due to colder/wetter springs and and poorly drained soils). |
| Use of controlled drainage structures may help retain water to facilitate off-season soil moisture recharge and could possibly raise the water table to help alleviate short-term water deficit conditions. | Cost of installation is high, and the benefit may not be realized every year. Its suitability will be location specific. |
| Installation of irrigation systems – a common strategy in western US Midwest (e.g., Kansas, Nebraska). | Many of the limitations would be the same as the use of controlled drainage structures (high costs and inconsistent benefits for our region). |

# *Regional Crop Updates: August 20-26, 2024*

By Lee Beers, Ryan McMichael, Kayla Wyse, Dean Kreager, Ken Ford, Stephanie Karhoff

Source: https://agcrops.osu.edu/newsletter/corn-newsletter/2024-29/regional-crop-updates-august-20-26-2024

Northeast – Lee Beers of OSU Extension Trumbull County reported that corn is in good condition and between R3 (milk) and R5 (dent) with very little disease pressure so far. Soybean is also in good condition despite dry conditions throughout large portions of northeastern Ohio. First crop soybean is between R4 (full pod) and R6 (full seed). In terms of disease, soybean vein necrosis virus incidence is high in the region (Figure 2), and frogeye leaf spot has also been found. So far white mold has not been an issue as it has in past years. Dry conditions have led to lower-yielding second cutting grass hay and third cutting alfalfa.

*Figure 1. Maturing soybeans in Fayette County. Image courtesy of Ken Ford.*

Central and West Central – Ryan McMichael of OSU Extension Mercer County reported that corn has reached the dent stage (R5) and overall is in fair condition with low disease pressure as it approaches black layer. Soybeans are in good condition and the main weed escapes observed in the region include waterhemp, volunteer corn, giant ragweed, and velvetleaf. Corn silage harvest began last week, but the majority of fields remain to be harvested this week. Second and/or third cutting hay continues, with good quality but low yield.

Northwest – Kayla Wyse of OSU Extension Williams County shared that disease and insect pressure remains low in corn and soybeans in northwestern Ohio, with mainly low levels of gray leaf spot and tar spot in corn. There was little field activity this past week in the region, but tomato harvest and manure hauling continue in portions of the region.

*Figure 2. Soybean vein necrosis virus widespread in Trumbull County. Image courtesy of Lee Beers.*

Southeast – Dean Kreager of OSU Extension Licking County reported that corn and soybeans are in poor condition as drought continues to impact the region. Though north central and west central portions of Licking County have received reasonable precipitation, the southeastern corner of the region is extremely dry. Pasture conditions continue to deteriorate and hay yields have been very poor. Area growers are invited to submit a report of local conditions and drought impacts here.

*Figure 3. Early planted corn maturing in Fayette County. Image courtesy of Ken Ford*

Southwest – Ken Ford of OSU Extension Fayette County reported that both corn and soybeans are in good condition, with early planted corn beginning to dry down (Figure 3). Soybean senescence is variable, and double crop soybeans faring surprisingly well given the low soil moisture levels since planting. Silage harvest is close to being finished in southwestern Ohio, occurring earlier than in past years. Third and/or fourth cutting of hay is also underway. Like other areas of the state, quality is average, but yield has been below average due to continuing dry conditions.

## *Killing giant ragweed just got harder for some Wisconsin farmers*

Source: https://www.sciencedaily.com/releases/2024/08/240821150007.htm

When giant ragweed takes hold in a crop field, the towering weed reduces yield and sends plumes of its famously allergy-inducing pollen into the air. There are few tools available to thwart the menace, especially for farmers growing non-GMO soybeans. Now, some Wisconsin farmers are left with even fewer options.

New research from the University of Wisconsin-Madison and the University of Illinois Urbana-Champaign shows some giant ragweed populations in Wisconsin have evolved

resistance to a crucial class of post-emergence herbicides known as protoporphyrinogen oxidase (PPO) inhibitors (Group 14 herbicides).

"It's hard to control giant ragweed with pre-emergence herbicides, in part because it's a larger seed and can emerge from greater depths. So farmers depend on post-emergence products. For folks growing non-GMO soybean, those POST products are ALS and PPO, and we already have fairly widespread ALS resistance in giant ragweed," said study co-author Pat Tranel, professor in the Department of Crop Sciences in the College of Agricultural, Consumer and Environmental Sciences (ACES) at Illinois.

"Losing PPOs means you're basically out of chemical options," he added.

The results won't surprise some Wisconsin farmers. Study co-author Rodrigo Werle, associate professor and Extension weed scientist at UW-Madison, says farmers started mentioning in 2018 that PPOs weren't working as well.

"We thought they had issues with application timing, that they were missing the ideal window for application," Werle said. "But the growers we were working with are very knowledgeable and did everything by the book. Small plants were regrowing after being sprayed, which can be a sign of resistance."

The research team asked farmers to collect and send seeds from plants in affected fields.

"We evaluated fomesafen (a PPO inhibitor) at 1x and 3x the label rate, and a lot of plants survived. Then we evaluated the dose response for fomesafen and lactofen (another PPO). We determined one population had almost 30-fold resistance to fomesafen and almost four-fold resistance to lactofen," said lead study author Felipe Faleco, a doctoral student at UW-Madison.

Faleco let plants that survived the 1x rate of fomesafen grow to maturity, then collected seeds and handed them off to Tranel, who had previously determined the molecular basis of ALS and PPO resistance in common ragweed, a close relative of the giant variety.

"We sequenced the genes for the PPO target enzyme and found the same mutation that we'd seen in common ragweed," Tranel said. "There were really no other mutations, so that is likely the basis of resistance in giant ragweed, too."

Tranel's group went farther, developing a molecular tool diagnostic labs can use to detect PPO resistance, offering farmers quick answers.

The Wisconsin team also tested for resistance to acetolactate synthase (ALS) inhibitors and glyphosate, finding four populations with resistance to ALS and two populations with resistance to glyphosate. These types of resistance had already been documented in giant ragweed, but the team also found one population with resistance to both.

"For us in Wisconsin, this is the first time we've documented two types of resistance in a single population in giant ragweed," Werle said. "It shows that it's not only waterhemp that is evolving multiple resistance. We also have some other weeds we have to keep an eye on."

Resistance to glyphosate affects GMO soybean growers, who turn to PPO and ALS herbicides in those cases. Similarly, non-GMO growers who can't use glyphosate rely on these chemistries. The authors say with ALS and PPO resistance -- essentially, zero chemical options -- more non-GMO growers may switch to GMO soybeans.

"Farmers plant non-GMO soybeans for the premiums; there's a financial reason to go that route even though weed control is more difficult," Werle said. "But if a farmer knows they're dealing with this type of resistance, that could prevent them from growing a non-GMO crop in a sustainable or a profitable way."

In addition to the potential impacts on farm management and profits, the findings matter for allergy sufferers.

"As farmers struggle with control, more ragweeds are going to escape and shed pollen," Tranel said. "So if you're living in a semi-rural area with corn and soybean fields around, it's likely there's going to be more pollen in the air."

## *Getting more money for hay is no secret*

By Mike Rankin
Source: https://hayandforage.com/article-4913-Getting-more-money-for-hay-is-no-secret.html

We hear a lot about “value-added” these days. When margins are tight, farmers figure out ways to get more money from the same raw product. Often, that involves skipping the middle man and realizing a chunk of the retail profit through practices such as processing milk or direct marketing meat. Organic production is another way of adding value to a product you are already selling. You get the idea.

How do you add value if you're in the business of producing hay? In most cases, hay already goes direct to the consumer (a livestock owner) in an unprocessed form. I've written extensively about the value that small square bales offer compared to larger packages. For this reason, some larger commercial hay operations have added a bale processor to slice and dice their large squares into smaller, bundled bales. This has opened previously unavailable markets and added value to their product. At the same time, they have maintained the efficiency of using large square balers.

When hay is short in supply and demand is high, almost any hay will fetch a profit-generating price. Those times are less common than when supply equals demand or exceeds it. For this reason, hay producers need to focus on one well-established strategy that involves little investment but will add value to their product every year, whether selling hay or using it on their own operations.

This value-added strategy has been available to hay producers from the first time a scythe was swung to lay down forage; it's simply accomplished by improving and maintaining hay quality. You've heard this story before, but the industry is still nowhere close to meeting its hay quality potential.

Regardless of what value-added practice it's compared against, exceptional hay quality can't be matched in terms of economic return from both a seller's and user's perspective. The difference in price between average quality alfalfa hay and premium quality hay is currently $60 to $80 per ton. A year ago, that difference was close to $100 per ton. Further, making better quality hay doesn't demand much, if any, additional investment. Here's why.

For the moment, forget about all of the products you can buy that promise higher quality hay. The number one factor that drives hay quality is simply plant maturity at cutting time, and the second most important factor isn't even close. This is true for grasses and legumes. If you want to receive more money or performance from your hay, weather should be the only thing that prevents a timely cutting.

Nobody's perfect, but . . .
Once hay is cut, only bad things happen from a forage quality standpoint, and that's true regardless of when it's cut. Therefore, once cut, haymaking becomes a game of maintaining quality rather than improving it.

Through research and experience, we know how to minimize quality losses after cutting. Nobody rolls a perfect 300, but you also don't want to find yourself staring at the equivalent of a 7-10 split. There are no forage quality mulligans.

Two keys govern forage quality after cutting: dry-down time and leaf retention. Both of these factors can make or break a hay crop.

Dry-down time is impacted by weather conditions, but it is also driven by swath width and conditioning. Swaths should ideally be laid as wide as possible, especially if a tedder or fluffer isn't used between cutting and raking. Some haymakers like to leave a wide enough gap between swaths to have a dry soil surface for placing the final windrow. Often, these same haymakers will need to ted or fluff the swath if it's a thick first cutting or the weather is uncooperative. This is done when the plant moisture is still sufficient to hold leaves. And that brings us to the second key.

Leaf retention for legumes is the other factor that significantly impacts final forage quality. Leaves make up about 50% of the alfalfa plant and change minimally in forage quality over time. Stems, on the other hand, decline rapidly in forage quality as the plant matures. All of this means that about 70% of the change in final forage quality can be attributed to leaf retention.

The opportunity to lose leaves comes during both windrow manipulation and baling or chopping. In all cases, leaf loss usually occurs because the forage is too dry for mechanical handling.

Storage matters

Even if all of the above factors are minimized, forage quality can easily be compromised during storage. I recently was on a road trip through the Northern Plains and witnessed thousands of tons of forage that were essentially rotting in round bales. These bales were either stacked pyramid style or in single rows but pushed together side-to-side rather than end-to-end. The weeks, months, or years of rain they endured essentially ran off one bale and into another. Again, this was a common sight, not a random stack here and there.

The same kind of loss can be seen in a poorly managed, horizontal silo or with any-sized square bales that are not tarped or put under a roof. It's one thing to lose quality during harvest because of uncontrollable weather factors, but storage is always 100% under the haymaker's purview.

For haymakers, forage quality is the value-added niche, or at least the easiest one. High-quality hay is always in demand and always commands a premium price. Not every load of hay can meet the standard because of uncontrollable weather factors, but

making the best quality hay that can possibly be made and stored should always be the end goal.

## *Lee's Monthly News Column*

Hello Trumbull County! In Northeast Ohio we usually complain about too much rain and water, and look for drainage options to move it off of our property. For the last two years we have been in drought conditions for at least a portion of the summer, and we need to consider how to put water back. As I'm writing this, portions of Trumbull County are classified as D0 - Abnormally Dry by the US Drought Monitor (droughtmonitor.unl.edu). This is a dramatic shift from this spring when we had so much rain that planting was delayed by 2-3 weeks.

Watering can be expensive, time consuming, and wasteful if not done correctly. Plants don't care if the water comes from a sprinkler, soaker hose, or a bucket as long as it has water when it needs it. Some watering options can be easier than others, however. Drip irrigation systems are the most efficient as they place water exactly where the plant needs it, and does not water the non-garden areas. These systems work great for vegetable and ornamental gardens because you can put an outlet on each plant. Soaker hoses are also useful for flower and vegetable beds, but can be cumbersome to place next to every plant. They also will water areas that you may not want to water.

When watering, you need to get moisture down into the soil, not just the surface. To do this, you need to add the equivalent of .25" of rain. If you are using a sprinkler, you can measure the amount of water applied by placing containers in the watering area and measuring the depth of the collected water. For other irrigation systems you will need to collect water under the soaker hose or a irrigation outlet. If you're like me, you may forget that the sprinkler is running. You can attach timers to your hose to start and stop watering on a schedule. This also makes watering earlier in the day much easier.

Why am I talking about watering plants in August? Well, its because dry weather this year will influence how well perennial plants will perform next year. Now is the time perennial plants start to accumulate sugars, starches, and other nutrients to prepare for winter and spring regrowth. Without adequate water this process slows down, or stops altogether. Regular, consistent watering is necessary for healthy plant growth. You should plan to water perennial plants until they have entered dormancy. This is indicated by dropping leaves, dying back, or the lack of new growth. Once plants go dormant for the winter their water requirements drops off quickly. Watering until dormancy will promote strong roots, promote nutrient uptake, and help prepare flower and leaf buds for next year.

After two dry summers in a row, the long term consequences of drought may be visible in the next couple of years. You may notice less vigorous spring growth, smaller flowers, less fruit, and more susceptibility to insects and diseases. This may be concerning, but for most healthy long-lived perennials they should recover over the next growing season assuming adequate soil moisture.

As always, if you have questions about plants in your garden give OSU Extension a call at 330-638-6783. Our staff and volunteer Master Gardeners can help all your growing questions.