What's Up, Doc?

Grayson County Ag and Natural Resources Newsletter

Vol 1: Issue 2 (July 2022) by D. Chad Cummings

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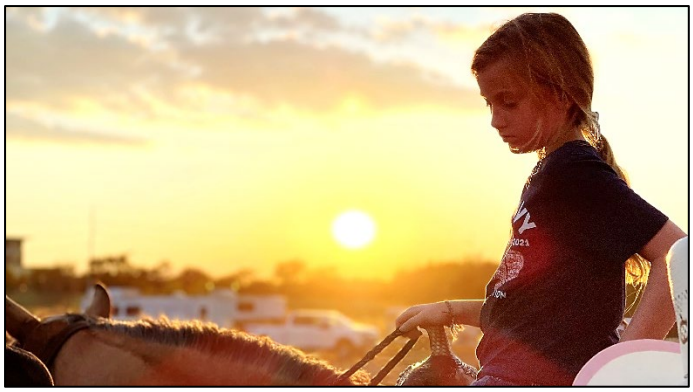

Grayson County USDA crop report summary

June 20 (Wheat harvest early report)

Winter wheat harvest is almost complete for the county. Speaking with local grain companies, the average yield for the area was 67-75 bu/A with a high above 80 bu/A and lows in the low 50s bu/A. Test weights averaged 57 lb/bu with the leading cause of draw down being Hessian fly damage which affected many susceptible varieties in the county.

For corn, most everything is tasseled, and many fields have begun initial grain fill and are in the soft dough stage. There is a good chance that we will have an early harvest if hot, dry conditions persist.

Grain sorghum, soybeans, and cotton are all in good shape and progressing nicely. the hot weather and ozone warnings may begin to take a toll on the crop as the summer persists.

Livestock are in good shape as well. Fly and parasite problems are increasing with the hot weather. No cattle stress deaths have been reported to our office at this time, but the near constant air movement seems to be helping with lower stress. Fruit and vegetable growers are reporting good harvests this year and indicating the wet weather early has helped in their yields.

Common summer sound insects (Cicadas and Grasshoppers)

Annual Cicada (*Neotibicen canicularis*).

Differential Grasshopper (*Melanoplus differentialis*).

In the News.....

Native bees need love too!

Native pollinators as important as honeybees

JUNE 24, 2022

A Texas A&M AgriLife Extension Service expert wants people to better understand and appreciate our native bee pollinators.

Any bee aside from a honeybee is considered a native bee, such as these bumblebees. (Michael Hodgins/pexels.com photo)

"When people see a bee in their garden, many assume it is a honeybee when, odds are, it is actually a native bee," said Molly Keck, AgriLife Extension integrated pest management specialist and entomologist, San Antonio.

She said, in the simplest of terms, a native bee is usually any bee except a honeybee since honeybees are not native to the Americas.

And while bees can look very similar or very different from each other, most bees have a "fuzzy" looking body, unlike wasps who are shiny and "smoother" looking.

Giving credit where credit is due

There are over 200,000 species of pollinators, and about 199,000 of them are insects.

There are over 4,000 species of bees in the U.S., making them the MVP of pollinators. And a bee's work is never done, considering that 90% of flowering plants require a pollinator.

Honeybees play a key role in agriculture, but native bees are just as important, Keck said.

“There are native bee species that are 17 times more efficient as pollinators than honeybees,” she said.

Native bees are also better at pollinating some of the most beloved backyard crops — including tomatoes, blueberries, and pumpkins — making them the heroes of home gardeners everywhere.

Natives thrive on variety

Whereas honeybees prefer blanketed areas of the same food source, such as a field of a single crop, native bees are all about variety.

The more types of flowers, fruits and vegetables that grow in a garden, the more native bees you can expect to see.

Bees are more attracted to flowers of certain colors. Shades in the blue and purple family can be especially successful in attracting pollinators to your garden. (Texas A&M AgriLife photo by Susan Himes)

“Essentially, to attract native bees, you want to have many different mini-landscapes inside your yard,” Keck said.

She said to get an example of a native bee’s ideal habitat, picture an English garden with hedgerows, pasture, plants, and flowers.

Bees are drawn to flowers because of their scent as well as the shape of their flower. They also are attracted to bright colors, especially blues and violets. Red they see as dark, like brown and black, and isn’t as appealing.

“Native bees feed in ‘pockets,’ so you don’t need as much space to attract them as honeybees,” Keck said. “You’ll just need a variety of food sources for them.”

Although bees may have a harder time finding their way to a garden balcony in a large city, a pollinator garden can be a success anywhere. Having gardens in cities also provides a key nutritional resource in what could be a food desert for native bees.

Texans with yards may consider not having turf everywhere, leaving some land uncultivated and allowing some ground to stay bare. Some native bees, like the mason bee, use mud as mortar to build their homes and having mud on the ground when the weather allows is also attractive.

Around 70% of bees nest underground rather than the traditional hives many people envision and that honeybees call home.

That might (not) sting

Although all female bees can sting, most native females won't sting unless trapped, hurt, or directly threatened.

"Native bees are unlikely to sting you," Keck said. "Honeybees are more territorial and likely to defend with a sting."

In other words, don't try to catch a native bee and you won't have too much to worry about. However, if you are allergic to bees, it is smart to avoid all types, as well as wasps and other flying-insect venoms, Keck warned.

A native bee retains its stinger after a strike, whereas a honeybee sting is fatal for the bee. And male bees? Neither honey nor native has any sting at all. However, there are far more female than male bees, so it is safe to assume a bee you see does have a stinger.

Extinction concern?

Keck said it's important for every Texan to be aware of the need to protect bee habitats, although there is no threat of extinction in our state quite yet.

"I think the amount of undeveloped land we have in Texas is part of the reason our numbers are still good," she said. "But as urban areas expand and the sprawl increases, we could start to see the same bee population problems some other areas face."

Whereas honeybees have been domesticated or managed for thousands of years, native bees are still independent contractors.

"Native bees do an equally important job as honeybees and for some crops like fruit, native bees are even better pollinators," Keck said. "To create an environment for them to thrive is something every Texan can support."

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Texas hay season looks bleak

Texas crop and weather report – June 22, 2022

JUNE 22, 2022

The 2022 Texas hay production outlook appears in doubt due to high fertilizer prices and widespread drought, said Texas A&M AgriLife Extension Service experts.

Hay bales could be in short supply as much of the state has reported poor forage and hay production conditions as the season. (Texas A&M AgriLife photo by Laura McKenzie)

Joe Paschal, Ph.D., AgriLife Extension livestock specialist, Corpus Christi, and Vanessa Corriher-Olson, Ph.D., AgriLife Extension forage specialist, Overton, said dry weather, high temperatures and reduced inputs like fertilizer have inhibited warm-season grass production across much of Texas. Hay quantity and quality are down, while the cost to produce bales is up, and weather forecasts do not look favorable.

Pockets of the state have received decent moisture, they said, but high fertilizer prices have discouraged hay producers from making applications. As a result, hay baled was expected to be of lower quality.

Paschal said prices for supplemental feed like range cubes and hay have continued to increase. Range cubes reached $400 per ton, while round bales were starting to fetch $75-$80. For weeks, AgriLife Extension agents have reported $80-plus bales in extremely dry areas of the state.

Some cattle producers around the state have been culling their herds deeper to reduce stocking rates and "mouths to feed," Paschal said. But many more face declining grazing, tightening hay supplies and below-average bale production this season.

"People are baling, but it looks like this hay season could be one cutting, maybe two," he said. "There is hay being fed now, so the hay situation could be tough."

Avoid overstocking as forage conditions decline

Paschal said hay production and grazing conditions were spotty and mirror scattered rainfall in south Central Texas from Del Rio to Kerrville and east of Corpus Christi back to the Rio Grande River. Some pockets have reported 4-7 inches, but much of that area had not received any rainfall since last fall.

Most of East Texas is experiencing abnormally dry to moderate drought conditions, according to the drought monitor map of Texas produced by the National Drought Mitigation Center at the University of Nebraska. Areas in south Central Texas were showing mostly severe and exceptional drought conditions, which translates into major to exceptional crop and pasture loss and widespread water shortages and restrictions.

Grasses and crop growth are stunted under abnormally dry conditions, and damages begin to show as moderate drought sets in, according to the center. Extremely high temperatures are exacerbating the moisture deficit for plants, including pasture grasses.

Corriher-Olson said weather outlooks suggest Texas will slip further into the drought. Weather systems during hurricane season could change that, but producers with grazing should be implementing contingency plans if they have not already.

"I really don't have a feel for how many producers are adjusting their grazing management as a result of drought and high fertilizer prices," she said. "It gets harder to avoid overstocking when forage production is limited. But it puts a lot of

producers in a really tight spot when they don't have the hay or grazing to try and maintain their herd."

Plan for tight supplies, test hay

Both Corriher-Olson and Paschal expect hay supplies to be tight and low quality going into winter if conditions do not reverse soon.

Drought and fertilization – each of those factors alone can put a dent in hay production, Corriher-Olson said, but both at the same time can be disastrous for both quality and yields. High temperatures also increase Bermuda grass's fiber content, making it less digestible for cattle.

Fertilizer prices have softened some, Corriher-Olson said, and producers could potentially fertilize ahead of a promising storm system that might provide moisture for a cutting. But cuttings are best at the beginning and end of the season when temperatures begin to decline.

One East Texas producer she talked to is forgoing fertilization this summer to invest input costs into cool-season forage production, she said.

Corriher-Olson said producers should be making decisions regarding stockpiled forages and hay supplies with an expectation of very high bale prices, especially for quality hay, just to cover the cost of fertilizer, pesticide and herbicide applications and diesel.

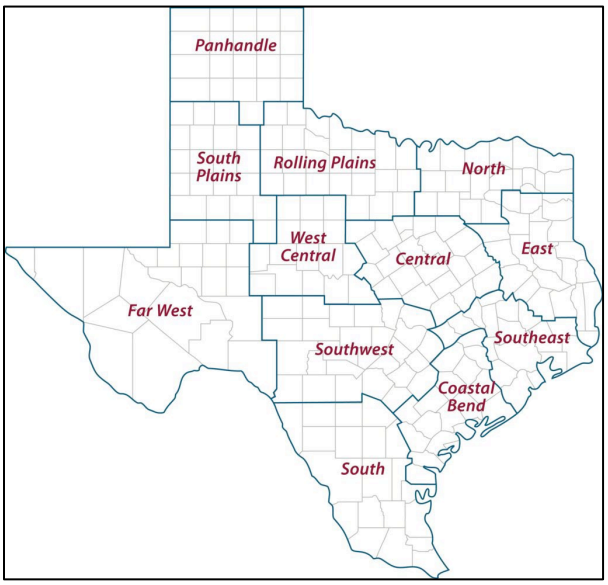
Paschal said producers should be planning for ways to stretch available nutrition – whether that is finding alternative feed like cotton seed, purchasing failed corn crops, or using supplemental feeds with a limiter to reduce the number of trips to feed.

Hay production conditions are better in states east of Texas, he said, and bales are likely to be moved into Texas or cattle are expected to be moved to better pastures. He suggests cattle producers test bales for their nutritional value, whether purchased or produced. Tests can provide information that will better guide cattle supplementation, improving the digestibility and nutritional value of that hay.

Producers can reach out to AgriLife Extension agriculture agents in their county for assistance with hay testing, Paschal said.

“It’s going to be tough,” he said. “There is a lot of hay cows will eat when there is nothing else, but it doesn’t mean it is good. There are ways to stretch a cow’s nutritional needs, but the bottom line is getting the right amount of protein and energy in her.”

AgriLife Extension district reporters compiled the following summaries:



A map of the 12 Texas A&M AgriLife Extension districts.

CENTRAL

The district experienced record-high temperatures and no rainfall. Most areas reported short moisture conditions. Dry conditions were dominating the area, and crop conditions were declining. Drought-stressed corn was maturing very rapidly. Expectations for corn were not good due to the 100-degree days and drought at tasseling/silking stages. Farmers finished oat and wheat harvests and were baling hay. Sorghum was coloring, and cotton was flowering. Stock tank levels were quickly declining. Pastures were in poor to very poor condition. Livestock were in fair condition.

ROLLING PLAINS

Days were very hot and windy. Cotton planting was in full swing with very little emerged. Some grasses, hay and Sudan grass were being baled. Corn and sorghum were forming ears and heads, respectively. More Sudan grass was planted and emerged but needed rain. Rangeland conditions and grass production continued to decline, with very poor to fair ratings reported. Some hay cutting occurred, but low yields were reported. Johnson grass meadows made the most hay per acre. Pastures looked good but were starting to burn. Livestock were in decent shape, but heat stress was reported. Stock tanks were dwindling as well.

COASTAL BEND

Drought conditions with wind continued to impact crops. Plants were stressed and stunted. Corn was drying down, and most fields were in poor condition, with a few

exceptions in isolated areas. Grain sorghum fields were turning color rapidly, and conditions ranged from very poor to good. There was some concern about sorghum lodging as stalks get drier. Cotton was blooming and setting bolls. Some cotton was zeroed out with some fields already plowed under. Pasture conditions continued to deteriorate, and hay was in short supply. Only pastures that were reserved or were very well managed remain in fair condition. Some hay was made in isolated pockets with better moisture, but most of the reporting area had not produced any bales yet. Hay growers were concerned with prussic acid in Sudan grass and Johnson grass hay. High feed costs were leading to hard livestock management decisions for producers. Many producers were culling their herds deeper and doing some early weaning. Livestock auction prices were still holding steady.

EAST

Abnormally high temperatures and no rain worsened drought conditions. Pasture and rangeland conditions were poor to fair. Subsoil and topsoil conditions were short. Producers finished their first cuttings of hay with yields being far below average. Lack of rain and high fertilizer prices continued to be major concerns. Heavier-weight feeder calf prices were stronger, and slaughter cattle prices were steady. Livestock were in fair to good condition.

SOUTH PLAINS

Subsoil and topsoil moisture levels were adequate in some areas. Producers were working to finish plantings. Cotton was struggling with the heat. Cattle were in good condition.

PANHANDLE

Soil moisture levels were short. Crop conditions were poor to fair. Producers were dusting in grain, hay and silage sorghum. Irrigation pivots were running steady to water corn and sorghum crops. Wheat grain harvest was expected to be very short as many fields were cut for silage and hay or damaged by May hailstorms. Some fieldwork continued. Pasture conditions recovered briefly but with very little vegetative growth due to drought. Overall, rangeland and pasture ratings were poor.

NORTH

Soil moisture levels ranged from short to surplus. High temperatures set in with no rain reported. Producers reported declining pasture conditions. Wheat harvest continued. Grain sorghum, soybeans, sunflowers, and cotton were all in good shape and progressing nicely. The hot weather may begin to take a toll on crops if dry conditions persist. Cattle were in good condition. Fly and parasite problems were increasing with the hot weather. Summer pastures were doing well for now.

FAR WEST

Conditions were windy, hot and dry, with a 106-degree high temperature and overnight temperatures in the 70s. Some areas received 1.5 inches of rainfall, while most areas received nothing. Lightning sparked isolated grass fires. Cotton planting was complete. No wheat made it to grain. All hay grazer was planted, and some was irrigated to help it get started. Very few irrigated cotton acres had emerged, and zero dryland cotton had come up. Irrigation water from Elephant Butte Reservoir was being released for cotton fields and pecan orchards around El Paso. Melons and pecans continued to make good progress. Pastures were very barren, and all livestock were being supplemented. Producers were selling off cattle herds due to extreme drought and continued to work late lambs and goats. Shipping of some lambs was underway.

WEST CENTRAL

Hot, dry, windy conditions were prevalent. Temperatures were at or over 100 degrees all week. Row crops were in very poor condition due to heat and lack of moisture. Cotton plantings were winding down, and early planted cotton was emerging. Initial reports on pecan crops were light. Insect pest problems were increasing. Livestock producers were still battling high feed costs and minimal forage in pastures and continued to ship more cattle as conditions worsened. A strong cattle market incentivized producers to cull herds deeper.

SOUTHWEST

Conditions remained dry with no chance of rain in the forecast. Creeks and ponds were drying up, and rivers were running very low. Irrigation capacity was strained, and lack of water was stressing crops. Cotton yield potential could decline without rainfall soon. Corn and grain sorghum yields were negatively impacted due to drought, high temperatures and spider mite infestations. Hay was in short

supply. Cattle, sheep and goat prices were holding steady. Rangelands were extremely dry, and producers were supplementing livestock rations. Mesquite bean production was spotty. Bobwhite quail were paring up, and more deer fawns were being seen.

SOUTH

Most areas reported very short moisture levels, while southern areas were reporting short soil moisture levels. Triple-digit temperatures continued with no rainfall. Row crops were progressing well. Cotton was developing quickly in sun and high temperatures. Cotton in Hidalgo County showed excellent boll loads with very little pest pressure, but fields in Willacy County showed drought stress. Some leaf rollers were reported in sesame fields. Peanut plantings continued and should be completed soon. Early planted peanuts were beginning to peg. Corn crops were starting to dent and dry down. Sorghum harvest was underway, and yields looked good. Later-planted sorghum looked better than early planted fields. Hay grazer and Bermuda grass fields should be harvested soon. Crops and grasses in drier areas were browning, and there were concerns about fires. Irrigated pecans, watermelons, cantaloupes, and Coastal Bermuda grass were in good condition. Yields in irrigated hay fields were fair. Citrus and sugarcane were being irrigated. Pasture and rangeland conditions were fair to good in some areas, but heat and lack of moisture were starting to take a toll, and many areas had little to no grazing. Livestock producers were having a very challenging time between feeding and watering herds and dealing with respiratory issues. Mesquite trees were putting on beans, which will help wildlife.

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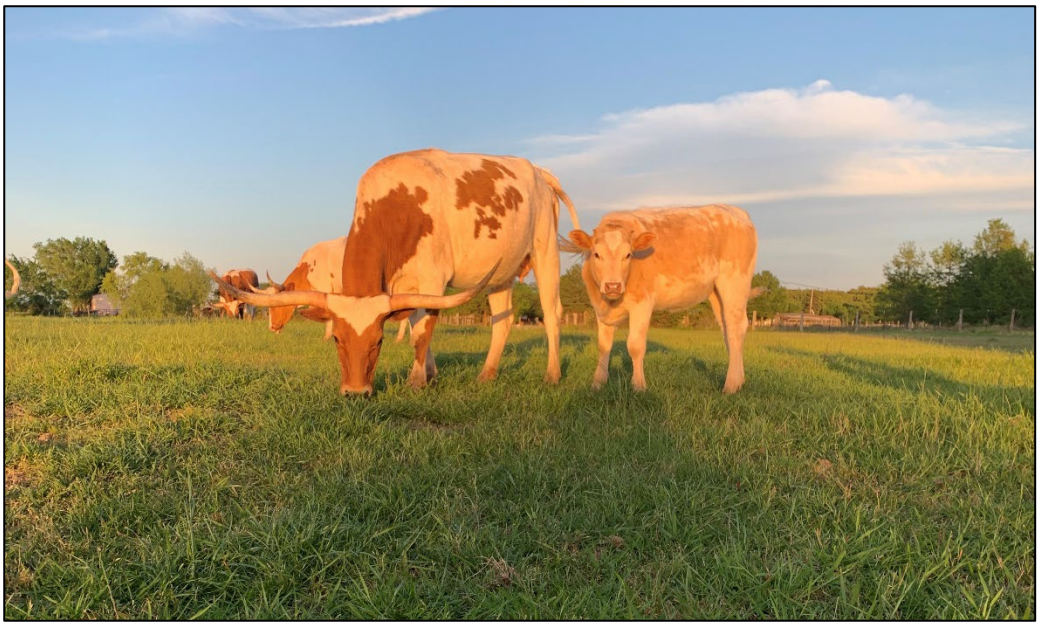


Nitrates and prussic acid in forages

When nitrates and prussic acid accumulate in forage, the feed may not be safe for livestock consumption.

Nitrates

Nitrate accumulation

Ammonium nitrogen is the preferred form of nitrogen for plant growth, but nitrate nitrogen is the form primarily taken up by plants. Even when ammonium and urea-based fertilizers are applied, most of the nitrogen taken up by plants is in the nitrate form because soil microorganisms quickly convert ammonium nitrogen to nitrate nitrogen (See Texas AgriLife Extension Service publication E-59, "What Happens to Nitrogen in Soils?"). Nitrates are extremely soluble in water and are easily absorbed by plant roots along with soil moisture.

Normally, plants reduce nitrates to ammonium ions and then assimilate them into amino acids and other proteins. This process, called nitrate reductase, occurs in the roots of some grasses such as bermudagrass, and in the leaves, stems and stalks of plants such as corn or sorghum. When plants are stressed (for example, by drought) this process slows or stops, allowing nitrates to accumulate. Here are some conditions that cause nitrate accumulation:

When the temperature is high and moisture is adequate, plants may undergo a process called photorespiration. Photorespiration produces carbon dioxide rather than assimilating carbon into energy building blocks (i.e., sugars, carbohydrates, etc.). This may cause nitrates to accumulate.

When the soil contains nitrate nitrogen but little soil moisture, nitrates are highly concentrated in the water plants take up. Plants don't have enough water to continue growing and nitrates accumulate.

Herbicide injury can limit the conversion and assimilation of nitrates in plants. After herbicide applications, check the field, especially field edges, for forage plants

affected by off-target herbicide drift. Three to 5 days of active growth are needed to significantly reduce nitrate levels in plants.

Nitrates often accumulate to toxic levels in the following plants:

Forages	Weeds
alfalfa	Canada thistle
barley	dock species
corn	jimsonweed
flax	johnsongrass
millet	kochia
oats	lambsquarters
rape	nightshade species
rye	pigweed
soybean	Russian thistle
sorghum and sorghum hybrids	smartweed
sudangrass	sunflower species
sugarbeets	

While these plants are the ones most likely to accumulate nitrates, nitrates are present to some degree in all forages, including bermudagrasses. Nitrates are nonvolatile and remain in non-ensiled plants after cutting, curing, and baling. Nitrates are soluble in plant tissues and will leach from the plant during sustained rainfall. However, weathering significantly reduces the nutritional value of hay bales, so it is not a good way to manage nitrates. Furthermore, the movement of leached nitrates within a weathered bale may limit the use of the forage.

Research at the Texas Veterinary Medical Diagnostic Laboratory (TVMDL) at Texas A&M University has found that it is safe to feed forage containing 1 percent nitrate (on a dry-matter basis) to healthy ruminants. Forage with a higher percentage of nitrate could be fed if it is ground and mixed with nitrate-free forage to reduce overall nitrate levels to less than 1 percent (dry-matter basis). Forage containing 0.5 to 1 percent nitrate should not be fed to weakened cattle unless your veterinarian has approved it. The 1 percent nitrate level set by the TVMDL is significantly higher than levels suggested by other southern universities. This level assumes that cattle are healthy, well-conditioned, and being fed a high-energy diet.

In healthy cattle, the nitrate consumed in normal forages is converted into protein in the rumen: nitrate→nitrite→ammonia→amino acids→proteins

Symptoms of nitrate poisoning

If forage contains too much nitrate the animals cannot complete the conversion and nitrite levels build up. Nitrite is adsorbed directly into the bloodstream through the rumen wall, where it combines with hemoglobin to form methemoglobin. Hemoglobin carries oxygen in the blood, but methemoglobin does not. The formation of methemoglobin can cause an animal to die from asphyxiation, or lack of oxygen. The animal's blood turns brown instead of the normal bright red. Monogastrics (i.e., horses, mules, swine, etc.) are less sensitive to nitrate toxicity than ruminants. An animal's conditioning affects its ability to assimilate or tolerate nitrates, so consult your veterinarian before feeding forage that contains nitrates.

Sampling for nitrates

The highest nitrate accumulation is in the lower stem, and the least is in the leaves. The forage species and the grazing method determine how plant samples should be taken for forage analysis.

If limit-grazing is practiced, and forage consists of traditional grasses, small grains or legumes, remove only the upper one-third to one-half of the plant for a sample. These are the plant parts that animals will consume. When limit-grazing corn, sorghum, sorghum-sudangrass and similar forages, sample only the plant leaves.

When rotational grazing or single-field grazing systems are used, a more conservative sampling approach is warranted because livestock will consume not just the leaves and upper plant parts but also the stems (which contain more nitrate). Take the lower one-third to one-half of traditional grasses, small grains and legumes for nitrate analysis, and the lower one-third of corn stalks, sorghum and sorghum-sudangrass stalks.

To sample standing forage, create a composite sample from plant parts taken from at least 10 to 15 areas with the same fertility and moisture conditions. Do not mix plants from "good" and "bad" parts of the field. Create different composite samples for these areas. Ship samples to the laboratory in clean paper sacks. Do not use plastic bags because the high moisture content will cause the samples to mold, which interferes with the nitrate analysis.

To sample forage in bales, take representative core samples with a bale probe. This is the only sampling method that will adequately evaluate the average nitrate levels in the bale, but this method cannot be used for sampling coarse-stemmed forage such as corn, sorghum, sorghum-sudangrass or similar plants unless the bale will be ground before it is fed. To sample a bale of coarse stemmed forage, split the bale open and collect the lower stems of individual plants to ensure that the highest possible nitrate level is revealed by the analysis. This will guard against timid animals consuming too much nitrate (in the lower stems) because the leaves and more palatable upper stems were eaten by the first animals at the bale.

Nitrate testing

For forages grown under the conditions described above, proper management practices include testing for nitrates. Testing can be done both in the field and in the laboratory. Field methods include qualitative spot color methods and some quantitative methods that use colorimeters and nitrate electrodes. However, field methods should be considered only as qualitative tools because it is difficult to obtain uniform samples and the tests are not precise enough to use the results for mixing feeds.

One quick test is the diphenylamine spot test. The Texas AgriLife Extension Soil, Water and Forage Testing Laboratory has long manufactured these quick-test kits for plant nitrate analysis, but because the kits contain sulfuric acid, shipping them has become difficult. The laboratory is investigating alternative quick-test methods. The diphenyl-amine test is comprised of diphenylamine salt (0.1 grams) dissolved in sulfuric acid (30 ml-36N). A single drop of this acid reagent is placed on a freshly split plant stem. If a dark blue color develops immediately (in the first 5 seconds), nitrate is present. If there is no immediate change in color there is no nitrate; however, a dark color(brown/black) will eventually develop if the reagent remains on the plant tissue for an extended time. The dark color is caused by acid caramelizing the plant sugars and carbohydrates. The pictures below illustrate results of the nitrate spot test.

The diphenylamine field test indicates only the presence or absence of nitrate. It does not determine the actual nitrate concentration and, as with any field test method, it should be used only as a screening tool. Any positive result from the spot test should be followed up with a laboratory analysis for quantification. A field test can help you quickly estimate what stem height is safe for grazing. Most field test methods work only on moist plants with stems thick enough to split and apply

the test reagent. Dried plants, hay, silage, fine-stemmed grasses, and similar material should be tested in a laboratory.

Interpreting laboratory reports

Nitrate content may be expressed as actual nitrate (% NO3) or nitrate-N (% NO3-N) values. The Texas AgriLife Extension Soil, Water and Forage Testing Laboratory reports nitrate in forage as actual nitrate. The industry standard is to report forage nitrates as percent nitrate, which differs from plant nitrate analysis. Plant nitrates are expressed as ppm nitrate-N. To convert nitrate-N levels to actual nitrate, multiply by 4.42. Some labs may report in parts per million (ppm). To convert ppm to percent, divide by 10,000. Understand the reporting method of the laboratory you use to prevent confusion that could cause you to feed a toxic nitrate level to livestock.

Nitrate management

The best way to manage forages that contain nitrates is determined by the forage type and the harvest method. All the management systems described here should be used in tandem with proper sampling and analysis.

Managing standing forages:

First, carefully determine the nitrate levels in various plant parts. Allow animals to graze the upper one-third to one-half of the grass, legume or leaves of coarse-stemmed forages if the nitrate level in these plant parts is safe. Monitor grazing closely and remove livestock when the safe portion of the forage is consumed.

Monitor nitrate levels in the lower one-third to one half of the plant or coarse stems if livestock are to be released into a field with questionable or potentially toxic nitrate levels. Generally, forage nitrate levels drop significantly 3 to 5 days after sufficient rainfall.

A third management practice is to cut the forage for hay, field cure and bale it. This will not lower the nitrate levels, but the bales can be ground and mixed with nitrate-free forages to retain a higher overall protein and energy value.

The forage could be harvested and ensiled. During the ensiling process nitrates are converted to volatile nitrous oxides, also called “silo gases.” These gases are highly toxic, and workers should be extremely careful when entering silo pits and bunkers where nitrate-tainted forages have been ensiled. A common safety practice is to

remove tarps from a portion of the silo a day or two before removing silage from that part of the pit.

Managing baled hay:

There are fewer options for managing baled forages that contain nitrates. The safest method is to grind the bales and thoroughly mix them with hay that is free of nitrate. There should be enough good forage in the mix to reduce the nitrate level to less than 1 percent. It is best to mix similar forage types so that the feed has a uniform particle size distribution. The optimum size is dictated by stem size; in general, the smaller the better. A handful of ground and mixed feed should contain portions of all plant parts from all forages used in the mix. The uniform size will help limit selective feeding by livestock. This grinding and mixing method should not be used for forages containing more than 2.5 percent nitrate.

If nitrate levels are higher than 2.5 percent or there is no way to grind and mix the forage, do not use the baled forage for livestock feed or bedding.

Prussic acid

Prussic acid in forages can pose a significant risk to certain grazing and barnyard livestock. Plants that accumulate prussic acid include:

Forage or plant	Prussic acid potential
pearl and foxtail millet	very low
sudangrass and sudangrass hybrids	low or moderate
sorghum-sudangrass hybrids	moderate to high
forage sorghum	moderate to high
shattercane	high
johnsongrass	high to very high
grain sorghum	high to very high
sorghum almum	high to very high
arrowgrass	low
velvetgrass	low
white clover	low
birdsfoot trefoil	low
chokecherry*	low
pincherry*	low
wild black cherry*	low
apricot*	low
peach*	low
apple*	low
elderberry*	low

* Prussic acid may be found in the leaves and seeds of these tree species but it is not likely that livestock will consume much of these plants. Do avoid housing livestock near these trees, especially if traditional forages are not available.

Under normal conditions, when these plants are actively growing and healthy, they contain low levels of prussic acid because the compound breaks down over time, thus eliminating toxic accumulations. Unlike nitrate, prussic acid may be present for a while and then dissipate from plants properly cured for hay.

Prussic acid accumulation can happen when:

- There are poor growing conditions that prevent stems from developing properly.
- Recent hay harvest or grazing causes slow and stunted growth of new plant tissue.
- Nitrogen fertilizers are over-used or there are other soil fertility or nutrient imbalances.
- Plants develop new growth after a prolonged drought.
- Plants are injured by herbicides, frost, hail, or other events.

Symptoms of prussic acid poisoning

The plants listed above produce cyanogenic glucosides (prussic acid) as they grow. Glucosides are sugar compounds that break down in the rumen, freeing the cyanide from the sugar and forming hydrocyanic acid. Hydrocyanic acid (HCN) is commonly known as cyanide. The HCN combines with hemoglobin to form cyanoglobin, which does not carry oxygen. Livestock poisoned by cyanide have respiratory stress like that caused by nitrate poisoning. A blood test can quickly distinguish between nitrate and prussic acid poisoning. If prussic acid is the toxic agent the blood will be cherry red, unlike the chocolate brown blood seen in nitrate poisoning. Horses, hogs and other nonruminant animals are less affected by prussic acid because their stomachs convert the prussic acid to less toxic formic acid and ammonium chloride.

Prussic acid poisoning can be treated effectively if the treatment is administered immediately after the first poisoning symptoms appear. Two common treatments are intravenous injection (125 to 250 ml) of 1.2% sodium nitrate or 7.4% sodium thiosulfate. Before administering the sodium nitrate treatment, have a veterinarian ensure that the symptoms are caused by prussic acid rather than nitrate.

Sampling for prussic acid

Prussic acid accumulates mainly in leaves, with highest concentrations in new growth. Concentrations in leaves are many times higher than in stems. Because livestock usually eat leaves before stems, samples taken for prussic acid analysis should be largely comprised of leaves. This is especially true when sampling fields where cattle will be allowed to graze. If grazing is limited, cattle probably will not consume stems.

Unlike nitrates, prussic acid may volatilize from cut/ harvested forages. The amount of volatilization in samples can be reduced by placing the samples in resealable plastic bags or pint glass jars before sending them to a laboratory. When filling the bag or jar, allow 25 to 50 percent headspace.

To sample standing forages, selectively remove the newest upper leaves from 10 to 12 plants in different areas of the field. Sample in locations most likely to have prussic acid problems (review the common causes). Place leaves in a sealable container, place the container on ice (but do not freeze), and ship immediately to the testing laboratory.

To sample baled forages, use a bale probe. Samples simply grabbed from the outsides of bales may not give accurate results because of volatilization. Place a single bale core in a sealed pint jar. More detailed instructions on sampling and shipping samples for prussic acid analysis can be obtained from the TVDML.

A testing laboratory can evaluate the prussic acid concentration either qualitatively or quantitatively. Some references suggest that 250 ppm HCN is a safe level. However, the extreme variability in prussic acid sampling and shipping methods and rapid field changes limit the value of a quantitative result. A simple qualitative analysis to show whether or not prussic acid is present will generally suffice. If a forage does contain prussic acid, livestock should not be allowed to consume it until the level declines to the point that it is no longer detectable.

Prussic acid management

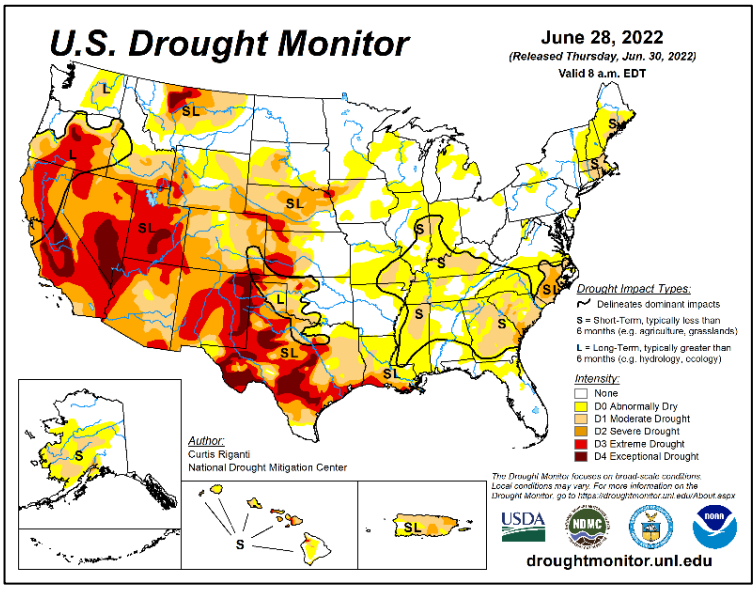
Forage type and harvest method determine the best management techniques.

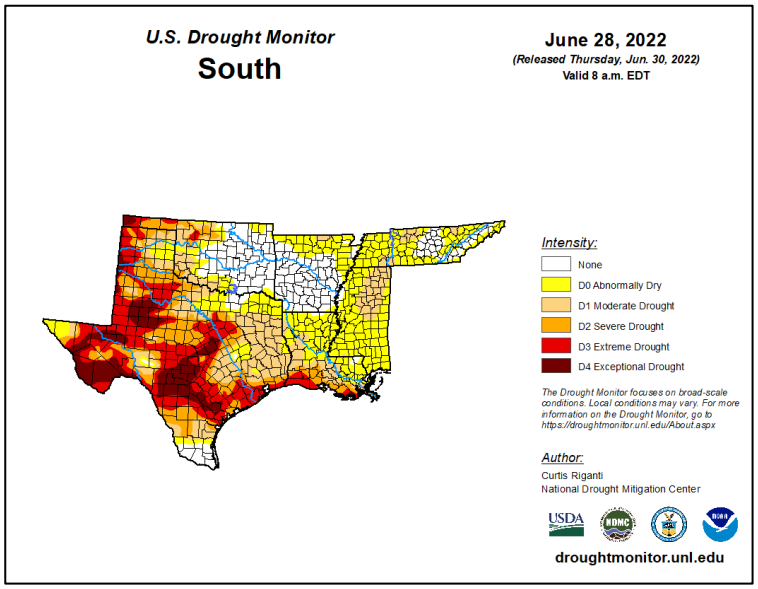
Standing forages that test positive for prussic acid and will be grazed should be sampled every 3 to 4 days. With frequent sampling, forage can be grazed as soon as it is safe and before its nutritive value decreases more than necessary.

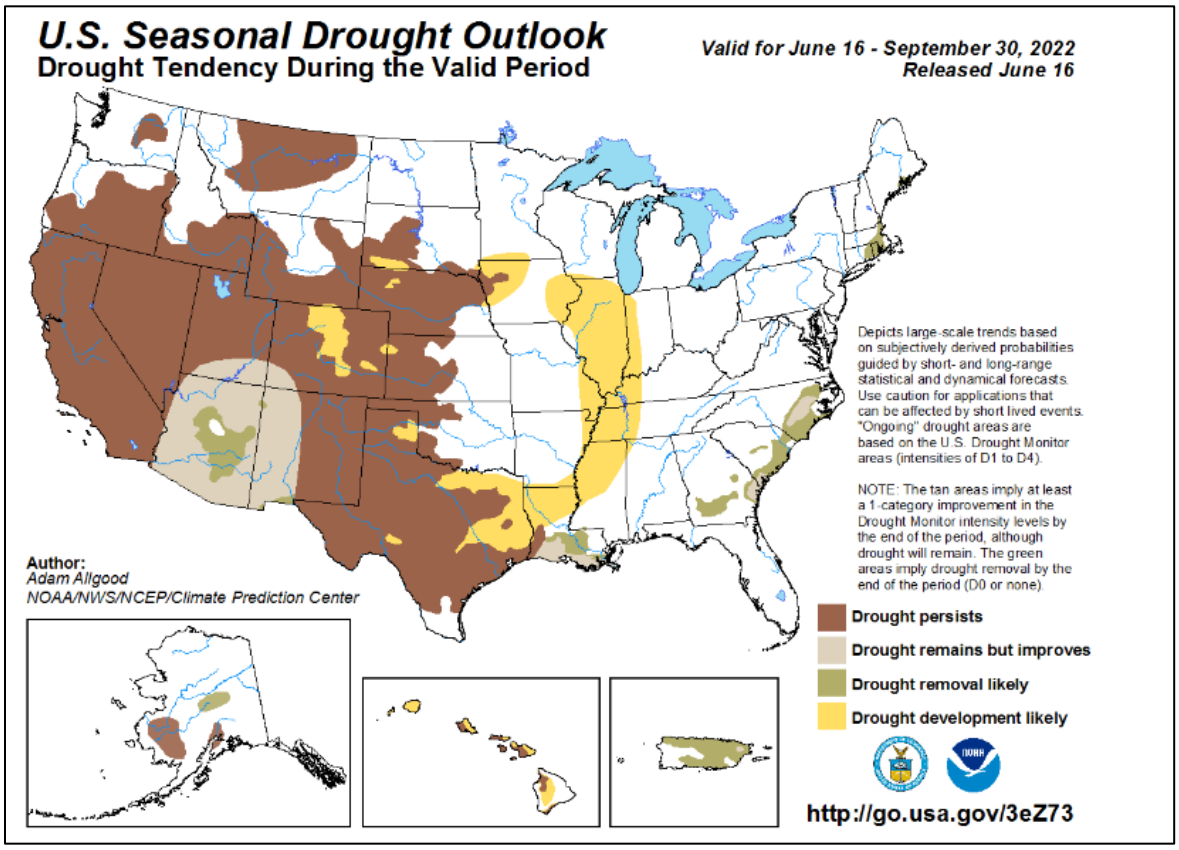
Standing forages can be green chopped and ensiled. Prussic acid is enzymatically converted to free cyanide, which escapes when silage is removed. Another benefit of green chop/silage systems is that the effect of prussic acid is diluted when livestock are not free to select only leaves.

Standing forages also can be cut, field cured and baled. As with all baled forages, proper sampling with a bale probe is required. Bales should be sampled repeatedly until prussic acid is no longer detected. Bales can be made even safer by grinding them to combine leaves and stems. **By: T.L. Provin and J.L. Pitt (E-543, 3/12)**

Current US drought monitor & 3-month climate prediction







Plants, insects, and diseases active now

Plants

Warm season weeds like crabgrass, foxtail, woolly croton (doveweed), ragweed, johnsongrass, and pigweed are at or near maturity and beginning to suffer from the hot, dry weather. In many cases Johnsongrass is putting on a seedhead in the bar-ditches and in some fields. Nightshades like silverleaf nightshade, buffalobur, ground cherry, and Horsenettle are mainly in reproductive stage. Foxtails, dallisgrass, and crabgrass are at reproductive maturity. Vegetation in general is beginning to dry down and slow growth significantly due to hot, dry conditions.

Insects

Web worms and other tree pests are increasing across the area. Low grasshopper populations are increasing in some areas with the dry weather, but populations are still lower than normal. No armyworm or cutworm issues have been reported area wide. Tick infestation levels are on the rise for humans and livestock.

There have been a few reports of treatable infestations of sorghum midge in the western part of the county. In addition, sunflower moths have increased to treatable levels in some fields.

Diseases

No real disease issues currently in any crops.

D. Chad Cummings, PhD

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Prepare your fall gardens now

Steps for fall garden planning

1. Since many summer vegetables can produce up until the first frost, it may be beneficial to have dedicated fall crop areas or beds to ensure timely fall plantings.
2. Till, pull weeds, spray weeds to remove existing vegetation.
3. Clean up and clear out old debris, plant parts, root systems.
    a. This provides disease and insect prevention
4. Soil test – whether you have raised beds, in ground gardens, or compost.
5. Access beds for damage, and make repairs.
6. **Contact your local Grayson County Extension Office or Master Gardener's groups for tips on soil tests and what plants to choose for your area and soil type (903) 813-4204.**

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Top tips for a successful fall vegetable garden

Learn how to plan and when to plant your fall garden

AUGUST 27, 2021

As we leave summer and enter the fall season, beginner and expert gardeners alike are planning their fall vegetable gardens. Whether you are growing vegetables in a pot in your apartment or refreshing your backyard garden, it is important to know that a fall vegetable garden needs to be managed differently than a spring garden.

The good news is that a well-prepared garden can ensure a bountiful harvest when the time comes, said Skip Richter, Texas A&M AgriLife Extension Service horticulture agent. Richter, who also hosts Garden Success, on KAMU FM/HD-1, shares the top tips for a successful fall vegetable garden.

Sunlight for fall vegetables

One of the most important things for a vegetable garden is learning how much sunlight your plants need. Vegetable gardens should receive at least six hours of direct sunlight, unobstructed by shadows from taller objects nearby.

“Crops and plants grown for their roots and fruits should be planted in areas that receive the most sunlight,” he said. “If you have to plant something a little more into the shade, do it with your leafy greens, which can tolerate a little less sunlight.”

Healthy soil for a healthy garden

Soil quality is another important factor when planning for a strong vegetable garden, Richter said.

Skip Richter holds some compost in his hands. (Texas A&M AgriLife photo by Laura McKenzie)

“By the time you put your first plant in the ground, you’re already 75% of the way toward success or failure,” he said. “At that point, you’ve either prepared a good-quality soil for your plants or you haven’t.”

If you are unsure about the quality or health of your soil, then you may consider getting a soil test. Soil testing helps you understand the precise composition of your

soil. Texans who wish to know more about their soil composition can order a soil test from AgriLife Extension.

One of the easiest ways to build healthier soil is by amending it with a store bought or do-it-yourself compost mix. Compost is comprised of organic matter that has decomposed into a soil-like substance.

“For a garden to thrive, organic matter in the soil is a necessity,” Richter said. “Compost helps sandy soils keep more water and nutrients, and it helps clay soils drain better and improves aeration among other benefits.”

If your soil has poor drainage, raised planting beds can help plants to thrive even during periods of excessive rainfall.

When to plant vegetables for fall

Fall gardeners can set the stage for a bountiful harvest by selecting the best vegetable varieties for their regions and planting them at the right time.

“In Texas, our fall season can be short between the blazing heat of summer and first frost of winter,” he said. “So, we want things that harvest quickly, and you want to select crops that are well-adapted to your area.”

AgriLife Extension’s Fall Vegetable Variety Selector gives detailed information to help choose the best species for any Texas region. Richter also recommended reaching out to county AgriLife Extension offices for more assistance with fall gardening.

Knowing just when to plant vegetables, according to region, is important. View the planting guide for suggested planting dates in Texas at https://tx.ag/FallGardenGuide.

Tips for a successful fall harvest

- Plan for adequate sunlight.
- Give roots and fruits the most sun.
- Use leafy greens in sun or in slightly shadier garden areas.
- Amend your soil with compost.
- Choose regionally adapted plants.
- Visit your county AgriLife Extension office for more help.
- Check out the online Fall Vegetable Gardening Guide.

Gabe Saldana

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Events Coming Up

Jul 08

- North Texas Cattleman's Field Day (Joint with Fannin County-*Savoy*)

Jul 15

- Collin Co. Landowner 101: Principles of Sustainable Ag. *(McKinney*)

Jul 20

- University Farm Summer Crops Field Day (*Greenville*)

Aug 1-3

- Beef Cattle Short Course (*College Station*)

Aug 19

- Collin Co. Landowner 101: Principles of Livestock Management (*McKinney*)

Aug 26

- Ag & Nat Resources & GCAD Ag Appraiser Seminar/Workshop (*Location TBD*)

Visit our website at Welcome to Grayson County - Grayson (agrilife.org) to sign up for the events.