



Forage Management During Dry Times

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Here we are again in hot, dry Oklahoma July. Thankfully, recent rains have lessened the drought in some areas but forecasted temperatures may challenge that relief. Reports of forage shortages have been coming in this past month and so a discussion of forage management through dry times seems fitting.

In general, forage systems of Western Oklahoma are accustomed to a drier climate. But drought can shed light on forage mismanagement that might not otherwise be noticeable during periods of adequate rainfall. To understand the importance of drought management, it's crucial to comprehend the long-term effects of less than average rainfall paired with overgrazing. Drought on its own does a great deal of damage to grass stands but overgrazing exacerbates the issue.

During a moisture shortage, some plant processes shut down to preserve the basic health of the plant. This may include root growth which is necessary for moisture extraction from the soil. Shoots and leaves of grasses are the forage utilized for grazing, but they are also the energy collectors of the plant. The lack of water can cause a plant to refrain from producing shoots or leaves at all. When shoot and leaf growth are limited, adequate plant food may not be produced to grow roots which leads to decreased forage growth. It's a vicious cycle that can take many years to recover.

Multiple years of drought stress can lead to a weakened plant system that is very susceptible to damage from overgrazing. The intensity of grazing or stocking rate refers to the number of animals and duration of grazing a pasture. Forage production can be extensively hindered by heavy grazing due to the excessive removal of leaves and shoots. For example, when cattle graze 90% of a plant, stress stops root growth in that plant for approximately 2 ½ weeks. When rain does come and pastures attempt to recover, it is crucial to limit the intensity of grazing. By maintaining a light to moderate stocking rate, adequate leaf and shoot material will be retained to allow the plant to grow. The timing and frequency of grazing must be managed to allow for increased forage growth. Remember, pasture rest needs to occur during the growing season when a plant can recover with moisture and warm temperatures. Wintertime rest does not accomplish the same recovery as a grazing break during the growing season.

While recent rains are an enormous blessing for pastures, weeds and johnsongrass may sprout that can be high in nitrates or prussic acid. Areas of West Central Oklahoma

have experienced this very thing in the past month. Small new shoots of johnsongrass tested extremely high in prussic acid which killed several cattle. There have also been a few samples of young hay grazer that didn't appear stressed but came back from the lab with 10,000+ppm nitrate which is well above the safe level of 3000ppm. Nitrates and prussic acid are a reality of grazing in Oklahoma summers, but producers can manage this risk with a few simple strategies: 1.) never turn hungry cattle out onto a new pasture, 2.) all plants are a risk in drought conditions but those more likely to accumulate nitrates and prussic acid are hay grazer, milo, johnsongrass, and most broadleaf weeds, 3.) test all forages prior to feeding, and 4.) understand the risks of toxicities in plants after a drought ending rain.

Drought should never be too far from producers' minds. Grazing with proper stocking rates and being aware of toxicities in summer plants are two ways to manage risk in forage systems this summer!

Grain Sorghum Harvest Aids

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Utilizing harvest aids for grain sorghum has become more popular in recent years. Historically, the crop would be left to terminate and senesce naturally. The main purpose of applying a harvest aid would be to improve harvest timing. Delayed harvest after the grain becomes mature can potentially reduce grain yields. An exposed crop can experience losses due to pest pressures like bird damage, as well as environmental losses like severe storms with strong winds or hail.

Many factors can delay harvest. Some newer genetics may exhibit characteristics like "stay green" where the plants stay green longer. At harvest, the higher moisture content of the plant can potentially spike grain moisture if combines are not set correctly. If fields have excessive weed infestations, the same concerns of spiking grain moisture at harvest can delay harvest. If stands are on the thin side and growing conditions improve later in the season, the addition of late tillers can become problematic. Unevenness in maturity of a field can also delay harvest.

Preparing the crop for harvest is achieved when harvest aids are applied correctly. Harvest aids in grain sorghum fall into two groups, herbicides and desiccants. The products available have very little influence on the grain itself but work more in the vegetative biomass of the plant. Therefore, these products have very little to no direct impact on grain moisture. Glyphosate, carfentrazone, and sodium chloride are currently the only three products labeled for use in grain sorghum.

Sodium chloride is a true desiccant and may not kill the crop but can rapidly dry-down any plant material that it contacts. If not harvested in a timely fashion, plant lodging or regrowth can occur. Glyphosate and carfentrazone are herbicides that, when use as

directed, can terminate the crop or weeds. Glyphosate is more widely used, but generally takes longer to shut down the plants. Glyphosate also has a longer pre-harvest interval at seven days, while carfentrazone is only three days. Carfentrazone is a good option to assist with broadleaf weed desiccation and is a great option to tankmix with glyphosate if there is concern of herbicide resistance.

If a producer chooses to have a harvest aid applied, applying the product correctly will greatly affect any potential economic gains. The first component of applying these products correctly involves application timing. A harvest aid should not be applied any earlier than physiological maturity, often referred to as black layer. Applying too early can reduce grain fill which will directly reduce grain yields.

To check for black layer, inspect the base of seeds on multiple plants, tillers of each plant, and locations within each panicle. Delayed plant emergence and late tiller additions will likely be farther behind. Typically, panicles mature from the top down. Maturity can widely range, so understanding how far along most of the crop is will improve proper application timing. Applying too late will not reduce grain yield but delaying harvest due to labeled pre-harvest timing intervals may lead to losses.

In addition to proper application timing, adequate spray coverage is also an important part in a successful harvest aid application. Apply these products in a minimum of 10 gallon of water per acre when ground applied or a minimum of 5 gallons of water per acre when aerially applied. Under certain conditions, like thick canopy of sorghum or weeds, increasing carrier volume up to 15 or 20 gallons of water per acre can increase efficacy of these products.

Harvest aids have no impact on yield potential in sorghum. Since these applications are made after physiological maturity, total yield potential has been set and crop dry-down is the only aspect remaining. Just like other crop protection products, harvest aids will only protect yield potential. A two-year study recently done by Oklahoma State University found yields for sorghum not treated with harvest aids resulted in an average reduction of around 7 bushels per acre in north-central Oklahoma and just over 5 bushels per acre in the panhandle.

More information can be found in the OSU factsheet "PSS-2183 Using Harvest Aids in Grain Sorghum Production" or by visiting your local OSU Extension office.

Does Stocking Density Affect Growth and Puberty Attainment of Replacement Beef Heifers?

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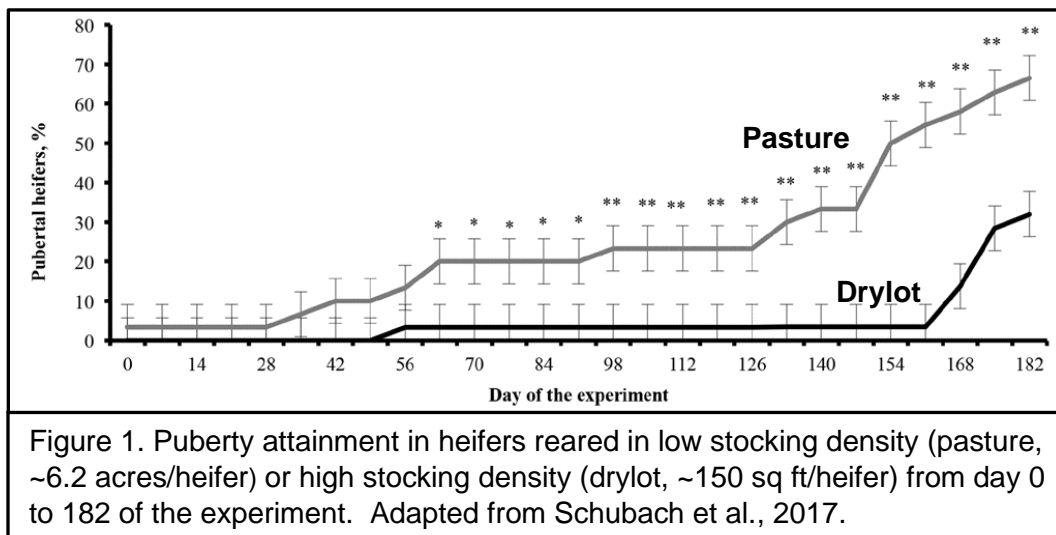
Public scrutiny of beef production systems is growing rapidly, and cattle welfare is one of the main targets for attention. Thus, cattle producers are challenged with improving production efficiency while fostering animal well-being. Stocking density is one example of management that may impact welfare and productive efficiency in cattle operations. In spring-calving cow-calf herds, replacement heifers are weaned in the fall and exposed to their first breeding season the following spring. Hence, these heifers are frequently developed in drylot systems to facilitate feeding and management during the fall and winter. However, research has shown that raising cattle in areas with elevated stocking density stimulates stress reactions which impairs reproductive function in beef cattle. Montana research has reported that heifers developed in drylot (~118 sq ft/heifer) compared to heifers developed on native range (~1.8 acres/heifer) gained over two times more body weight (BW; ~84 vs 33 lb). However, heifers developed in drylot had greater average or resting heart rates and spent less time loafing than heifers developed on native range. New Mexico research has also shown that heifers developed in drylot had greater average daily gain (ADG, 1.52 vs. 0.58 lb/day), but reduced pregnancy rates (84 vs. 91%) compared with cohorts reared on range pastures.

Oregon State University researchers hypothesized that elevated stocking density impairs welfare and reproductive development in beef heifers. To test their hypothesis, they compared growth, physical activity, stress-related and physiological responses, and puberty attainment in heifers developed on high (drylot) or low (pasture) stocking densities from weaning until the start of their first breeding season. In this experiment, 60 Angus x Hereford heifers averaging 210 days of age and weighing 485 lb were assigned to two stocking density treatments for 182 days: drylot (~150 sq ft/heifer) or pasture (~6.2 acres/heifer). The pastures were harvested for hay prior to the beginning of this experiment, and negligible forage was available for grazing throughout the experimental period. Thus, all heifers (both treatments) were limit-fed daily a diet consisting of 8.8 lb of alfalfa hay and 6.6 lb of corn (both on dry matter basis) along with ad libitum access to water and a commercial mineral/vitamin mix.

Heifers were fitted with a pedometer fixed behind their right shoulder and weekly pedometer results were recorded and blood samples were collected for puberty evaluation via plasma progesterone. On days 0, 49, 98, 147, and 182 of the experiment, hair samples were collected from the tail switch for analysis of hair cortisol concentrations. Cortisol concentration in hair from the tail switch have been validated as a biomarker of chronic stress in cattle given that cortisol is gradually accumulated in the emerging tail hair.

There were no differences between treatments for final heifer BW (786 lb) and ADG (1.71 lb/day) during the 182 day trial. However, heifers on pasture took more steps per week than drylot heifers (19,839 vs, 3,147). This outcome was expected since the pasture heifers had more space to roam. Hair cortisol concentrations were greater for drylot than pasture heifers beginning on day 98 indicating the drylot heifers experienced more chronic stress.

Drylot heifers experienced delayed puberty attainment compared with pasture heifers (Figure 1) despite their similar ADG. At the end of the trial, a greater number of pasture heifers were pubertal compared to drylot heifers (66.5 vs. 31.9%). It was reported that within heifers that reached puberty during the experiment, drylot heifers were heavier (820 vs. 703 lb) and older (363 vs. 328 days) than pasture heifers at puberty attainment.



These authors concluded that “rearing replacement beef heifers in drylot with high stocking density negatively impacted stress-related and physiological responses, and delayed puberty attainment compared with rearing heifers in pastures with low stocking density. In addition, these results were independent of heifer nutritional status and growth rate, but were associated with reduced physical activity and increased chronic stress caused by high stocking density.” These results suggest that stocking density should be considered in heifer development programs to optimize reproductive and overall efficiency of cow-calf operations. Heifers developed in drylot may grow faster but reach puberty later than heifers developed on pasture.

Pasture Rainfall Index Insurance

Trent Milacek, NW Area Ag Economics Specialist

The Pasture, Rangeland, Forage Insurance Program provides protection for perennial forage. This insurance is similar to group-risk protection in that it provides area-wide coverage. It is difficult to quantify the value of forage crops, so to provide insurance on these crops a rainfall index is insured. This policy makes payments if the actual rainfall is below the covered index.

The rainfall index is calculated using National Oceanic and Atmospheric Administration Climate Prediction Center data from 1948-present. An index is assigned for 12 mile by 12 mile grids over the entire coverage area. All of Oklahoma is covered and each grid is independent of state and county lines. To determine which grid your farm is located in, a grid locator tool can be accessed at <https://prodwebnlb.rma.usda.gov/apps/prf>.

Once a producer has located the grid their farm is located in, they will begin the process of selecting coverage. The amount of coverage and the associated premium are determined through six criteria.

First the producer must determine what their intended use will be. They may insure their grass as either grazing or hay acreage. The insurable value of grazed land is lower than that of hayed land. Likewise, the land insured as hay must indeed be hayable.

Then the producer must select the coverage level. Coverage levels can vary from 70, 75, 80, 85, or 90 percent of the rainfall index value. Indemnities are triggered if the actual rainfall is below the coverage index. If the coverage level is 90 percent, then an index less than 0.9 would trigger a payment. Increasing levels of coverage will increase insurance premiums.

After selecting a coverage level, the producer chooses a productivity factor. This allows a producer to tailor the coverage to their farm. A productivity factor between 60 and 150 percent of the county base value is selected. If a producer is growing a forage that is more valuable than the county base value, then they would want to use a productivity factor higher than 100 percent. Alternatively, if their forage is of less value than the county average then they would choose a productivity factor less than 100 percent. As with coverage levels, increasing the productivity factor will increase premium costs.

Next, a producer will choose the insured interest. This is the amount of interest they have in the growing crop that is at financial risk. The insurable interest of a land owner growing forage on their own land would typically be 100 percent. When the land is leased, the insured interest is the percentage of financial risk the producer has in the forage being grazed or hayed.

Then an index interval will be chosen. The index interval is a 2-month time period when rain is critical to the operation. At least two index intervals must be chosen with no

more than 60 percent of coverage in any one index interval. For example, a producer could choose to insure 60 percent of his forage in May-June, and 20 percent in August-September, and 20 percent in November-December. Any given month cannot be insured in two intervals. A producer cannot choose to insure 60 percent in the June-July interval, and then insure 40 percent in the July-August interval because July is covered in both intervals. If the rainfall in a grid during the 2-month time period is lower than the trigger grid index, which is the coverage level times the expected grid index, an indemnity may be triggered.

Finally, a producer will indicate the number of insured acres. An acre insured for grazing cannot likewise be insured for haying in the same year. Also, the same acres cannot be insured in more than one grid ID or county. When acreage is located in multiple grid ID's, a producer can choose to put all of that acreage into one grid, or divide the acreage into separate grids.

This coverage is based on rainfall over the entire grid. It is possible that rain could fall in another part of the grid and cause a payment to not be triggered, even if a producer's own farm has received below normal rainfall.

The deadline to purchase is November 15, 2020 for coverage in the 2021 crop year. If you would like to learn more about the Pasture, Rangeland, Forage Insurance Program and Rainfall Index Insurance, you may reference the Oklahoma Cooperative Extension Service fact sheet AGEC-333 or contact your local county extension agent.

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Leasing Land for Wildlife and Recreation

Trent Milacek, NW Area Ag Economics Specialist

If producers are interested in increasing revenue from land assets, one way is to explore recreational leasing. One of the most common recreational leases in Oklahoma are hunting/fishing leases. It is important to determine the landowner's liability and to protect their assets when allowing outside parties access to their land. If a tenant is interested in subleasing land for recreation, they must determine if they have that right in their current lease with the landowner before engaging with a third party.

Hunting leases are a form of recreational leasing. Those interested are encouraged to read the OSU factsheet NREM-5032 for detailed information on developing and marketing a hunting lease. The factsheet can be found at the following web address: <http://factsheets.okstate.edu/documents/nrem-5032-lease-hunting-opportunities-for-oklahoma-landowners/> It is important to seek legal counsel before entering into any lease to ensure your rights are protected.

A good hunting lease outlines appropriate use of the land and facilities so that the lessor and lessee are aware of each party's expectations. Native wildlife are publicly owned, so hunting leases only grant access and use of the property in which these resources can be pursued. This makes it understood that a landowner does not guarantee any wildlife to be present on the property. A "hunting lease" only grants the lessee the right to make specific and limited use of the property. Therefore, this lease is more easily revoked if the need arises.

There is no "standard" hunting lease. Multiple-year leases are less common than one-year leases. Multiple-year leases may be more attractive to organizations or groups and could be more valuable to lessees looking for consistency. One-year leases are flexible for landowners if they are unsure of their future intentions or if they want to change the use of the land in the future.

Reducing liability to landowners when leasing land for hunting is a serious consideration. From NREM-5032, "Oklahoma's recreational use statute and Oklahoma Limitation of Liability for Farming and Ranching Act may offer protection from liability for landowners when guests use their property without fees, when lessees pay less than \$10 per acre, or when the lessees and guests sign a properly executed liability waiver."

Hunting leases can be a good way to gain revenue from agricultural land. They can also help reduce trespassing, vandalism and theft due to increased activity through the presence of lessees. However, landowners will need to consult an attorney when developing a lease and must work with lessees throughout the lease. Landowners may also lose some use of their land as is necessary for lessees to utilize the land. If these potential positives outweigh the negatives, both parties can benefit. For more information or to obtain a copy of the factsheet NREM-5032, please contact your local county extension educator.

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Trapping Nuisance Armadillo

Dwayne Elmore, Ph.D., Extension Wildlife Specialist

Armadillo feed on invertebrates such as insects and earthworms by digging in loose soil. This digging can become a nuisance when it happens in the home landscape. Damage is generally most pronounced in the summer months as lawns are irrigated which makes the soil easier to dig in and brings invertebrates closer to the surface. Armadillo damage is easy to identify as it is noted by multiple shallow holes (usually up to 6"). Also, they will often root similar to pigs, especially in loose mulch.



Armadillo frequently dig and root in lawns or in mulch. Tree squirrel and skunk damage can look similar but is usually smaller in diameter and depth compared to armadillo damage.

If damage is excessive and exceeds tolerance, trapping should be considered. While armadillo can be caught fairly easily, after a few episodes of trapping and disposal of the animal you may decide the damage is tolerable after all. If so, consider cutting back on irrigation to lessen the likelihood of future damage. Armadillos are not protected in Oklahoma and may be trapped all year. Trapping is highly effective using an approximately 12 x 12 x 32-inch live catch trap and funnels to direct the armadillo into the trap. Poultry wire (at least 12" tall) held up with rebar or other rigid stakes works well for the funnels. Do not leave any space between the trap door and the wire or the armadillo is likely to push through the gap. Place the trap either in the area of the landscape where damage is pronounced or where armadillos are entering the landscape (if known). Irrigate the area immediately around the trap to increase chances of capturing the armadillo as they seem to be attracted to freshly irrigated lawns. Also, line the bottom of the trap with freshly dug soil to attract the armadillo and to help them feel secure entering the trap.



Armadillos are generally easy to capture in a live-catch trap using funnels. This trap set has used existing barriers such as a tree to help funnel armadillo. Notice the poultry wire held in place with rebar. Fresh soil covering the bottom of the trap would also be a good idea.

Once trapped, it is not legal to move the armadillo to another location and release it unless you have landowner permission. If you do decide to kill the armadillo, do it as humanly as possible or call a professional nuisance wildlife control operator (<https://www.wildlifedepartment.com/law/nwco-operators>) to have them remove the animal. A shot to the head or spine with a 22 caliber rimfire rifle or high velocity air rifle will work. Before shooting, make certain that there are no rocks or other hard objects under the armadillo to prevent a ricochet. Also wear eye protection to prevent debris from injuring your eyes. To reduce the potential of leprosy transmission, use gloves when handling the armadillo or the trap. For additional tips on dealing with nuisance armadillo, see <http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-11773/NREM-9029-2.pdf>.

Dove Field Management

Dwayne Elmore, Ph.D., Extension Wildlife Specialist

The mourning dove is a popular game animal in Oklahoma and many landowners manage fields for the purpose of hunting dove during the fall. Fields for mourning dove can be as small as one acre, however larger fields will attract more dove for longer periods of time and can accommodate more hunters. Generally fields at least 10-20 acres will be ideal for optimal dove hunting. Fields of this size can generally accommodate 10-20 hunters safely depending on field layout. There are several agronomic plants that can be managed for dove including: corn, cereal/small grains, grain sorghum, millets, soybean, sunflower (e.g. Perodovik), and buckwheat.

The most important consideration for any managed dove field is that the seed must be available on relatively bare ground before dove can use it. Dove fields with a thick thatch layer of litter or dense overstory of plant material will not be used! This means that some type of manipulation of the crop will be needed in most instances. Management practices that increase seed availability in dove fields include: burning, mowing (and potentially raking), herbicide, and grazing. Additionally, portions of fields or entire fields can remain fallow to provide openings and food availability for dove. Each of these various practices has advantages and disadvantages depending on the amount of litter, the type of plant, and the time of year.

Burning can be useful for crops that produce a lot of dry flammable material such as wheat, millet, grain sorghum, and corn. The plant material must be dry before a fire can effectively carry through the stand. This is an excellent strategy to quickly make seed available on a clean field surface. The downside to this technique is that it can be difficult to burn sections of the field if the manager wishes to hold some food in reserve for later in the season. Additionally, some seed could be damaged by the fire if it has not shattered. Mowing/shredding is often used by landowners as it can be done with any crop and most landowners have a mower. It offers the advantage of targeting sections of fields such as strips or blocks so that food can be held in reserve. The disadvantage is that litter remains on the field which may can impede doves from feeding. It may be necessary to mow several times to reduce the litter to small pieces. Alternatively, the field can be burned after mowing. This generally does not damage grain as the mowing shatters most of the seed onto the ground where it is protected from the flames. Herbicide can be used to "burn down" a field in some circumstances. However, in fields with abundant litter, this will still not create adequate bare ground. This practice has some application with soybean and herbicide is useful to prepare millet fields for burning. Grazing can be used to reduce the plant canopy and create bare ground. The disadvantage is that with many of the planted corps, cattle will consume much of the seed and dove food will be reduced. Grazing has some application for

sunflower fields as cattle movement and feeding will shatter the seed onto the soil surface and can create bare ground.

If the goal is to provide hunting opportunity during early September, then manipulation of the field should be started in July or August, meaning the grain must be mature by that time. Allow at least 2 weeks for doves to concentrate on manipulated fields. The number of dove that can be attracted will be based on food availability, local dove production, migration patterns, and the surrounding area. If you wish to attract doves throughout the hunting season, stagger the manipulation every 2 weeks to ensure seeds are available over a longer time period. This can be done in strips or patches. Consider planting patches of different crops with varying maturity times. If you wish to hunt doves during the December season, it is critical to retain seed through the fall. This can be accomplished by delaying manipulation, planting larger fields, and planting crops that do not readily deteriorate (e.g. grain sorghum and corn).

Regardless of how you manage dove fields, be certain to check current wildlife regulations at <https://www.wildlifedepartment.com/> to ensure that you are hunting in a legal manner. When in doubt, call your local wildlife officer to verify that a given practice is legal for the game you intend to hunt. For additional information see <http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-10363/NREM-9024web.pdf>.



This wheat field was planted in October and then mowed and burned the following July. This is an ideal field to attract dove as there is abundant wheat seed on bare ground.

Extension Experience – Insights into Oklahoma Agriculture

The Northwest Area Extension Staff would like to announce the creation of our new podcast *Extension Experience*. The *Extension Experience* podcast is brought to you by Josh Bushong, Trent Milacek, and Dana Zook. Each week we provide perspective on Agriculture topics and offer insight from our experience working with Extension Educators and Producers across Oklahoma.

The *Extension Experience* podcast is available on Spotify, Google Podcasts, and Apple Podcast platforms. You can also access the episodes on spotlight <http://spotlight.okstate.edu/experience/>.

We hope you consider listening to Extension Experience.

