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Inside:

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Grazing Management of Summer Annual Grasses

Dirk Philipp, Associate Professor-Forages

Summer annual grasses are considered a good choice for providing forage during the hot Arkansas summer months. Popular in our state are pearl millet (*Pennisetum americanum*) and sorghum-sudangrass (*Sorghum bicolor*) varieties. Both forages have outstanding yield potentials and deliver on them if correct planting strategies, fertilization and grazing management techniques are being followed. Summer annual grasses especially make sense on farms where fescue is the prevailing forage. Being C-4 plants, pearl millet and sorghum-sudangrass have a high water use efficiency and respond well to nitrogen fertilizer.

Pearl millet is an excellent forage that can also be safely used for horses. This grass is relatively tolerant of acidic soils, high humidity and diseases – all typical for Arkansas growing conditions. It does not present a danger from prussic acid as do the sorghum species. To achieve good productive stands, pearl millet should be established into a prepared seedbed to ensure good emergence and little competition from undesirable plants. As always, check regularly on soil pH levels and required fertilizer based on tests.

Summer annual grasses are a good choice for providing forage during the hot summer months, especially on farms where fescue is the prevailing forage.

Grazing of pearl millet can be initiated when the canopy reaches 1 to 1.5 feet in height. It should be noted that pearl millet is sensitive to close grazing. A stubble of 6 inches should be left in any case, primarily because otherwise the leaf area from which growth is re-initiated would be too small to generate sufficient energy via photosynthesis. If forage stands have been grazed unevenly, regrowth can be improved by clipping pastures to an even height, although in most cases this is probably not necessary. Stock pastures again when canopy height reaches about 1 to 1.5 feet or slightly higher. In our experience gained from a pilot study conducted at the Fayetteville location, summer annual grasses regrow very quickly, so it is likely that producers get a few grazing cycles out of the growing season.

The number one problem of pearl millet is the possible high nitrate content. We have seen several instances in which high nitrate concentrations were evident in hayed pearl millet from fields that have been fertilized with poultry litter over the years. The lower stems usually accumulate nitrate at a higher rate than the leaves. Under stress, nitrate can build up in leaf and stem tissue. Stress factors include drought, freezing temperatures and over-fertilization. High N rates, especially on drought-prone sites can result in excessive nitrate accumulation.

Sorghum-sudangrass has an even higher yield potential than pearl millet. The establishment is similar to other warm-season annuals – it is important to plant seeds into a prepared and settled seedbed and manage it appropriately to achieve high yields. Apply fertilizer according

(Continued on page 2)

Arkansas 4-H Members Face Tough Competition at 2015 Mid-America Grassland Evaluation Contest

John Jennings, Professor, Extension Forages

Evaluating a grazing system, wildlife habitat, soils and identifying plants are some of the things that Arkansas 4-H members had to learn to compete in the 16th annual Mid-America Grassland Evaluation Contest held June 3 in Springfield, Missouri. Arkansas 4-H teams from Cleburne, Randolph, Madison and Van Buren counties and an FFA team from Pocahontas competed in a field of 26 teams from Missouri, Ohio and Arkansas. The FFA team from Pocahontas was the first from Arkansas to compete in the Mid-America competition.

To qualify for the Mid-America Grassland Contest, each team had to place in the top five of the Arkansas Grassland Evaluation Contest. The students have to complete four sections in the contest including Grassland Condition, Wildlife, Soils and Plant ID.

For the Grassland Condition section, the students must assess current grazing conditions in the field, determine fertilizer and weed control recommendations, calculate how much forage is needed in spring, summer, fall and winter for an example herd and make recommendations for improvement – all in 25 minutes.

For the wildlife section, students must evaluate the field habitat value for quail and rabbits, make recommendations to improve the habitat and answer 20 questions on wildlife management.

In the soils section, students must locate the contest site on a soil map, determine the correct soil, answer questions evaluating the soil, guess the slope of the field and determine suitability of 10 forages for that site.

In the plant ID section, the students must correctly identify 25 pasture plants from a list of 75 possible species. An extra twist is that in order to receive points for a correct plant ID, each plant's life cycle has to be answered correctly as well.

At first glance the contest appears overwhelming, but after some study, students and agents learn the flow and logic of the material. Many county agents and vo-ag teachers from several states have commented that it is probably the most real-life contest available.

Arkansas 4-H teams competed very well in the 2015 Mid-America Grassland Evaluation Contest, taking fourth-place individual honors and third- and fifth-place teams in the 4-H Division amid very tough competition. Cleburne County 4-H, coached by Cleburne County staff chair Michelle Mobley, took third place team. Mobley's team won the 2015 Arkansas Grassland contest. Team members were Rachel Wilson, Stephen Wilson and Kathryn Beckdoldt. Rachel Wilson took fourth place individual. Randolph County 4-H took fifth place team.

The Randolph County team was coached by Randolph County staff chair Mike Andrews. Team members included Jesse DeJournett, Blaine Huddleston and Garrett Andrews. Andrews also coached the Pocahontas FFA team. Team members were Will Sparks, Brittany Luttrell and Clara Luttrell.

The Madison County 4-H team was coached by Madison County 4-H agent Jerry Jo Hamm and included members Mitchell Nelson, Anna Shrader and Laura Ogden.

The Van Buren County team was coached by Van Buren County staff chair Danny Griffin. Team members included Bryce Sawyer, Clay Evans, Brooklyn Smith and Casey Deckard.

Congratulations to these young people for competing and for learning about managing grasslands and forages. ■

Grazing Management *(Cont.)*

to soil test results, as always recommended. Seeding rates can be adjusted to achieve slightly higher leaf percentages as sorghum-sudangrass develops thicker stems than pearl millet.

Minimum grazing height for sorghum-sudangrass is 24 inches. Similar to pearl millet, leave a stubble height of 6 inches to ensure good regrowth and do not restock pastures again until canopy heights are 18 to 24 inches.

The apparent problem with sorghum-sudangrasses is prussic acid. This compound accumulates in the leaves, more so in short plants and during vegetative growth. Prussic acid accumulation is a response to stress by the plant, such as drought and freezing temperatures. Be especially careful with the last round of grazing in fall when plants are already short from repeated grazing and the first nights of frost occur. Defer grazing for at least a week to let the prussic acid concentration decline below nontoxic levels. In general, do not let horses graze sorghum-sudangrass because they can contract cystitis syndrome. Unlike nitrate, prussic acid concentrations decline during storage. If in doubt, test harvested forage for nitrate and prussic acid at a reputable laboratory. Monitor nitrate concentrations and prussic acid concentrations with the help of your county Extension office if in doubt to bring livestock safely through the summer months. ■

Beef Cattle Health Concerns During and After Flooding Conditions

Dr. Tom R. Troxel, Professor

What Is a Veterinarian-Client-Patient Relationship (VCPR)?

A VCPR is present when all of the following requirements are met:

1. The veterinarian has assumed the responsibility for making clinical judgments regarding the health of the livestock and the client has agreed to follow the veterinarian's instructions.
2. The veterinarian has sufficient knowledge of the livestock to initiate at least a general or preliminary diagnosis of the medical condition of the livestock. This means that the veterinarian is personally acquainted with the keeping and care of the livestock by virtue of a timely examination of the livestock by the veterinarian or medically appropriate and timely visits by the veterinarian to the operation where the livestock is managed.
3. The veterinarian is readily available for followup evaluation or has arranged for the following: veterinary emergency coverage and continuing care and treatment.
4. The veterinarian provides oversight of treatment, compliance and outcome.
5. Patient records are maintained.

During a major flood, soil particles and trash can be moved for miles. Listed below are some diseases a cattle producer may be concerned with due to exceptional flooding conditions. Because of this unique situation, working with your veterinarian is very important.

Hardware Disease

Hardware disease is produced when a sharp object pierces the stomach wall. A sharp object, such as a nail or piece of wire, may perforate into the heart sac. The object lies originally in the reticulum. The reticulum "catches" all heavy objects that are ingested. When muscles contract, the "hardware" may be forced through the wall of the reticulum, diaphragm and heart sac.

Symptoms may include poor appetite, depression and reluctance to move. Cattle seem to have indigestion and show signs of pain when defecating. If perforation of the heart has occurred, fluid, due to infection, may accumulate around the heart and produce abnormal heart sounds. The brisket may be quite flabby due to a large amount of fluid. The cow may also be bloated. These symptoms may subside or disappear within one to seven days but may reoccur.

During a major flood, soil particles and trash can be moved for miles, leading to health problems and disease in cattle.

Walk pastures looking for nails, metal pieces and other items cattle might ingest. Remember, metal pieces may become baled and fed to cattle in the wintertime. Therefore, hardware disease may not become apparent until the winter months.

Blackleg (*Clostridium chauvoei*)

Blackleg begins when the susceptible animal ingests the endospores which are found primarily in the soil. Although blackleg has occurred in calves as young as two months of age, the disease generally affects animals between six months and two years of age. Occasionally, losses may be seen in adult cattle. Blackleg infections typically occur during the late summer and early fall, and blackleg usually affects rapidly growing calves.

Typically, animals infected with blackleg die rapidly without any signs of illness. However, clinical signs that may be noted very early in the disease include lameness, loss of appetite, fever and depression. Animals quickly die within 12 to 48 hours after contracting the disease. Although treatment usually fails, appropriate doses of penicillin may prove helpful. If an animal does survive, it will likely suffer from a permanent deformity. Prevention of blackleg is best accomplished through routine vaccination.

Enterotoxemia

A pathogen that can be highly fatal in young calves is *Clostridium perfringens* type C, also known as enterotoxemia or purple gut. It is usually seen in calves less than 30 days old. *Clostridium perfringens* type C is a normal inhabitant of the gastrointestinal tract but only causes disease under certain circumstances. The clinical signs produced by *Clostridium perfringens* type C are due to its release of an enterotoxin. This disease has a sudden onset, and some calves will die without showing any symptoms.

The specific condition commonly associated with enterotoxemia is a sudden increase in the calf's dietary intake. Therefore, if management practices (penning the cows separate from the calves) or weather cause an increase in the interval between meals, a calf may overconsume milk and thereby establish the proper environment for the bacteria to grow. Clinical signs include weakness, abdominal distention, bloody diarrhea, uneasiness (straining or kicking at abdomen) and convulsions. Postmortem lesions normally seen are bloody, fluid-filled small intestines that give rise to the common name "purple gut." Vaccination of cows before calving will improve passive immunity via colostrum to protect calves early in life.

Leptospirosis

Leptospirosis is a disease caused by bacteria that are well suited for wet, moist environments. Cattle can be exposed from contaminated stock ponds, wildlife, rodents or infected domestic animals. Transmission can occur when the bacteria penetrate a mucous membrane (mouth, nose, conjunctiva or genital tract) or enter an open wound. Once an animal is infected, the organism circulates throughout the body and localizes in the kidneys, mammary glands and genital tract. When the urogenital tract becomes infected, the bacteria can be shed in urine, uterine discharge, semen and aborted fetuses/placentas. This shedding allows other herd mates to become exposed and infected.

Leptospirosis may lead to many reproductive problems such as infertility, early embryonic death, late term abortions (second or third trimester), weak newborn calves and low-grade uterine infections. Cows may not abort the fetus when they first contract the disease, and infected cows frequently exhibit no other signs of illness. Leptospirosis can survive in a moist environment for an extended period of time. Standing water and runoff water could be sources of infection for a cow herd and should be managed to prevent contamination.

Anthrax

There are three types of anthrax which affect skin, lungs and the digestive system. Generally, outbreaks of this disease occur in areas where cattle have previously died of anthrax, due to the presence of spores which remain viable for decades. Cattle infected with anthrax will progress from a normal, healthy state to death in a matter of hours. Symptom include signs of weakness in herd cattle, difficulty in breathing, convulsions, bloody discharges from natural openings of the body, mild fever and muscle aches and stomach pain. Vaccination is very effective in preventing further occurrence of anthrax in cattle (Colorado Serum Company).

Internal Parasites Including Flukes

The amount of parasite pressure in a pasture varies with season and management. Parasite burden peaks during the spring and is lowest during the hot, dry summer months. Due to the wet, cool spring and the flooded regions, a high internal parasite burden may be a concern for cattle producers. When selecting a dewormer, the following items should be considered: type of animal being treated (calf vs. cow, beef vs. dairy), product efficacy, ease of application, broad spectrum of control (immature, mature and inhibited), cost effectiveness, slaughter/milk withdrawal time and personal safety

Liver flukes maybe a concern in area where historically they have not been a concern. The fluke's life cycle requires two hosts – cattle and snails. The snail inhabits open, muddy areas. The adult flukes are found in the bile ducts of cattle. The eggs are laid in the ducts and expelled with the feces. A larval stage hatches from the egg and infects the snail, where it reproduces asexually. Specific stages of the juvenile fluke leave the snail and encyst on aquatic vegetation. Cattle eat the vegetation and become infected. The fluke migrates to the liver, infects the bile ducts and matures into an adult. Not all dewormers are labeled for fluke control, so be sure to check the product label if fluke control is desired. ■

Shade for Beef Cattle

Shane Gadberry, Associate Professor

Heat stress during summer negatively affects animal performance. During summer months in the south, cattle are exposed to not only high temperatures and humidity but also direct sunlight. Although grazing cattle can't escape the heat completely, they instinctively will use natural shade to escape the radiant heat of the sun and may also immerse themselves in ponds or stream pools for cooling. Management for reduced heat stress has production, environmental and welfare implications. While small acreage, extensive grazing systems in the southeastern U.S. usually offer natural shade, more intensive systems using rotational grazing or drylot confinement may not provide natural shade.

From a production perspective, access to shade may neither improve nor hinder growth compared to cattle in a similar environment without access to shade. Research has demonstrated that in feedlot confinement, shade may be beneficial early until cattle become acclimated to summer heat. Breed type and coat color can influence heat tolerance. Brahman influence and tropically-adapted beef breeds such as Senepol and crosses that express slick hair traits tolerate the summer's heat better than dark-colored beef breeds and cattle that retain a thicker hair coat into summer. Research with cattle of different coat colors at the USDA Meat Animal Research Center indicated that solar absorption was greater in cattle with darker hair coats (dark red and black) and black cattle spent more time in the shade than white cattle. Cattle with dark coats also pant more than cattle with light-colored coats.

Management for reduced heat stress has production, environmental and welfare implications.

Heat stress can increase body temperature, but this response is not observed in all studies. Research in Thailand observed greater oxidative stress and increased ratio of neutrophils to lymphocytes, which is also an indicator of greater stress among cattle without shade compared to cattle with shade access.

Cattle with access to shade may exhibit less time grazing. This observation was recently reported in a study out of Uruguay. Although cattle without shade were observed spending more time grazing, the weight gain response among cattle with or without shade was similar.

The challenge to providing shade to cattle managed under intensive grazing is overcome by using shade cloth to construct an artificial shade. Shade cloth comes with different levels of sun blockage (40 to 80 percent) and will cost approximately $3.20 per square foot. The Uruguay study compared activity with different amounts of sun blockage and found that 80 percent shade increased lying time, but even the 35 percent block provided relief from the sun. Research with 80 percent artificial shade in feedlot pens has demonstrated improved weight gain and feed conversion response

compared to pens without shade. In a recent grazing study, Guillermo Scaglia at LSU observed similar performance among heifers that had access to artificial shade with 80 percent blockage compared to natural shade. Research with permanent artificial tin roof shade was compared to tree shade and no shade at the University of Arkansas, Livestock and Forestry Research Station. During early summer, natural shade demonstrated the greatest benefit, but over the entire observation period, there were no differences in cow weight gain among treatments of shade and no access to shade.

To cool themselves, cattle may also immerse themselves in water when accessible. This is commonly observed with cattle on toxic fescue, even when the temperature should be comfortable for cattle. Researchers in Brazil observed that cattle naturally preferred shade over water immersion. During a recent farm visit in Arkansas during early afternoon, there were only a couple of cows in the pond whereas the majority of cows were standing under shade trees.

While access to shade may not always improve cattle performance due to their ability to acclimate to their summer environment, from a welfare perspective cattle instinctively seek relief from the radiant solar heat of the sun during summer, and providing shade affords this opportunity. Use of shade cloth can provide shade to cattle in more intensively managed systems such as rotational grazing or confinement feeding systems. Since cattle seem to spend more time using shade to seek relief from the sun than immersing themselves in water for cooling, speculatively thinking, strategic placement of shade may provide opportunities to reduce environmental damage to stream banks or ponds.

When constructing shade, approximately 15 to 20 square feet is recommended per 400-pound calf, 20 to 25 square feet per 800-pound feeder calf and 30 to 40 square feet for beef cows. University of Kentucky publication AEU-91, *Shade Options for Beef Cattle*, provides additional detail on artificial shade construction. ■