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ANIMAL SCIENCE E-NEWS

INSIDE:

DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

A new clover for Arkansas

John Jennings, Professor & Forage Specialist

A new clover, called Balansa clover (*Trifolium michelianum L.*), has been undergoing tests and demonstrations in Arkansas. This clover has greater tolerance to wet soils and to low soil fertility than many commonly grown clovers such as red or white clover. Balansa clover is a winter annual plant, meaning it germinates in fall, grows and matures in spring, and dies before hot summer weather. It has very good cold tolerance and should be adapted statewide. It has been grown successfully in demonstrations from Hope to Paragould with no obvious winter damage. The characteristic that is most intriguing is its tolerance of wet soils. Many low-lying pastures in Arkansas are frequently waterlogged in late winter and spring making it difficult to maintain good stands of any legume. Observations in farm demonstrations showed that Balansa clover tolerated standing water in pastures in February and March. Results from a forage research study conducted on a very wet soil at the SWREC at Hope showed that Balansa clover had excellent growth and stand density, but stands of crimson and arrowleaf clovers were thin and poor. Balansa had a canopy height of 20" on April 20 compared to a canopy height of only 7" for white clover. Maturity of Balansa appears to be between that of crimson clover (very early) and that of arrowleaf clover (very late). April to early May appears to be the period of highest productivity. Palatability is excellent. It has a soft, hollow stem and in farm demos, livestock consumed the entire topgrowth of the plants. Reports indicate that it typically does not cause bloat in grazing systems. The recommended seeding rate is 8 lbs/acre, and the optimum seeding period is during October in a short grass sod. It can be planted with a no-till drill or broadcast. Planting depth should be about ¼". One drawback is that Balansa has poor seedling vigor and does not compete well with thick stands of ryegrass or heavy infestations of buttercup. Winter weed control with appropriate herbicides will greatly improve stands. Initial tests showed good control of buttercup with either 2,4-DB (Butyrac) and Raptor herbicides with no damage to the clover. Spring growth has been impressive where weeds were controlled or where there was little ryegrass competition. These results along with farm demonstration observations indicate that Balansa clover may be a good choice for wet-natured soils. ■

Crimson clover on the left. Balansa clover on the right. Photo taken at SWREC on April 20, 2020.

Eastern Equine Encephalomyelitis (EEE) in Horses

Mark Russell, Assoc. Professor - Equine

Recently there was an outbreak of Eastern Equine Encephalomyelitis (EEE) in Horses in Arkansas. The distribution of EEE has historically been restricted to the eastern, southeastern and some southern states (but disease incidence is also reported in the upper Midwestern states of Ohio, Michigan and Wisconsin). As such, it may be a good time for horse owners to brush up on EEE. The following is a fact sheet developed by the American Association of Equine Practioners (AAEP).

Disease Name: Eastern Equine Encephalitis, Eastern Equine Encephalomyelitits or EEE Disease Type:

Viral Transmission: Vector borne. This virus is transmitted by mosquitoes or other biting insects. Birds act as reservoirs for the virus; mosquitoes and other biting insects then carry the pathogen from infected birds and transmit it to horses when they bite. A horse affected with EEE is not contagious and poses no risk to other horses, humans or birds.

Frequency: Low

Incubation period: 3-7 days

Carrier status: Infected horses cannot transmit the disease to other horses. The virus can only be transmitted to a horse via an insect vector.

Shedding period: Infected horses do not shed the virus, nor do they act as a source of virus to insect vectors.

Latency: Infected horses pose no risk of infection to other horses.

Severity: High. Morbidity rate in horses infected with EEE is 75-95%

Clinical signs and symptoms

- Depression and anorexia without fever when initially infected
- Moderate to high fever 102.5-104.5°F (39.17-40.28°C)
- Lack of appetite
- Lethargy/drowsiness

Neurologic signs

- Onset of neurologic disease is frequently sudden and progressive
- Periods of hyperexcitability, apprehension and/or drowsiness
- Fine tremors and fasciculations of the face and neck muscles
- Convulsions
- Cranial nerve paralysis - facial paralysis and weakness of the tongue are very common
- Head tilt, droopy lip, muzzle deviation
- Weakness, ataxia, and dysmetria (incoordination) in one or all limbs
- Complete paralysis of one or more limbs
- Colic
- Recumbency (inability to stand)
- Death

Diagnoses: Diagnosis is made by a veterinarian by measuring titers in serum (a component of whole blood), using an ELISA (enzyme-linked immunosorbent assay) or, less commonly, with PCR on CSF (cerebrospinal fluid).

Treatment: There is no cure for Eastern Equine Encephalitis. Supportive care is administered in horses which show clinical signs.

Prognosis: Poor. Horses infected with EEE do not often survive. Morbidity rate is 75-95% and death usually occurs within 2-3 days of onset of signs.

Prevention: Keep all horses up to date on vaccinations. Initial vaccination is followed in 4 to 6 weeks with a booster; yearly revaccination is recommended. More frequent boosters (i.e. twice yearly) are recommended in areas with year-round mosquito seasons and in endemic areas.

Practice vector management on all properties where horses are kept:

- Use insect repellents frequently; re-apply after rain.
- Keep horses in at night when possible and apply insect repellant.
- Eliminate or minimize standing water.
- Stock tanks or ponds with mosquito-feeding fish.
- Eliminate brush piles, gutters, old tires and litter.
- Remove all equipment in which standing water can collect

Biosecurity: There are no recommended biosecurity protocols nor do restrictions need to be placed on affected or recovered animals as they pose no risk of infection to other horses. Practice vector control management on your facility to reduce risk of transmission from insects. ■

Native Perennial Warm Season Grasses Require a Flexible Approach to Weed Control

Dirk Philipp, Assoc. Professor - Forages

Native perennial warm season grasses (NPWSG) are difficult to establish or so they say. In our experience, this depends on a lot of factors, and one major factor is weed control before, during, and after establishment. Since NPWSG are likely to be planted on pastureland with a history of other forage crops cultivated over the years, there will always be undesirable plants to be contended with for years to come. It is simply impossible to "kill all weeds out," as there may be such a large seedbank in the ground that it is unfeasible to take care of every single weed species upfront.

Instead, our experience over the years taught us to take full advantage of the unique morphological characteristics of NPWSG and pursue a flexible approach to weed control. Here are a few things we learned by working with NPWSG during the past several years:

1. *Be patient.*

Not a strong suit of anyone, but NPWSG clearly grow much more slowly during the establishment year than other introduced annual or perennial forage species. They do also emerge very unevenly; seeds keep germinating over the course of the first growing season as the percentage of "hard seed" can be substantial. It is not uncommon to observe rows of NPWSG early on with large parts of the field still empty weeks after planting, yet by the end of the summer, most areas will have filled in nicely with an unexpected uniform stand that seemed out of reach months ago.

2. *Tackle weeds in a flexible manner*

Landowners will know the history of their place and fields slated for establishment of NPWSG. There is no way to create a "weed-free" zone anywhere, so the name-of-the-game is to control weeds in a targeted, strategic fashion. For example, we usually do not apply the herbicide Plateau® (labeled for grassy weeds in NPWSG) outright after planting NPWSG in spring, but rather wait and see what weed pressure we have to deal with and at what time. We found good success with combination of mechanical and chemical weed control, using the low canopy of NPWSG during spring and early summer, and its progressively taller canopy during fall to our advantage.

Big Bluestem grass in August.

Early in the summer, several weeds including johnsongrass, pigweed, and even goose or barnyard grasses are taller than the newly planted NPWSG. Bushhogging the fields at that moment appears to work very well for opening up the canopy for the NPWSG, suppress the weeds temporarily, and get ready for an herbicide application that will control said weeds. A quick word regarding traffic on newly planted sites: Yes, traffic of whatever kind on NPWSG should be avoided at any time, but the equipment used (bushhog and sprayer) is luckily on the less-heavy side, so that risk can be taken. If the ground is wet and ruts are to be expected, this approach must be postponed until conditions are drier.

The approach of bushhogging followed by an herbicide application has worked well for us to control pigweed. It is nearly impossible to treat pigweed at the right time as this plant is very vigorous and resilient at any developmental stage. Once pigweed and other weeds are sufficiently set back, the native grasses win the upper hand as by mid-summer NPWSG are growing beyond the canopy of other undesirable plants. Johnsongrass might pose a problem as it grows nearly as tall as big bluestem. Landowners should make efforts to control johnsongrass before NPWSG are planted. Although johnsongrass can be very well controlled with grazing, it easily becomes persistent in NPWSG stands that are not grazed at all. As a reminder, johnsongrass spreads readily via seeds, so keeping it short via grazing will vastly help control it in the long-term.

3. *Take advantage of NPWSG tall canopy structure*

NPWSG are obviously to be used for grazing, but deliberate biomass accumulation at specific times will also help control weeds. Big bluestem-dominated mixtures create enough height and shade to reduce or even fully impede the growth of many weeds. This helps during July and August when even weed species become vulnerable to droughty conditions (but the NPWSG much less so) Although the reasons to establish NPWSG are multiple (summer forage, aesthetics, wildlife habitat), they clearly benefit from grazing early in their growing season. Grazing promotes tillering, plant vigor, and increased access to light of associated species that mature later in the season, such as indiangrass and little bluestem that are often mixed in with big bluestem. NPWSG should not be grazed after 4-6 weeks before the first frost. While there's some debate on how early or late grazing should be deferred, keep in mind flowering NPWSG are a beautiful sight to behold, so you might want to take the animals off a little earlier anyway. ■

The Lab or the Sample?

Shane Gadberry, Professor - Department of Animal Science
Bob Powell, Yell County Extension Agent

Sometimes unexpected results are returned from a forage test. This "unexpected" may be due to how a field was managed, historical test results from the same field, or results originating from different labs. Reliable results are the product of both a good sample and good laboratory practices.

The good sample. The good sample must be representative. A grab sample of hay from one or two bales isn't representative of the whole lot. Core samplers are idea for baled forage, and research on sample variation has shown that a 20% sampling rate is needed to account the potential bale-to-bale variation in quality. The collected core samples must be well mixed before taking a subsample to send to the lab. Feeds that are stored in barns, bins or piles should also be subsampled at different locations or possibly different times as the feed becomes accessible during filling or feeding. Sampling during filling is helpful in planning. Sampling during feeding is retrospective. Collecting representative pasture or silages samples is more challenging than baled forage or feeds. Silage samples shouldn't be sampled until the preservation process is complete.

The good laboratory. Use a laboratory that is both equipped to provide the desired analysis and routinely analyzes feedstuffs representative of the area. Labs that routinely analyze the same types of samples can recognize when results don't fit within the normal range. The laboratory should have a quality assurance program in place. The National Forage Testing Association (NFTA) works with laboratories to certify quality assurance for different analytical techniques in forage analysis. Many labs that participate in NFTA accreditation will place the NFTA certified symbol on their report. The University of Arkansas, Fayetteville, Division of Agriculture's Diagnostics Laboratory (ADL) includes at least one check sample in every run for protein and fiber quality assurance. The ADL allowed margin of error is 10%. If a check sample falls below or above 10% of its known value, the entire sample set is rerun. The running average bias is 3% or less. Check samples confirm that instrumentation and chemicals used in the process are performing accurately.

Between lab comparison. In fall 2020, forage samples were collected from round bales from a single hay cutting. Samples from this lot were submitted to 3 labs on 3 separate dates to determine if any differences might exist. These 3 labs are commonly used by companies or county Extension agents in Arkansas. Measures of fiber did not differ statistically among labs, however, protein did differ. One lab's protein value was significantly lower than the ADL value. The ADL result was statistically similar to the third lab used in the comparison. This confirms the reliability of forage test results coming from the ADL in comparison to other labs receiving Arkansas forage samples.

- **Total Digestible Nutrients (TDN)** reported in routine forage test results is not measured directly but estimated from a mathematical formula based on fiber, protein, and possibly other plant compounds. The TDN equation of choice will differ from lab-to-lab. It is important to use a lab that reports TDN using an equation that is representative of the feedstuff analyzed. The ADL uses empirical equations specific to various forage types for reporting TDN. The ADL currently does not support TDN estimation for byproduct feeds or total mixed rations.

Within lab comparison. Our fall 2020 lab comparison study not only provided us with some information about the average quality of our forage sample coming from 3 different labs but also provided some insight into the variation we might see when submitting subsamples of the sample to the same lab at different times. The minimum and maximum estimate of protein was 9 and 11% (dry matter basis), and the minimum and maximum estimate of TDN was 54 and 57% (dry matter basis). Given the ADL's good laboratory practices, this difference is associated more with our subsample than laboratory technique. The ADL check sample error included with our samples averaged 3% or less, depending on the plant compound.

In conclusion, feed test results don't always return with values aligning with expectations. Use good sampling techniques to make sure that sampling error isn't at fault. When sampling, collect more material than needed for analysis, thoroughly mix the sample, divide the sample into 2 portions, and send one portion to the lab. Retain the second portion if further analysis is needed. Laboratories also hold samples for a short period after analysis as part of good laboratory practices in case further analysis is needed. If there is a question of lab accuracy, never pull a new sample and submit it to a different lab for comparison. The new sample is not the same as the original. Comparing results from two labs is meaningless when results differ by more than 10% because the result that is more correct is unknown. The outcome becomes picking the result that makes you the happiest. Lab comparisons require using a single, well mixed sample of small uniform particle size that can be subsampled. At least 3 labs should be included in the comparison to determine if there are actual outlier results. ■