Summer 2008

# The Forage Leader

A Publication of the American Forage and Grassland Council

*This issue of The Forage Leader is sponsored by CSREES-USDA.*

## Knowing What's in Your Pasture Is Key to Knowing What Your Horse is Eating

*By Jesse Morrison With Ray Smith*
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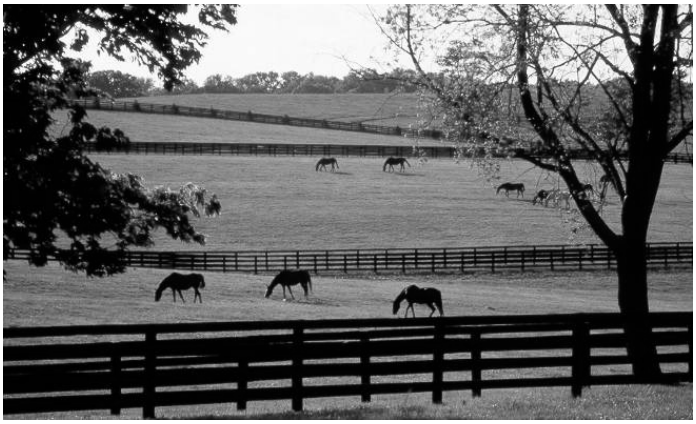
*This article is one of a series that will appear from participants in the 2008 AFGC Emerging Scientist Competition. Their participation was made possible through the generous support of CSREES-USDA, which sponsored the 2008 competition.*



The horse industry is Kentucky's top agricultural cash crop and has a remarkable economic impact nationwide. Therefore, high quality pasture and efficient forage utilization is essential for animals to remain healthy and producers to remain economically viable. Tall fescue toxicosis and its effects are a concern for many in the agricultural sector, but especially so for producers in the Thoroughbred horse industry in central Kentucky. In the United States, an estimated 700,000 horses are managed on tall fescue. Results from a pasture evaluation project conducted in 2005 and 2006 showed that the vast majority of horse pastures in the Central Kentucky Bluegrass Region contain significant amounts of tall fescue (26% of total ground cover on average, ranging from 8 to over 43%) with an average endophyte infection rate of 69% and ergovaline concentrations ranging from 90 – 790 ppb.

During the three weeks surrounding May 1, 2001, 20-30% of Kentucky's pregnant mares suffered abortions. Overall, an estimated 2,600 foals were lost, at a cost of approximately 336 million dollars to the state's horse producer. The cause of this syndrome, called Mare Reproductive Loss Syndrome (MRLS), was linked to accidental ingestion of eastern tent caterpillars. In light of the events surrounding MRLS, farm managers and owners have become more aware and concerned about their animals' diet when on pasture. These concerns have evolved into research focused on a healthy diet, and its effects on pregnancy, parturition, and the overall well being of the Thoroughbred industry.

Since tall fescue is endemic to the Central Kentucky region and thrives in the transition zone climate, it is difficult and costly to eliminate from existing pastures. This research project focuses on diet composition of horses on pasture with a specific emphasis on tall fescue and is de-

**Knowing What Your Horse is Eating**
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# The Gavel Exchange

*Bill Tucker, President AFGC*

What a year! Does anyone remember a more challenging time? As agricultural professionals we are used to wide weather fluctuations, radical price swings, and close margins but this has got to be a combination year for the books. If you are reading this from one of the areas that has suffered from the floods, the searing early summer temperatures and subsequent drought, or a previously unthought-of tornado target our thoughts and prayers go out to you. If you are struggling with a new economic reality that is moving at such a rapid pace you can't seem to estimate costs fast enough to react as the sharp manager you thought you were, don't feel alone. If you find yourself with less disposable income, pressing family needs, and community and professional commitments that you are having a hard time meeting take solace in the knowledge that you are the norm not the exception.

At our place it seems to be more and more of a challenge to keep everyone upbeat, focused, and enthused about tomorrow while struggling through the realities of today. We pride ourselves on running a lean no frills operation with an eye always on the bottom line. This year the bottom may be through the line. I often think if I could just slow down long enough to take a good inventory, of all the sources of help to work through some of these problems, maybe the problems wouldn't exist. But first would have to come that slow down part. Frequently my thoughts are pulled towards that next conversation with the bank, an employee, a family member, or a landlord that requires me to advocate our position until we reach a positive outcome for all concerned. Yes, it's a challenging year indeed. So how goes your year? Specifically, how challenged are your leadership skills this year? Have you inventoried your support network? Do you find yourself repeatedly advocating this position or that? If so, AFGC can help. I encourage you to seriously consider joining us in Charlotte, North Carolina on November 5$^{5h}$ and 6$^{th}$. Plan now to attend our Leadership and Advocacy Workshop.

Every leader in every Council should plan on joining your national board and a team of trained experts to sharpen your effectiveness both internal to your Council's work and in your personal life and business. Plan on an extended, professionally facilitated session on personal leadership skills, empowering volunteers and employees, and managing both time and budget for maximum effectiveness. Plan to learn in depth the many ways that AFGC can support your local Council, the multiple services that the national office offers for direct management, and new services evolving as this program is being developed. Take advantage of a group of exceptional professionals as they offer a short course on the do's and don'ts of effective advocacy work for non-profits and agricultural producer groups.

Most importantly, don't miss this tremendous networking opportunity to interact with fellow leaders from throughout the country. Learn what has worked and what hasn't in other places. If you hale from a state that does not currently have an organized AFGC Affiliate Council please call me directly at 434.944.2292 or our national office at 800.944.AFGC. We want to help you get organized with the goal of being able to join us at this important event. It is only open to active Affiliate Councils, so won't you consider organizing today? We want you there. It is good for you. It is good for us. We are a better WE together. Come join us in November!

# AFGC Event Calendar

For the latest AFGC, AFGC Affiliate Council and related events, please visit the AFGC web site at www.afgc.org. AFGC welcomes all suggested event postings. Affiliate Councils, in particular, should send their meeting details via e-mail to mbandy@afgc.org. Please be sure to include dates, times, locations, contact information and a brief summary.

**PA Agricultural Progress Days**
*Tue Aug 19, 2008 8:00 AM - Thu Aug 21, 2008 5:00 PM*
For more information, contact: Dick Hann; Phone: 717.832.0127; E-mail: hannr54@comcast.net

**Pennsylvania Forage and Grassland Council Summer Picnic**
*Fri Aug 20 2008 6:00 PM*
For more information, contact: Dick Hann; Phone: 717.832.0127; E-mail: hannr54@comcast.net

**2009 Appalachian Grazing Conference**
*Fri Mar 6, 2009 8:00 AM - Sat Mar 7, 2009 5:00 PM*
For more information, contact: Becky Casteel; Phone: 309.293.6131, ext. 4231; E-mail Becky.Casteel@mail.wvu.edu

# AFGC News and Updates

## AFGC Will Host Leadership & Advocacy Workshop This November

The American Forage and Grassland Council (AFGC) will host a Leadership & Advocacy Workshop this fall. It will take place Nov. 5-6, 2008, followed by an AFGC Board Meeting Nov. 6-7, in Charlotte, North Carolina at The Blake Hotel.

AFGC's Leadership and Advocacy Workshop will be open to the leadership of the organization's Affiliate Councils and members of the national Board. The association will provide complimentary registration to two representatives from each of its Affiliate Councils. Additional council representatives may attend by paying a registration fee. Attendees are responsible for their own travel and hotel arrangements. The Workshop is made possible, in part, by a grant from The Forage Foundation.

AFGC sees this program as an opportunity to give back to its volunteers at the local and national level who drive the organization's activities. The program is designed to:

**1) Provide leadership skills, both personal and professional.** The content will teach local and national leadership to understand the complexities of volunteering to serve non-profit organizations in leadership capacities, including board and committee service. Additionally, guests will learn to more effectively utilize volunteer time.

**2) Develop advocacy skills.** A second component of the program is to teach attendees the skills needed to successfully advocate, on behalf of the organizations, to governing bodies, both local and national. The focus will be on working with legislative bodies and staffers.

**3) Offer valuable networking.** A final component of the meeting will be the development of stronger ties between national and local leadership as a result of the conference experience. This will help AFGC and its leadership move in tandem as they tackle complex challenges facing the industry and the association community.

The program includes beverage breaks, dinner Nov. 5, and continental breakfast and lunch Nov. 6. Below is a tentative event schedule:

Wednesday, November 5
- Leadership Training, 1-6 p.m.
- Break, 3:30-3:45 p.m.
- Dinner, 6:30-8:30 p.m. (Includes AFGC Overview)

Thursday, November 6
- Continental Breakfast, 7:30-8 a.m.
- Advocacy Training, 8 a.m.-12:30 p.m.
- Break, 10:30-10:45 a.m.
- Lunch, 12:30-1:30 p.m.
- Meeting Adjourns, 1:30 p.m.

The AFGC Board of Directors will meet on Thursday, November 6 from 2-5 p.m., and on Friday, November 7, from 8 a.m.-Noon.

Details will be distributed to Affiliate Councils this summer and will also be available on the AFGC web site.

## 2009 Annual Conference Is Beginning to Take Shape; Mark Your Calendar Now!

Grand Rapids Michigan will be the site of the 2009 AFGC Annual Conference. It will take place at the Amway Grand Plaza Hotel, June 21-23.

This event promises the very best in education, exhibits and networking. You'll hear relevant presentations delivered by today's academic and on-the-ground practitioners. From the opening program to the closing Awards Banquet, you'll find activities and information designed to help you navigate today's forage and grassland environment. The Forage Spokesperson Competition, National Hay Show, Emerging Scientist Competition and more await you in Grand Rapids!

Meeting highlights include:
- Plenary and technical sessions addressing our most pressing issues;
- The best products and services displayed on the exhibit floor;
- Networking opportunities designed to keep you connected with your peers;
- Contests, awards, scientific displays, and much more.

The event will be hosted in conjunction with the Michigan Forage Council. A local Host Committee has been formed and is working with AFGC's national leadership and staff to develop, promote and implement the conference.

Preliminary information will be posted on the web this summer and members will be notified as more details and registration become available.

## AFGC Certified Grassland Professional Program on Solid Ground

The American Forage and Grassland Council sponsors its Certified Grassland Professional (CGP) program to recognize knowledge within the discipline.

Certified Grassland Professional certification signifies that the designated individual has met the basic qualifications to be able to carry out professional work in the field, and

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signed to develop a tool for horse farm owners and managers to assess what their animals are actually consuming when grazing a mixed species pasture. This will help producers make informed management decisions for pastures containing tall fescue.

Several techniques are available to evaluate diet composition of animals grazing pasture. One non-invasive technique is microhistological analysis, which has been proven to be an effective way to determine diet in both domesticated and wild animals including caribou, elk, deer, coyote, goat, cattle and jackrabbits. This method of determining diet composition is based on microscopic recognition of generally unique and identifiable undigested cellular structures from the cuticle layer of the plant leaf.

Subjectivity is inherent with a technique like microhistological analysis, which makes training necessary to become familiar with unique plant microscopic characteristics and the differences between plant species. The objective of this research was to determine if the microhistological technique as described by Sparks and Malechek in 1968 can accurately predict the diets of domesticated horses grazing cool-season pasture. Secondly, to determine if there is a relationship between the amount of tall fescue available in a pasture and the amount that horses will consume.

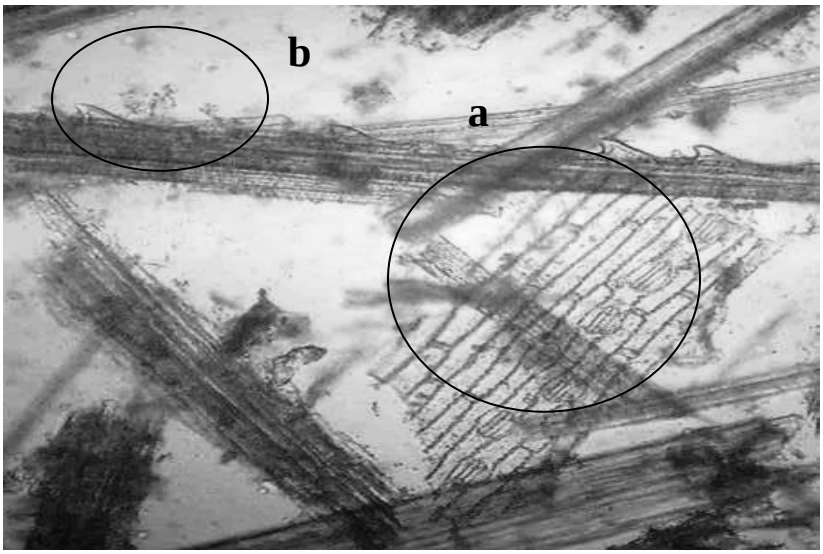


Image 1. An example of a manure sample containing tall fescue epidermis (a) and orchardgrass prickle hairs (b) in a viewing frame at standard magnification.

To begin this study, extensive microscope training was required. For training, small samples of Kentucky bluegrass, orchardgrass, and tall fescue leaves were dried and ground to a fine consistency. Ground material was soaked in household bleach (6% sodium hypochlorite) for around six minutes, and then rinsed with water. A microscope was used to practice viewing and telling the difference between each species' unique characteristics (Image 1). Digital pictures were taken and drawings were made of these unique characteristics.

After sufficient training, two laboratory studies were designed to make sure that the microhistological technique was accurate enough to be considered suitable for use with horses. The first study involved mixing small amounts of the ground grass material in different proportions and evaluating these mixtures using the microhistological technique. In the second study, three horses were fed a strict diet of pure tall fescue, bluegrass, or orchardgrass. Manure samples were taken after several days of feeding in hopes of having nearly pure tall fescue, bluegrass and orchardgrass manure. These manure samples were dried, ground and bleached like before, then mixed in different proportions. These manure mixtures were evaluated for composition. The results of these two studies were accurate enough to design a third study utilizing horses grazing in a mixed cool-season pasture.

This study divided a small pasture into eight separate 0.50 acre lots. Each lot was evaluated to determine what plant species were present and in what abundance. Each lot had one horse turned out in it to graze for a period of six days. After three days, manure samples were taken from each horse, as these samples would most accurately represent the diet of each horse on the first day in the lot. These samples were kept separate, but prepared as mentioned before by drying, grinding and bleaching. Each sample was evaluated for botanical composition using the microhistological technique and a measurement of Dry Matter Diet Composition was calculated. These values for each cool season grass (Dry Matter Availability and Dry Matter Diet Composition) were compared and the following plots were made.

Figure 1 shows a strong relationship ($r^2 = 0.81$) between the percentage of tall fescue in the grazing lot and the corresponding percentage in the diet. With each percent increase in tall fescue composition in the grazing lot, there was a corresponding 0.43% increase in diet composition. These results suggest that horses may not avoid or select against tall fescue. At low botanical composition percentages, horses in this experiment consumed a higher percentage of their diet in tall fescue than what was available; while at higher percentages (> 35%) they selected slightly lower amounts.

This information is important for two reasons; primarily, it shows that horses will not necessarily select against tall fescue when grazing a mixed species pasture. Secondly, it indicates that producers with pastures of equal or less than average tall fescue percentage (26%) may not need to eradicate tall fescue from their pastures, which can be expensive and labor intensive. Figure 1 shows that

horses grazing in paddocks with a tall fescue percentage between 12 and 30% were likely to consume the same amount (20-25%) of tall fescue.

Figure 2 showed a relationship ($r^2 = 0.57$) between the percentage of orchardgrass in the grazing lot and the corresponding percentage in the diet. With each percent increase in orchardgrass composition in the grazing lot, there was a corresponding 0.42% increase in diet composition. These results indicate that, similar to tall fescue, horses did not avoid or select against orchardgrass. At low botanical composition percentages, horses consumed a higher percentage of their diet in orchardgrass than was available; while at higher percentages (> 30%) they selected slightly lower amounts in relation to what was available. Levels of orchardgrass in the feces could possibly plateau at approximately 35%.

This data is of great importance to horse owners concerned about what pasture grasses are best suited for their animals. It is also useful to producers trying to minimize consumption of tall fescue, because orchardgrass can be used as an acceptable replacement forage grass for tall fescue.

In conclusion, this research supports the use of microhistological analysis to estimate the diet composition of thoroughbred horses when grazing exclusively cool-season grass pastures. It also shows that there are relationships between the species botanical composition of a pasture and the botanical composition of the diet.

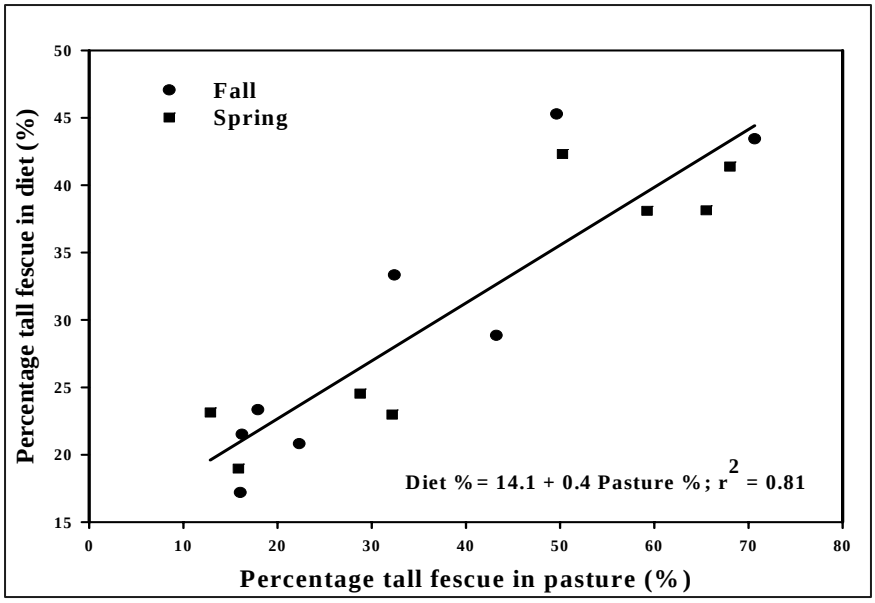


Figure 1. Regression plot of manure tall fescue percentage and percent tall fescue available in paddocks from grazing experiment.

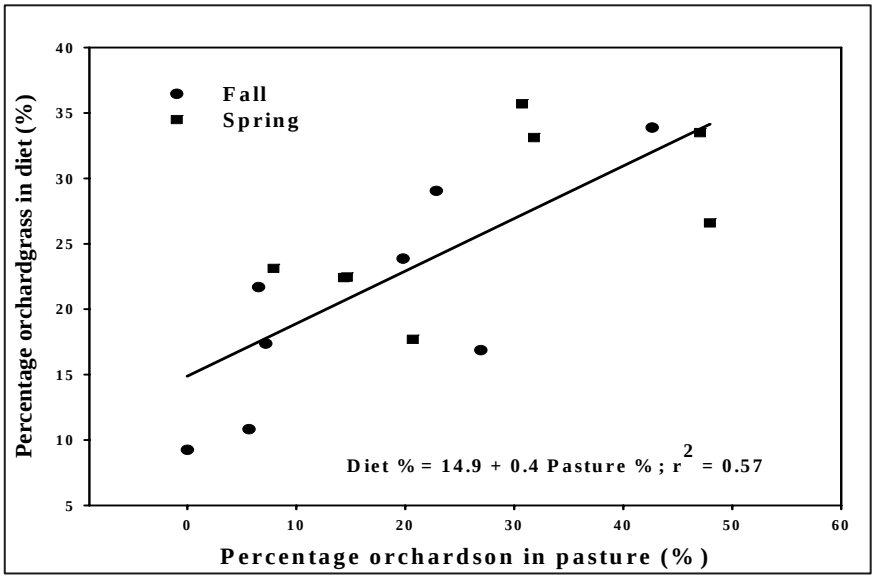


Figure 2 Regression plot of manure orchardgrass percentage and percent orchardgrass available in paddocks from grazing experiment.

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has not been found to engage in unprofessional conduct. Persons possessing the professional credentials indicating that they can plan critical conservation practices and implement sound resource management of pasture, hayland, and grazed cropland may be certified as such by the American Forage and Grassland Council after successfully passing a CGP Exam.

To date, 61 individuals have earned their CGP status. Following the initial exam, all certified individuals are required to re-certify every two years by acquired 32 Continuing Education Units, or CEUs.

Continuing Education Units must include a diversity of topics. At least 16 CEU's must come from the following subject matter areas: vegetative management, animal management, conservation planning on grasslands and grazing lands, pasture condition assessment, economics of forage and grassland management, and grassland soil management, soil quality, erosion control, and soil fertility management. The remaining CEU's should be in subject matter related to professional practice of forage and grassland management.

Details on the CGP program are available on the web site at www.afgc.org, or by contacting the AFGC office at 877.402.7722 or via e-mail, info@afgc.org.

# Management Practices for Reducing Nitrate Content in Bermuda Grass Forage

*By Tara Woods With Benjamin Neal and Richard Joost*
*University of Tennessee Martin*

*This article is one of a series that will appear from participants in the 2008 AFGC Emerging Scientist Competition. Their participation was made possible through the generous support of CSREES-USDA, which sponsored the 2008 competition.*

High rates of N fertilization typically associated with hay production of hybrid bermudagrass often results in accumulation of potentially toxic levels of nitrate which can cause hypoxia and death in livestock if the forage nitrate content exceeds 15,000 ppm. Plants can accumulate nitrate when environmental conditions such as cloudy weather, cold temperatures or drought reduce photosynthesis. Under these conditions, nitrate is taken up by the plant, but can not be assimilated into protein. When high nitrate forages are consumed by ruminant livestock, nitrate can be converted into nitrite in the rumen and absorbed into the bloodstream where it blocks the oxygen-carrying capacity of blood and can in some cases result in death.

A field study was conducted during the 2006 and 2007 growing season in Martin, Tennessee, to evaluate the effects of nitrogen fertilization management on nitrate accumulation in bermudagrass. This study evaluated the impact of amount, timing and source of N on the yield and nitrate content of hybrid bermudagrass. Fertilizer applications were split into three equal applications applied at spring green up, and following the first and second harvests. Nitrogen was applied at three rates (200, 400 or 600 lbs N/acre) annually using three N sources. The N sources included ammonium nitrate, urea + the urease inhibitor NBPT, or urea + NBPT + the nitrification inhibitor dicyandiamide. The urease inhibitor NBPT is marketed as a liquid under the trade name Agrotain. Super U is the trade name of urea that is formulated as a liquid with the addition of Agrotain and the nitrification inhibitor dicyandiamide and then granulated (Fig. 1).

The goal of using these N sources was to determine if maintaining N in the ammonium form through the use of inhibitors that slowed the conversion of N to nitrate in the soil would reduce nitrate accumulation by bermudagrass. Nitrification is the natural conversion of ammonium in the soil to nitrate. Urea that is applied as a topdress treatment to forages is subject to volatilization losses of up to 50%. Volatilization occurs when urea is converted to ammonia by the enzyme urease. Use of a urease inhibitor can slow this conversion, giving surface-applied urea an opportunity to be incorporated into the soil by rainfall.

Figure 1. Urea + Agrotain (top), ammonium nitrate (bottom left), and Super U. (bottom right).

A third variable in this study was the timing of N application. N was applied either immediately following each of the first two harvests, or delayed for one- or two-weeks after harvesting. This was done to determine if allowing regeneration of leaf tissue following harvest would increase N use efficiency.

Bermudagrass forage was harvested each year on an approximately monthly basis during the growing season based on accumulated forage growth. In 2007, the third harvest was delayed for approximately 60 days due to extreme drought that limited regrowth following the second harvest. There was no significant difference in yield among the three N sources in either 2006 or 2007, indicating that the urease inhibitor reduced ammonia volatilization losses of urea, making the urea sources equivalent to ammonium nitrate in N-supplying ability (Table 1). There was also no significant difference in yield among the three fertilization timing treatments, which means that a producer could apply topdress N to bermudagrass anytime within two weeks of harvest without reducing yield.

| N Source | Total Yield - 2006 Season | Total Yield – 2007 Season |
|---|---|---|
| | Yield/lb per acre | |
| **Ammonium Nitrate** | 12441 | 5886 |
| **SuperU** | 11940 | 5514 |
| **Agrotain** | 12187 | 5638 |
| **LSD (0.05)** | ns | ns |

Table 1. Yield in response to N source 2006 and 2007 with severe drought conditions in 2007.

Nitrate accumulation was not affected by N application timing. Nitrate accumulation was greatest in the July harvest in 2006 with plots fertilized with ammonium nitrate accumulating an average of 1,450 ppm, which is in the safe range for ruminant livestock. Very little nitrate was accumulated in the second harvest forage in 2007 due to extreme drought. There was so little soil moisture available during this period that surface applied N was not incorporated into the root zone.

Forage from plots fertilized with urea + NBPT, or Super U accumulated less nitrate than those treated with ammonium nitrate averaged over the two years of the study (Fig. 2). There was no significant yield increase beyond the 400 lbs N/acre rate (Fig. 3); however, nitrate accumulation in forage increased at each N rate from 200 to 600 lbs N/acre (Fig. 4), but all levels were clearly in the safe range. High N fertilization and slower plant growth are primary reasons for nitrate accumulation, but even with 600 lb N/A we did not observe excessive accumulation in either year of this experiment. When available soil N in the nitrate form exceeds what the plant can effectively convert into protein, plants accumulate the nitrate and store it in a water soluble form. Normally, drought conditions would result in high nitrates with high N application rates, but the severe drought of 2007 apparently did not allow enough growth for nitrate uptake.

In conclusion, there appears to be no yield benefit to using more than 400 lbs N/acre annually to fertilize bermudagrass hay in Tennessee. As long as topdress N fertilizer is applied within two weeks following harvest, these results suggest that the potential for nitrate accumulation or reduction in yield is reduced, but more research needs to be conducted to confirm these findings . Producers are encouraged to check nitrate levels in warm season grass pastures or hay during drought, after frost, and when using high N application rates.

**Figure 2. N source influence on nitrate accumulation in bermudagrass forage.**

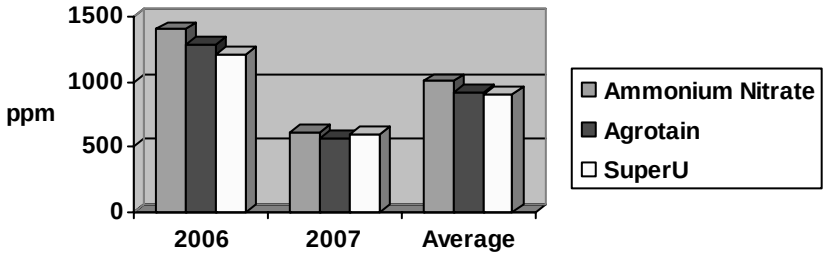



**Figure 3. Bermudagrass yield response to N application rate.**

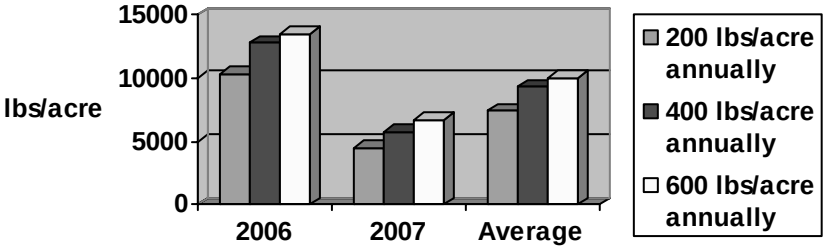
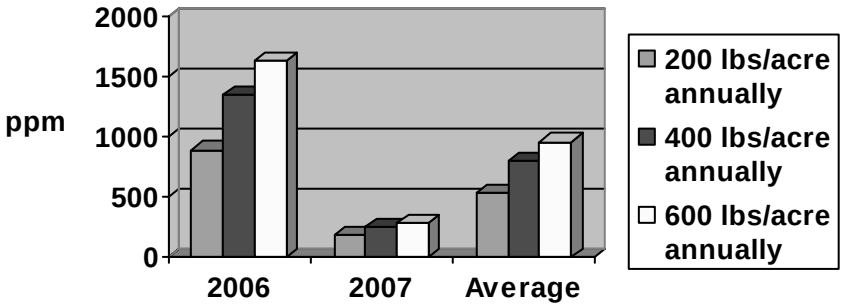



**Figure 4. Nitrate accumulation response to application rate**




**Nitrate Levels and Feeding Options.**

| Nitrate ($NO_3$) in dry matter | | Feeding Instructions |
|---|---|---|
| 0.0 – 0.44% | 0 – 4,400 ppm | Safe to Feed* |
| 0.44 – 0.88% | 4,400 – 8,800 ppm | Limit to 50% of total dry ration for pregnant animals. |
| 0.88 – 1.50% | 8,800 – 15,000 ppm | Limit to 25% of total dry ration. Avoid feeding pregnant animals. |
| Over 1.50% | Over 15,000 ppm | Toxic. Do not feed. |

*assumes sufficient vitamin A and no non-protein nitrogen supplement in the overall feed ration.

# Pre-Graze Mowing of Tall Fescue Pasture

*By T.M. Smith With D.J. Barker and M.R. Anderson*
*The Ohio State University*

*This article is one of a series that will appear from participants in the 2008 AFGC Emerging Scientist Competition. Their participation was made possible through the generous support of CSREES-USDA, which sponsored the 2008 competition.*

Tall fescue is a cool season perennial grass that is well adapted and persistent in Ohio and Kentucky and surrounding states. Fescue matures in late May and early June and becomes very coarse. It is known for it's symbiotic relationship with a fungal endophyte, which enhances the plant's highly desirable characteristics of persistence, drought and grazing tolerance, but also limits the usefulness of tall fescue as a forage plant in the pasture. The fungal endophyte produces toxic alkaloids and as the plant matures, the alkaloid concentration increases, especially in the seedheads. This increase in alkaloid concentration leads to decreased intake by livestock as well as other symptoms that are referred to as fescue toxicity. Therefore, livestock producers are met with the challenge of managing tall fescue to reduce toxicity symptoms. Mowing of summer fescue pasture is often used to remove seedheads, thereby improving forage quality and reducing alkaloid levels. However, the benefit for improved pasture utilization by mowing prior to grazing is uncertain. The objective of this study was to investigate the effect of mowing pasture prior to grazing on total forage utilization in mature tall fescue pasture.

The study was conducted in July, 2007 on mature tall fescue pasture (80%+ tall fescue). Two treatments were imposed and randomly allotted to plots (mowed, or unmowed). The mowing treatment used a sickle-type mower conditioner and livestock were allowed to begin grazing immediately following mowing. The mowing height was four inches. Plots were grazed by sheep, cattle, or goats. Pastures were divided into 0.25 acre paddocks, which were grazed two days each, with the mowing treatment randomly assigned in a randomized complete block design. Pre- and post-graze samples were taken from the "above-mower-height" and the "below-mower-height" for both mowed and un-mowed treatments and then separated into four fractions (green stem, dead stem, green leaf, dead leaf) to determine sward composition and fraction consumed by livestock. Three quadrat samples were taken from each plot, pre- and post-grazing, and above and below the mowing height (four inches). Samples were dried at 60ºC for 48 hours. The sheep and goat plots were grazed in succession, with the sheep grazing first, and then the goats grazing what remained. The cattle grazed a completely different set of plots than the sheep and goats. The cattle pasture had three replications (six plots) and sheep/goat pasture had four replications (eight plots). Statistical analysis was performed using a completely randomized design and the proc GLM procedure in the SAS statistical software package. Each species was analyzed as a separate experiment.

There were no statistical differences in the total amounts of forage consumed (on a dry matter basis) as a result of treatment for any of the three species of livestock (Figure 1), however both cattle and goats showed a trend for decreased intake as a result of the mowing treatment

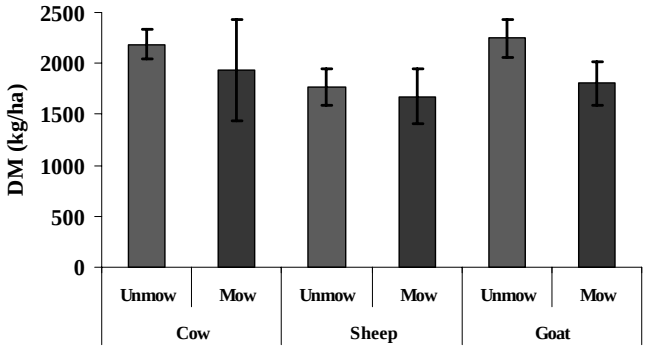



Figure 1: Total dry matter consumed by species and treatment.

Treatment - Cow: P = 0.0891
Treatment - Sheep: P = 0.7524
Treatment Goat: P = 0.1517

(P=0.08 and P=0.15, respectively). When comparing the amount of forage consumed either above or below the four inch mowing height, the sheep showed a trend (P=0.1) to consume more forage below four inches for the mowing treatment, while the goats ate less forage below the four inch height as a result of mowing (Figure 2). The cattle consumed similar amounts of forage above and below the four inch height after mowing. When comparing the composition of the sward before and after cattle grazing, there was no response to treatment (data not shown). A comparison of the sward compositions for the sheep experiment showed that the there was 18% more dead leaf in the sward after grazing than before and 31% more green stem before grazing than after, indicating that the sheep preferred to eat green leaf and green stem more than dead leaf (data not shown). There were no interactions between grazing and treatment. Sward composition comparisons for the goats reveal a 22% increase in dead stem for the mowing treatment. There was also an increase of 19% in dead stem after grazing compared to before grazing, indicating decreased consumption of dead material and proportional increase in green material consumption by goats. Similar to the sheep experiment, there were no interactions between grazing and treatment (data not shown).

Pre-Graze Mowing
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# AFGC Corporate Members

AFGC established its Corporate Membership Program to provide an opportunity for the corporate community to benefit from, and contribute to the association. Through the generous support of the corporate community, AFGC is able to develop programs to support the membership while maintaining a competitive dues structure. Platinum and Gold Corporate Members receive business card listings in *The Forage Leader* in recognition of their support. Details on all Corporate Members are available to members by logging into the AFGC web site and selecting the Corporate Members search from the AFGC Easy Search page.

### Platinum Corporate Members

Grassland Oregon, Inc.
Phone: 503.566.9900
Web: http://www.sucraseed.com

K-Line Irrigation North America
Phone: 269.429.3000
Web: http://www.k-linena.com

Pennington Seed, Inc.
Phone: 706.474.2801
Web: http://www.penningtonseed.com



### Gold Corporate Members

DLF International Seeds
http://www.dlfis.com

Pioneer Hi-Bred International, Inc.
http://www.pioneer.com

Syngenta Seeds/NK Brand Alfalfas
http://www.nk-us.com



### Silver, Bronze & Copper Corporate Members

Ampac Seed Co.
Bamert Seed Co
Cal/West Seeds
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Continued From Page 8

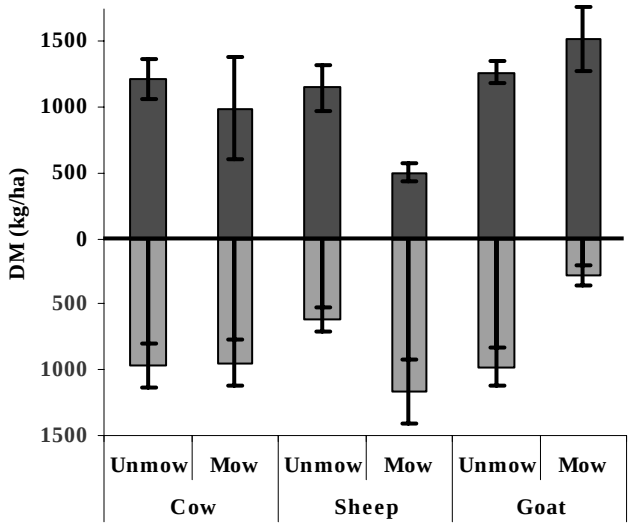



Figure 2: Dry matter forage consumption above and below the four inch mowing height by species and treatment.

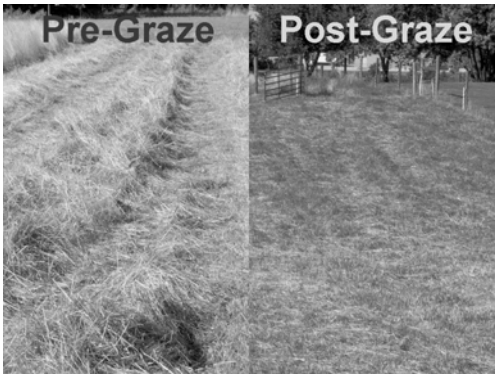
Consumption*Location - Cow: P = 0.8293
Consumption*Location - Sheep: P = 0.1121
Consumption*Location - Goat: P = 0.2030

## About Our Sponsor

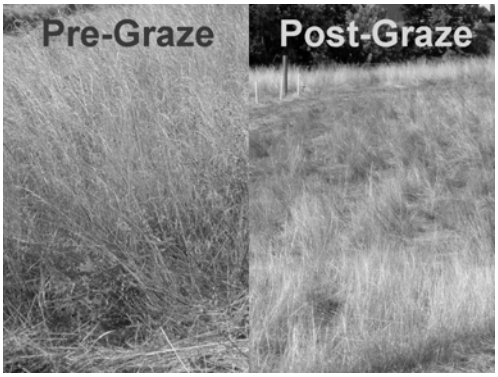
USDA's Cooperative State Research, Education, and Extension Service (CSREES) supports research, education and extension programs in the Land-Grant University System and other partner organizations through federal funding and leadership. CSREES provides annual funding to land-grant universities and competitively granted funds to researchers in partner organizations. CSREES also helps universities identify and meet research, extension and education priorities in areas of public concern that affect agricultural producers, small business owners, youth and families and others. CSREES sponsored AFGC's 2008 Emerging Scientist Competition, making the publication of papers, like those that appear in this issue, possible. For more information, visit http://www.csrees.usda.gov.

In conclusion, mowing prior to grazing had no statistical difference in regards to total dry matter consumption of tall fescue forage on cattle, sheep, or goats, despite a vivid visual appearance to the contrary (Figure 3). If mowing is already part of the management regime (normally done after grazing), there is no disadvantage of mowing prior to grazing. Therefore, there is no net benefit or drawback to mowing mature tall fescue pasture prior to grazing in terms of animal intake. This study did not measure the subsequent rates of re-growth, and future work will investigate the possibility of longer term effects of mowing prior to grazing on forage production.

Figure 3: Visual appearance of plots pre- and post-grazing by treatment.

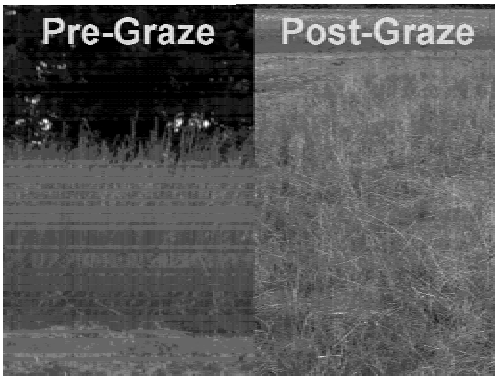



sheep/goat pasture-mowed treatment




sheep/goat pasture-un-mowed treatment


cattle pasture-mowed treatment




cattle pasture-un-mowed treatment

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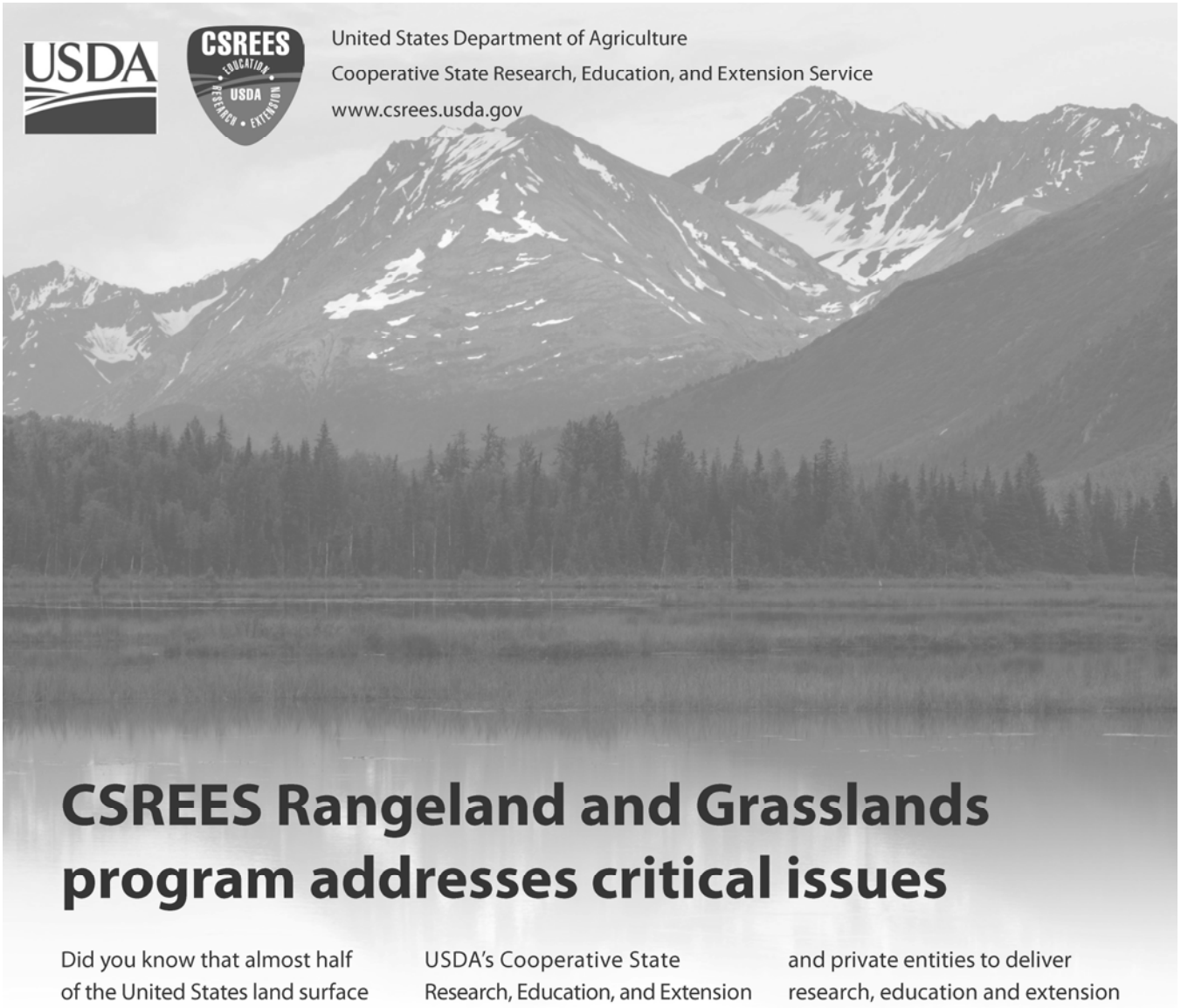

# CSREES Rangeland and Grasslands program addresses critical issues

Did you know that almost half of the United States land surface is made up of grasslands? These economically, socially and ecologically important lands provide significant forage to the farming and ranching industry.

However, grasslands are becoming endangered due to urbanization, wild fires, invasive species, changing land use and technology, climate change and insufficient water. These forces work together to alter vegetation, interrupt hydrologic function, decrease biodiversity and disrupt the flow of ecosystem services.

USDA's Cooperative State Research, Education, and Extension Service (CSREES) seeks to ensure the sustainability of one of our nation's most vital resources. Through research related to water quality and quantity, erosion, habitat needs and prevention of habitat fragmentation, researchers are learning to scientifically evaluate rangelands and grasslands so owners can better understand them and make the appropriate land-use decisions.

CSREES began the Rangelands and Grasslands program in 2007 and partners with USDA, university and other federal, state and private entities to deliver research, education and extension efforts to help reverse current and prevent future grassland losses, while maintaining long-term productivity and value.

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The Forage Leader is published quarterly by the American Forage and Grassland Council. For editorial or sponsorship information, please contact AFGC via mail, phone, fax or e-mail. AFGC, 350 Poplar Avenue, Elmhurst, IL 60126. Telephone 800.944.2342. Fax 630.359.4274. E-mail info@afgc.org.



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