Animal Science E-News

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April 19 'Managing Breeding & Feeding' Field Day at Batesville Station

Mary Hightower, Director of Communication Services

Managing aspects of the breeding and feeding of cattle are the key topics for the April 19 livestock field day at the Livestock and Forestry Station in Batesville.

"We have top speakers from Arkansas and Texas sharing research on cattle breeding tools, improving weight gains and one on the applications and implications of the microbial universe inside your cattle's respiratory and digestive tracts," said Don Hubbell, director of the Batesville Station.

The event opens at 10 a.m. There is no cost to attend. For more info, call the Batesville Station at (870) 793-7432. The agenda:

- 10:10 a.m. – "Castration Contemplations for the Cow-Calf Operation," Dr. John Richeson, West Texas A&M
- 10:50 a.m. – "Current Tools in Beef Cattle Breeding: What's Worth the Money?" Dr. James Koltes, U of A System Division of Agriculture
- 11:30 a.m. – "Improving Weight Gain of Growing Cattle on Fescue Pasture," Dr. Shane Gadberry, U of A System Division of Agriculture
- 12:15 p.m. – LUNCH
- 12:50 p.m. – "The Optimal Mineral Program for Your Cow Herd," Dr. Beth Kegley, U of A System Division of Agriculture
- 1:30 p.m. – "Using Rotational Grazing to Manage Alfalfa Pastures," Dr. Paul Beck, U of A System Division of Agriculture
- 2:10 p.m. – "Bovine Respiratory and GI-Tract Microbiome: Applications in Animal Health and Growth," Jiangchao Zhao, U of A System Division of Agriculture
- 3 p.m. – Adjourn

For more information on livestock management, contact your county extension office or visit www.uaex.edu. ■

U of A Animal Science Hosts 2016 State Beef Quiz Bowl

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The University of Arkansas Department of Animal Science hosted the annual statewide Beef Quiz Bowl Feb. 26 in Fayetteville at the Pauline Whitaker Animal Science Center. This program is funded by the Arkansas Beef Council through revenue collected from the Beef Check-Off.

This Cooperative Extension activity provides students in Arkansas an incentive to learn more about management, food safety, forage nutrition, quality assurance and the end beef product. Educational material was provided for county extension agents and vocational agriculture instructors to further the learning process beyond that of their beef 4-H and FFA projects. *(Continued, page 2)*

Champion Team: Benton County 4-H (left to right) Johnny Gunsaulis, coach, Josh Kay, Kimberly Kay, Alex Joyce, Alisun Watson, and Travis Justice, executive director, Arkansas Beef Council.

U of A
DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

What Is Soil Health?

John Jennings, Professor - Forages

The term "soil health" is in all agricultural media these days, but there seems to be no standard for what that term means. Healthy soil is important for forage production, but how do you know if your soil is "healthy"? Many that promote this concept imply that soil health and forage productivity can be improved dramatically just by grazing in a certain manner. Claims are that by doing nothing more than trampling old mature forage into the soil surface, soil microbes will abound and will therefore unlock soil-bound nutrients previously unavailable to plants. Soil organic matter will also skyrocket, creating a virtual cornucopia of high-quality forage. Use of fertilizer and herbicide is scorned due to unfounded claims that these are unnatural and destroy soil life. Advocates of natural systems talk about how diverse forage communities evolved to support grazing herbivores and if we reduce inputs and graze properly, then soil health will increase and productivity will increase as well. The most irksome point of this reasoning is that no data are ever presented to support the case. No soil tests, no before and after forage production and no organic matter tests are offered, but just lots of circumstantial claims. What is not discussed is that fenced, grazed pastures are not the truly natural systems as is being presented. When man erected fences and maintained livestock year-round on a piece of property, the production demands on that soil/forage system changed dramatically from the times when bison roamed freely on the plains. Remember that economics and land ownership were not involved during natural development of the prairies.

Soil health assessments should include measurements of fertility status and organic matter levels. Research has shown that when these factors are optimum, then forage growth improves. The point is that to improve something you must measure where you are starting. Soil tests give you a starting point. Soil tests are free through the University of Arkansas and provide information on soil pH, P, K and other major and minor minerals. Soil organic matter can be tested for a small cost. This basic information gives an idea of "how much gas is in the tank" to promote healthy forage growth. Healthy forages promote healthy soil and vise-versa. It's hard to dramatically improve production on low-fertility soil. A case-in-point is the 300 Day Grazing Project at the Batesville Research Center. We managed a herd of fall-calving cows to achieve a grazing season of 300 days. A first step was to soil test all pastures for a fertility inventory. Fertility deficiencies were addressed as budget allowed and clover interseeding began in fescue pastures. As soil fertility improved, clover stands and forage quality improved, and spring N fertilizer need dropped. Rotational grazing helped maintain soil fertility through nutrient cycling. After obtaining excellent clover stands, no N fertilizer was needed in spring. N fertilizer was only applied in a targeted manner to portions of bermudagrass for summer grazing and to selected fescue pastures for winter stockpiling. Forage productivity improved over the entire growing season. Grazing seasons over 300 days were achieved every year except 2012, and most folks remember that year.

Grazing animals do not improve soil fertility – they merely recycle nutrients already in place. The only way to truly improve soil fertility is to import nutrients through fertilizer, hay imported from off-farm, supplemental feed, mineral, poultry litter, etc. Research has shown this works. Our projects have shown good soil fertility improvements just by feeding hay in low fertility areas. Feed the soil by improving fertility and it feeds your forage that feeds your livestock that recycle most of the nutrients back to the soil. Relying only on a "grazing of the month" approach to improve fertility is like running in circles. You do a lot of moving, but always end up in the same place. Excess doesn't lead to success. Use the tools and technology available. Measure where you are starting to create a plan to reach your goal. That can be summed up by a quote from Yogi Berra "If you don't know where you are going you might wind up someplace else". ■

Beef Quiz Bowl *(Cont.)*

Students were tested on many levels of question difficulty. The questions were compiled by our Animal Science faculty and judging team students and covered all aspects of beef production. Four students made up each team, and these teams competed in a double elimination tournament.

Second Place Team: Greene County 4-H (left to right) Paula Norman, coach, Katie Reinhart, Callie Newsom,Travis Justice, executive director, Arkansas Beef Council, Layne Kelley, Samuel Harris, and Debbie Copeland, coach.

Third Place Team: Faulkner County 4-H (left to right) Steve Mohser, coach, Colte Mohser, Rachel Harris, Rebecca Thomas, coach, Travis Justice, executive director, Arkansas Beef Council, Allyson Sellers, and Austin Cook.

Twenty-eight teams, 112 students plus 4-H agents, ag instructors and parents attended this event. Preparation for this contest allowed students to sharpen their knowledge about beef cattle production. Additionally, students improved communication, goal setting, critical thinking and team building skills and ultimately enhanced their interest in beef cattle. This program has a great impact on educating students and encouraging a broadened perspective about their role in beef production, food safety and consumer acceptance. These efforts will be continued by the University of Arkansas Animal Science Department, Cooperative Extension Service, Arkansas Beef Council and agriculture teachers across the state. ■

Spring and Summer 2016 Equine Events

Mark Russell, Assistant Professor - Equine

Mark these 4-H horse events on your calendar.

State 4-H Roping

- Summer Horse Camp: June 6-9, 2016, Diamond TR Ranch/4-H Center

District Shows

- Northwest Ozark District Show: June 4, Pauline Whitaker Arena, Fayetteville
- Southwest District Show: June 10, Saline County Fairgrounds
- Delta District Show: June 14, White County Fairgrounds
- Central Ozark District Show: June 21, White County Fairgrounds

State Show, July 12-15, 2016, White County Fairgrounds

Southern Regionals, Perry, Georgia, July 26-31

Comparison of Spring Oats, Winter Oats and Winter Wheat for Fall Forage Production

Kenny Simon, Program Associate - Forages, Dirk Philipp, Assistant Professor - Forages, John Jennings, Professor - Forages, and Robert Rhein, Farm Foreman

Providing adequate high-quality forage for grazing in late October through December is difficult to accomplish with traditional winter annuals such as wheat, rye or ryegrass. Spring oats can extend the grazing season in fall when other forages are less productive, thereby reducing the dependence on stored or purchased feed. Spring oats are a winter annual crop. They grow quickly and provide palatable and nutritious forage for livestock. Demonstration results show that spring (Jerry) oats planted in early September produced adequate forage for grazing by late October.

A replicated research trial was conducted at the University of Arkansas Watershed Research and Education Center (WREC) in Fayetteville to determine influence of planting date on late fall dry matter yield of a spring oat (Jerry), a winter oat (Bob) and a winter wheat (VNS) planted in a prepared seedbed. Other objectives of the study were to compare forage nutritive quality and cold hardiness of fall-planted Jerry oats, Bob oats and VNS winter wheat.

The small grains were no-till planted on a well-firmed, prepared seedbed on August 31, September 22 and October 13. Prior to planting, the experiment plots were disked then culti-packed. The seeding rate was 115 pounds per acre. Pre-formulated NPK fertilizer was applied to each plot immediately after planting, using soil test reports and recommendation for winter annual forage production.

Stand observations were made throughout the growing season. Plots planted on August 31 and September 22 were slower to establish than those planted on October 13. This is likely due to above-average temperatures coupled with below-average rainfall during the month of September. Plots planted on October 13 established quickly but had limited fall forage production.

All plots were harvested on December 2. Plots planted on August 31 and September 22 produced more yield by harvest time than those planted on October 13 (Table 1). Jerry oats produced significantly more DM yield than Bob oats and VNS wheat for each planting. Bob oats produced significantly more DM yield than VNS wheat for the August 31 planting but not the September 21 or the October 13 planting. VNS wheat produced limited DM yield regardless of planting date. At least 900 to 1,200 pounds of forage DM per acre should be available before turn-in. Therefore, only Jerry oats and Bob oats planted on August 31 produced enough forage for late fall grazing.

Forage quality samples were collected at harvest. Forage nutritive quality for the small grains was excellent (Table 2). Forage quality tended to decline with plant maturity. Plots planted on August 31 had lower CP and TDN than those planted on September 22 and October 13. However, the forage quality exceeded nutrient requirements of all classifications of livestock. Plots planted on October 13 had the highest CP and TDN.

Table 1: Influence of planting date on late fall dry matter yield of Jerry oat, Bob oat and VNS wheat

Planting Date	Jerry oats	Bob oats	VNS Wheat
August 31	1905	1485	995
September 22	1267	525	550
October 13	446	140	234

Winter injury was also measured at harvest. Jerry oats had significant winter injury regardless of planting date. Winter injury on Bob oats and VNS wheat was minor. However, Bob oats and VNS wheat planted on August 31 had more winter injury than those planted on September 22 and October 13. VNS wheat planted in October showed no signs of winter injury.

Early-planted Jerry oats offer high-quality forage for grazing in late October through December. Early planting is a must to maximize yield potential. Delaying planting by three and six weeks reduced yield by 50 percent and 75 percent, respectively, compared to early planting. One potential disadvantage of oats is the lack of cold hardiness. Producers should plan on utilizing the forage by January 1. While the VNS wheat had limited DM yield at harvest, it will produce most of its forage DM the following spring. ■

Table 2: Forage nutritive quality of Jerry oat, Bob oat and VNS wheat

	Jerry oats		Bob oats		VNS wheat	
Planting Date	CP (%)	TDN (%)	CP (%)	TDN (%)	CP (%)	TDN (%)
August 31	17.1	66.8	19.6	72.7	21.6	72.9
September 22	23.3	74.3	29.8	70.5	27.0	80.3
October 13	28.9	74.7	30.9	83.2	30.4	77.7

Three-Year Results of Ouachita District Bermudagrass Variety Demonstration

The Ouachita District County Extension Agriculture Agents with Paul Beck, Professor, John Jennings, Professor, Vic Ford, Southwest Research and Extension Center Director, and Rick Cartwright, Associate Director - Agriculture and Natural Resources

A small plot bermudagrass variety demonstration was established by the Ouachita District county extension agents in the spring of 2012. In this demonstration located at the University of Arkansas Southwest Research and Extension Center, we established 11 bermudagrass varieties that are fairly common to our area in four 5' x 20' plots per variety. The varieties that were established included five hybrids (Genesis, Vaughn's #1, Ozark, Tifton 44 and Midland 99) and six seeded varieties (Mohawk, Cheyenne II, common, Sungrazer, Sungrazer Plus and Wrangler).

The summer of 2012 was an establishment year and no yield or quality data was collected. To date, forage yield has been collected on two dates in 2013 (with supplemental irrigation), three dates in 2014 and four dates in 2015. Plots were fertilized with triple 17 fertilizer (300 pounds per acre rate) in early May of each year supplying 51 pounds of nitrogen, phosphorus and potassium. Additionally, 50 pounds of actual nitrogen was supplied after each harvest. Forage quality was determined for the plots harvested in July and August of 2014 and all four harvests in 2015 (June, July, August and September).

There are several points that are fairly clear from the harvest yields presented in the table at right. With the management in place, the hybrid varieties were tops on the list in total production over the three years, even though in the first year the best of the seeded varieties performed fairly similarly to the best hybrid varieties. In the second year of production, the hybrids Midland 99 and Tifton 44 began to be the most productive with other hybrids lagging slightly behind, while the seeded varieties were substantially lower in production. These two points illustrate that for hybrid varieties to show their true benefit and potential, they must be managed intensively with high rates of fertility and frequent cutting intervals, and establishment may not be as quick as with seeded varieties. Over the three years, Tifton 44 produced 25 percent more than common bermudagrass, while the hybrids Midland 99 and Ozark produced 15 percent more than common. The selected seeded varieties (Sungrazer, Sungrazer Plus, Mohawk, Cheyenne II and Wrangler) were similar or slightly less productive than common. The final point to consider is that the lowest-performing variety is actually an excellent variety for where it was developed. Wrangler (a seeded variety) was developed by Oklahoma State University and is very productive and cold tolerant in Oklahoma, Kansas and Missouri yet does not seem to be a very good variety for our region in southern Arkansas.

Any of the varieties will provide excellent quality hay if managed with adequate fertility and harvested at the proper timing.

The forage quality analysis indicates that on the average all varieties would produce hay that is higher in nutritive value (crude protein and TDN) than required by a lactating cow. Our highest-yielding variety (Tifton 44) was actually also our lowest in both crude protein (11.7 percent) and total digestible nutrients (TDN, 60 percent). Several of the seeded varieties produced forage that was over 13 percent crude protein and 63 percent TDN, which is excellent hay quality for this region. Any of the varieties will provide excellent quality hay if managed with adequate fertility and harvested at the proper timing.

This bermudagrass variety demonstration is managed and all the labor is supplied by the county extension agriculture agents of the Ouachita District of southwest Arkansas. It is a huge undertaking with a tremendous amount of time and energy involved, but the lessons learned and information collected are valuable to our clients, the forage producers of southwest Arkansas. ■

Dry matter yields of Ouachita District bermudagrass plots for growing seasons 2013 through 2015

Variety	Average Total Seasonal Yield	Rank	% Crude Protein	% Total Digestible Nutrients
Tifton 44	5,855	1	11.7	60.0
Midland 99	5,463	2	12.7	62.4
Ozark	5,432	3	12.6	62.3
Vaughan's #1	5,159	4	13.1	63.2
Genesis	4,820	5	13.7	64.7
Common	4,722	6	13.4	63.7
Sungrazer Plus	4,696	7	13.3	62.7
Sungrazer	4,560	8	13.7	63.4
Mohawk	4,488	9	13.6	63.2
Cheyenne II	4,486	10	13.4	63.0
Wrangler	3,986	11	14.5	64.5