



Our Forages, Our State, Our Future: Looking Back and Foraging Ahead

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Visit us at: <http://mississippiforages.com>

In this article, I have decided to take a different approach and highlight some of the changes and challenges that the MSU Forage Program has faced in the last 5 years. When I arrived to Mississippi State in the summer of 2007, I saw a vast number of opportunities to develop an Extension and Research Program that will help the clientele and state holders receive the necessary responses to make their management and economic sustainability more in tune with the rest of the forage industry in the region. The intent of this article is to provide an overview of what has been happening in the MSU Forage Program.

Forages include both native and introduced species that provide approximately 75% of the nutrients consumed by livestock including: beef cattle, dairy cattle, sheep, goats, and horses. Forages such as bermudagrass, bahiagrass, dallisgrass, small grains (wheat, oats and rye), tall fescue, summer annual grasses (sorghums, sudangrass, crabgrass) and annual and perennial clovers are just some of the forage utilized in Mississippi. Forages also enhance water quality, serve as sinks for the disposal of agricultural and municipal wastes and can be renewable sources of energy. They provide food and habitat for wildlife and are used to reclaim disturbed lands and public right-of-ways. Mississippi's forage producers utilize over 2.2 million acres of private land for grazing, hay production, wildlife habitats and conservation. Forage systems are used to sustain grazing systems for 900,000 beef cattle and over 200,000 horses in the state. They contribute more than \$1.7 million annually to the Mississippi's economy and provide direct income for more than 40,000 producers.

Extension Programs

Extension activities provide information to a diverse clientele and support local county programs. A number of educational extension programs are available to producers with respect to forage production and sustainability. These programs and activities include county forage educational demonstrations and field days, producer educational meetings, newsletters, radio programs, informational fact sheets and publications, the Mississippi grazing school, focus programs, NRCS personnel and county agent training, pasture evaluation, pasture walks, development of grazing plans and the development of decision support tools (hay, fertilizer, stocking rate, forage quality, grazing capacity and seeding rate calculators). The web-based Mississippi Hay Directory allows Mississippi forage producers to share information about hay availability and marketing. The Mississippi Forages website (<http://mississippiforages.com>) in MSUCares.com also provides producers with information about establishment, fertilization, and grazing strategies for different forage crops.

Forage Variety Testing

Year-round variety testing is done across four locations to evaluate the performance of 12 species including annual ryegrass, tall fescue, forage sorghums, teffgrass, crabgrass, bahiagrass, bermudagrass, alfalfa (conventional and RR), small grains, annual and perennial clovers, forage



mixes, brassicas, native grasses and bioenergy crops. Forage variety testing is conducted at Holly Springs, Starkville, Newton and Poplarville. Data collected in the different variety trials is published yearly in forage variety trial bulletins and this information can be used by county extension personnel as well as producers to determine which varieties might be more suitable for their environment. Information related to forage variety testing can be found at <http://msucare.com/> or by contacting your local county extension office.



Research and Demonstrations

MSU Forage Research is conducted on agricultural topics pertinent to the diverse Mississippi's ecosystem and the southern U.S. The research effort of the MSU forage team uses innovative science to identify problems, provide solutions, and develop technologies that benefit the forage-livestock community across the state. The main goal is to improve the economic and environmental status of the state's forage and grassland agriculture. The degree to which research programs are developed is dependent upon adapted forage species, specific livestock enterprise, soil types, geographic areas, management skills, time, and economic feasibility. MSU Forage research program focuses on five core areas: (1) variety testing, (2) nutrient management and soil quality, (3) hay production management, (4) forage quality and evaluation, and (5) grazing management strategies. Currently, MSU Forage program has approximately 40 research programs on different stages of development, but because of space limitation, I will highlight a few of them.



Mississippi State University Forage Extension and Research Team
Front (left to right): Jeremy Duckworth (Research Associate), Isaac Picket (undergraduate student), Daniel Moore (undergraduate student), Dr. David Lang (Research Professor).
Back (left to right): Dr. Rocky Lemus (Extension Forage Specialist), Jesse Morrison (PhD graduate student), Corey Davis (former undergraduate student), Derek McCain (undergraduate student), Josh White (Research Associate, Variety Testing), and Dr. John Reed (USDA-ARS).
Other members: Dr. Bisoonat Macoon (Assistant Research Professor), Dr. Brian Baldwin (Professor, Plant Breeding and Bioenergy Crops) and Brett Rushing (Research Associate, Plant Breeding and Bioenergy Crops).

Suitability of Alfalfa Varieties in Mississippi

There has not been any work done at MSU since the early 1980s on alfalfa evaluation. During the last decade new varieties [conventional and Roundup Ready (RR)] has been released to the market with potential for use and adaptability in MS. Twelve conventional alfalfa varieties were established in Starkville, MS on October of 2010 at a seeding rate of 20 lb/ac. Fall dormancy (FD) ranges from group 4 to group 10. There were 5 harvests in a 30-35 day cutting interval in 2011. Average yield per cut was 1849 lb/ac with higher yield in April and lowest yield in September. Total yield production in 2011 ranged from 8,320 to 10,155 lb/ac. Bulldog805 (FD5) and Magnum VI (FD4) were the highest yielding while CW500 (FD5) was the lowest yielding variety. Crude protein ranged from 24 to 28% and ADF from 29 to 39%, respectively. A similar on-farm demonstration is in place in Tylertown, MS and RR varieties were also included. Study will be continued for at least 2 more years to look at persistence.

Multi-state Perennial Peanut Project

This project is conducted in conjunction with 8 different universities in the southern U.S. Eight varieties of perennial peanut are being evaluated at the three locations (Holly Springs, Starkville and Poplarville) as potential forage crops. Perennial peanut can produce high quality forage in the summer and has no bloating effects on livestock. Establishment of perennial peanut is a slow process (~2 yrs) and more data will be made available in the near future.

Nutrient Management: Lime and Potassium (K)

Over 70% of forage producers in Mississippi do not soil test, but yet we observe large quantities of fertilizer being applied. This poor management practice causes major losses in fertilizer use, forage production and forage quality. This study focuses on following every day forage producer's practices. The response of six hybrid bermudagrasses were evaluated on a soil with a pH of 5.5 and low K levels. All plots received 200 lb N/ac/yr in four split applications (50 lb N/ac) during the first 4 cuttings. Along with N, some plots received lime, potash or a combination of both. Plots were harvested on a 30 to 35 days cutting interval. Preliminary data collected in 2010 and 2011 indicated that yields and forage quality increased when lime, potash or both were applied along with N. Soils that received lime averaged a soil pH of 6.0 in 2012. Potassium levels did not improve beyond the medium level due to biomass removal. Economic analysis

indicated that there was very little difference in cost per pound of forage produced because yield increases and improvement of forage quality compensated for the extra cost of the lime and potash application.



Fertilizer Use Efficiency

Increase on fertilizer prices during the last decade and regulation of ammonium nitrate has raised questions about fertilizer sources. Due to the combination of high temperatures and humidity during the summer months, fertilizer sources such as urea or urea ammonium nitrate solution (28-32%) might not be the best choice for mid-summer applications. A study was initiated in 2010 to compare the effects of no nitrogen control (C), ammonium nitrate (AN), urea (U) and urea ammonium sulfate (UAS) on bermudagrass forage production. Nitrogen was applied at a rate 200 lb N/ac/yr in four split applications on 50 lb N/ac. All plots received 2 ton lime/ac and 120 lb K/ac. Potash was applied in 50/50 split application at the beginning of the season and after the second harvest. Preliminary data collected in 2010 and 2011 indicated that AN had the highest forage production when compared with U or UAS. There is no difference in forage production between U and UAS. Yield production with U or UAS was 12% lower than AN. Urea and UAN solution might have better utilization in early spring or late fall when temperatures are less conducive to nitrogen volatilization.

Inter-seeding of bermudagrass or bahiagrass with annual ryegrass

Many producers tend to add bahiagrass or bermudagrass when planting annual ryegrass. A study was conducted from October 2011 to June 2012. Annual ryegrass was seeded at 15 or 25 lb/ac. Pensacola bahiagrass was seeded into the annual ryegrass plot at a seeding rate of 20 or 25 lb/ac in October, December, February and April. Bermudagrass was also seeded at 10 or 15 lb/ac following the same protocol used for the bahiagrass. Preliminary data indicated very little germination (<0.5%). This is not a recommended practice because moisture and temperatures above 50 degrees in late fall will allow some plants to germinate and be killed by subsequent frost. Inter-seeding both species in February and April was also detrimental due to main factors: (1) annual ryegrass becomes very competitive from February to late April making it difficult for small seeds to germinate and (2) spring time is usually wet which increases the chances for seed spoilage due to the combination of wet and cool conditions. This is not a recommended practice or economically advantageous.

Grazing beef heifers in annual ryegrass and clover mixtures

Due to rapidly increasing fertilizer prices, there has been a tremendous interest in planting and grazing clovers with winter annuals (ryegrass and small grains). In 2010, livestock was grazed in paddocks containing Marshall annual ryegrass only or in paddocks that had a combination of ryegrass + arrowleaf clover (R+AC) or ryegrass + berseem clover (R+BC). Paddocks with annual ryegrass only were fertilized with commercial nitrogen. Beef steers grazing a mixture of 'Marshall' ryegrass with arrowleaf or crimson clover had higher animal daily gains, but means were not significantly different. Both systems, R+AC and R+BC produced higher gain per acre when compared to ryegrass only. Utilization rates were higher with ryegrass only early in the season, but greater with clover mixture later in the season. The observed patterns could be related to more palatable ryegrass early in the season when clovers were not actively growing. On the other hand, clovers are more active in the spring while ryegrass is becoming more mature. Having clovers in the pasture might have contributed to more palatable forage.

Our Forages, Our Future

The MSU forage program continues to grow and making sure that recommendations are made to meet the demands of Mississippi's forage and livestock industry. The Forage Program has been successful on obtaining external funding to provide quick responses to the clientele. This has been possible due to the great partnership that the forage program has developed with different venues including the seed industry, herbicide companies, fertilizer products and livestock nutrition enterprises. I hope producers will continue taking advantage of the programs that we offer through field days, grazing school, cattlemen's meetings, radio programs and newsletters, because the future of the livestock industry depends today more than ever on forage production and utilization. Mississippi is a blessed state that can grow forages year-round and it is up to the clientele that we serve to take advantage of the information that is available and put it into practice. No every forage or livestock producer will be able to follow every practice, but my goal is that everyone will be able to take something that is adaptable and economically sound for their operation. **Always remember that forages are the green foundation of a livestock enterprise. Forage producer first and livestock producer second.**

Forages at Mississippi State are an integral part of the Agronomic Crops Program in the Department of Plant and Soil Sciences (<http://www.pss.msstate.edu/>). For more information related to forages please feel free to contact the MSU Forage Program at (662) 325-7718 or RLemus@ext.msstate.edu.

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Warm-season Grass Forage Tour

July 28, 2012

Mississippi State University

Location: Henry H. Leveck Animal Research Farm (South Farm),
Forage Unit
Starkville, MS

Registration: 7:30 A.M.

Tour 8:00 A.M –10:30 A.M



Topics will include:

- ◆ Teffgrass, crabgrass and sorghum variety trials.
- ◆ Fertility demonstrations.
- ◆ Forage Quality.
- ◆ Bermudagrass and bahiagrass trials.

This is a free event, but early registration is encouraged.

For more information contact Ms. Julie White,
Dr. Rocky Lemus, or visit [http://msucares.com/crops/
forages/foragetour/reg_form.html](http://msucares.com/crops/forages/foragetour/reg_form.html)

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