Forage News

MISSISSIPPI STATE UNIVERSITY EXTENSION SERVICE

Hay Production and Management Program

Volume 6, Issue 7

Rocky Lemus
Extension Forage Specialist

July 2013

Visit us at: **http://mississippiforages.com**

Hay is a stored feed widely used during winter feeding when grazeable forages are not available. In Mississippi, approximately 28% of the total forage production is harvested for hay. There are approximately 700,000 acres in hay production. Most of the hay production in dominated by bahiagrass and bermudagrass. Cow-calf producers, beef cattle stocker operators, dairy producers, and horse produces rely heavily on hay to provide an economical source of animal nutrition. To maintain their operations, producers are constantly striving to improve and balance both the productivity and economic efficiency of the available hay. Several key points to remember in considering the production, storage, feeding, and supplementation of hay include: species, fertility, weed control, hay management and quality evaluation.

Species – Yield and quality of different forages will have an effect on hay quality and production. Good quality forage can be produced from all of the legumes and grasses we grow in Mississippi, if they are harvested at the proper stage. But the "window of opportunity" for good quality forage is narrower for grasses than for legumes, because quality declines more rapidly in grasses. Forage quality usually declines more rapidly in the spring than it does in late summer, so a timely first harvest is important to achieve good quality. New species grass species such as endophye free tall fescue, bahiagrass, and hybrid bermudagrass (**Fig. 1**) have contributed to an increase in acres and tons of hay production in MS in the last 20 years.

Fertility – In the last five years, there have been an increase in the amount of fertilizer applied to pastureland in MS, but the reality is that most of those applications are not based on soil test recommendation, which might lead to less nutrient use efficiency if pH and time of application are not managed correctly. High yields of hay remove large amounts of nutrients. It is recommended that hay fields should be soil tested annually and follow any lime and nutrient applications (nitrogen, phosphate, and potash) recommended by the soil test. Maintaining a proper pH will allow plants increase nutrient uptake and minimize losses. Maintaining soil nutrients in the "medium to high" level will make forages productive and cost effective, and will prevent weed encroachment. Apply N according to how much forage you need to produce for your livestock.

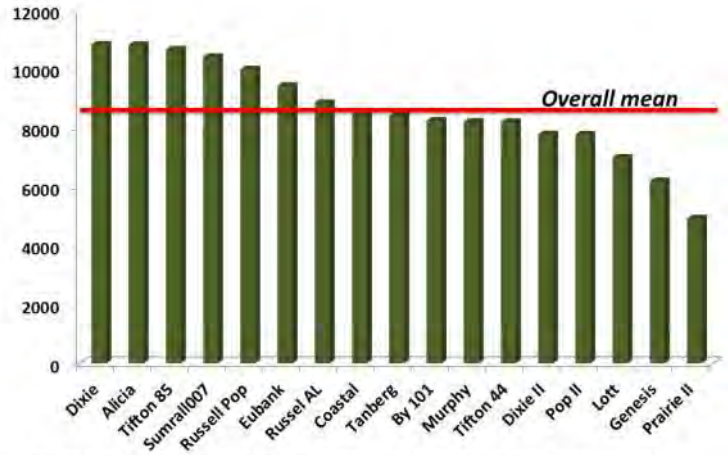

Figure 1. Hybrid bermugrass forage production at Mississippi State (9 year average). Source: Lang, 2013.

Weed Control – Weeds compete with the desirable grasses for sunlight, water, and nutrients and some are toxic to cattle. Hay produced to sell will not have premium quality if it contains weeds. Chemicals are available to control weeds in hay fields, and they should be applied when weeds are young and tender. This will be more economical since young weeds can be sprayed with lower rates of herbicides. Follow rate recommendation as well as haying restrictions.

Hay Management (harvest, conditioning, baling, and storage) – Numerous factors impact the quality of hay actually consumed by livestock, including losses at harvest, bailing, storing, and feeding. Harvesting at proper stage of maturity (boot stage) will maintain quality components (especially protein and sugars). As forages advance from the vegetative to reproductive stage (seed), yields continue to increase, but forage quality deteriorates rapidly (high in fiber, and low in protein, digestibility, and palatability). Most forages might have close to 20% loss in TDN (total digestible nutrients) and 40% loss in protein per ton by delaying harvest of only 10 days past the most desirable maturity stage. This results in a drop in dry matter intake by the livestock resulting in supplementation. Conditioning (crushing the stems) at the time of mowing will improve curing by allowing the stems to dry at nearly the same rates at the leaves. Conditioning has been

Table 1. Hay classification of different forage groups based on forage quality analysis.

		Grass		Grass/Legume		Legume	
Hay Quality	ADF	CP	TDN	CP	TDN	CP	TDN
	%						
Excellent	<30	>11	>64	>16	>64	>21	>64
Very Good	31 – 35	8 – 10	60 – 64	13 – 15	60 – 64	18 – 20	62 – 64
Good	36 – 40	7 – 8	57 – 60	12 – 13	57 – 60	16 – 18	60 – 62
OK for maintenance	41 – 42	5 – 7	55 – 57	9 – 12	55 – 57	14 – 16	56 – 60
Poor, should be avoided	43 – 45	4 – 5	52 – 55	7 – 9	52 – 55	12 -14	52 – 56
Much and bedding only	> 46	<4	<52	<7	<52	<12	< 52

ADF = Acid Detergent Fiber; **CP** = Crude Protein; **TDN** = Total Digestible Nutrients

shown to decrease the drying time of large stemmed plants by almost one day, resulting in less leaf and nutrient loss.

During bailing and storage, moisture content is the worst enemy. It is recommended to harvest and bale when plants are about 18 to 20% moisture. Harvesting at these low moisture levels will reduce losses of the water soluble part of the plant (proteins and sugars). Of the sources for nutrient losses in hay, storage losses can be the greatest potential losses, but can be the most controllable. Improper hay storage can result in losses ranging from 5 to 50%. Store bales in the barn four weeks after bailing to reduce heating (sweating) and prevent fires. If hay is going to be stored outside and not elevated off the ground, consideration should be given to hay wraps to prevent moisture from penetrating deep into the bale. The loss of nutrients and dry matter yield during mechanical harvesting and storage of forages is extremely high. On average, 20 to 40% of the standing forage is lost during hay making. In making dry hay, field losses are usually greater than storage losses.

Quality Evaluation – There is a considerable amount of variation in hay composition even among bales that come from the same lot. A lot of hay is generally considered to be hay from the same cutting, field, species, variety, maturity stage, and curing conditions that have been stored under similar conditions. Collecting a representative hay sample and having it analyzed is absolutely critical for obtaining accurate forage quality information [crude protein (CP), fiber (ADF and NDF), and total digestible nutrients (TDN)]. This quality information can be used to determine the type and amount of supplementation needed for the desired level of animal production (**Table 1**).

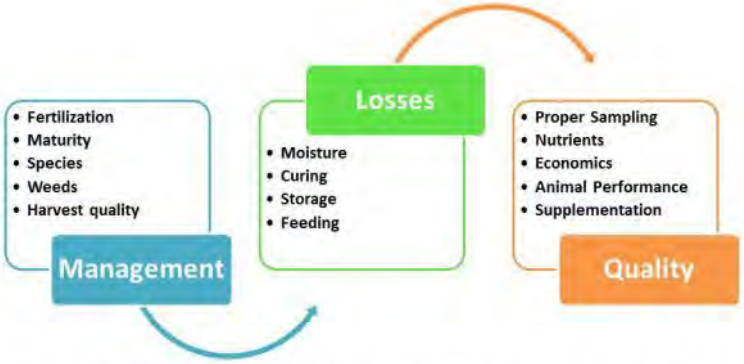

Figure 2. Integration of major components in hay production.

Hay production can be a complicated process. Yet producing high-quality hay should be a goal of each hay producer. Cutting hay at proper stage of maturity and moisture content and providing proper fertilization will allow livestock producers to get higher-quality hay and reduce possible supplementation. Don't Guess, Hay Test! Know what you are feeding and supplement with protein or energy when necessary. Starting with the proper quality forage, storing, and feeding the hay correctly can result in an inexpensive, yet cost-effective winter feed that might increase animal performance. A successful hay production and utilization depends on the integration of harvest management, hay preservation, and quality analysis (**Fig. 2**).

For Upcoming forage related events visit: http://forages.pss.msstate.edu/events.html

Cooperative Extension Service • Mississippi State University
Mississippi State University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation or group affiliation, age, disability, or veteran status.