Harvest Management Strategies

Harvest management practices in forage systems must be specific to the forage species or group of species being used in a given time (figure 56).

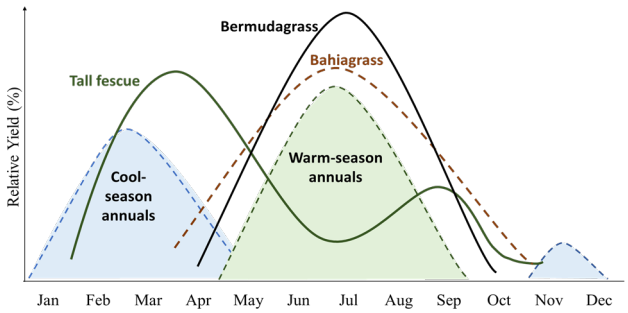

Figure 57. Seasonal forage production distribution representation for major categories in Alabama

Figure 58. Plan management practices to meet your goals.

GRAZING MANAGEMENT PRACTICES

Grazing management plays a crucial role in determining forage production, forage quality, and animal performance in forage-based livestock production systems. When structuring management practices for a system, it is necessary to plan according to your goals to meet requirements of animal categories in terms of diet quality and length of feeding. Other important considerations are management level, budget, and expected return on investment. While there is no one-size-fits-all forage program, there are several concepts and strategies to consider.

Continuous and rotational stocking of pastures are the most-used methods. Under continuous stocking, animals have unrestricted access to one pasture during the entire grazing season. Under rotational stocking, the pasture system is subdivided into paddocks that will alternate between grazing and rest for plant regrowth during the grazing season.

Rotational stocking generally requires a higher level of management and more labor but provides more even distribution of recycled nutrients and improved forage utilization efficiency. The regrowth period can vary to avoid overgrazing or undergrazing and ensure proper carbohydrate (energy) storage replenishment, forage accumulation, and timely harvest.

Creep grazing can be used in cow-calf systems to allow calves access to greater nutritive value forage adjacent to the area in which the dams are grazing. This can be accomplished by installing openings between higher- and lower-quality pastures that are only large enough for calves to pass through, or an electric wire at a height that only calves can go under without being shocked.

Strip grazing consists of using temporary fencing to restrict grazing to an area for a short period of time and subsequently providing access to other strips as needed. This practice is commonly used with stockpiled forages (i.e., tall fescue or bermudagrass) but can also be used to supplement animal diets with higher-quality forage such as winter annuals.

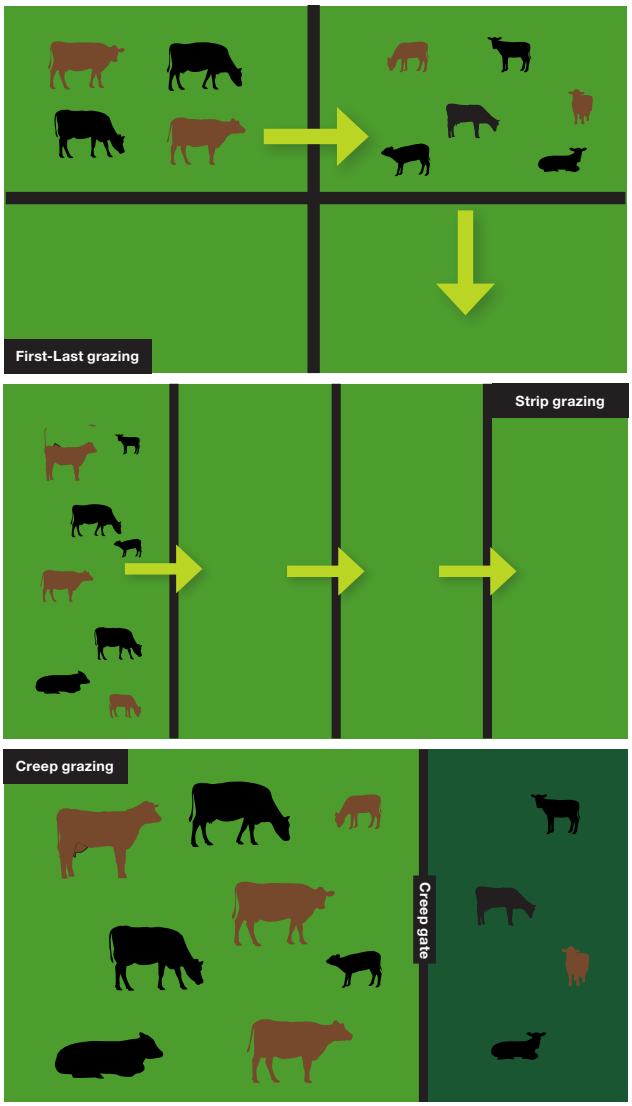

Figure 59. Grazing management methods for first-last grazing (top), strip grazing (middle), and creep grazing (bottom).

First-last grazing consists of allowing animals with higher nutritional requirements to graze a given pasture area first to remove the higher-quality forage and then continue forward in a rotation ahead of a second group. Animals with the lower nutrient needs complete the removal of available forage mass. This can be applied using different animal categories (i.e., stocker calves and mature cows) or different animal species (i.e., cows and goats) to optimize grazing.

Under any management method, it is essential that producers properly understand how to estimate forage mass to adjust stocking rate (see appendices). See table 9 for rotational stocking guidelines.

Table 9. Guidelines for Rotational Stocking

	Target Height (in)		Regrowth Interval (days)
Forage Species	**Begin Grazing**	**End Grazing**	
Legumes			
Alfalfa (for hay)	10-16	3-4	28-35
Alfalfa (for grazing)	10-16	3-4	28-35
Clovers	8-10	3-5	20-35
Perennial Peanut	8-10	4-5	28-42
Sericea Lespedeza	8-15	4-6	20-30
White Clover	8-10	3-5	20-35
Perennial Grasses			
Bahiagrass	10-14	3-4	10-20
Bermudagrass	10-14	4-6	25-30
Dallisgrass	8-10	3-4	7-15
Tall Fescue	8-12	4-8	15-30
Annual Grasses			
Annual Ryegrass	6-12	3-4	20-30
Crabgrass	8-12	3-6	20-30
Pearl Millet	20-24	8-12	20-30
Small Grains	8-12	3-4	15-30
Sorghum/ Sudan hybrids	20-24	8-12	15-20

HAY PRODUCTION AND STORAGE

When producing hay, the following moisture levels are safe for baling: less than 20 percent for small rectangular bales; less than or equal to 18 percent for large round bales; and less than or equal to 16 percent for large rectangular bales. In Alabama, most hay is put up for storage in large round bales.

It is not possible to simultaneously maximize yield and nutritive value, but timely harvest can help to ensure good nutritive value and yield. Table 10 provides recommendations on the stage of hay harvest of various forages. Depending on the forage yield and stand density at harvest, additional processing, such as tedding and raking, are often required to help hay achieve dry-down prior to baling. Emerging technologies with hay binding mechanisms are constantly occurring.

KEY CONCEPTS OF HAY STORAGE

Weathering of hay bales during storage can result in losses of dry matter and forage quality that results in reduced hay intake and compromises animal health and performance. Following are storage guidelines:

- Store hay bales inside a barn or other covered storage structure when possible.
- Select a well-drained site away from trees if hay is stored outside. Although the edge of a field can be a convenient place for storage, storing bales under a tree line reduces exposure to sunlight and promotes moisture holding in bales.
- Store round bales in rows end-to-end in a north-south–facing direction to maximize exposure to sunlight during the day. Leave 18 to 36 inches between rows of bales to permit sunlight and airflow.

Table 10. Recommended Stage of Growth for Harvesting Various Forage Crops

Forage Species	Time of Harvest
Legumes	
Alfalfa	Bud stage for first cutting after establishment; 10% bloom thereafter
Perennial peanut	Height of 10-12 in or every 28-42 days
Sericea lespedeza	Height of 15-18 in
Perennial Grasses	
Bahiagrass	Height of 10-12 in or every 4-5 weeks
Bermudagrass	Height of 14-18 in or every 4-5 weeks
Tall fescue	Boot stage[1]
Annual Grasses	
Annual ryegrass	Boot stage*
Crabgrass	Height of 10-12 in or every 4 weeks
Pearl millet	Height of 24-30 in
Small grains	Boot stage*
Sorghum/sudangrass hybrids	Height of 30-40 in

*Boot stage occurs when the seedhead is present in the flag leaf sheath but has not emerged yet.

- Avoid contact of hay bales with soil; contact results in much bottom spoilage. If hay is stored outside, place bales on rock, railroad crossties, or pallets to avoid contact with soil.
- Reduce risk of fire. Bale at an appropriate moisture range of 10 to 20 percent and observe temperature of bales (figure 60). Monitor internal hay temperature after baling to ensure internal temperatures are below 120 degrees Fahrenheit. The flash point or temperature of concern is between 140 and 150 degrees Fahrenheit. If bales are registering temperatures this high, remove them from the barn or structure.

Figure 60. Hay storage on proper barn construction (top) and hay fire inside barn (bottom).

BALEAGE AND SILAGE PRODUCTION AND STORAGE

In the Southeast, the use of baleage/haylage is increasing. Baleage is a fermented forage product that is stored in the absence of oxygen (anaerobic conditions). Naturally occurring bacteria on the plant surface consume some of the readily available carbohydrates and produce organic acids that help to drop the pH quickly and prevent spoilage and mold growth.

When producing baleage, harvested forage is baled at 40 to 60 percent moisture. This reduces the time needed to bale harvested forage in comparison to hay (1 to 3 days versus 3 to 5 days in drying time); helps maintain forage quality; and reduces losses of dry matter. In terms of harvest recommendations for specific forages, the cutting time and stubble height are similar to those for hay production.

After forage is harvested, the wilting time varies depending on different forage species along with field and weather conditions. The wilting time can vary between 4 hours to a couple of days or more depending on field and weather conditions. Use of a microwave to determine the moisture of the harvested material is a quick test that can be done after cutting (see Appendix B).

When the moisture level is appropriate, the forage can be baled. The bales can be sealed airtight with plastic using a bale wrapper.

Store bales in a dry area. It is recommended that forage analysis similar to that of hay be conducted before feeding. Use a hay probe with a corded drill for extra power to collect samples. After collecting the samples, tape the holes to prevent air and wildlife from getting inside the bales; intrusion causes damage and loss of forage quality.

When a bale is later unwrapped, the feed should smell bread-like/acidic and be free of excessive amounts of mold. Some wrappers seal individual bales separately; inline bale wrappers prepare several bales for storage (figure 61). Forage baled at a higher moisture level than recommended leads to issues with bale spoilage and loss of form during storage (figure 62).

Silage is harvested forage that is ensiled at 65 to 70 percent moisture. Generally the forage is chopped and compacted to eliminate oxygen. In the Southeast, silage is usually stored in an open-style concrete bunker or plastic silage bags (figure 63).

Figure 61. Individual bale wrappers.

Figure 62. Moisture levels at proper range (left) and above proper range (right) impact bale integrity during storage.

Harvest corn for silage at the full dent stage or when the milk line is about one-third down the kernel. The corn should be around 30 to 45 percent dry matter (or 70 to 85 percent moisture). At this stage, the corn ear has begun to fill in and achieve most of its nutritional value without significant leaf and stalk loss. Harvesting earlier than this may result in less desirable fermentation characteristics.

The minimum particle length of corn silage is ½ to ¾ inch. This particle size packs more uniformly in a silo or bunker and can be quite palatable for cattle. Pack silage as uniformly as possible to prevent exposure to oxygen and decrease the opportunity for spoilage. With sorghum, forage-type varieties are usually used for silage because of higher forage dry matter production.

Figure 63. Corn silage stored in an open-style concrete bunker.