



CONSERVATION ENHANCEMENT ACTIVITY

E528A

CONSERVATION STEWARDSHIP PROGRAM

Maintaining quantity and quality of forage for animal health and productivity

CONSERVATION PRACTICE: 528 - Prescribed Grazing

APPLICABLE LAND USE: Pasture; Range; Forest; Associated Ag Land

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Managing the harvest of vegetation with grazing and/or browsing animals for the purposes of maintaining desired plant composition/plant vigor and improving/maintaining quantity and quality of forage for the animals' health and productivity. Follow the recommendations of a qualified professional, as detailed in the documentation and implementation requirements.

Criteria

- A written plan matching the forage quantity and quality produced with the grazing and/or browsing demand will be followed.
- Removal of herbage will be in accordance with site production limitations, rate of plant growth, the physiological needs of forage plants, and the nutritional needs of the animals.
- Deferments will be planned and implemented for critical periods of plant needs (such as post-planting or renovation, severe drought, etc.).
- Manage grazing and/or browsing animals to maintain adequate cover on sensitive areas (such as riparian areas, wetlands, habitats of concern, karst areas, etc.).
- Manage livestock movements based on rate of plant growth, available forage, and allowable utilization target. Develop and follow contingency plans to deal with episodic disturbance events.

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- Plan grazing and/or browsing to match forage quantity and quality goals of the producer within the capability of the resource to respond to management. Plan the intensity, frequency, timing, and/or browsing to reduce animal stress and mortality from toxic and poisonous plants.
- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.
- The qualified professional's provided recommendations (see documentation requirements) will be based on the National Research Council's Nutrient Requirements of Domestic Animals.

Documentation and Implementation Requirements

Participant will:

Prior to implementation, make initial target livestock performance goals and mediation actions taken available to NRCS; including reasons for no action.

Prior to implementation, obtain a written plan for collecting samples, sample analysis, and corresponding management recommendations as developed and provided by a Certified Range Management Consultant, Certified Professional in Range Management, Certified Forage and Grassland Professional, NRCS Technical Service Provider certified for development of a DIA 159, or a non-affiliated consultant with a bachelor or higher level degree in forage agronomy, range science, animal science, animal nutrition or other closely-related plant science discipline or a minimum of three years' experience in grazing lands conservation planning and grazing animal nutrition.

During implementation, keep records to annually document prescribed grazing requirements are met.

After implementation, make available documentation of protein and energy of consumed forages/browse based on a land grant university laboratory analysis, including corresponding management recommendations. The analysis may be based on collected sample of the forage available to the livestock or fecal samples analyzed with appropriate Near-infrared spectroscopy (NIRS). This analysis needs to illuminate shortfalls and/or excessive amounts of protein and energy. **Samples must be submitted in a timely manner to allow for appropriate adjustments in management and/or supplementation.**

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- After implementation, make grazing and supplementation records available for review by NRCS.

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NRCS will:

Prior to implementation, assist the participant with development of a grazing plan if requested to do so.

During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions, as it relates to sample analysis results.

After implementation, review forage or fecal sampling schedule and corresponding management actions taken to determine if a supplementation plan was reasonably followed.

After implementation, annually review documentation provided indicating that prescribed grazing specifications have been met and to verify the enhancement has been implemented.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____

Contract Number _____

Total Amount Applied _____

Fiscal Year Completed _____

NRCS Technical Adequacy Signature

Date

ALABAMA – E528A Supplement- Maintaining quantity and quality of forage for animal health and productivity

Requirements:

1. Average annual livestock dry matter needs will be balanced with available forage without deficiency for the yearly summary. The Forage/Animal Balance Worksheet will be completed to document.
2. Livestock will be rotated between at least 3 pastures in a particular functional-group (e.g. warm season pastures or cool season pastures) to facilitate prescribed grazing. Starting and ending grazing periods will meet the guidelines in the table below. Pastures will be sized and stocked to facilitate meeting the requirements for grazing heights and resting periods. It is anticipated that with a three-pasture rotation that each pasture would rest about 66 percent of the grazing cycle. Additional pastures will enable additional rest.
3. A contingency plan will be developed denoting the use of sacrifice areas for pasture management during drought or other weather-related events. These areas will be labeled on the conservation plan map.
4. At least one forage sample will be taken quarterly representing the dominant forage being grazed at the time and analyzed for dry matter, neutral detergent fiber, acid detergent fiber, crude protein, total digestible nutrients (TDN), and relative forage quality (RFQ). At least one hay sample will be taken during the winter-feeding period. (Costs typically range from \$20-\$50 dollars/sample.)
5. Maintain grazing records to include pasture or field number, acres, forage type, animal type and number, forage height in and out-with dates. Records should be submitted quarterly along with forage analyses.

Grazing will be managed according to the Prescribed Grazing (528) Standard.

The days of rest needed for plant recovery and regrowth range from 7 to 45 days, depending on the forage species (see below table). Stocking rates and growing conditions can also affect the forage growth. Grazing systems should be designed to meet the rest requirements of a specific forage as well as the needs of the livestock. For example, by using four pastures with 14 days of grazing per pasture, the grazing cycle is 56 days and each pasture rests 75% of the time or 42 days.

FORAGE GUIDELINES FOR PRESCRIBED GRAZING SYSTEMS

Common Forages	Begin Grazing (in)	End Grazing (in)	Usual days of Rest
Alfalfa grazing types	10	4	35 - 40
Bahia grass	6	2	10 - 20
Bermudagrass common	5	2	7 - 10
Bermudagrass hybrid	6	3	7 - 10
Big Bluestem	18	10	30 - 45
Dallis grass	6	3	7 - 15
Eastern Gama grass	15	8	30 - 45
Tall Fescue	6	3	15 - 30
Indiangrass	12	6	30 - 40
Orchard grass	8	3	15 - 30
Switchgrass	18	10	30 - 45

Interpreting a Forage Analysis for Beef Cattle

► Analysis of forages is an important tool to develop strategic supplemental feeding strategies for beef cattle. Understanding the nutritional level of available forage can help manage feed input costs more closely and meet the nutritional demands of the herd more accurately.

The Auburn University Soil, Forage, and Water Testing Laboratory provides producers with a detailed forage analysis that includes important nutritional components such as dry matter (moisture), total digestible nutrients, crude protein, fiber, nitrate-nitrogen, relative forage quality, and mineral concentration. This overview of the testing procedure provides definitions of these terms to help you start interpreting a forage analysis report. A more detailed interpretation and assistance with balancing rations can be obtained by contacting your Animal Science and Forage regional Extension agent. Find your agent at www.aces.edu/directory.

A forage analysis will have two columns of numbers on the report. The first column is on a dry matter basis, and the second is on an as-fed or as-received basis. When interpreting a forage analysis report for developing a supplemental feeding strategy, all interpretation is based on the dry matter basis column. Moisture levels may vary across samples. Comparing forages on a 100% dry matter basis allows for a more equal comparison among forage types.

Definitions

Dry Matter (DM), %. Forage samples are oven dried to determine the amount of water and dry matter in a sample. Understanding the dry matter % influences how stable stored forages such as hay, baleage, and silage may be during storage. A goal of 85% dry matter is preferred for hay. Baleage may contain between 40 and 60% dry matter, and silage between 30 and 40% dry matter to ferment properly.

Crude Protein (CP), %. Crude protein is the total nitrogen in a forage sample multiplied by a 6.25 correction factor. Protein is important for growth, milk production, and muscle development. A lactating



cow needs a diet containing 11% CP on a daily basis during the first 60 days after calving. During mid-to-late lactation, CP needs decrease to 9%. A dry, pregnant cow has the lowest CP needs (7%) until the last 60 days before calving when nutrient needs begin to increase again.

Fiber Components

Neutral Detergent Fiber (NDF). The NDF value is the total cell wall, which consists of hemicellulose, cellulose, and lignin. As forage NDF increases, forage intake decreases. The percentage of dry matter intake of the animal as a percentage of their body weight per day can be estimated as $120/\text{NDF}$. For example, if the forage report has a dry matter NDF value of 60%, then dry matter intake (as a % of body weight) = $120/60 = 2.0\%$. The calculated, estimated dry matter intake of this forage is 2.0% of the animal's body weight.

Acid Detergent Fiber (ADF). Acid detergent fiber is an estimation of the component of the forage that is indigestible to the animal. This value refers to the cell wall portions of the forage that are made up of cellulose and lignin. The greater the ADF, the less digestible forages become to the animal. Both NDF and ADF



increase as the forage becomes more mature because of increasing cell wall content. Most forages have an ADF value of 40% or greater. The ADF value is used to determine the total digestible nutrients of the forage.

Total Digestible Nutrients (TDN). Energy value of a forage is expressed as total digestible nutrients. Typically, the greater the value, the more energy-dense the forage is considered. Low-quality hay is generally 45 to 52% TDN. Mid-quality hay is generally 52% to 58% TDN, and high-quality hay is greater than or equal to 58% TDN. A dry cow requires a minimum of 48% TDN, and a lactating cow needs a diet that is at least 60% TDN per day.

Key Minerals

Calcium (Ca) and Phosphorous (P), %. Calcium and phosphorous are important minerals in beef cattle diets. A dry cow requires 0.25% Ca and 0.16% P in their diet on a daily basis. Cows in peak lactation need

0.31% Ca and 0.21% P. A Ca-to-P ratio of 2:1 to 4:1 is desirable. When P levels are higher than Ca levels, a high calcium mineral supplement should be used. Most of the time, however, a standard, complete mineral is sufficient. More information on selecting a mineral supplement is available in Extension publication [ANR-2209, “Considerations for Mineral Supplementations for Cow-Calf Operations.”](#)

Additional Measures

Relative Forage Quality (RFQ). This is a single number that can be used to compare the overall quality of one or more forage samples. The RFQ value combines an estimate of predicted intake and digestibility, which makes it a good measure of forage quality and can help provide insight on potential animal performance. In general, RFQ values range from 50 to 250, with the upper end representing the highest-quality forage. Figure 1 illustrates RFQ values and the expected ability of the forage to meet animal nutrient requirements. The greater the nutrient demands, the greater quality forage needed to support animal performance.

Nitrate-Nitrogen, ppm. Plants under stress can accumulate excessive amounts of nitrates, which at high levels can be toxic to livestock. Forage crops such as Sorghum sp., summer annuals, and bermudagrass may accumulate nitrates under conditions of high fertility, drought stress, etc. Table 1 shows the threshold for acceptable feeding values.

pH. This is a measure of the degree of acidity in ensiled forage crops. Good corn or sorghum silage generally has a pH of 3.5 to 4.5, and baleage from 3.5 to 5.5.

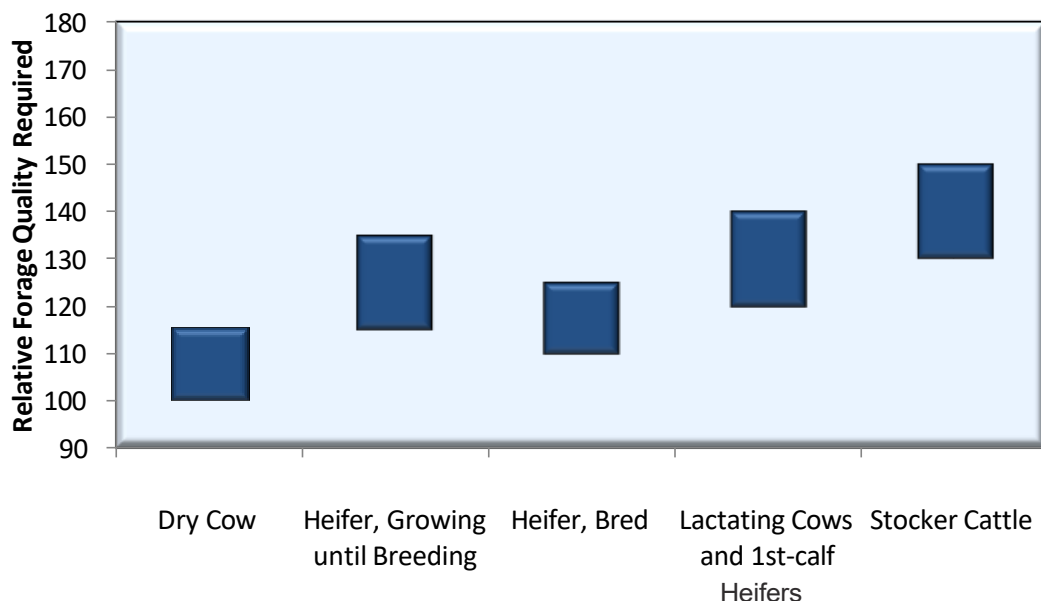


Figure 1. Relative forage quality requirements based on animal class and stage of production.

Table 1. Level of Nitrate-Nitrogen in Forages and Expected Level of Feeding Risk

Nitrate Nitrogen (NO ₃ -N), ppm, DM Basis	Level of Risk
0 to 1,500	Generally safe to feed. In upper range, use caution when feeding pregnant or young animals, and prevent over-consumption frequently observed in feeding large round bales.
1,500 to 5,000	Limit to half of the total dry matter intake. Feed a balanced ration with adequate energy. Do not feed with liquid feed or other nonprotein nitrogen supplements.
5,000 +	TOXIC. Do not use in free-choice feeding situations. Feed containing such levels of nitrates may be ground and mixed if the nitrate-containing feed contributes to no more than 15% of total ration by weight.

Applying This Information on the Farm

- Review your forage analysis results to determine overall quality on a dry matter basis.
- Compare the expected dry matter intake, total digestible nutrients, protein, calcium, and phosphorous values to the nutrient requirements of your herd. Daily nutrient requirements of beef cattle during different stages of production can be found in Extension publication ANR-0060, "Nutrient Requirements of Beef Cattle."

If forage report values are less than the daily nutrient needs, additional supplemental feeds may be needed in the diet. Contact your local Animal Science and Forage Extension agent for information on developing balanced rations.

To obtain analyses, submit Alabama forage and feed samples to the following:

**Auburn Soil, Forage,
and Water Testing
Laboratory
961 S. Donahue Drive
Auburn University, AL 36849
Phone: (334) 844-3958**

Find submission forms at www.aces.edu/anr/soillab/forms/index.php



Kimberly Mullenix, *Extension Specialist*, Assistant Professor, Animal Sciences, Auburn University; and **Leanne Dillard**, *Extension Specialist*, Assistant Professor, Animal Sciences, Auburn University

For more information, contact your county Extension office. Visit www.aces.edu/directory.

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