

**NATURAL RESOURCES CONSERVATION
SERVICE KENTUCKY CONSERVATION
PRACTICE STANDARD**

PRESCRIBED GRAZING

(Ac.)

CODE

528

DEFINITION

Managing the harvest of vegetation with grazing and/or browsing animals.

PURPOSE

This practice may be applied as a part of conservation management system to achieve one or more of the following:

- Improve or maintain desired species composition and vigor of plant communities.
- Improve or maintain quantity and quality of forage for grazing and browsing animals' health and productivity.
- Improve or maintain surface and/or subsurface water quality and quantity.
- Improve or maintain riparian and watershed function.
- Reduce accelerated soil erosion, and maintain or improve soil condition.
- Improve or maintain the quantity and quality of food and/or cover available for wildlife.
- Manage fine fuel loads to achieve desired conditions.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where grazing and/or browsing animals are managed.

CRITERIA

General Criteria Applicable to All Purposes

Removal of plant material will be in accordance with production potential, rate of plant growth, management goals, and the physiological needs of forage plants. Refer to tables 1, 2, and 3 of this standard, and chapter 5 section 2 of the National Range and Pasture Handbook for guidance and determinations.

Manage kind of animal, animal number, grazing distribution, length of grazing periods, and timing of use to provide sufficient deferment from grazing to maintain a desirable, productive plant community. Refer to Kentucky NRCS "graze.xls" spreadsheet for detailed guidance.

Protect soil, water, air, plant, and animal resources when locating livestock feeding, handling, and watering facilities.

Manage grazing animals to maintain adequate vegetative cover on environmentally sensitive areas such as riparian areas, wetlands, habitats of concern, and karst areas. Move livestock before the most sensitive resource is impacted.

Prescribed grazing schedules will be developed to serve as initial guides. Grazing cycles should be adjusted so as to ensure that enough pastures are available in grazing system to allow for adequate forage regrowth periods. The regrowth period is usually 15-21 days in early summer and 30- 42 days in the late summer and fall.

TABLE 1: DRY MATTER (Pounds per acre inch) Based on Levels of Management

| Key Species | Avg Mgt Level ^{1/} (Lbs) | Low to High Mgt Level (Range) ^{2/} (Lbs) |
|--|--------------------------------------|--|
| Alfalfa/Alfalfa & Grass | 200 | 75-300 |
| Bermudagrass | 250 | 100-300 |
| Kentucky Bluegrass | 160 | 100-275 |
| Native Warm Season Grasses | 100 | 50-250 |
| Orchardgrass | 180 | 75-300 |
| Orchardgrass/certified Red Clover | 225 | 100-400 |
| Orchardgrass/legumes | 200 | 100-325 |
| Red Clover | 220 | 100-300 |
| Tall Fescue | 210 | 100-350 |
| Tall Fescue/certified Red Clover | 210 | 100-375 |
| Tall Fescue/legumes | 200 | 80-325 |
| Tall Fescue + 90 N (split) | 210 | 100-350 |
| T Fescue/Orchardgrass/Bluegrass/legume | 200 | 100-400 |
| Small Grain | 150 | 75-250 |
| Ryegrass | 250 | 75-400 |

^{1/}

The values should only be used as guides. They represent estimated average values taken from many sources across the region from thick, well fertilized, actively growing plant stands that typically result from an average level of management.

^{2/}

These values should only be used as guides. They represent an estimated average range of values taken from many sources across the region. The range (spectrum) begins with plant stands resulting from low management levels which are typically characterized by thin, not fertilized, often overgrazed stands to the highly intensive management level which represents thick stands with rapid growth and high yield.

TABLE 2: Harvest Efficiency of Pastures with Different Grazing Strategies

| Method | % Utilization ^{1/} |
|---------------------------|-----------------------------|
| Strip grazing | 75-80 |
| Rotation two times/day | 75-80 |
| Daily rotation | 65-75 |
| Rotation every two days | 60-70 |
| Rotation every three days | 55-60 |
| 3 to 7 day rotation | 50-55 |
| 3 to 5 week rotation | 30-50 |
| Continuous grazing | 20-40 |

^{1/}

These values should be used only as a guide. Considerable variation can exist within and among categories. The terms "harvest efficiency" and "utilization rate" are often used interchangeably.

TABLE 3: Forage Crops and Prescribed Grazing Heights

| Forage Crop | Height to Begin Grazing (inches) | Height to End Grazing (inches) |
|----------------------------|----------------------------------|--------------------------------|
| COOL SEASON GRASSES | | |
| Annual Ryegrass | 6 to 12 | 2 to 3 |
| Bluegrass | 4 to 6 | 1.5 to 2 |
| Oats | 8 to 12 | 3 to 4 |
| Orchardgrass | 8 to 10 | 3 to 4 |
| Timothy | 6 to 8 | 3 to 4 |
| Reed Canarygrass | 8 to 10 | 3 to 4 |
| Tall Fescue | 4 to 10 | 2 to 3 |
| WARM SEASON GRASSES | | |
| Bermudagrass | 4 to 8 | 1 to 2 |
| Big Bluestem | 15 to 20 | 10 to 12 |
| Caucasian Bluestem | 10 to 20 | 4 to 6 |
| Indiangrass | 12 to 16 | 6 to 10 |
| Johnsongrass | 16 to 20 | 8 to 12 |
| Pearl Millet | 12 to 24 | 8 to 10 |
| Sudangrass | 20 to 24 | 8 to 12 |
| Eastern gamagrass | 18 to 22 | 10 to 12 |
| Switchgrass | 18 to 22 | 8 to 12 |
| LEGUMES | | |
| Alfalfa | 10 to 16 | 3 to 4 |
| Alsike Clover | 8 to 10 | 3 to 4 |
| Birdsfoot Trefoil | 6 to 8 | 3 to 4 |
| Crimson Clover | 8 to 10 | 3 to 4 |
| Hairy Vetch | 6 to 8 | 3 to 4 |
| Ladino Clover | 6 to 8 | 3 to 4 |
| Kobe Lespedeza | 6 to 8 | 3 to 4 |
| Korean Lespedeza | 6 to 8 | 3 to 4 |
| Sericea Lespedeza | 8 to 15 | 3 to 4 |
| Red Clover | 8 to 10 | 3 to 4 |
| Sweet Clover | 6 to 8 | 3 to 4 |
| Common White clover | 4 to 6 | 1 to 2 |

Note: Grass/Legume mixes will be grazed according to the height prescribed for the dominant species. At outset of the grazing season, begin grazing perennial grasses at slightly shorter heights than the lowest one listed under Height to Begin Grazing column to stage pasture growth. Upper values of Height to Begin Grazing are the maximum for good forage quality. If height is exceeded, a haycrop cutting is a better option. In any case, if grass is in the boot stage or legume is in full bloom regardless of height, a haycrop cutting is a better option unless acreage in that stage of maturity is too small to be worth the effort.

Note: Information for tables 1, 2, and 3 was compiled from Kentucky GLA software, Southern Forages Handbook, and University of Kentucky College of Agriculture sources and publications.

Adequate quantity and quality drinking water will be supplied at all times during period of occupancy.

Provide deferment or rest from grazing or browsing to ensure the success of prescribed fire, brush management, seeding or other conservation practices that cause stress or damage to key plants.

Develop contingency plans to deal with expected episodic disturbance events, e.g. insect infestation, drought, wildfire, etc.

Additional Criteria to Improve or Maintain the Health and Vigor of Plant Communities.

Duration and intensity of grazing and/or browsing will be based on desired plant health and expected productivity of key forage species to meet management objectives.

Plan periodic deferment from grazing and/or browsing to maintain or restore the desired plant community following episodic events, such as wildfire or severe drought.

Where appropriate, soil test periodically for nutrient status and soil reaction and apply fertilizer and/or soil amendments according to soil test to improve or maintain plant vigor.

Additional Criteria to Improve or Maintain Quantity and Quality of Forage for Animal Health and Productivity

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.

Enhance diversity of rangeland and pasture plants to optimize delivery of nutrients to the animals by planning intensity, frequency, timing and duration of grazing and/or browsing.

Plan intensity, frequency, timing and duration of grazing and/or browsing 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.

Dietary needs of livestock will be based on the National Research Council's Nutrient Requirements of Domestic Animals or similar scientific sources with appropriate adjustments made for increased energy demand required by browsing or grazing animals foraging for food including travel to and from pasture site.

Biosecurity safeguards will be in place to prevent the spread of disease between on-farm or ranch classes of livestock and between livestock farm or ranch units.

Shelter in the form of windbreaks, sheds, shade structures, and other protective features will be used where conditions warrant to protect livestock from severe weather, intense heat/humidity, and predators.

Additional Criteria to Improve or Maintain Surface and/or Subsurface Water Quality and Quantity.

Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover.

Plan intensity, frequency, timing and duration of grazing and/or browsing to:

- Minimize deposition or flow of animal wastes into water bodies,
- Minimize animal impacts on stream bank or shoreline stability.
- Provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff.
- Provide adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation.

Additional Criteria to Improve or Maintain Riparian and Watershed Function.

Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover and riparian/floodplain plant community structure and functions.

Plan intensity, frequency, timing and duration of grazing and/or browsing to:

- Provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff.
- Provide adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation.
- Maintain adequate riparian community structure and function to sustain associated riparian, wetland, floodplain and stream species.

Additional Criteria to Reduce Soil Erosion and Maintain Soil Condition

Minimize concentrated livestock areas, trailing, and trampling to reduce soil compaction, excess runoff and erosion. Plan intensity, frequency, timing and duration of grazing and/or browsing to provide adequate ground cover, litter and canopy to maintain or improve infiltration and soil condition.

Additional Criteria to Improve or Maintain Food and/or Cover for Fish and Wildlife Species of Concern

Identify species of concern in the objectives of the prescribed grazing plan. Plan intensity, frequency, timing and duration of grazing and/or browsing to provide for the development and maintenance of the plant structure, density and diversity needed for the desired fish and wildlife species of concern. Refer to the KY Wildlife Habitat Evaluation Procedure (KWHEP) and the conservation practice standard 645 Upland Wildlife Habitat Management for determining when grazing strategies may be appropriate.

Provide rest from grazing during critical nesting periods.

For pollinator habitat refer to the Kentucky Pollinator Handbook for grazing strategies (i.e. flash grazing) that may enhance or maintain forb stands designed to support pollinator habitat. This practice may be utilized as an O&M practice to maintain well established stands of pollinator habitat.

Note that some forb species used in pollinator plantings may not be suitable for grazing and can be toxic to livestock.

Flash grazing or long rotation periods can

create disturbance regimes and assist in maintaining early successional habitat and associated flowering plants. For pollinator habitat disturbance regimes, flash grazing should have long rotation periods and should be performed no more frequently than every two to three years. Timing and intensity of flash grazing should be based on the carrying capacity and number of animals including the size of the area.

Additional Criteria for Management of Fine Fuel Load

Plan intensity, frequency, timing and duration of grazing and/or browsing to reduce hazardous fuel loads.

Plan intensity, frequency, timing and duration of grazing and/or browsing to manage fuel continuity, load and other conditions to facilitate prescribed burns.

CONSIDERATIONS

When needed, rest areas for a period of time to ensure the success of seeding, brush management, prescribed fire, or other conservation practices.

Resting overgrazed forages and using them for hay can expedite their recovery. Typically, a 30 day rest is needed to produce enough forage to justify the cost of harvesting hay.

Where practical, start the grazing sequence in a different management unit each growing season.

When weeds are a significant problem, prescribed grazing should be implemented in conjunction with pest management to protect desired plant communities. Control weeds before harvesting fields for hay or feed hay in the same fields the hay was harvested from.

Design and install livestock feeding, handling, and watering facilities in a manner that improves and/or maintains even grazing distribution. Design and install these facilities to minimize stress, the spread of disease, parasites, and toxic plants.

Balance supplemental feed and/or mineral

requirements with the grazed forage consumption to meet the desired nutritional level for the kind and class of grazing livestock.

Single trees for shade can be lightning attractants that can be hazardous to livestock.

Use of natural or artificial shelter will be included as part of this practice when conditions demand.

Animal husbandry requirements which may affect the design of the grazing prescription will be considered.

Prescribed grazing schedules should be designed to account for variations in the growth and amount of forage available due to variations in temperatures, precipitation, land resources, and stocking rate.

PLANS AND SPECIFICATIONS

Prepare a prescribed grazing plan for all management units where grazing will occur. This practice can be applied on the whole operating unit or a portion of it. The plan will incorporate any additional feed supplementation for the operating unit or portion of the operating unit being addressed. Grazing schedules will be recorded in a manner that is readily understood and useable by the decision maker in their daily operations.

The prescribed grazing plan shall conform to all applicable federal, state and local laws.

Seek measures to avoid adverse effects to endangered, threatened, and candidate species and their habitats.

The goals and objectives of the producer will be clearly stated in conjunction with the grazing management plan. Guidelines for developing a prescribed grazing plan include:

1. **Resource Inventory.** Condition of pastures, existing structures, facilities, and soil mapping unit/pasture and hayland suitability group.

2. **Forage Inventory.** The expected forage species/plant community, and the quantity of forage expected in each pasture during the grazing period (Kentucky graze excel spreadsheet).

3. **Forage-Animal Balance.** This ensures that the available forage meets the forage demand for livestock and/or wildlife of concern. Balance the monthly livestock demand with the cumulative quantity of forage produced or acquired (Kentucky graze excel spreadsheet).

4. **Grazing Plan.** Identifies the number of days grazing and rest for all of the pastures or paddocks (Kentucky graze excel spreadsheet).

5. **Contingency Narrative** Detail potential problems (severe drought, flooding, wet and warm winters, etc) that serves as a guide for adjusting the grazing prescription to avoid resource degradation and economic collapse. See Operation and Maintenance section of this standard for additional information addressing contingencies.

6. **Record Keeping / Monitoring Narrative.** Statements of how to record prescribed grazing data, and assessments as to whether the grazing strategy is meeting the producer's goals. Identify the key areas that the manager should evaluate in making grazing management decisions. Examples of key areas that the manager should evaluate include riparian areas, livestock concentration areas, etc.

7. **Wildlife Habitat Narrative.** Outlines the considerations made for wildlife species of concern including pollinators.

OPERATION AND MAINTENANCE

Operation: Adequate stubble heights for maintaining a productive and desirable forage plant community will be utilized on the majority of all pastureland throughout the occupation period of grazing units.

A producer may need to graze one pasture close (sacrifice one paddock) to protect other pastures from being overgrazed, to aid in maintenance of legumes, to control weeds, or provide high quality forage at a later date. However, at any one time, no more than 20 percent of the total grazing acreage should be grazed lower than the heights listed to end grazing (table 3). Management adjustments will be made as needed to ensure that the goals and objectives of the prescribed grazing strategy are met.

Options to protect forage heights include, but are not limited to:

- A) Move or rotate livestock to another pasture or paddock.
- B) Feeding hay or other supplemental feed.
- C) Reducing the number of animals.
- D) Leasing additional pasture
- E) Fertilizing when moisture is available or seeding annuals, etc.
- F) Strategic confinement

Prescribed Grazing will be applied on a

All facilitating and accelerating practices (e.g. fence (382), Pest Management (595), Brush Management (314), Pasture Planting (512) (etc.) that are needed to effect adequate grazing and/or browsing distribution as planned by this practice standard will be maintained in good working order and are being operated as intended.

continuing basis throughout the occupation period of all planned grazing units.

Adjustments will be made as needed to ensure that the goals and objectives of the prescribed grazing strategy are met.

Maintenance: Monitoring data and grazing records will be used on a regular basis within the prescribed grazing plan to insure that objectives are being met, or to make necessary changes in the prescribed grazing plan to meet objectives.

REFERENCES

Barnes, R.F., D.A. Miller, and C.J. Nelson.
1995. Forages, The Science of Grassland
Agriculture, 5th Ed. Iowa State University
Press, Ames, IA.

Bedunah, D. J. and R. E. Sosebee, Editors.
1995. Wildland Plants. Physiological Ecology
and Developmental Morphology. Society for
Range Management, Denver, CO.

Heitschmidt, R. K. and J. W. Stuth eds. 1991.
Grazing Management an Ecological
Perspective. Timber Press

Hodgson, J. and A.W. Illius. Editors. 1996.
Ecology and Management of Grazing
Systems. CABI, Wellingford, UK.

Holechek, J. L., R. D. Pieper and C. H. Herbel.
2000. Range management principles and
practices. 5th edition. Prentice Hall, NJ.

Smith, D., R.J. Bula, and R.P. Walgenbach.
1986. Forage Management 5th ed.
Kendall/Hunt Publ. Co. Dubuque, Iowa.

United States Department of Agriculture,
Natural Resources Conservation Service.
1997. National range and pasture handbook.
Washington, DC.

Vallentine, J.F. 2001. Grazing management.
Academic Press, San Diego, CA.

Voisin, A. 1959. *Grass productivity*.
Philosophical Library, New York.