

NATURAL RESOURCES CONSERVATION SERVICE
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 for one or more of the following purposes:

1. Improve or maintain desired species composition and vigor of plant communities;
2. Improve or maintain quantity and quality of forage for animal health and productivity;
3. Improve or maintain surface and/or subsurface water quality and quantity;
4. Improve or maintain riparian and watershed function;
5. Reduce soil erosion, and maintain or improve soil condition;
6. Improve or maintain the quantity and quality of food and/or cover available for wildlife;
7. 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 herbage shall be in accordance with site production limitations; rates of plant growth;

maintenance of plant carbohydrate reserves for regrowth, winter and drought survival; and the nutritional needs of the animals.

Prescribed grazing shall include an evaluation of pasture condition, using the current approved Pasture Condition Score (PCS) sheet. Manage pastures to meet a minimum PCS value of 30 on all grazing units, with the exception of a designated sacrifice lot.

If an evaluation determines that the current pasture condition is less than 30, recommendations shall be made to improve the existing condition so that the planned (future) condition will have a quality rating of 30 or more. If the current condition is equal to or greater than 30, recommendations shall be made to maintain the existing condition or improve it towards optimum conditions.

Manage the kind of animal, animal number, grazing distribution, length of grazing periods, and timing of use to meet the desired objectives for the plant community and the associated resources, including the grazing and/or browsing animal.

Determine forage demand per herd based on the total number of animal units and the daily intake rate per animal unit. Determine available supply based on expected forage production in the grazing system and the forage utilization rate (grazing efficiency) appropriate for the system. Use appropriate planning tools to assess and document forage-livestock balance, and to provide grazing management guidelines for the client. Refer to Tables 1 through 4 in this standard for additional guidance when assessing the management unit and designing a sustainable grazing system.

Provide utilization or stubble height target levels to be used in conjunction with monitoring to help ensure that resource conservation and producer objectives are met.

Plan sufficient deferment from grazing to reduce stress and damage to forage plants. As needed, rest pastures for a period of time to ensure the success of brush control, seeding, or other conservation practices.

Control toxic and poisonous plants that can cause illness or death of livestock.

Provide livestock with access to adequate quantity and quality of drinking water while on pasture.

Manage grazing animals to maintain adequate vegetative cover near sensitive areas (e.g., riparian areas, wetlands, and other habitats of concern), and to sustain or improve soil condition and the filtering capacity of the vegetation.

Develop a contingency plan to address expected episodic events (e.g., severe drought, flooding) to ensure resource management and economic feasibility without resource degradation.

Additional Criteria to Improve or Maintain Desired Species Composition and Vigor of Plant Communities

Base the duration and intensity of grazing on desired plant health and expected productivity of key forage species. Adjust grazing periods and/or stocking rates as needed to meet production objectives, while maintaining plant species composition and vigor.

Apply lime and fertilizer, if needed based on soil test results, to improve or maintain plant vigor. The use of commercial fertilizer and other forms of plant nutrients must be in compliance with Delaware nutrient management regulations, as applicable.

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

Plan grazing to match forage quantity and quality with the goals of the livestock producer and

within the capability of the resource to respond to management.

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

Balance supplemental feed and/or minerals with pasture forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock. Base the dietary needs of livestock on the National Research Council's Nutrient Requirements of Domestic Animals or similar scientific sources.

Design and install livestock feeding, handling, and watering facilities in a manner to improve and/or maintain animal distribution, and to minimize stress, spread of disease and parasites, and contact with harmful organisms and toxic plants.

Use biosecurity safeguards to prevent the spread of disease between classes of livestock on the farm and between farms.

Provide shelter in the form of windbreaks, sheds, shade structures, and other protective features 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

Provide adequate ground cover and plant density to maintain or improve the filtering capacity of vegetation.

Minimize concentrated livestock areas to enhance nutrient distribution and to reduce soil compaction, runoff, and erosion. Locate areas of high animal concentration away from waterways, streams, and ponds whenever possible.

Do not allow livestock to have unrestricted access to surface waters. Provide alternative watering sites, such as troughs, stream crossings, and other limited access points. Use filter strips as needed to intercept particulates and soluble pollutants in surface runoff.

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 the intensity, frequency, timing, and duration of grazing and/or browsing to provide adequate ground cover and plant density to maintain or improve infiltration capacity, reduce runoff, improve the filtering capacity of the vegetation, and to 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

Plan the intensity, frequency, timing, and duration of grazing and/or browsing to provide adequate ground cover, plant litter, and canopy to maintain or improve infiltration and soil condition.

When grazing crop residue, monitor ground cover during the grazing period and remove animals when residue approaches the minimum amount needed to keep soil loss within tolerance and maintain soil condition.

Minimize concentrated livestock areas, trailing, and trampling to reduce soil compaction, runoff, and erosion. Pasture fencing layouts shall provide travel lanes that are least prone to livestock trail erosion and will provide protection for sensitive areas, such as wetlands. Refer to the Delaware conservation practice standard for Heavy Use Area Protection (561) for design criteria for livestock travel lanes.

Do not graze poorly drained and very poorly drained areas when soils are saturated. If better-drained pastures are not available, provide a heavy use or sacrifice area that can be used during wet periods to spare the pastures from damage. Use the Delaware conservation practice standard for Heavy Use Area Protection (561) or Critical Area Planting (342) for vegetative heavy use areas, using maximum planting rates for adapted species. An all-season corral, barn, protected livestock yard, indoor arena, or well-

drained grass pasture can be suitable for this purpose.

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 the 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.

When wildlife habitat is identified as a resource concern, manage for diverse plant communities to the extent feasible. For most wildlife, a mixed stand of grasses (especially native grasses), forbs, and legumes will provide optimum food and/or cover. Use prescribed grazing to manage the plant community so that it provides the necessary species composition, plant height, structure, and density for the desired wildlife species.

Reduce grazing during critical nesting periods. Use only light grazing pressure during the nesting season (April 15 to August 15), and do not graze below 6 inches to maintain habitat for ground-nesting birds. Where feasible, graze only one-third of the stand each year, or leave ungrazed strips at least 35 feet wide along field edges to provide undisturbed nesting habitat. To provide winter cover, allow sufficient recovery time in the fall so that the stand is at least 8 inches in height before dormancy.

Use appropriate measures to avoid adverse effects on endangered, threatened, and candidate species and their habitats.

Additional Criteria for Management of Fine Fuel Load

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

Note: Specific programs may dictate criteria in addition to, or more restrictive than, those specified in this standard.

CONSIDERATIONS

Consider all resource concerns when locating livestock feeding, handling, and watering systems. Hay rings, mineral feeders, troughs, and other facilities should be spaced out individually in each pasture to avoid creating single multi-use areas frequented by animals.

Consider developing a rotational grazing system that provides forage for as much of the year as possible to minimize supplemental feed costs.

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

Consider that renovation of pastures may be necessary when existing forages are not producing enough forage to meet the demands of the grazing animals. Refer to the Delaware conservation practice standard for Forage and Biomass Planting (512) for recommended species and planting rates.

Consider the need for supplemental feed. Plan for no more than 30% of the total annual herd forage needs (documented by a forage-livestock balance) to be met by supplemental feed or hay from external non-grazed land.

When weeds are a significant problem, consider using associated conservation practices such as Brush Management (314), Herbaceous Weed Control (315), and/or Integrated Pest Management (595) in conjunction with prescribed grazing to protect desired plant communities.

Consider the needs of other enterprises utilizing the same land, such as wildlife and recreational uses.

Consider improving carbon sequestration in biomass and soils through management of grazing and/or browsing to produce the desired results.

Refer to the Delaware Prescribed Grazing Fact Sheet for additional information concerning managing grazing to improve plant and livestock health and productivity and to protect soil, water, and wildlife resources.

PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared in accordance with the previously listed criteria. Plans and specifications shall contain sufficient detail to ensure successful implementation of this practice, and may be recorded in narrative form, on Implementation Requirements (IR) worksheets, fact sheets, or other approved forms.

At a minimum, develop a prescribed grazing plan that includes the following components:

1. Goals and Objectives - Clear statement of the producer's goals and objectives, including whether expansion is planned;
2. Plan Map - Include field numbers, acres, planned pasture layout, sacrifice area, fences, travel lanes, shade/shelter, watering areas, and other components of the grazing system;
3. Soils Map - Include map unit descriptions, productivity groups, and yield potential, as appropriate;
4. Resource Inventory - Brief description of the farm operation, including but not limited to:
 - a. Number and types of livestock, pastured acres, and tillable acres;
 - b. Condition of existing forage (complete the Pasture Condition Score sheet);
 - c. Resource concerns and enhancement opportunities, including the location and condition of existing structural facilities such as buildings, fences, and watering systems.
5. Forage Production - Assess the expected forage quality, quantity, and species of forage in each management unit during the grazing period;
6. Animal Requirements - Assess the monthly and annual livestock feed demand;
7. Forage Balance - Develop a sustainable grazing plan for the management unit(s), which insures that forage produced meets forage demand of livestock. Use approved

methods to calculate and document this balance;

8. **Grazing Guidance** - For each forage type, include recommended grazing heights (in/out of paddocks) and identify periods of grazing, rest, and other treatment activities for each management unit;
9. **Contingency Plan** - Describe potential problems (e.g., drought, excessive wetness, etc.) and provide guidelines for adjusting the grazing prescription to ensure resource management and economic feasibility without resource degradation. Identify emergency feed resources and when they will be used, or other alternatives to provide supplemental sources for forage (e.g., hay fields) when sufficient pasture forage is not available;
10. **Monitoring Plan/Recordkeeping** - Assess the effectiveness of the grazing strategy in meeting objectives. Identify the key areas and key plants that the manager needs to evaluate in making grazing management decisions.

It is the responsibility of the landowner/client to maintain records as needed to document plan implementation. Use the 528 Implementation Requirements worksheet to document the following:

- a. Type and number of livestock;
- b. Predominant forage species and condition;
- c. Grazing dates;
- d. Starting and ending grazing heights;
- e. Management following the grazing period (e.g., clipping, dragging, fertilization);
- f. Length of rest period;
- g. Supplemental feed (if any).

OPERATION AND MAINTENANCE

An Operation and Management (O&M) plan shall be prepared and is the responsibility of the

client to implement. The appropriate fact sheet(s) and IR worksheet may serve as the management plan, as well as supporting documentation, and shall be reviewed with and provided to the client.

At a minimum, the following components shall be addressed in the O&M plan, as applicable:

1. Use prescribed grazing on a continuing basis throughout the occupation period of all planned grazing units;
2. Inspect the entire management area at least annually to determine whether the desired vegetation is present in suitable quantity, quality, and distribution to meet prescribed grazing objectives. Based on the evaluation, adjust grazing periods or livestock numbers if stocking rates endanger the productivity of the forage species;
3. Manage grazing to limit damage to the forage crop. This is especially critical during periods when fields are wet and compaction can occur, such as during late winter. Move livestock to a feedlot or designated sacrifice area in times of very wet soil or drought conditions to protect the integrity of the pasture plants;
4. Soil test all pastures and hay fields at least every 2 to 3 years. Apply soil amendments periodically, based on soil test results, to meet desired yield goals, promote plant regrowth, and help maintain the life of the stand. The use of commercial fertilizer and other forms of plant nutrients must be in compliance with Delaware nutrient management regulations;
5. Clip and drag pastures as needed to initiate vegetative regrowth and/or control undesirable plant species and better distribute nutrients;
6. To the extent feasible, “spot” spray or mow to control weeds, so that desirable plants are not destroyed unnecessarily. Noxious weeds must be controlled as required by state law;
7. Renovate and/or re-seed pastures if the stand is undesirable or unable to meet system needs;

8. Where wildlife habitat is a concern, reduce grazing during critical nesting periods. Use only light grazing pressure during the nesting season (April 15 to August 15), and do not graze below 6 inches to maintain habitat for ground-nesting birds. Where feasible, graze only one-third of the stand each year, or leave ungrazed strips at least 35 feet wide along field edges to provide undisturbed nesting habitat.

For optimum results, ungrazed strips should be at least 50 feet wide, preferably adjacent to woody cover, or leave the entire field ungrazed during the primary nesting season. To provide winter cover, allow sufficient recovery time in the fall so that the stand is at least 8 inches in height before dormancy;

9. Eliminate hazards from pastures that may injure livestock, such as loose wires, other hardware, old post holes or animal burrows, and downed trees or heavy limbs;
10. Maintain all facilitating practices (e.g., fences, watering facilities, etc.) in good working order;
11. Describe the time of year or frequency of use restrictions, if any. *Pay particular attention to program requirements as they relate to acceptable vs. restricted uses and other management restrictions.*

SUPPORTING DATA AND DOCUMENTATION

The following is a list of the minimum data and documentation to be recorded in the case file:

1. Location of the practice on the conservation plan map;
2. Assistance notes. The notes shall include dates of site visits, name or initials of the person who made the visit, specifics as to alternatives discussed, decisions made, and by whom;
3. Prescribed grazing plan, completed IR worksheet, and copy of the appropriate fact sheet(s) or other specifications.

REFERENCES

1. Cornell University, Department of Animal Science. *Plants Poisonous to Livestock and Other Animals*. On-line database at: <http://www.ansci.cornell.edu/plants/index.html>
2. Hill, Steven R. and Peggy K. Duke. *100 Poisonous Plants of Maryland*. Extension Bulletin 314, University of Maryland Extension. http://extension.umd.edu/sites/default/files/docs/programs/woodland-steward/EB314_PoisonousPlantsMD.pdf
3. Johnson, Quintin, Mark VanGessel, Richard W. Taylor. 2014. *Pasture and Hay Weed Management Guide*. Delaware Cooperative Extension, University of Delaware. <http://extension.udel.edu/ag/files/2012/08/PHWeedguide.pdf>
4. Maryland Cooperative Extension. *Wildlife Management Fact Sheets*. <https://extension.umd.edu/tags/wildlife-management>
5. Penn State University, College of Agricultural Sciences. 2015. *The Agronomy Guide*. <http://extension.psu.edu/agronomy-guide>
6. Penn State University, College of Agricultural Sciences. *Forage Crops*. <http://extension.psu.edu/plants/crops/forages>
7. USDA, Natural Resources Conservation Service. *Conservation Practice Standards*. Delaware Field Office Technical Guide, Section IV.
8. USDA, Natural Resources Conservation Service. *Fish and Wildlife Habitat Leaflets and Technical Notes*. <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/fishwildlife/pub/>
9. Virginia Tech Extension. *Pasture & Forage – Crops & Soils*. Publications and Educational Resources. <https://pubs.ext.vt.edu/category/pasture-forage-cs.html>

TABLE 1: Pasture Intake Rate and Recommended Paddock Rotation Schedule		
Livestock Type	Intake Rate ^{1/} (% of body weight per day)	Paddock Rotation Schedule (days)
Beef Cows - Lactating	2.2 – 2.7%	3 - 7
Beef Cattle - Maintenance	1.8 - 2.2%	3 - 7
Stocker Cattle	2.5 - 3.0%	1 - 3
Ewes - Lactating	3.5 – 4%	1 - 3
Ewes - Maintenance	1.8 – 2.0%	3 - 7
Horses	2.0%	3 - 7
Goats - Lactating	5.0%	1 - 3
Goats - Maintenance	1.8 – 2%	3 - 7
Dairy Cows – Lactating (pasture only)	3%	0.5 - 1
Dairy Cows - Total Mixed Ration (TMR)	2.0 – 4.0%	0.5 - 3
Dairy Heifers	2.3%	1 - 3

TABLE 1 NOTE:

^{1/} Dependent on amount of supplemental feed, hay, grain, TMR, etc. that is fed.

TABLE 2: Grazing Efficiency Guidelines		
Number of Paddocks ^{1/}	Approximate Days on Each Paddock	Grazing Efficiency
1 (continuous grazing)	----	0.40 or less (or 0.80 if overgrazed, low yield)
4 to 6	7 to 9 days	0.40 to 0.55
8 to 10	4 days	0.55 to 0.65
24 to 45	1 day or less	0.70 to 0.80
Hay	----	0.70 to 0.80

TABLE 2 NOTE:

^{1/} In general, as the number of paddocks increase, average paddock size and the number of days on each paddock decreases. Grazing will be more efficient, and more time will be allowed for regrowth in each paddock.

TABLE 3: Recommendations for Grazing Heights, Recovery Days, and Number of Paddocks in Rotational Grazing Systems ^{1/}

Forage Species	Growth Periods	Height in Inches		Recovery Days ^{2/}	Number of Paddocks ^{3/}
		To Begin	To Stop		
Alfalfa	Spring	6" to bud	2 - 3	30	--
	Fall	12 - 18	2 - 3	--	--
	Winter	12 - 18	3	--	--
Annual Ryegrass	Early Spring	6 - 8	3 - 4	21 - 45	7 - 15
	Spring	8 - 10	2 - 3	Replant in Fall	5 - 10
	Fall	6 - 8	4	30 - 60	10 - 20
	Winter	6 - 8	3 - 4	30 - 90	10 - 30
Bermudagrass (Common and hybrid varieties, plus mixtures with white clover)	Spring	4 - 6	2 - 3	21-30	7 - 10
	Summer	4 - 6	2 - 3	10 - 21	3 - 7
	Fall	4 - 6	2 - 3	20 - 40	7 - 13
	Frosted ^{4/}	2+	2 - 3	120 - 210	10 - 40 ^{5/}
Big Bluestem	Early Summer	12	6	21 - 30	7 - 10
	Mid Summer	12	6	21 - 40	7 - 13
	Early Fall	12	9	120 - 210	10 - 40
Birdsfoot Trefoil - Upright Type	Spring	6 - 18	3	--	--
	Summer	10 - 15	3	--	--
	Fall	10 - 15	3	--	--
Birdsfoot Trefoil - Prostrate Type	Spring	6 - 15	2	--	--
	Summer	10 - 12	2	--	--
	Fall	10 - 12	3	--	--
Bluegrass	Early Spring	4 - 6	1 - 2	30 - 45	10 - 15
	Spring	4 - 6	1 - 2	14 - 30	5 - 10
	Summer	4 - 6	1 - 2	30 - 60	10 - 20
	Fall	4 - 6	1 - 2	21 - 35	7 - 12
Caucasian Bluestem	Early Summer	8 - 12	4	--	--
	Mid Summer	8	4	--	--
	Early Fall	8	6	--	--
Clover, Red	Spring	6 - 12	2 - 3	--	--
	Summer	6 - 10	2 - 3	--	--
	Fall	6 - 18	2 - 3	--	--
Clover, Red, in mixtures with cool-season grasses	Spring	6" to bud	3 - 4	10 - 21	4 - 7
	Summer	10" to bud	3 - 4	21 - 40	7 - 13
	Fall	Frosted ^{6/}	3 - 4	90 - 120	10 - 20 ^{7/}

TABLE 3: Recommendations for Grazing Heights, Recovery Days, and Number of Paddocks in Rotational Grazing Systems ^{1/}

Forage Species	Growth Periods	Height in Inches		Recovery Days ^{2/}	Number of Paddocks ^{3/}
		To Begin	To Stop		
Clover, Alsike/Ladino	Spring	4 - 8	2	--	--
	Summer	4 - 8	2	--	--
	Fall	4 - 8	2	--	--
Clover, Common White Dutch	Spring	4 - 7	1 - 2	--	--
	Summer	4 - 7	1 - 2	--	--
	Fall	4 - 7	1 - 2	--	--
Crabgrass and associated warm-season species	Spring	6 - 8	3 - 4	21 - 35	5 - 13
	Summer	6 - 12	3 - 4	14 - 30	7 - 12
	Fall	4 - 6	1 - 3	Replant in Spring.	10 - 40 ^{8/}
Crop Residue (corn or sorghum)	Oct-Jan	Begin grazing immediately following harvest. If cover crop is not planted, leave residue as needed for soil protection.		Not applicable.	If cover crop is not planted, subdivide enough to utilize the residue while leaving cover for soil protection.
Eastern Gamagrass	Early Summer	14 - 20	8	21 - 30	7 - 10
	Mid Summer	15 - 24	8	21 - 40	7 - 13
	Early Fall	15	8	120 - 210	10 - 40
Indiangrass	Early Summer	12	6	21 - 30	7 - 10
	Mid Summer	12	6	21 - 40	7 - 13
	Early Fall	12	9	120 - 210	10 - 40
Kale	60 days planted	12 - 20	3	--	--
	Thereafter	12 - 16	3	--	--
Lespedezas - Annual	Summer	8 - 15	3	--	--
	Last	8 - 15	3	--	--
Lespedezas - Perennial	Summer	10 - 15	3	--	--
	Fall	10 - 15	3	--	--
Little Bluestem	Spring	12	4 - 6	--	--
	Summer	12	4 - 6	--	--
	Fall	12	4 - 6	--	--
Orchardgrass	Early Spring	6 - 12	3 - 4	30 - 45	10 - 15
	Spring	6 - 10	3 - 4	14 - 30	5 - 10
	Summer	6 - 10	3 - 4	30 - 60	10 - 20
	Fall	6 - 10	3 - 4	21 - 35	7 - 12

TABLE 3: Recommendations for Grazing Heights, Recovery Days, and Number of Paddocks in Rotational Grazing Systems ^{1/}

Forage Species	Growth Periods	Height in Inches		Recovery Days ^{2/}	Number of Paddocks ^{3/}
		To Begin	To Stop		
Perennial Ryegrass	Early Spring	6 - 10	2 - 3	30 - 45	10 - 15
	Spring	6 - 8	2 - 3	14 - 30	5 - 10
	Summer	6 - 8	2 - 3	30 - 60	10 - 20
	Fall	6 - 8	2 - 3	21 - 35	7 - 12
Rape	60 days planted	12 - 20	3	--	--
	Thereafter	12 - 16	3	--	--
Reed Canarygrass	Early Spring	8 - 14	6	30 - 45	10 - 15
	Spring	8 - 12	6	14 - 30	5 - 10
	Summer	8 - 12	6	30 - 60	10 - 20
	Fall	8 - 12	6	21 - 35	7 - 12
Smooth Bromegrass	Early Spring	6 - 10	2 - 3	30 - 45	10 - 15
	Spring	6 - 10	2 - 3	14 - 30	5 - 10
	Summer	6 - 10	2 - 3	30 - 60	10 - 20
	Fall	6 - 10	2 - 3	21 - 35	7 - 12
Switchgrass	Early Summer	12	6	21 - 30	7 - 10
	Mid Summer	12	6	21 - 40	7 - 13
	Early Fall	12	9	120 - 210	10 - 40
Tall Fescue	Early Spring	6 - 12	2 - 3	30 - 45	10 - 15
	Spring	6 - 10	2 - 3	14 - 30	5 - 10
	Summer	6 - 8	2 - 3	30 - 60	10 - 20
	Fall	6 - 10	2 - 3	21 - 35	7 - 12
	Winter (Stockpiling)	6 - 12+	2 - 3	45 - 90	15 - 30
Timothy ^{2/}	Spring	6 - 10	2 - 3	14 - 30	5 - 10
	Summer	6 - 10	2 - 3	30 - 60	10 - 20
	Fall	6 - 10	2 - 3	21 - 35	7 - 12
Turnips	60 days planted	12 - 20	3	--	--
	Thereafter	12 - 16	3	--	--
Winter Small Grain	Fall	6 - 12	3	45 - 90	15 - 30

TABLE 3 NOTES:

^{1/} This table provides guidelines concerning when to start and stop grazing established stands. Rotational systems include all systems that provide a recovery period. Based on available data, recommendations for the minimum number of recovery days and number of paddocks are provided in the table.

For all forage species, the lower beginning heights are for peak performance livestock such as lactating dairy cows. Cow/calf operations do well with somewhat lower quality forage found at the taller limits. Grazing at the

lower beginning heights may not always allow for complete restoration of food reserves and may result in shorter stand life.

- 2/ Expected number of rest days before regrazing.
- 3/ The number of paddocks listed here is based on a grazing period of 3 days and assumes the growth will be ready for regrazing in the number of days shown in the previous column (recovery days). Short grazing periods generally result in best utilization of available forage with the least forage loss or quality changes.
- 4/ Frosted growth can be used flexibly, but may need supplemental protein, and it should be used before all leaves deteriorate.
- 5/ Number of paddocks are based on a 3-day grazing period and an attempt to use the frosted forage in 30-120 days during fall-winter period.
- 6/ Should usually have 45 days rest immediately before a killing frost. Thereafter, the growth may be grazed or harvested before leaves drop.
- 7/ Number of paddocks is based on a 3-day grazing period within each paddock and the goal of using all frosted growth in 30-60 days or before leaves drop.
- 8/ Late summer growth may be grazed in the fall, but quality may be limiting. Utilization can be improved with a very high stocking density to graze a paddock in a shorter time period (less than 3 days).
- 9/ Timothy is better suited for hay than for grazing. Poor regrowth; only suitable for less intense grazing systems. Susceptible to insect and disease problems.

TABLE 4: Recommended Residual Heights in Continuous Grazing Systems ^{1/}		
Forage Species ^{2/}	Height at First Grazing (in inches)	Average Height of Pasture (in inches)
Bermudagrass	4	2
Bluegrass	4 - 5	2 - 3
Clover - Alsike, Red, & Common White	4 - 7	3
Clover - Ladino	8 - 10	3 - 4
Fescue	6 - 8	3 - 4
Orchardgrass	6 - 8	4 - 5
Smooth Bromegrass	Before jointing	3 - 4
Timothy	Before jointing	4
Winter Small Grains	8 - 12	3 - 6

TABLE 4 NOTE:

- 1/ Table 4 provides guidelines for managing established stands in continuous grazing systems.
- 2/ The following species tend to become depleted in stands under continuous grazing systems where no recovery period is used. Therefore, these species are not recommended for use in continuous systems: Alfalfa (including grazing types), Big Bluestem, Birdsfoot Trefoil (upright & prostrate types), Caucasian Bluestem, Eastern Gamagrass, Indiangrass, Kale, Lespedeza (annual and perennial), Little Bluestem, Rape, Reed Canarygrass, Switchgrass, and Turnips.