■ Grazing Management

The manipulation of grazing animals to accomplish desired results when considering of animal, plant, land, or economic responses.

1) **Grazing readiness:** the defined stage of plant growth at which grazing may begin under a specific management plan without permanent damage to vegetation or soil. Grazing readiness should be monitored to determine when grazing can begin in the spring. Grazing readiness, as it relates to plant phenology, is similar among most grasses; however, when it occurs can vary dramatically.

Tip: The following is a guide to aid in determining when plants are ready to be grazed.

Leaf Stage Development:

Native grasses at the 3½ leaf stage
Exotic (tame) grasses at the 3 leaf stage

Leaf Height

(minimum vegetative height in inches):

4 inches: crested wheatgrass, Kentucky bluegrass, little bluestem, Russian wildrye, sideoats grama

6 inches: alfalfa, sweetclover, green needlegrass, slender wheatgrass, western wheatgrass

8 inches: big bluestem, sand bluestem, creeping foxtail, Indiangrass, intermediate wheatgrass, pubescent wheatgrass, prairie sandreed, reed canarygrass, smooth bromegrass, tall wheatgrass

12 inches: switchgrass

Approximate Date

(range readiness should primarily be determined by leaf stage and height, calendar dates should be used as a guide only):

April 20 - May 1: crested wheatgrass, sweetclover

May 1- May 10: creeping foxtail, Kentucky bluegrass, reed canarygrass, Russian wildrye, slender wheatgrass, smooth bromegrass

May 10 - May 20: alfalfa, green needlegrass, intermediate wheatgrass, pubescent wheatgrass, western wheatgrass

June 20 - June 30: blue grama, prairie sandreed, sideoats grama, switchgrass

After July 1: big bluestem, little bluestem, sand bluestem

Minimum Heights of Pasture Species for Beginning and Ending Grazing[1]

	Begin Grazing		End Grazing	
	Minimum & Optimum			
Species	Height of Vegetative Growth in Inches	Approximate Date	Minimum Stubble Height in Inches	Minimum Regrowth Before Killing Frost in Inches
Alfalfa	6 – 10	May 15	3	8
Sweetclover	6 – 10	May 1	2	-
Big bluestem	8 – 14	July 1	6	6
Crested wheatgrass	4 – 6	April 20	3	4
Green needlegrass	6 – 8	May 15	3	5
Indiangrass	8 – 14	July 1	6	6
Intermediate wheatgrass	8 – 14	May 15	4	6
Kentucky bluegrass	4 – 6	May 7	2	4
Little bluestem	4 – 6	July 1	3	4
Pubescent wheatgrass	8 – 14	May 15	4	6
Prairie sandreed	8 – 14	June 20	4	6
Reed canarygrass	8 – 8	May 7	4	6
Russian wildrye	4 – 4	May 7	3	4
Sideoats grama	4 – 6	June 20	2	4
Slender wheatgrass	6 – 12	May 7	3	6
Smooth bromegrass	8 – 14	May 7	4	6
Switchgrass	12 – 20	June 20	8	10
Tall wheatgrass	8 – 14	May 7	4	6
Western wheatgrass	6 – 10	May 15	4	5

*Grass and legume mixtures should be grazed in a manner that favors the dominant desired species.

*Height is the average height when leaves are lifted to a vertical position.

*To get the highest return from smooth bromegrass, intermediate wheatgrass and pubescent wheatgrass, start grazing when the plant is in the early boot stage. Clip high prior to seed set to trigger regrowth of basal sprouts.

*The last harvest of alfalfa for pasture for hay should generally be made 35 to 45 days prior to the time when the first hard freeze normally occurs.

*Minimum regrowth is critical if stand is to be maintained. On pasture grazed only during the dormant season stubble height at the end of the grazing period is applicable.

*Approximate date is for continuous grazing. Rotation grazing can usually begin three to seven days earlier.

[1]NRCS Field Office Technical Guide, April 1998

2) **Rotational grazing:** a system of grazing requiring two or more pasture units between which grazing animals are moved in sequence, thereby resulting in grazing periods being followed by non-grazing periods. Rotational grazing is a management strategy that is HIGHLY RECOMMENDED.

NOTE: It is highly recommended that before implementing a rotational grazing system a resource inventory be completed to help develop the proper rotational sequence based on goals and available labor of the land manager. For assistance in completing a resource inventory, see the technical assistance section of this guide.

Tip: The number of pastures within a rotation should be based on the producer's goals, management abilities, available labor, terrain and water availability. The number of pastures influences the length of time a pasture will be grazed and the length of time a pasture will be rested after grazing. Three pastures are probably the minimum number of pastures needed for a rotation to be effective. However, without proper grazing management, the number of pastures becomes inconsequential and higher pasture numbers may actually be detrimental.

Tip: Plant health and growing conditions will influence the number of days a plant needs to recover from grazing. A general rule is to plan for a minimum of 30 days of rest in western Minnesota and eastern North Dakota and 45 days of rest in western North Dakota under good growing conditions (fast growth). As plant growth slows, rest periods need to be extended to permit proper plant recovery after grazing. Rest periods of at least 45 days in western Minnesota and eastern North Dakota and 65 days in western North Dakota are probably required. Under drought conditions, longer rest periods may be needed to ensure grazed plants recover adequate leaf area prior to next grazing.

Monitoring plant growth and adjusting these rest periods during the grazing season to reflect actual growing conditions is recommended.

Tip: A proper rotation should consider impacts on both the plant and grazing animal. Grazing pastures once during the grazing season may reduce nutritional value of the pastures grazed later in the growing season due to a high degree of mature plants being utilized. Grazing a pasture twice in the same growing season may improve plant vigor while potentially increasing nutritional value of the grazed plants.

Tip: For native pastures (rangeland), alternate grazing periods from year to year so that a pasture is not grazed during the same time of the growing season two years in a row. For example, eliminate the "classic" spring pasture, summer pasture and fall pasture rotation schedule.

Tip: For tame pastures (pastureland) grazing periods need not be altered from year to year provided proper grazing management and soil fertility are maintained. For example, a crested wheatgrass pasture would be grazed first in the spring each year.

3) **Degree of utilization:** the proportion of current year's forage production that is consumed and/or destroyed by grazing animals. May refer to a single plant species or to a portion or all the vegetation.

Tip: Proper utilization varies by plant species. However, most plants do not tolerate overgrazing (overuse of a plant for consecutive years). Grazing utilization is classified as slight, moderate, full, close, and severe use (see following table for description of each grazing use category). Proper utilization should be monitored using those grasses that are desired by the type of livestock being grazed and meet your management objectives. For example, needle-and-thread versus sand dropseed, or green needlegrass versus upland sedges. If you are managing your rangeland for forage production, you would want to monitor the level of use on green needlegrass since green needlegrass is a more desirable forage species than upland sedges.

Tip: General rule of thumb would be proper utilization is moderate to full use, depending on plant species.

Utilization Level		% Use[1]	Description[1]
Slight	0 – 20	Appears practically undisturbed when viewed obliquely. Only choice areas and forage grazed.	
Moderate	20 – 40	Most all of accessible range shows grazing. Little or no use of poor forage. Little evidence of trailing to grazing.	
Full	40 – 60	All fully accessible areas are grazed. The major sites have key forage species properly utilized (about half taken and half left). Points of concentration with overuse limited to 5 to 10 percent of accessible area.	
Close	60 – 80	All accessible range plainly shows use and major sections closely cropped. Livestock forced to use much poor forage considering seasonal preference.	
Severe	> 80	Key forage species completely used. Low value forage carrying grazing load.	

[1]E. J. Dyktserhuis. 1951

Figures 2,3 and 4 show different grasses and the relationship between plant height and weight. Because most of the weight of a grass plant is near the base, 50% use by weight is not the same level as 50% use by height.

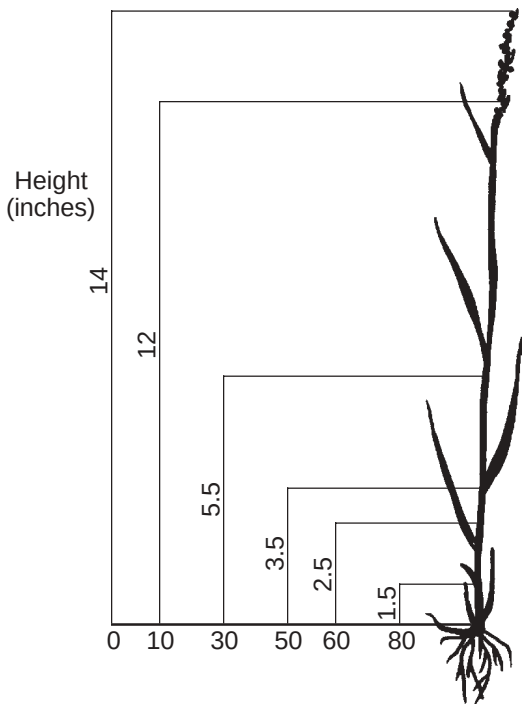

Figure 2. Percent weight of western wheatgrass utilized at different stubble heights[1]

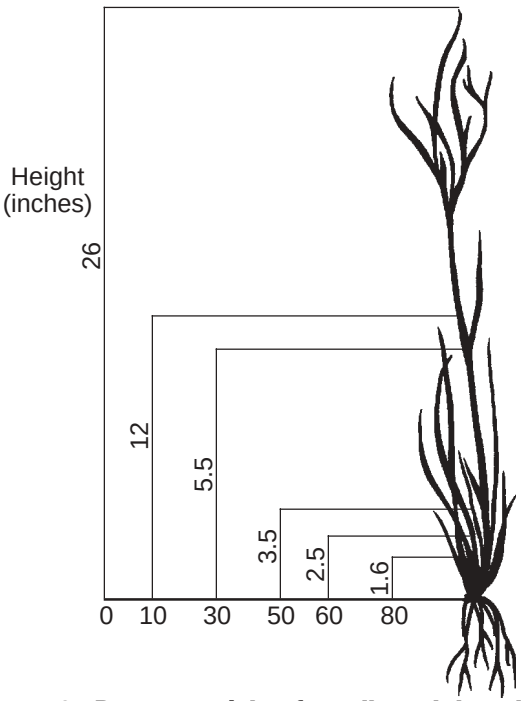

Figure 3. Percent weight of needle-and-thread utilized at different stubble heights[1]

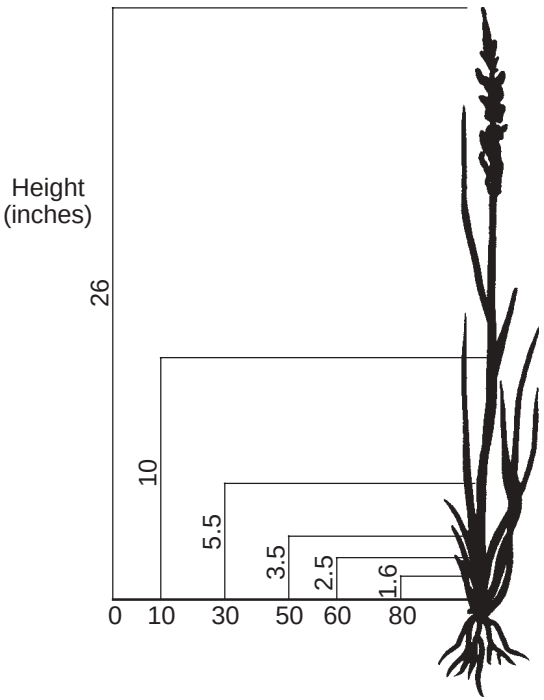

Figure 4. Percent weight of green needlegrass utilized at different stubble heights[1]

[1]Montana State University. 1999.

Tip: Degree of utilization is a measure of grazing intensity. A proper utilization level helps ensure that the grazed plant maintains adequate leaf area for photosynthesis and a deep, healthy root system. It also ensures that some plant material remains in the pasture for ground cover.

Tip: No use, over an extended period of time, will be detrimental to plant vigor, plant diversity and overall rangeland health.

The amount of leaf material removed during the growing season also affects how rapidly a grazed plant will recover from a grazing event (Figure 5). The following table from “Grass: A stockman’s crop and how to harvest more of it” (Harland E. Dietz) illustrates the impact of leaf removal on plant growth.

Percent leaf of volume removed	Percent of root growth stoppage
10%	0%
20%	0%
30%	0%
40%	0%
50%	2 - 4%
60%	50%
70%	78%
80%	100%
90%	100%

Tip: The more leaf area that is removed from a plant during each grazing event, the more time the grazed plant(s) will need to recover. Pastures within a rotation that are grazed short (more than 50 percent of the leaf area removed) will need to be given more recovery/rest time. This is especially important during periods of less than ideal growing conditions.

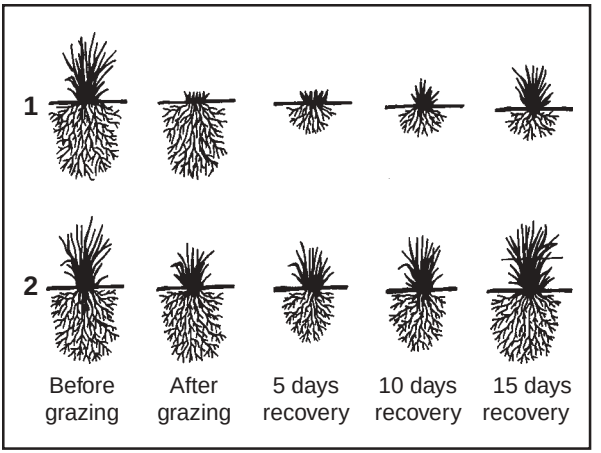

Figure 5. Plant regrowth rates depend on the amount of leaf removed at a grazing. Plant 2 regrows more quickly because it can fix more energy through photosynthesis than Plant 1, which must draw on its root reserves for energy to regrow. (Reprinted with permission from "Pasture Vegetation – The Monitoring Tool Box" Land Stewardship Project. June 2000.)

Tip: For monitoring degree of use information, see "Monitoring" section, Tab 19.