

Determining Pasture Utilization Using Average Stubble Heights

Range and Pasture Jobsheet 23

The Prescribed Grazing Practice Standard (528) documents minimum average stubble heights that need to be maintained for proper grazing. This job sheet provides a method for determining whether the average stubble heights in a pasture are above or below these values. The Prescribed Grazing Practice Narrative contained in the Conservation Plan of Operations should identify the grass species being managed and the minimum acceptable stubble height for the species.

Transect location and setup

Stubble heights may be quite uniform across the pasture; however, in most cases there will be some variation. Variation results from differences in grazing distribution due to pasture size, watering locations, location of shade, etc.

To ensure the sampling process accounts for this variation, transects should sample all the different grazing zones that are found within the pasture (see example on page 3). Do not include heavy use areas (bare areas) in the sample. These areas are not providing grazeable forage and their effect will be reflected in the stubble height of the existing forage.

Twenty sample points will be taken on each transect. The points within each transect need to be taken at regular intervals. To determine this interval, divide the total length of each transect by 20. This is how far apart the sample points within each transect should be.

Sampling method

A minimum of 1 transect with 20 sample points will be taken across the pasture. More transects may be required. At each sample point, the average stubble height, within a 6-inch radius of the selected point, is determined. **If the stubble height is lower than the recommended height a “below” is recorded. If the stubble height is equal to or higher than the recommended height an “above” is recorded.**

Mature seed stalks should not be accounted for within this average height. For example, if a sample point had bahiagrass with an average leaf canopy height of 2 inches, but there were several seedstalks averaging 12 inches in height, the seedstalks would not be used in determining the average.

For each transect there are 3 possible outcomes:

- Grazing may continue; stubble height is above the recommended value - the number of samples counted as “below” is less than or equal to that stated in the “Count at which grazing may continue” column (Table 1).
- Grazing should stop; stubble height is below the recommended value - the number of samples counted as “below” is greater than or equal to that stated in the “Count at which grazing should stop” column (Table 1).
- More transects are needed - the number of samples counted as “below” is between the values stated in Table 1. There is not sufficient information to make a decision.



After 6 transects have been taken (i.e., the total number of sample points equals 120) and a clear decision still cannot be made, arrangements should be made to stop grazing in that pasture because the actual stubble height is likely less than the recommended value.

In some instances it may be obvious, without running transects, that the existing stubble height in a pasture is above or below the recommended value. In this situation, the observer may choose to document this decision without taking any measurements.

Sample timing

Sampling may occur at any time for management purposes, such as deciding when to rotate pastures, etc. To document Prescribed Grazing, monitor during the following times:

- For continuously grazed, perennial warm-season pastures (exa. bermudagrass, dallisgrass, bahiagrass, carpetgrass) sample from mid-July through September.
- There are situations where utilization below the recommended stubble height is an acceptable management practice, such as when preparing to overseed cool season forages on a perennial pasture. Do not monitor these pastures just prior to planting.
- For continuously grazed, perennial cool season pastures, (fescue) sample from mid-March through mid-May.
- For continuously grazed annual pastures (ryegrass, sudangrass, crabgrass, small grains, millet) sample anytime during the growing season.
- For rotationally grazed pastures sampling can occur anytime. However, sampling should occur on the most recently grazed pasture or the pasture the animals are about ready to leave.

References

D.L. Turner and W.P. Clary. 2001. Sequential sampling protocol for monitoring pasture utilization using stubble height criteria. J. Range Mgmt. 54:132-137.

Stubble Height Determination Worksheet

Table 1. The cumulative sample size is stated for each transect. Twenty sample points are to be taken on all transects. The values needed to determine whether grazing can be continued or should be stopped are also documented.

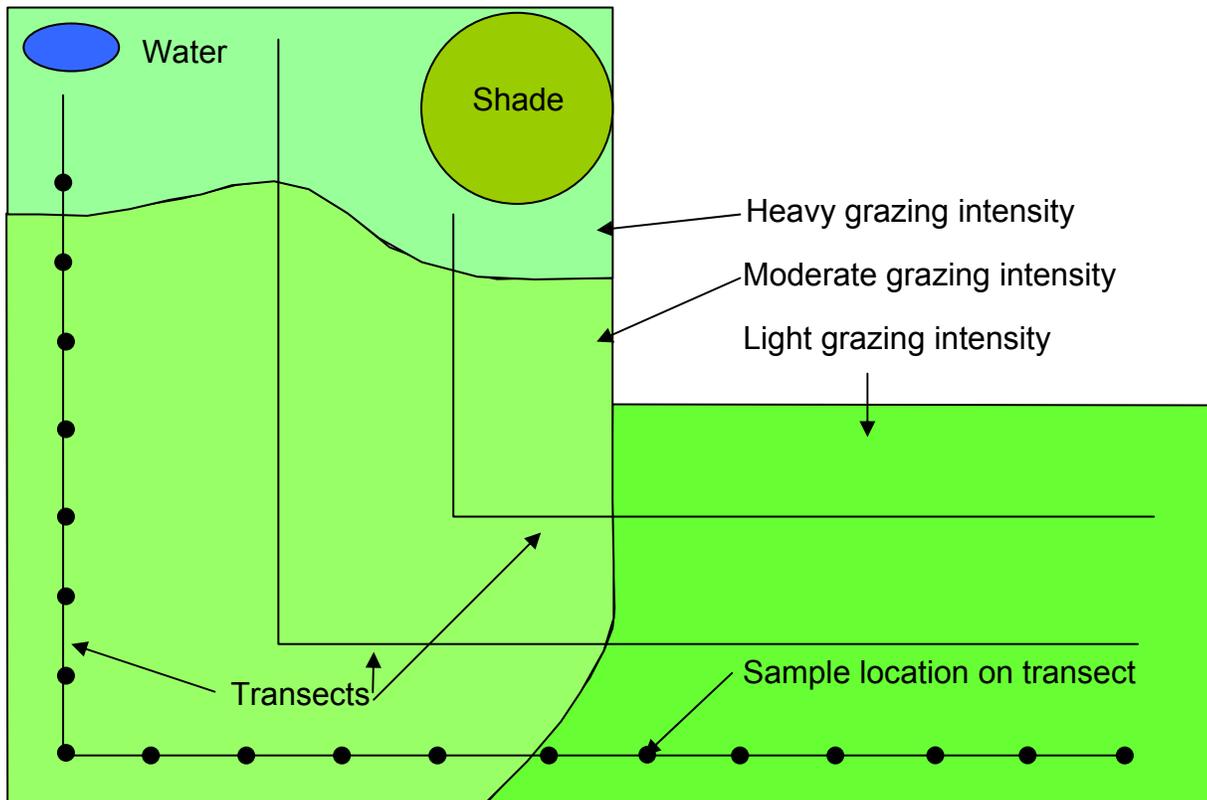
Transect #	Cumulative Sample Size	Count at which grazing may continue	Count at which grazing should stop
1	20	1	19
2	40	10	28
3	60	19	37
4	80	28	46
5	100	37	54
6	120	46	63



Landowner:				Grazing system: Continuous / Rotational (circle one)	
Date:				Mgmt. species	Recommended stubble height (in.)
SWCD-FO:				1.	
Farm No.:				2.	
Tract/Field No.:				3.	
Observer:					
Transect No.	Above counts	Below counts	Cumulative below count	Transect No. at which decision could be made	
1				Decision made (circle one): Properly grazed/Overgrazed	
2				Comments:	
3					
4					
5					
6					

- Fill out the landowner information and other data needed to identify the farm and the individual pasture being monitored.
- Determine the management species in the pasture. Record the minimum stubble height recommendation from the Prescribed Grazing Practice Standard for these species. **This will change based on grazing system.**
- Select the first transect location ensuring it traverses as many different grazing zones as possible. The transect does not necessarily need to be a straight line. Effort should be made to locate subsequent transects across the entire pasture.
- Measure the average stubble height of the forage within a 6-inch radius for each of the 20 points within a transect. Measured values below the recommended stubble height are tallied in the “below count” column. Measured values equal to or above the recommended stubble height are tallied in the “above count” column. For the first transect, the number of “below” counts should be transferred to the “Cumulative below count column”. For subsequent transects the “Cumulative below count column” should include the count taken from the current transect plus those of all the previous transects.
- After each transect is run compare the recorded cumulative “below” counts to those in table 1 for the appropriate transect number. For each transect, there are 3 possible outcomes:
 - Grazing may continue; stubble height is above the recommended value - the number of samples counted as “below” is less than or equal to that stated in the “Count at which grazing may continue” column (Table 1).
 - Grazing should stop; stubble height is below the recommended value - the number of samples counted as “below” is greater than or equal to that stated in the “Count at which grazing should stop” column (Table 1).
 - More transects are needed - the number of samples counted as “below” is between the values stated in Table 1. There is not sufficient information to make a decision. After 6 transects have been taken (i.e., the cumulative sample size equals 120) and a clear decision still cannot be made, arrangements should be made to stop grazing in that pasture because the actual stubble height is likely less than or equal to the recommended minimum stubble height value.

EXAMPLE – Determining stubble height in a pasture



Locate transects so they cross all levels of grazing intensity, while staying out of heavy use areas like those found immediately surrounding water troughs and shade. Transects may curve to accommodate the shape of the pasture, if necessary.

Landowner:	John Doe			Grazing system:	<input checked="" type="radio"/> Continuous	<input type="radio"/> Rotational (circle one)
Date:	8/1/2003			Mgmt. species	Recommended stubble height (in.)	
SWCD-FO:	Rapides Parish			1. bermudagrass	3"	
Farm No.:	222			2. bahiagrass	3"	
Tract/Field No.:	647/2			3.		
Observer:	John Smith					
Transect No.	Above counts	Below counts	Cumulative below count	Transect No. at which decision could be made	4	
1	13	7	7	Decision made (circle one)	<input checked="" type="radio"/> Properly grazed	
2	12	8	7 + 8 = 15	Comments:		
3	13	7	15 + 7 = 22			
4	14	6	22 + 6 = 28			
5						
6						

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Table 2. Grazing use heights and recovery periods for selected forage species.

Species	Minimum heights prior to grazing (inches)	Minimum residual grazing heights (inches)		Average recovery period (days) ¹
		Continuous grazing	Rotational grazing	
Grasses				
Annual ryegrass	8	4	3	14-21
Bahiagrass	4	3	2	20-26
Bermudagrass, common	4	3	2	18-24
Bermudagrass, hybrid	6	4	3	18-24
Big bluestem	12	8	6	21-35
Broadleaf signal grass	8	4	3	21-30
Carpetgrass	4	3	2	18-24
Crabgrass	8	4	3	21-30
Dallisgrass	5	4	3	18-24
Eastern gamagrass	15	10	8	24-38
Indiangrass	12	8	6	21-35
Johnsongrass ²	20	8	6	21-30
Oats	8	4	3	14-21
Pearl Millet	20	10	8	10-20
Rye	8	4	3	14-21
Sudangrass ²	20	8	6	21-30
Switchgrass	12	8	6	24-38
Tall fescue ³	8	4	3	21-30
Wheat	8	4	3	14-21
Legumes				
Annual lespedeza	4	3	2	18-24
Crimson clover	8	4	3	16-24
Persian clover	8	4	3	16-24
Red clover	8	4	3	16-24
Sericea lespedeza	8	5	3	14-21
Subterranean clover	4	3	2	14-21
White clover	4	3	2	14-21

¹ Based on favorable growing conditions for the plant. Longer recovery periods will be needed during stress periods. Shorter recovery periods may be needed during fast growth conditions.

² Refer to Forage Sorghums under Degree of Use Criteria on Cropland for detailed grazing guidance.

³ Do not graze or hay tall fescue from May 15 to September 15. This plant is a cool season perennial and the persistence of this plant can be severely reduced by defoliation during this period.

Refer to Nutrient Management (590) Practice Standard for information on fertilizing on pastureland. Refer to the current L.S.U. Agriculture Center Suggested Chemical Weed Control Guide for information on herbaceous weed control on pastureland.