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## Estimating Grass Utilization Using Photographic Guides

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# **Estimating GRASS Utilization Using Photographic Guides**

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Stocking rate, and the resulting level of grass utilization (or grass weight removed) by grazing livestock, has more impact on grass productivity than any other single factor within the range manager's control. Determining the level of utilization for a pasture is one of the most important measurements that a manager can make when monitoring grazing management over years. The photo guides and procedures presented in this publication are intended to make grass utilization estimates both rapid and useful. The terms "utilization," "use," and "degree of use" all have similar meanings.

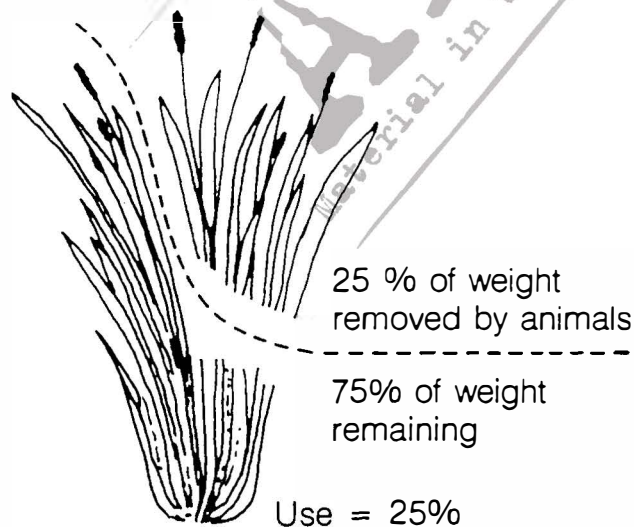
## What Does Utilization Mean?

Utilization is the proportion of current year's forage production that is consumed and/or destroyed by grazing animals. Utilization may refer either to a single species or to all of the grazable vegetation of a pasture (Jacoby, 1989). Pasture utilization may be estimated based on the utilization of a single species or combinations of species for different range sites or different grazing seasons.

"Utilization," "use," or "degree of use" is expressed as a percentage of the total weight that is removed (Figure 1).

Utilization estimates can be made for grasses, forbs, or browse (shrubs), but are limited in this publication to estimates for grasses.

Figure 1. Forage use of a bunchgrass.

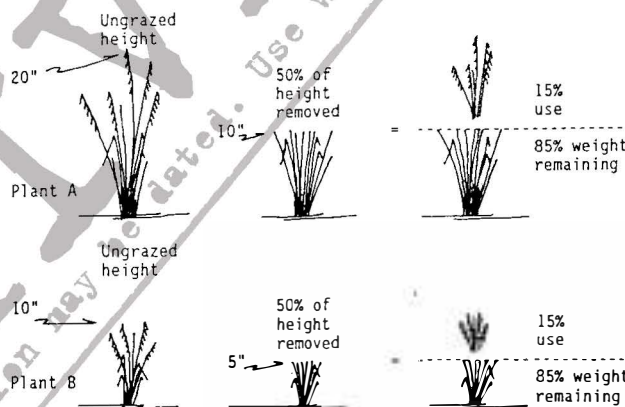


## Height-Weight Relations in Grass

It's important to remember that **utilization refers to percent of weight removed, not to percent of height removed**. Plant height of a grass obviously will vary drastically from year to year or from location to location, but weight distribution from bottom to top of a grass plant is consistent. Most of the weight of a grass plant is concentrated nearer the bottom.

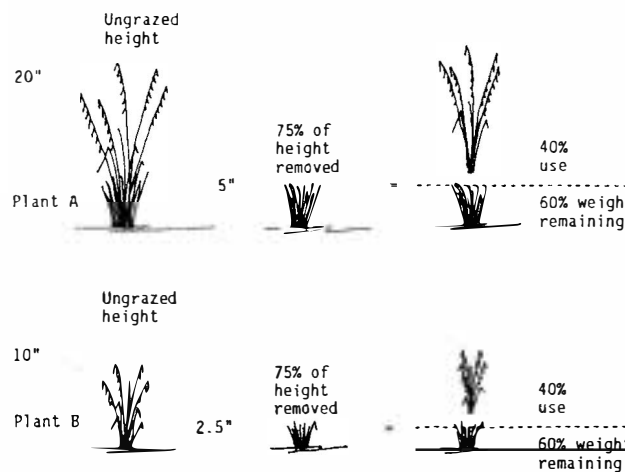
Figure 2 shows two different sideoats grama plants, both grazed to 50% of their original height. The percent weight removed is the same, 15%, when grazed to 50% of the ungrazed height.

Figure 2. Sideoats grama grazed to 50% of original height.



When these plants are grazed to 25% of their original height, percent weight removed is again the same for both (see Figure 3). In this example, 40% of the weight is removed when either plant is grazed to 25% of the ungrazed height.

Figure 3. Sideoats grama grazed to 25% of original height.



# Why Determine Utilization?

Early researchers learned that the health and vigor of a grass plant (or a pasture) is not affected as much by the amount of height removed as by the amount of weight removed. Research has shown that a typical grass plant needs at least 50% of its leaf surface to remain vigorous and productive. Grass plants need the food manufactured by the remaining leaves in order to regrow and survive. Thus, utilization estimates are made on individual plants, but what is of real interest is whether all plants throughout the pasture are receiving a level of use that will promote vigor and sustained production.

Here are some specific situations where a manager may want to monitor pasture utilization:

- A pasture is scheduled to be used in early summer for one month, but after just three weeks of grazing, utilization estimates indicate that the desired use (say 50%) has already been achieved. The manager may elect to rotate livestock to a fresh pasture to prevent decreased animal performance or loss of plant vigor.
- The same pasture, in a different year, has been grazed for its budgeted one month; utilization estimates show 25 percent use. Grass in the next pasture scheduled to be grazed has not grown as expected. The manager elects to hold stock in the first pasture for an additional two weeks, knowing utilization levels will not be excessive. The next pastures will have the benefit of increased vigor and production as a result of the delayed turnout.
- Non-uniform patterns of use in a pasture are a clear sign that forage harvest efficiency is not optimum. If the disparities in degree of use are sufficiently large, the manager may cross-fence the pasture, develop water, or change the seasons of use to give more uniform utilization and greater animal production.
- Utilization estimates over several representative years clearly demonstrate which individual pastures or ranch units are overstocked or understocked. The manager uses this information to decide whether the ranch can sustain the existing stock or whether stock numbers should be changed -- either up or down.
- Utilization records for a pasture over several grazing seasons provide evidence whether use levels are

contributing to improvement or deterioration in range health and productivity. For example, when the manager feels that range condition appears to be deteriorating, a utilization record might suggest several possibilities:

- Livestock grazing is or is not the likely culprit.
- Weather fluctuations might be partly responsible.
- Adjustments in season of use are warranted.
- Stock reductions may be required.

## Applying Utilization to Management

The complexity of grass utilization patterns in many situations, except tame pasture monocultures, dictates a need to simplify procedures for utilization estimates. This is accomplished by selecting key grasses (indicator grasses) in key areas for utilization estimates rather than by estimating utilization for all species. Unless the manager resorts to a single or a few key species for utilization estimates, he will be confronted by a large variety of species, each utilized to a different degree depending on its availability, location, season of use, and animal preferences.

### Selecting Key Grasses for Measurement

Key grasses are vital to maintenance of livestock carrying capacity and animal performance. These grasses (or indicator grasses) selected for utilization estimates are important for different reasons. A species selected as key should fit one or both of these criteria:

- It is one of the most abundant species in the pasture during the season of livestock use, and it makes up a large portion, even the major portion, of the animal's diet.
- It has indirect value in the pasture. Correctly called an indicator, this grass is not abundant enough to produce much forage. However, it is judged to be important from the standpoint of plant species diversity, wildlife value, soil stability, nutrient cycling, or similar biological criteria.

A word of caution: Highly preferred species ("ice cream" plants) in many range situations may occur in only small quantities. On these species, higher levels of use often are tolerated in order to obtain fuller use of more abundant species. However, "ice cream" plants generally can be maintained or even increased in a pasture if grazing deferments permit them to recover during their critical growth periods.

In general, correct grazing for one, two, or three key forage plants means correct grazing for the entire pasture.

### **Selecting Key Areas for Measurement**

Analogous to the key plant concept for determining utilization is the key area theory. Just as a single species or group of species is a key to correct use, so a representative area may be selected to estimate utilization. The principle is that no pasture of appreciable size or complexity is used uniformly. Heavy use is inevitable near watering locations, salt grounds, level valley floors, and more accessible ridge tops. Likewise, lighter use, or even nonuse, may prevail at great distances from water and on very steep hillsides.

Certain areas may be designated as sacrifice areas and will be overused just as the uncommon and highly preferred species may be overused. Other areas will most likely be underused, since their full use would cause serious overuse and range damage to more accessible areas. The intermediate areas, then, become the key areas from which to judge utilization of the pasture. However, if you want to make a use map for the pasture, utilization will be estimated in all major representative areas of the pasture.

### **Selecting Dates for Measurement**

#### **After the Grazing Period**

Estimate utilization as soon after the grazing period ends as is possible.

For season-long grazing in South Dakota, about mid-October is the best time to assign final yearly use ratings.

For pastures grazed once, but briefly -- typically one to three months -- estimate utilization as close to the livestock removal dates as possible. This is especially important, because grass continues to grow and the longer you delay estimating utilization, the more distorted and misleading your estimates of use will be.

For pastures grazed more than once in a season, make utilization estimates at the end of each use period, on the appropriate key species for that period.

#### **During the Grazing Season**

Mid-season estimates are useful for predicting when the desired use level will be reached. Adjustments in stock numbers often can be made by rating utilization in mid-season. Early-season stocking manipulations (mid-season or earlier) can help to avoid serious overuse in dry years or to take advantage of surplus forage in good years.

## **Determining Utilization**

### **Use Rating Classes**

Six use rating classes define categories into which visual estimates of utilization can readily be placed. Table 1 gives a brief description of utilization in each class. These ratings are used by the Soil Conservation Service and others and are the standard for defining range or cultivated pasture utilization levels.

### **Individual Plant Photo Guides**

Photographs in this guide (pages 10 through 17) show six levels of use for eight species common to South Dakota ranges and cultivated pastures. Plants have been clipped to show utilization of 0% (unused), 10%, 30%, 50%, 70%, and 90%. These use levels are designed to aid in placing utilization estimates in a specific use rating class.

Determining the use rating is quite easy and fast for individual plants or areas in a pasture. The grazed plant(s) is compared to the photographs of that species which show various levels of use. In actual practice, grazed plants are first compared to ungrazed "neighbors" to get a feel for their original height. Then the percent height removed is estimated and the photo guides are used to categorize the percent of use (by weight). The best fit between the grazed plant and the photographs allows direct placement into one of the use ratings described in Table 1. Utilization estimates for individual plants are averaged or expanded to represent use of the area. (See Paced Transect Method.)

A special caution is needed. The photographed plants are relatively tall for some parts of the state and for some growing conditions. However, the relationship between a plant's height and its weight is consistent. Therefore, when you estimate utilization on a plant whose unused height is different from that in the photo guides, take care to judge use in relation to proportion of the height grazed, not the actual "inches" of height grazed. Ignore the inch increment marks and think of the grid in terms of proportion of the ungrazed height versus the grazed height.

It often will be useful to use "bracketing" to discern the proper use rating class. This is done by asking a series of questions that tightens the bracket. For example:

**Question 1.** Is the grazed plant (or plants in the area) grazed more or less than 50%?

**Answer 1.** By comparison to the photographs it is clearly grazed less than 50%.

**Table 1. Use rating class descriptions for varying levels of use.**

Use Rating Class	Use of Current Year's Growth <sup>1</sup>	Whole-Pasture Use Description
UNUSED	0%	No livestock use
SLIGHT	1 to 20%	Appears practically undisturbed when viewed obliquely. Only choice plants and favored areas near water, trails, or shade are grazed.
MODERATE	21 to 40%	Most all of accessible pasture shows grazing. Little or no use of poor forage. Little evidence of trailing to grazing.
FULL	41 to 60%	All fully accessible areas are grazed. The major sites have key forage species properly utilized (about 1/2 taken and 1/2 left). <sup>2</sup> Points of concentration with overuse limited to between 5% and 10% of accessible area.
CLOSE	61 to 80%	All accessible pasture plainly shows use and major sections are closely cropped. Livestock forced to use much poor, dry, and stemmy forage considering seasonal preference.
SEVERE	81 to 100%	Key forage species almost completely used. Low-value forage carrying grazing load. Trampling damage widespread in accessible areas.

<sup>1</sup>These use categories apply to individual plants as well as to average area or whole-pasture use.

<sup>2</sup>The reference to "proper utilization (about 1/2 taken and 1/2 left)" is the Soil Conservation Service standard for weight removal. Proper utilization, depending on circumstances, can range from a low of "unused" to a high of "close."

**Question 2.** Is the plant grazed more or less than 30% (but less than 50% as established with Answer 1)?

**Answer 2.** By comparison to the photographs, it is grazed more than 30%, but it is closer to 30% than to 50%.

**The conclusion is,** therefore, that the plant or area falls in the 21-40% Class, which is **Moderate use.**

This process for determining utilization is known as the Grazed-Class Photo Guide procedure.

within a pasture and can be used to suggest where improvements like water developments or fence changes should be made. Changes would be suggested where large areas of under- or over-utilized forages occur.

A use map is simply a general map of the pasture completed near the end of the grazing season or grazing cycle. It need not be technical or detailed and should not require much time to complete. Yet the use map, created diligently each year on each pasture in question, is probably the most valuable range monitoring record a manager can maintain.

## Making a Pasture Use Map

Once degree of use estimates can be made for key species, a use map or use pattern map is often the next logical step. Use pattern maps reveal grazing patterns

An existing range inventory map drawn on an aerial photograph makes an excellent base map. The use map can be made on a photocopy of the inventory map. In the absence of a range inventory, a use map can be made from any property map that shows fences, water sources, and major terrain features that influence livestock movement. Record the use within each major range site/condition mapping unit or significant

terrain feature in the pasture. These zones of use are compiled on a map, as shown in Figure 4.

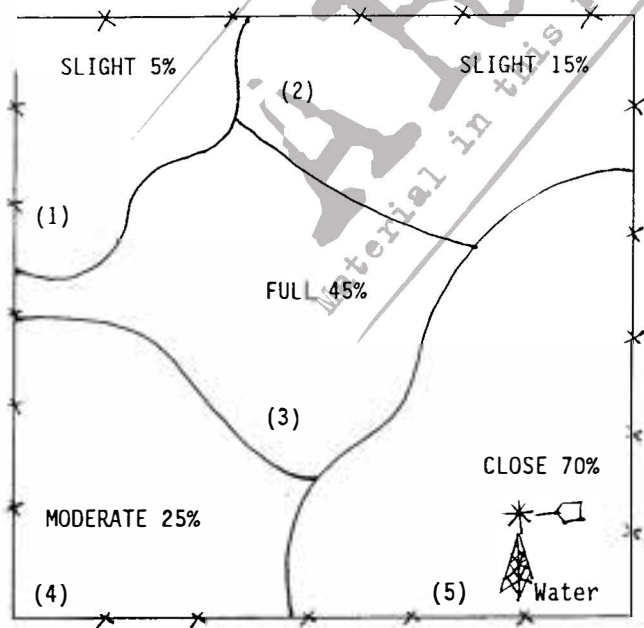
The sampling procedure requires that every **zone of use** (mapping unit) is visited to make estimates of use for the **key species** in each zone. The intensity of sampling depends on the complexity of the vegetation, topography, and the degree of accuracy desired. To obtain a representative use estimate, sample the zone perpendicular to drainages, soil variation, slopes, and trails.

A good "feeling" for degree of use in a zone can be made by mentally integrating the visual impression of utilization for the zone into a single value and comparing to the grass use photo guides for placement into the appropriate use rating class. For many purposes, this approach is adequate for estimating current species use. Referring to the photographs of pasture utilization (pages 18 through 28) also may be helpful.

### Paced Transect Method

When more accurate utilization estimates are required, walk in a straight line, or serpentine through the zone to be mapped, taking samples at regular intervals, either at each pace or every other pace. Utilization of the key species nearest and forward of the same toe is recorded in one of six use classes using the Dot-Dash Tally method (see Figure 5). Generally, you should take 50 plant samples for 90% accuracy, 100 samples for 95% accuracy. To calculate **current use** of a key species in a zone, sampled plants are tallied in each use class (Figure 5).

**Figure 4. Final use map of pasture showing zones of use on a key species.**



If 50 plants are sampled, double the dot-dash tallies to determine grazed plants percentage in each use class. If 100 plants are sampled, Dot-Dash Tallies equal grazed plant percentages in each use class. The current use percentage is determined by multiplying each mid-point percentage by the grazed plant percentage and dividing by 100. The sum of the current use percentages is the **total current species use** in percent.

Once the monitored pasture has been adequately sampled, the second step is to record either the use class percentage or the **total current species use** percentage or its corresponding **use rating** from Table 1. Place these entries on the **pasture use map**, Figure 4.

## Estimating Proper Stocking Rate and Carrying Capacity

### Proper Range and Pasture Use

It is not the intent of this publication to address the intricacies of proper range or pasture use, but a brief discussion is appropriate inasmuch as degree of use is the mechanism for determining whether a pasture is properly used. Experiences and research in the Northern Great Plains have repeatedly demonstrated that there is a clear relationship between degree of use and the maintenance of range and cultivated pasture production.

**Full use** (41-60%) of rangelands during the growing season, as an average over the years, is known to sustain vegetation productivity and reliant livestock carrying capacity. Full use is not necessarily proper use. Full use generally will maintain a pasture, but it is not as beneficial for pasture improvement as are lesser degrees of use.

**Moderate use** (21-40%) frequently has produced more profit, over a longer period of time, with fewer animals, than have higher stocking rates.

In drought years, moderate rates of stocking can produce **close use** (61-80%). Where use is entirely during winter, proper use in some situations may be close use.

Appropriate grazing systems will result in more uniform use and will give beneficial periods of non-use for important species groups. Grazing systems should improve efficiency of forage harvest, but grazing systems alone are not a substitute for proper grazing use.



Figure 5. An example of a dot-dash tally form that can be used to calculate current species use for each use mapping unit. (Schmutz, 1978.)

PROJECT \_\_\_\_\_ DATE Nov. 1, 1994  
 PASTURE High Tower SURVEYOR JRS

Location: Key Species:					Location: Key Species:					
Use Class (%)	Mid-Point (%)	Dot-dash Tally	Grazed Plants (%)	Current Use (%)	Use Class (%)	Mid-Point (%)	Dot-dash Tally	Grazed Plants (%)	Current Use (%)	
0		BC	17	0.00	0					
1-20	10	BC	27	2.70	1-20	10				
21-40	30	BC	43	12.90	21-40	30				
41-60	50	BC	13	6.50	41-60	50				
61-80	70		0	—	61-80	70				
81-100	90		0	—	81-100	90				
Total Current Species Use (%)				22.10	Total Current Species Use (%)					

Location: Key Species:					Location: Key Species:					
Use Class (%)	Mid-Point (%)	Dot-dash Tally	Grazed Plants (%)	Current Use (%)	Use Class (%)	Mid-Point (%)	Dot-dash Tally	Grazed Plants (%)	Current Use (%)	
0					0					
1-20	10				1-20	10				
21-40	30				21-40	30				
41-60	50				41-60	50				
61-80	70				61-80	70				
81-100	90				81-100	90				
Total Current Species Use (%)					Total Current Species Use (%)					

Ranges that are overstocked will be overused before the end of the grazing season unless stocking rate is reduced at mid-season. Pastures that are overused year after year show signs of overgrazing with disappearance or decreased vigor of more productive forage species, regardless of grazing system in use.

### **Estimating Proper Current Stocking Rate and Carrying Capacity**

The **grazed-use class** method of estimating utilization has been used by Schmutz (1978) to make mid-season stocking adjustments so that pastures can be more nearly grazed at their full or proper forage use capacities. Proper forage use is variable. Final estimates of forage utilization also may be made to determine proper annual carrying capacities.

To make mid-season (interim) estimates of proper current stocking rates, make utilization surveys after full growth of forage and before the end of season. You can use the utilization estimates (proper forage use and current forage use), along with the animal unit months used (grazed), to estimate the proper number of animal unit months remaining in the current grazing year.

$$\text{Animal Unit Months Remaining} = \frac{\text{Proper Forage Use (\%)} \times \text{Current Forage Use (\%)} \times \text{Animal Unit Months Used}}{\text{Current Forage Use (\%)}}$$

To calculate an estimate of the stocking rate necessary to properly use a pasture for the remainder of the grazing season, the Animal Unit Months remaining are divided by the calendar months of grazing remaining. An estimate of the current year's projected total carrying capacity can be calculated by adding Animal Unit Months Used to estimated Animal Unit Months Remaining.

### **Estimating Proper Annual Carrying Capacity**

At the end of the grazing season, a utilization survey can be made on a given area to determine the proper annual carrying capacity in relation to the actual animal units grazed:

$$\text{Proper Annual Carrying Capacity in Animal Unit Months} = \frac{\text{Proper Forage Use (\%)} \times \text{Actual Animal Unit Months Grazed}}{\text{Actual Forage Use (\%)}}$$

Actual forage use is calculated at season's end. Accumulation of proper use data for several years will give an estimate of the average annual proper carrying capacity for the pasture.

## **Effect of Plant Growth on Use Estimates**

These grazed-use class approaches for estimating proper stocking rate and carrying capacity are designed for use on pastures after normal seasonal growth is completed. In dry years when plants don't complete their growth, the guide won't distinguish between use and non-growth. In these circumstances, the method can be used to estimate proper use and proper annual carrying capacity at the end of the grazing season, but interim estimates of annual carrying capacity will be low. Where grazing season growth is an important factor, proper use and proper annual carrying capacity can be estimated at the end of the grazing season, but the interim estimates of annual carrying capacity will be high.

## **Photo Guides for Key South Dakota Grasses**

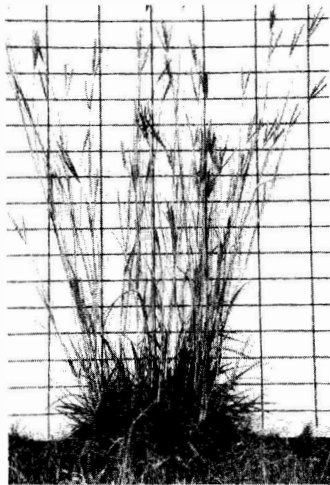
The eight grasses shown on pages 10 through 17 are among the most common forages on range and seeded pastures. Grass height varies considerably from year to year and place to place. Therefore, in order to use these photographs for degree of use estimates in the field, the grid increment marks must be interpreted in terms of proportion of unused (0%) versus grazed height.

## **Visual Estimates of Pasture Utilization**

The photographs on pages 18 through 28 provide for comparative evaluation of degree of use for different range sites and cultivated pastures in several parts of South Dakota.

# Photo Guides for Key South Dakota Grasses

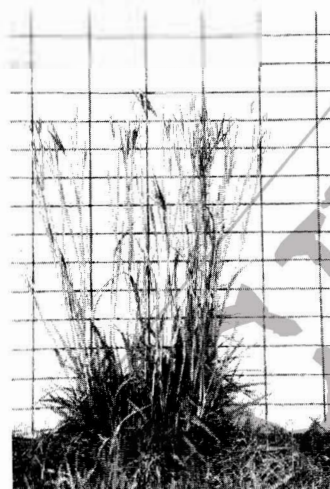
## **Big Bluestem Use**



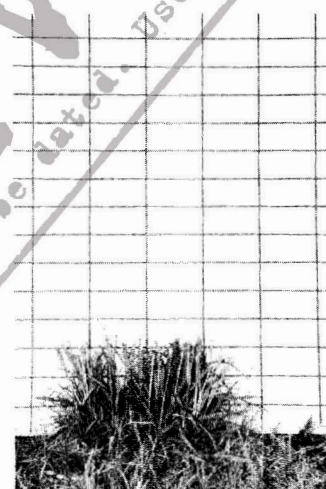
**Unused 0%**



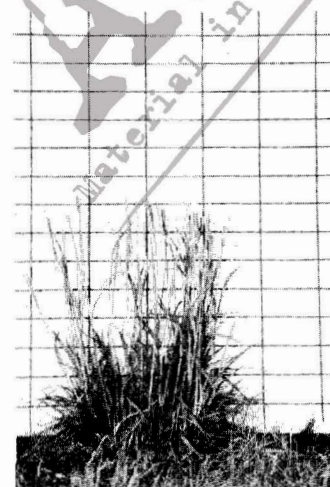
**Full 50%**



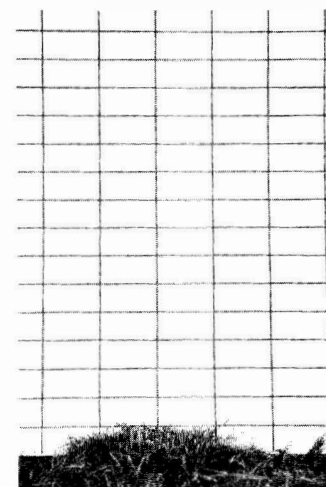
**Slight 10%**



**Close 70%**

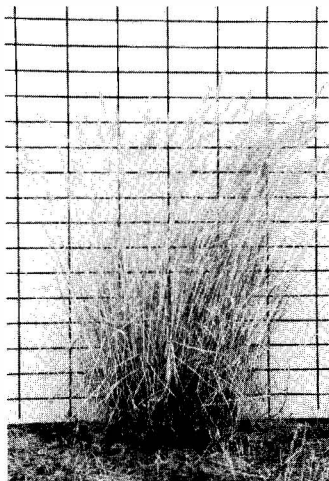


**Moderate 30%**

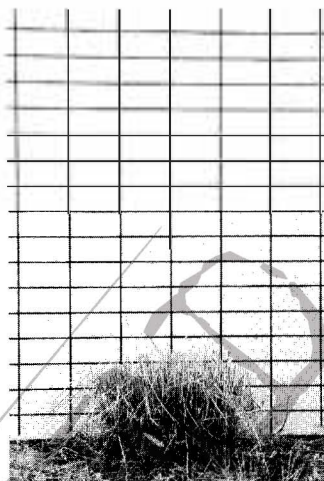


**Severe 90%**

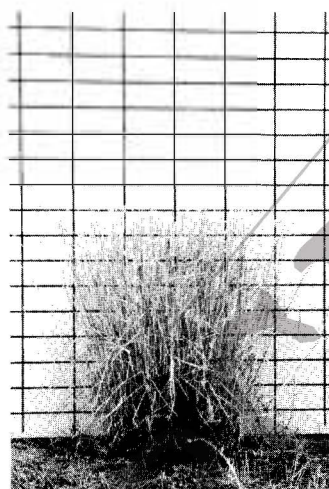
**Crested  
Wheatgrass  
Use**



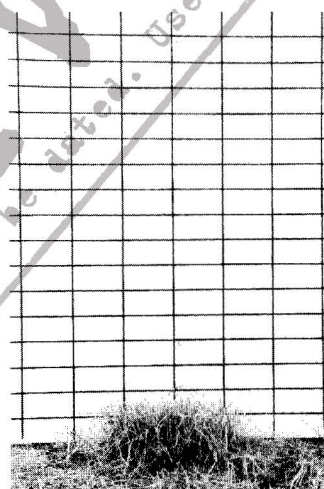
**Unused 0%**



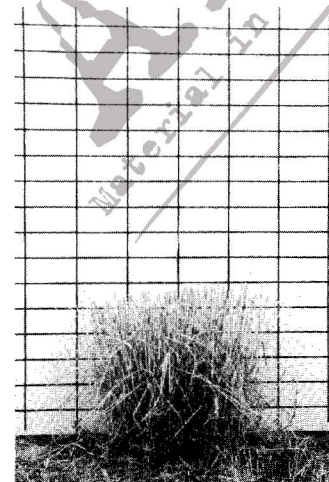
**Full 50%**



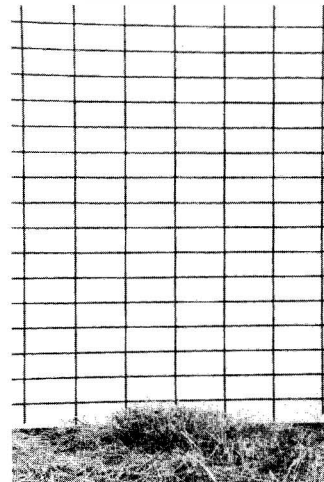
**Slight 10%**



**Close 70%**

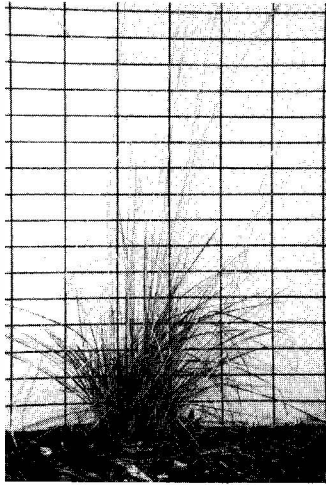


**Moderate 30%**

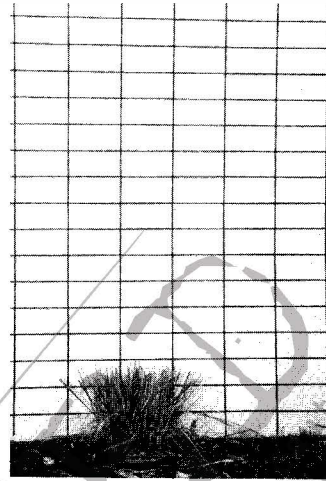


**Severe 90%**

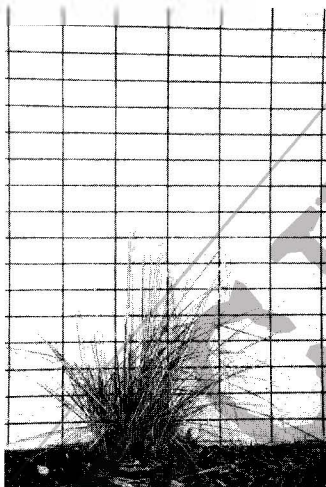
**Green  
Needlegrass  
Use**



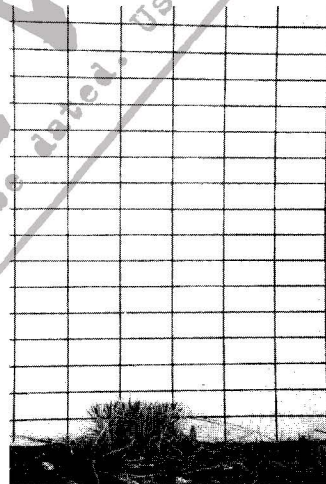
**Unused 0%**



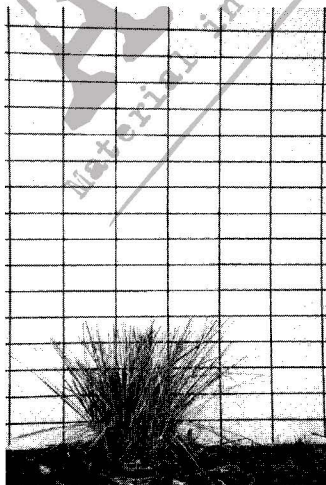
**Full 50%**



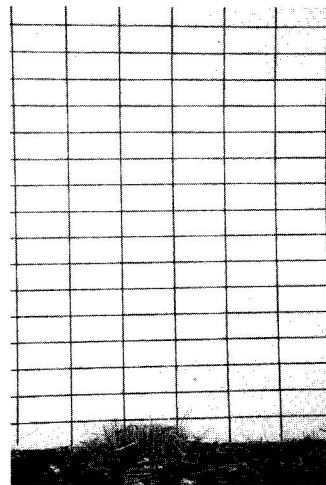
**Slight 10%**



**Close 70%**

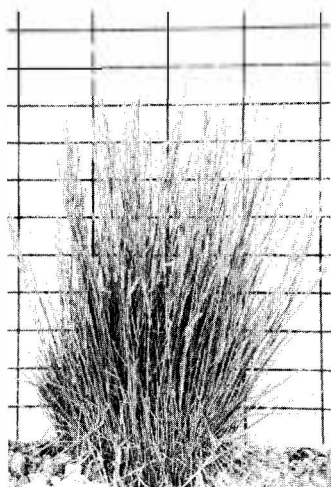


**Moderate 30%**

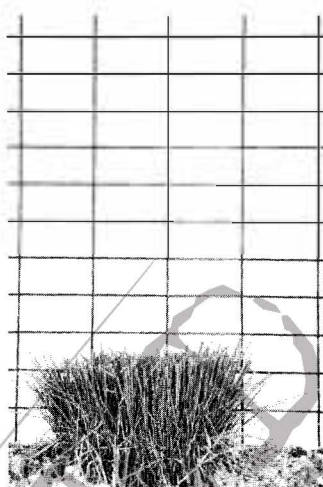


**Severe 90%**

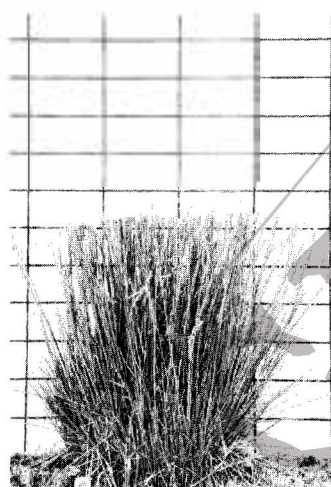
**Little  
Bluestem  
Use**



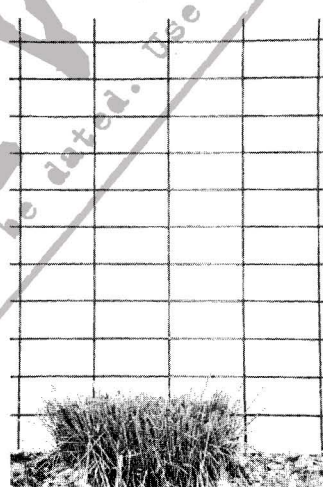
**Unused 0%**



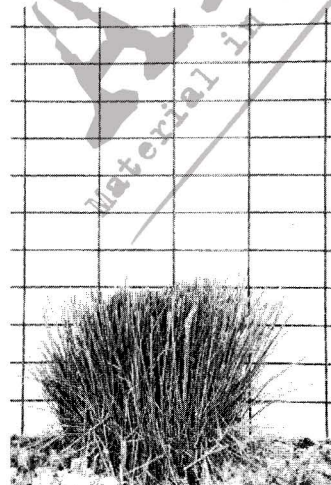
**Full 50%**



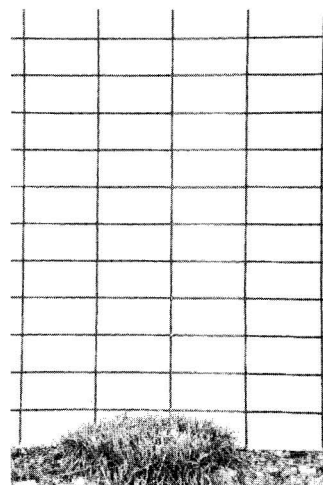
**Slight 10%**



**Close 70%**

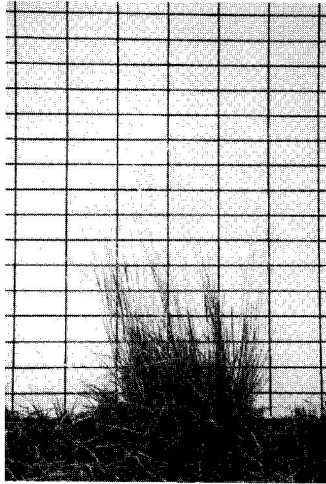


**Moderate 30%**



**Severe 90%**

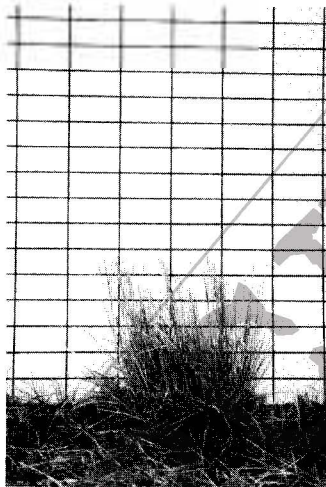
**Sideoats**  
**Grama**  
**Use**



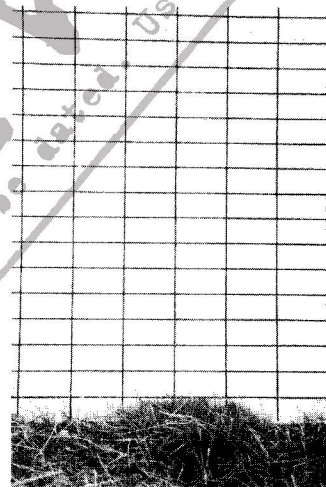
**Unused 0%**



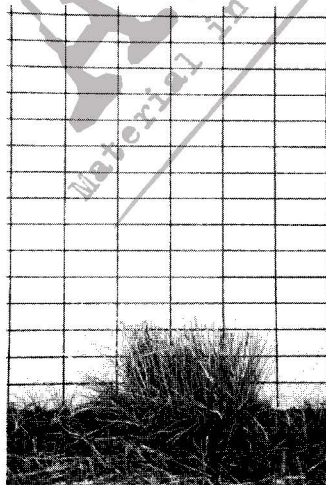
**Full 50%**



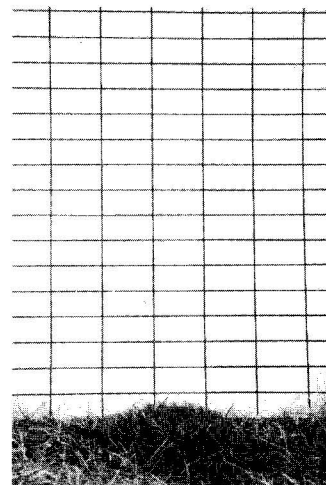
**Slight 10%**



**Close 70%**

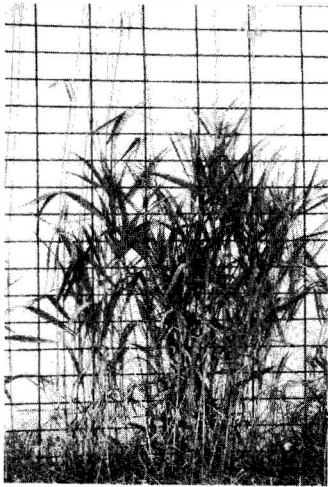


**Moderate 30%**

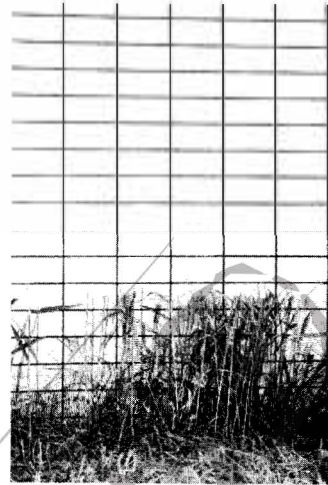


**Severe 90%**

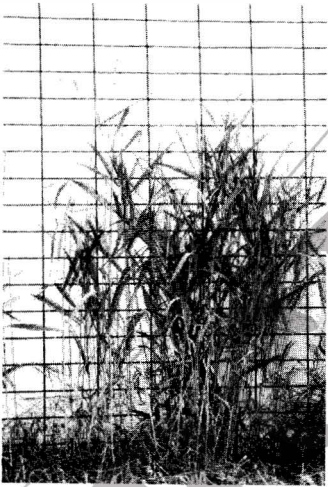
**Smooth  
Bromegrass  
Use**



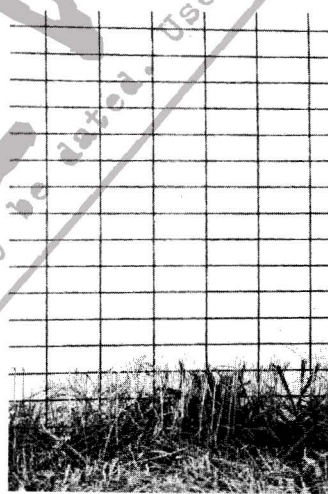
**Unused 0%**



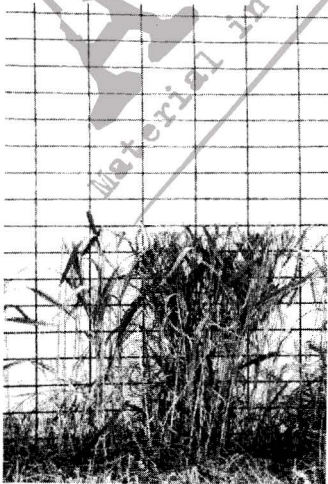
**Full 50%**



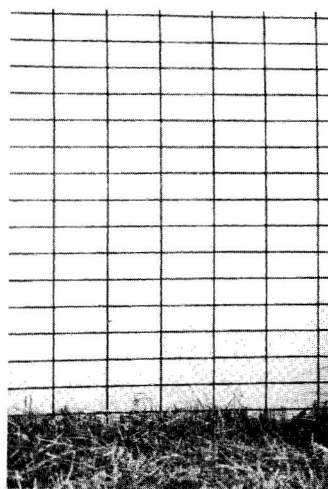
**Slight 10%**



**Close 70%**



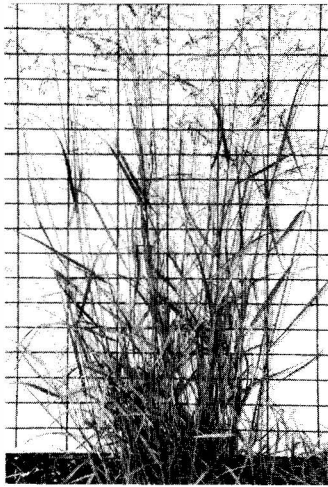
**Moderate 30%**



**Severe 90%**



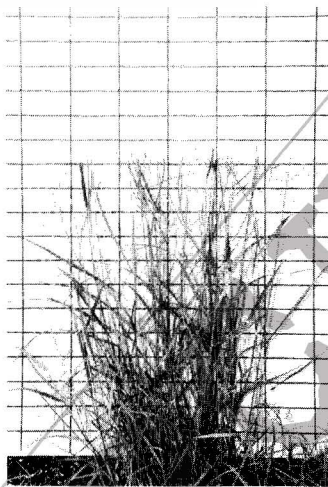
**Switchgrass  
Use**



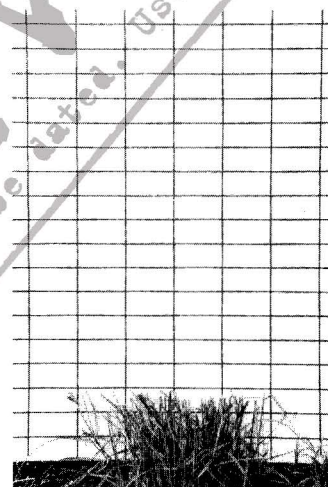
**Unused 0%**



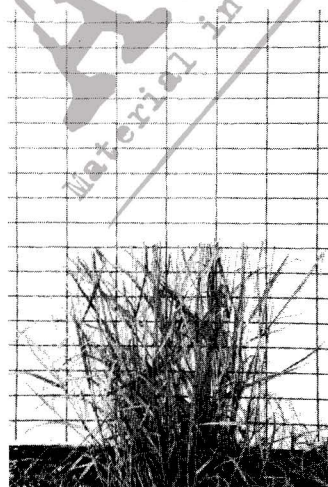
**Full 50%**



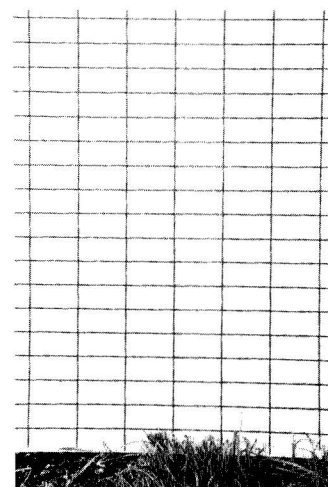
**Slight 10%**



**Close 70%**

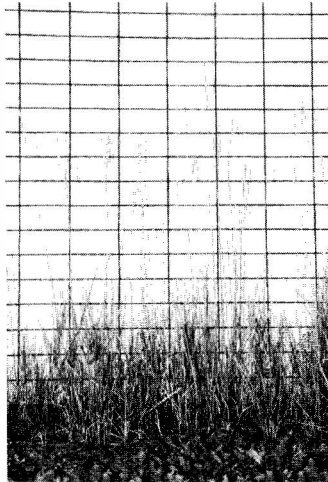


**Moderate 30%**

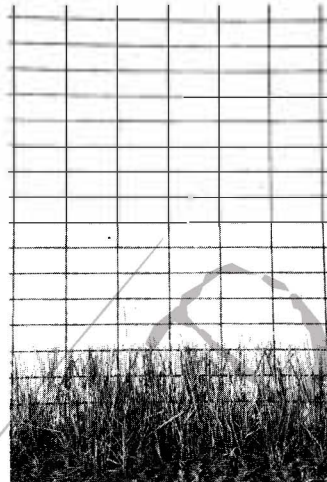


**Severe 90%**

**Western  
Wheatgrass  
Use**



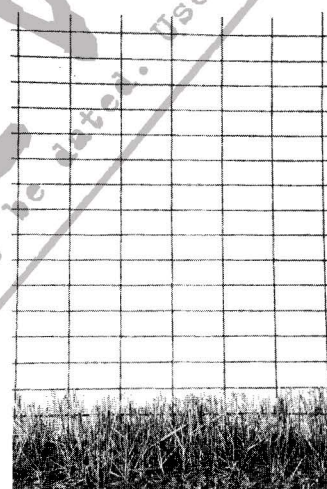
**Unused 0%**



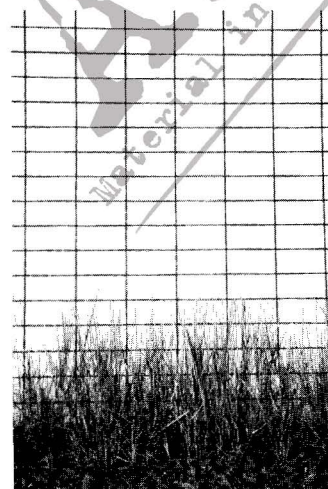
**Full 50%**



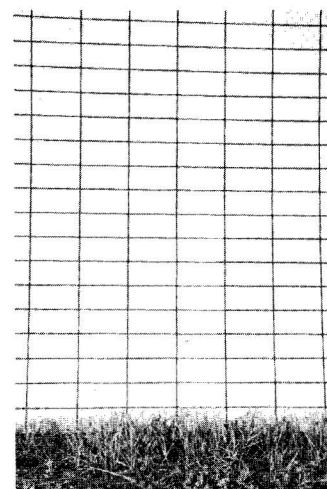
**Slight 10%**



**Close 70%**



**Moderate 30%**



**Severe 90%**

# Visual Estimates of Pasture Utilization

## Clayey range site, central South Dakota

This site has soils that are deep silt loams to clay with a silty clay to clay subsoil. Principle species are western wheatgrass and green needlegrass with blue grama, buffalograss, and sedges. Forbs and shrubs usually are not abundant.

### **Slight Use (10%)**

Close examination is required to find evidence of animal activity or grazing. Use on individual plants is less than 20%. Almost all use is on grass blades. Fewer than 50% of all plants have been grazed.

Buffalo County.

High - good condition.

2,800 lbs. remaining.



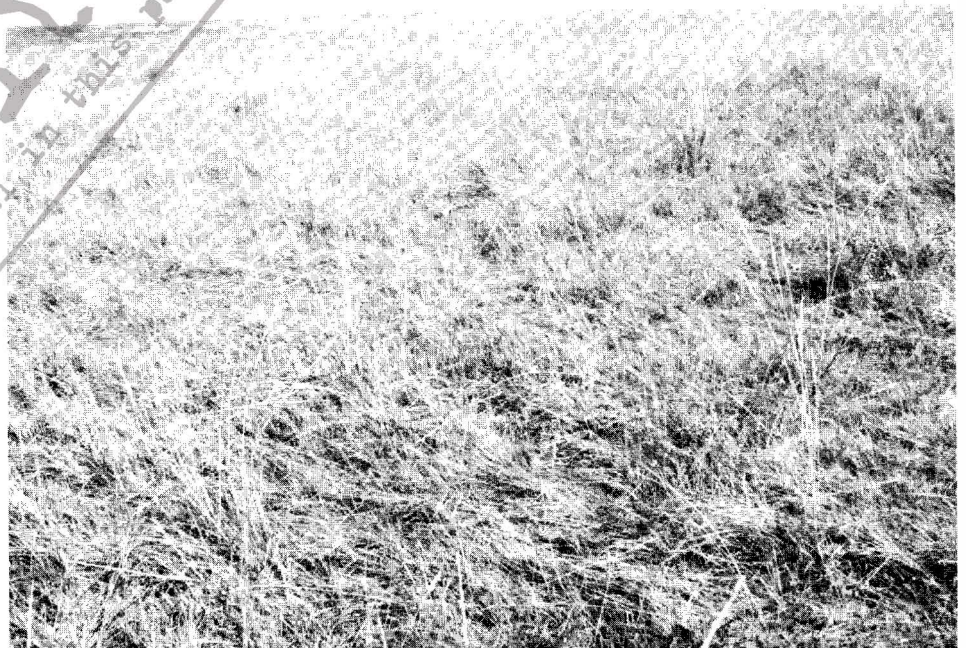
### **Moderate Use (35%)**

Trampling disturbance is easily seen. Most individuals of the preferred species have been grazed slightly. Almost no grass is grazed greater than 50% use. Flowering stems or blades protected by stems are seldom grazed. Pasture use generally is uneven.

Buffalo County.

Excellent condition.

2,500 lbs. remaining.



**Clayey range site, central South Dakota** (continued)



**Full Use (45%)**

Trampling and grazing apparent. Most individuals of palatable species are grazed, many more than 50%. Green needlegrass grazed; flowering stems knocked down, although most not grazed. Western wheatgrass seed heads still evident. Pasture use generally is uniform.

Buffalo County.

High - good condition.

1,500 lbs. remaining.



**Close Use (65%)**

A stubble-like appearance exists, except much plant material is lodged from trampling. Use is very uniform, most individuals grazed at 35% or greater. Ground cover still good in wet year. Resource could not sustain this level of use.

Buffalo County.

High - good condition.

900 lbs. remaining.

## **Clayey range site, central South Dakota** (continued)

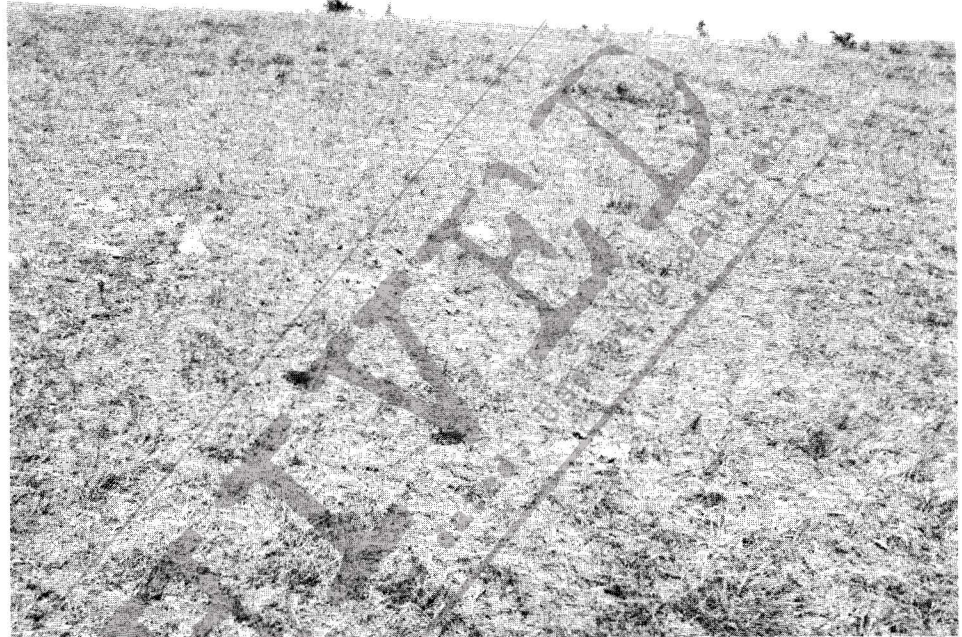
### **Severe Use (90+%)**

Stock would find difficulty getting a full mouth of forage. Much is broken, lying flat, unavailable. Low value forages grazed. Fecal material, rocks, or cactus often a major visual feature. Bare soil easily visible. Repeated use at this level will cause production declines and elevated erosion potential.

Buffalo County.

High-good condition.

200 lbs. remaining.



## **Silty range site, central South Dakota**

This site, often on rolling uplands, has deep soils that provide good soil-water-plant relationships. Tall grasses like big bluestem often are co-dominant with several other grass species and forbs. Leadplant and rose often occur.

### **Slight Use (10%)**

Close inspection is required to see evidence of grass use or forage trampling. Minor trailing may be evident through tall grass stands.

Beadle County.

Excellent condition.



**Silty range site, central South Dakota** (continued)

**Moderate Use (25%)**

Selective grazing pressure on highly palatable species like big bluestem and succulent forbs. Aspect and stature of community is still that of tall grasses. Some areas may have full grazing use, others may be lightly used.

Beadle County.

High condition.



**Severe Use (90%)**

Essentially all available plant material has been grazed. Ground cover here is still high, but repeated use at this level will eventually result in greatly diminished forage production and increase the potential for erosion.

Beadle County.

High condition.



### **Clayey range site, western South Dakota**

Silt loam to clay loam surface soil has a clayey subsoil. Principle species are western wheatgrass with green needlegrass and shorter species and sedges.

#### **Moderate Use (35%)**

Patterned grazing use is evident; most seed stalks remain standing. Few individuals grazed more than 50%. All preferred species show some grazing use.

Pennington County.

High - good condition.



#### **Close Use (70%)**

Key forage species are grazed to the maximum; many others are grazed to 50% use. No patches are ungrazed. Individual grasses that matured early and became coarse often are only moderately grazed. Much soil is exposed; erosion potential is elevated.

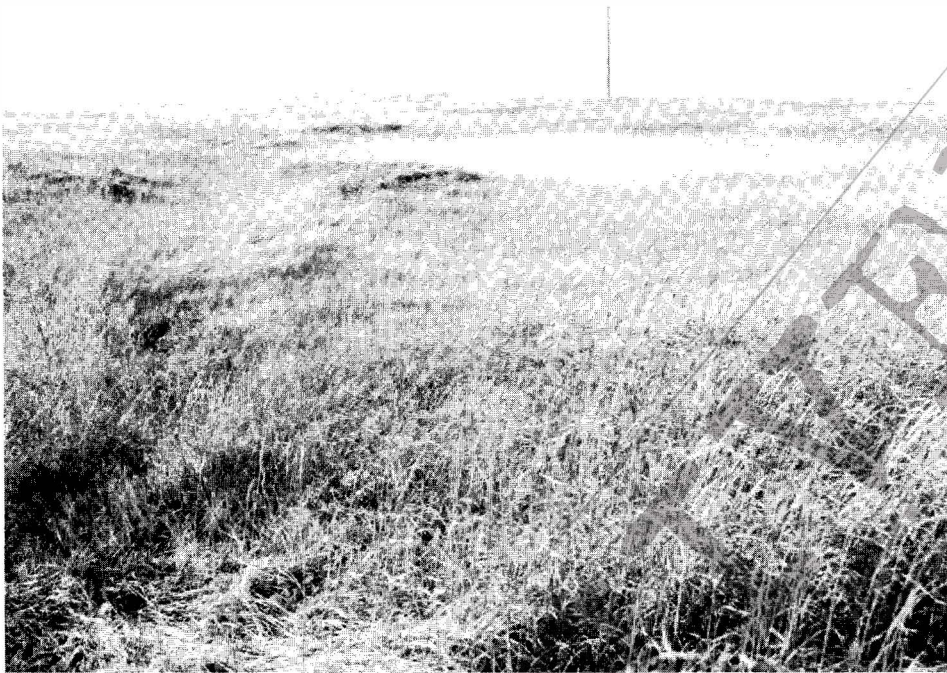
Pennington County.

Good condition.



### **Overflow range site, western South Dakota**

These sites, with sandy to clayey soils, are deeply developed and highly productive due to overflow water. Species composition varies with soils and location in the state, but big bluestem and western wheatgrass, along with other tall grasses, often are dominant. Shrubs, trees, and forbs are common from place to place.



#### **Unused (0%)**

In an unused state, many of the grasses fully mature and develop abundant seed heads because of supplemental water.

Harding County.

High - good condition.



#### **Moderate Use (35%)**

Preferential grazing on big bluestem is seen with full or close use, resulting in greatly reduced number of seed producing stems. Use is spotty if several grass species are abundant. Trampling is evident, but most vegetation remains standing.

Harding County.

Good condition.



## **Overflow range site, western South Dakota** (continued)

### **Close Use (75%)**

Much grass is grazed to height of lawn mower; less palatable grasses remain essentially ungrazed. Livestock sign is common. Erosion hazard not necessarily elevated if grazing-resistant species like Kentucky bluegrass occupy site.

Harding County.

Lo- good condition.



### **Crested wheatgrass pasture**

### **Slight Use (10%)**

Evidence of use is difficult to see. Almost no plants are fully used.



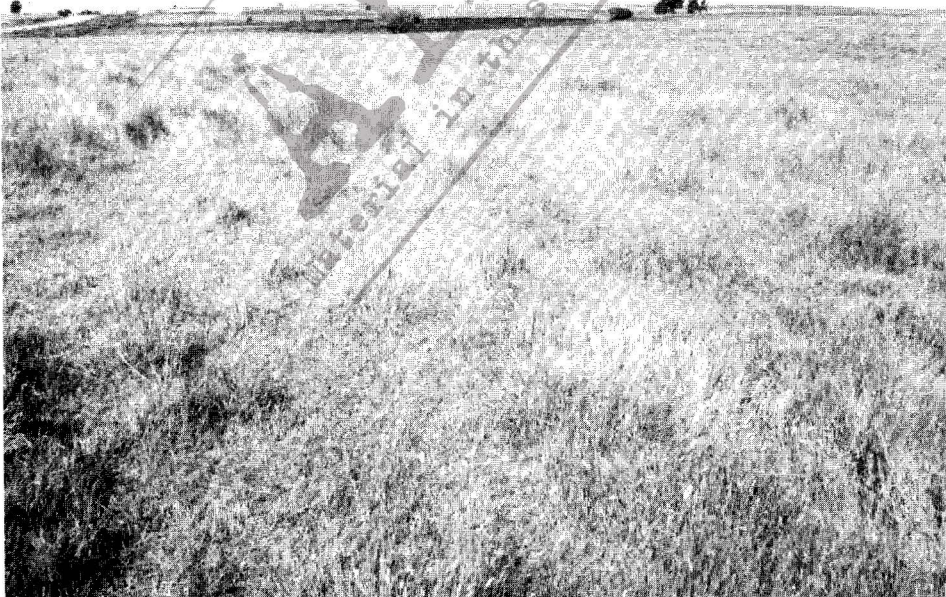
## **Crested wheatgrass pasture** (continued)

### **Moderate Use (30%)**



Evidence of use is easy to see. Some plants grazed more than 50%. Majority of plants not grazed or grazed around edges only. Some trampling is apparent.

### **Severe Use (70%)**



Most plants grazed to short stubble height. Many ungrazed "wolf" plants may give appearance that pasture is not severely used. Wolf plants go ungrazed from year to year.

## Smooth brome grass pasture

### **Moderate Use (35%)**

Use appears very selective, grazing mostly on upper leaf blades. Some seed stalks may have been grazed. Very few, if any, areas have been closely grazed, thus grazing is not patchy.



### **Full Use (55%)**

Nearly all plants grazed. Most grazed to near 25% of their ungrazed height. Areas grazed less heavily have "spotty" grazing appearance.



## **Smooth brome grass pasture** (continued)



### **Close Use (70%)**

Pasture looks like it has been mowed for hay, except for occasional seed stalks which are only partially grazed.

## **Switchgrass pasture**



### **Moderate Use (25%)**

Most disturbance appears to be from minor trampling. Grass use is limited to upper leaf blades of most individual plants.

## **Switchgrass pasture** (continued)

### **Full Use (50%)**

Use has clearly decreased overall plant height; most individual grasses grazed, including some seed head use and breakage. A few individual plants have been grazed severely.



### **Close Use (70%)**

Leaves thoroughly utilized; mostly tall stem stubble remaining.



# Glossary\*

**Actual forage use (%)**. Syn. *use*.

**Animal-unit-month**. The amount of dry forage required by one animal unit for one month based on a forage allowance of 26 pounds per day. Not synonymous with *animal-month*. Abbr. AUM. The term AUM is commonly used in three ways: (a) Stocking rate, as in "X acres per AUM"; (b) forage allocations, as in "X AUMs in Allotment A"; (c) utilization, as in "X AUMs taken from Unit B."

**Carrying capacity**. The maximum *stocking rate* possible which is consistent with maintaining or improving vegetation or related resources. It may vary from year to year on the same area due to fluctuating forage production.

**Current forage use (%)**. Used to suggest additional grazing is planned. Syn. *use*.

**Degree of use (%)**. The proportion of current year's forage production that is consumed and/or destroyed by grazing animals. May refer either to a single species or to the vegetation as a whole. Syn. *use*.

**Key species**. (1) Forage species of sufficient abundance and palatability to justify its use as an indicator of the *degree of use* of associated species. (2) Those species which must, because of their importance, be considered in the management program.

**Overgraze**. Continued heavy grazing which exceeds the recovery capacity of the community and creates a deteriorated range. Compare to *overuse*.

**Overstock**. Placing a number of animals on a given area that will result in *overuse* if continued to the end of the planned grazing period.

**Overuse**. Utilizing an excessive amount of the current year's growth which, if continued, will result in *range deterioration*. Compare to *overgrazing*.

**Pasture**. (1) A grazing area enclosed and separated from other areas by fencing or other barriers; the management unit for grazing land. (2) Forage plants used as food for grazing animals. (3) Any area devoted to the production of forage, native or introduced, and harvested by grazing. (4) A group of subunits grazed within a rotational grazing system.

**Proper use (%)**. A degree of utilization of current year's growth which, if continued, will achieve management objectives and maintain or improve the long-term productivity of the site. Proper use varies with time and systems of grazing. Syn. *proper utilization*, *proper grazing use*; cf. *allowable use*.

**Proper forage use (%)**. Syn. *proper use*.

**Range or Rangeland**. (n) Uncultivated lands that provide necessities of life for grazing and browsing animals. Rangelands may include all but barren deserts, naturally occurring grasslands or shrublands, high alpine meadows, or forested and wooded lands having grazing or browsing value. Range is not a use. (adj.) Modifies resources, products, activities, practices, and phenomena pertaining to rangeland.

**Season of use**. Grazing restricted to a specific season.

**Stocking rate**. The number of specific kinds and classes of animals grazing or utilizing a unit of land for a specified time period. May be expressed as animal unit months or animal unit days per acre, hectare, or section, or the reciprocal (area of land/animal unit month or day). When dual use is practiced (eg., cattle and sheep), stocking rate is often expressed as animal unit months/unit of land or the reciprocal. Syn. *stocking level*.

**Tame pasture**. A pasture which has been *cultivated* and *seeded* to forage species.

**Turnout**. Act of turning livestock out on the range at the beginning of the grazing season.

**Underuse**. A degree of use less than proper use.

**Understock**. To place a number of animals on a given area that will result in *underuse* at the end of the planned grazing period.

**Use rating (class)**. Assignment of use (%) into one of six categories: unused (0%), slight (1-20%), moderate (21-40%), full (41-60%), close (61-80%), or severe (81-100%).

**Use (%)**. The proportion of current year's forage production that is consumed or destroyed by grazing animals, commonly expressed as a percentage. May refer either to a single species or to the vegetation as a whole. Syn., *degree of use*.

**Utilization (%)**. Syn. *use*.

\*Adapted from Jacoby (1989)

## References

- Schmutz, Ervin M. 1978. Estimating range use with grazed-class photo guides. University of Arizona Cooperative Extension Service & Agricultural Experiment Station Bulletin A-73 (rev.).
- Dyksterhuis, E.J. 1964. Proper range use. South Dakota State University Cooperative Extension Service FS 220.
- Anderson, E. William and Wilbur F. Currier. 1973. Evaluating zones of utilization. Journal of Range Management. 26(2): 87-91.
- Taylor, John E. and John Lacey. 1987. Monitoring Montana rangelands. Montana State University Cooperative Extension Bulletin 369.
- Jacoby, Peter W. 1989. A glossary of terms used in range management. Society for Range Management, Denver, Colo.

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PROJECT \_\_\_\_\_ DATE \_\_\_\_\_

PASTURE \_\_\_\_\_ SURVEYOR \_\_\_\_\_

Location: Key Species:					Location: Key Species:				
Use Class (%)	Mid-Point (%)	Dot-dash Tally	Grazed Plants (%)	Current Use (%)	Use Class (%)	Mid-Point (%)	Dot-dash Tally	Grazed Plants (%)	Current Use (%)
0					0				
1-20:	10				1-20:	10			
21-40:	30				21-40:	30			
41-60:	50				41-60:	50			
61-80:	70				61-80:	70			
81-100:	90				81-100:	90			
Total Current Species Use (%)					Total Current Species Use (%)				

Location: Key Species:					Location: Key Species:				
Use Class (%)	Mid-Point (%)	Dot-dash Tally	Grazed Plants (%)	Current Use (%)	Use Class (%)	Mid-Point (%)	Dot-dash Tally	Grazed Plants (%)	Current Use (%)
0					0				
1-20:	10				1-20:	10			
21-40:	30				21-40:	30			
41-60:	50				41-60:	50			
61-80:	70				61-80:	70			
81-100:	90				81-100:	90			
Total Current Species Use (%)					Total Current Species Use (%)				

Location: Key Species:					Location: Key Species:				
Use Class (%)	Mid-Point (%)	Dot-dash Tally	Grazed Plants (%)	Current Use (%)	Use Class (%)	Mid-Point (%)	Dot-dash Tally	Grazed Plants (%)	Current Use (%)
0					0				
1-20:	10				1-20:	10			
21-40:	30				21-40:	30			
41-60:	50				41-60:	50			
61-80:	70				61-80:	70			
81-100:	90				81-100:	90			
Total Current Species Use (%)					Total Current Species Use (%)				



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