

Fall Grazing Reduces Grass-Leaf Height

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Most livestock producers in the Northern Great Plains are familiar with the axiom "after a frost in the fall, grazing does not hurt perennial grasses". Grazing beef cattle on native range during the fall season is an optional management practice used in the Northern Great Plains. Fall occurs between the autumnal equinox (22 September) and the winter solstice (21 December) and includes October, November, and December. This late-season management practice is frequently incorrectly referred to as "winter grazing". A search of the pertinent scientific literature does not produce data to support the belief that native grasses are unaffected by late-season grazing. In fact, results of a study conducted from 1958 to 1962 at the Dickinson Research Extension Center indicated that fall grazing is detrimental to perennial grasses, greatly reducing leaf height of graminoid plants the following growing season.

Beef and range research were halted at the Dickinson Experiment Station for the duration of World War II. Following the war, the beef herd was built up and managed with a contemporary repeat spring, summer, and fall pasture grazing schedule. During the growing season, the 40-acre fall pasture was used as a native-grass study area on which basic plant growth data were collected for numerous range-related investigations. An enclosure (A) was constructed on the fall pasture during the spring of 1958, and a second enclosure (B) was constructed during late summer of 1961. From 1958 to 1962, Dr. Warren C. Whitman and Dr. Harold Goetz conducted a five-year study designed to evaluate the effects fall grazing had on the height of grass leaves during the following growing season.

Plant heights were determined by measuring leaves of an average of ten ungrazed lead tillers of each species to the nearest 1 cm. Measurements were collected at approximately 7- to 10-day intervals from early April to mid September. Leaf heights were measured from the ground to the tips of extended leaves. Leaf-height measurements for needleleaf sedge (*Carex eleocharis*), needle and thread (*Stipa comata*), western wheatgrass (*Agropyron smithii*), and blue grama (*Bouteloua gracilis*) were collected in the fall pasture during the growing seasons following treatments of fall grazing and in enclosures A and B, which were not grazed in the fall. A summary of these data and their interpretation is the primary subject of this report.

Goetz (1963) reported maximum heights of ungrazed leaves of lead tillers of needleleaf sedge, needle and thread, western wheatgrass, and blue grama measured from 1958 through 1962. Goetz (1963) stated that these data show that leaf heights for the four species of grasses and sedge were greater inside the exclosures than outside on the fall-grazed rangeland, irrespective of moisture conditions. Goetz (1963) concluded that the results of the study indicate a great reduction in maximum leaf height because of the decreased vigor of the plants on rangeland subjected to fall grazing. On rangeland grazed during the fall, maximum leaf heights were reduced 23.0%, 17.3%, 30.4%, and 43.0% for needleleaf sedge, needle and thread, western wheatgrass, and blue grama, respectively, compared to the maximum leaf heights on treatments not fall grazed (table 1). Fall grazing reduced the maximum leaf height of major graminoids by an average of 28.4% during the succeeding growing season.

Data collected by Whitman and Goetz during their study clearly show that fall grazing on native rangeland hurts range plants and reduces leaf height by diminishing the vigor of the plants. Pastures grazed during the fall season cannot carry the same stocking rate as pastures grazed during the summer season. Fall-grazed pastures should have the stocking rate reduced initially to about 50% of the stocking rate that that pasture could carry during the summer season.

The range condition of pastures that have a history of being grazed during the fall season can be improved if the fall grazing management is changed from the native range pasture to an alternative forage type, like a variety of perennial wildrye (Altai, Russian, Basin) or a spring-seeded winter rye pasture. The data from Goetz (1963) can be used to help predict the levels of improvement in the major species after the fall grazing practice has been changed. The average maximum leaf height of the major native range graminoids could be expected to increase 17.2% during the first year if the growing season had normal precipitation conditions. An increase in leaf height of 42.5% could be expected within four years of changing from a fall grazing management practice.

The scientific results from the five-year research project Dr. Whitman and Dr. Goetz conducted at the Dickinson Research Extension Center to evaluate the effects fall grazing has on grass leaf height contradict the popular opinion that fall grazing native rangeland is a benign practice and provide evidence that fall grazing of native range causes biological damage to the major range species.

Fall grazing of rangelands causes a decrease in plant vigor and a great reduction in leaf height (28%) of the major graminoids during the succeeding growing season, regardless of the growing-season moisture conditions. Fall grazing does hurt perennial grasses.

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Table 1. Average maximum leaf height [centimeters (cm) and inches (in)] of ungrazed lead tillers measured during growing seasons following treatments fall grazed or not fall grazed (mean of 1958-1962), summary of data from Goetz (1963).

| Treatments | | Exclosure | Fall grazed | Percent difference from treatments not fall grazed (%) |
|--------------------|------|-----------|-------------|--|
| Upland sedge | (cm) | 12.6 | 9.7 | -23.0 |
| | (in) | 5.0 | 3.8 | |
| Needle and thread | (cm) | 23.1 | 19.1 | -17.3 |
| | (in) | 9.1 | 7.5 | |
| Western wheatgrass | (cm) | 32.6 | 22.7 | -30.4 |
| | (in) | 12.8 | 8.9 | |
| Blue grama | (cm) | 16.5 | 9.4 | -43.0 |
| | (in) | 6.5 | 3.7 | |

Literature Cited

Goetz, H. 1963. Growth and development of native range plants in the mixed prairie of western North Dakota. M.S. Thesis, North Dakota State University, Fargo, ND. 165p.

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