

Preferences of Steers for Certain Native and Introduced Forage Plants

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Knowledge of an animal's preference for certain forage plants is important in planning and managing the use of range and pasture land. Palatability or animal preference is not easy to measure since so many factors affect it. There are times and conditions when a species, normally considered unpalatable, is selectively grazed by cattle. Tribe (1952) has outlined animal and nonanimal factors that may influence palatability. Springfield and Reynolds (1951) state that succulence of forage and time of day influenced preference of cattle for reseeded grasses. Hurd and Pond (1958) and Rogler (1944) have also studied preferences of cattle for forage species.

The purpose of this study was to compare preferences of steers for various forage species which commonly occur in Oklahoma ranges or are planted for pasture.

Methods and Procedures

Pure stands of the following species were planted in 1949 in plots on a Norge loam soil of low to moderate fertility near Stillwater Oklahoma:

Big bluestem
Andropogon gerardi
Little bluestem
A. scoparius
Indiangrass
Sorghastrum nutans
Switchgrass
Panicum virgatum
Sideoats grama
Bouteloua curtipendula
Sand lovegrass
Eragrostis trichodes
Weeping lovegrass
E. curvula

Caucasian bluestem
Bothriochloa caucasicus
King Ranch bluestem
B. ischaemum
Sericea lespedeza
Lespedeza sericea
Alfalfa
Medicago sativa

The plots were 15 x 100 feet, randomly located with two replications. The indiagrass, sideoats grama, and one series of little bluestem plots had been used in a clipping study for six years prior to the palatability test. The clippings from these plots were discarded. The grass was conspicuously less robust in these plots and its color was yellow-green compared with a dark green color, presumably due to higher nitrogen content in species in the other study plots. Other plants abundant enough to test preferences of steers but not located in individual plots, were:

Johnsongrass
Sorghum halepense
Silver bluestem
*Bothriochloa saccharoides*¹
Scribner panicum
Panicum scribnerianum
Heath aster
Aster ericoides
Western ragweed
Ambrosia psilostachya
Western yarrow
Achillea lanulosa

There were approximately four acres, including the plots, in the test area. Some native grasses and forbs had invaded but none of the original plots had

lost their identity. The King Ranch bluestem plots were set back by winter-kill in 1962-63 but sufficient forage was available by August, 1963, to be tested with other species. The test area was mowed to a four-inch stubble in early March, so that each species would have uniform green forage for grazing.

Eight steers, averaging 560 lbs. were turned into the plots on the morning of May 22, 1963, where they had free choice grazing of all the species, and remained there until May 25 (Fig. 1).

The same group of steers, now averaging 635 lbs. was again used in an identical manner from August 7 to 10, 1963, to test preferences for these species at a later stage of development. Forage was not limited on any plot and was green and succulent during both tests.

Immediately following the steer grazing, the plots were sampled to determine percentage of grazed plants of each species. A single point sample was used along a pace transect and the nearest plant to the point was recorded as grazed or ungrazed. Fifty point samples were taken for each species, 25 in each replication. The percentage of plants grazed was considered an index to preference for the species.

Results and Discussion

The steers appeared nervous for about an hour after being released on the plots. They traveled continually in a close group from one end of the area to the other, taking bites but not exhibiting a significant preference. After becoming accustomed to the area, they continued to move about but it was apparent they spent more time grazing on certain plots than on others.

Johnsongrass was the most highly preferred species studied with a 100 percent grazed rating for both test periods. The steers

¹ Also *Andropogon saccharoides*



FIGURE 1. Steers grazing on big bluestem plots.

did not graze it continually but rather returned to it more frequently and grazed it longer than other species. In May, the order for the five most highly preferred species was Johnsongrass, switchgrass, alfalfa, little bluestem, and big bluestem (Table 1). The middle three species all rated 64 percent grazed. In August, the order was Johnsongrass, big bluestem, sand lovegrass, King Ranch bluestem, and little bluestem. Big bluestem, sand lovegrass and indiangrass were the only species to show a significant increase in preference rating from the May test to the August test.

Plants with a yellow-green color were not selected as readily as dark green plants of the same species. This is shown in Table 1 where preference for vigorous dark green little bluestem plants was compared with less vigorous little bluestem which had been clipped in a prior study. This indicates that the preference for indiangrass and sideoats grama might have been greater had the plants been more vigorous.

Japanese brome (*Bromus japonicus*) was scattered over the area and was just forming in-

florescence during the May test. It was not sampled for percentage of plants grazed but it was observed to be frequently selected by the steers.

The weeping lovegrass plots, from all outward appearances, were ideal for grazing, but the steers continually traveled across them with no more than a "sniff" for a plant.

Sericea lespedeza appeared to have desirable qualities but was ignored by the steers in both tests. Plants which had invaded the sericea plots, such as tall dropseed (*Sporobolus asper*) and switchgrass, were grazed. Tall dropseed was also grazed in the alfalfa plots but was not grazed outside of them. This presumably indicates that tall dropseed was more desirable to the steers due to its higher nitrogen content imparted by the leguminous plants.

Plant maturity appeared to influence palatability. Switchgrass was highly preferred in the May test but was not grazed in August. Seedstalks were forming in August and the plants were quite stemmy. This characteristic of switchgrass has been shown in another study (Dwyer, 1961). Caucasian bluestem was well into the flowering stage by the August test and the percentage of plants grazed dropped from 34 percent in May to four percent in August. Johnsongrass, however, was grazed equally during these two periods.

Steer preferences have definitely been established for the

Table 1. Proportion of grazed plants among 18 species, following free-choice grazing by steers, 1963.

Species	Date of Test		Average
	May 22-25	August 7-10	
Johnsongrass	100	100	100
Big bluestem	54	88	71
Sand lovegrass	32	72	52
Little bluestem	64	36	50
Alfalfa	64	12	38
Switchgrass	64	0	32
King Ranch bluestem	no data	70	—
Little bluestem ¹	14	30	22
Caucasian bluestem	34	4	19
Indiangrass ¹	8	24	16
Heath aster	30	0	15
Silver bluestem	20	6	13
Scribner panicum	22	0	11
<i>Sericea lespedeza</i>	0	0	0
Sideoats grama ¹	0	0	0
Weeping lovegrass	0	0	0
Western ragweed	0	0	0
Western yarrow	0	0	0

¹ These plots were mowed and clippings discarded in a study from 1955-1960.

plants in this study. Some species were highly preferred and some were wholly ungrazed. It appears that animals would consume greater quantities of forages they prefer than those less preferred. If this is true then preference would have some influence on animal gain, thus the preference an animal shows for a species should be considered in the selection of plants for seeding pastures.

Summary

Relative preference of yearling steers for 18 species of native and introduced forage plants was tested. Three-day grazing tests were made in May and August, 1963, using the same steers. Most of the species studied were planted in pure stands in plots 15 x 100 feet. Other species were not in plots but were abundant

enough so that preferences of the steers could be tested. Percentage of plants grazed was considered an index to preference for the species.

Johnsongrass was the most highly preferred species in both tests. Other species highly preferred were big and little bluestem, sand lovegrass, alfalfa, switchgrass and King Ranch bluestem. Switchgrass rated high in the May test but rated zero in the August test. King Ranch bluestem was not rated in May due to winter-kill but rated high in the August test.

Weeping lovegrass, sericea lespedeza, sideoats grama, western ragweed, and western yarrow were ungrazed during both grazing tests.

Stage of maturity and color (as influenced by nitrogen content) were obvious factors which

affected the selection of the steers for certain plants.

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