Cattle Preferences for Forage Species in Northern Arizona[1]

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Highlight

Preference ratings—determined by comparisons with bottlebrush squirreltail—showed Kentucky bluegrass, Arizona fescue, and mountain muhly were highly preferred in the pine type in summer, while prairie junegrass was most preferred in spring–fall in the pinyon–juniper type.

Differences in livestock preference for forage species have long been observed. Preferences vary with plant species, plant parts, plant succulence, time of day, and other plant as well as animal characteristics. A knowledge of preferences is useful when establishing many range management practices.

Cattle forage preferences for the major species were determined in northern Arizona for summer grazing in the ponderosa pine type and for spring–fall grazing in the pinyon–juniper type. Conditions varied from 10 to 40% utilization of the weight of perennial grasses and grasslike plants.

Methods

Utilization data were collected from the Beaver Creek Pilot Watershed (Worley, 1965) and the Wild Bill Evaluation Area (Pearson, 1964) over 4- and 3-year periods, respectively. Percent utilization by weight at the end of the grazing season was determined by weight estimate on Beaver Creek and by paired-plot techniques on Wild Bill. The data were collected by species from 9.6-ft^2 plots. Both areas were grazed by yearling cattle. The utilization of forage grasses by wildlife, as indicated by the lack of use in range units without cattle, was negligible.

Utilization in itself did not adequately represent cattle preference, since some forage species were less available than others due to their distribution and abundance on the range. The utilization of individual species was therefore compared to the utilization of a standard or base species on each plot to compensate for unequal accessibility. The comparison of utilization of a species in relation to associated species has often been used in determining forage preference (Cook et al., 1962). The standard species used for comparison was bottlebrush squirreltail, which was widely distributed over the two areas and was readily utilized in all situations. Plot data were used only if the standard plant and at least one other species were present, and if any of the species had been grazed. A total of 689 observations met these criteria for developing the preference ratings.

Preference, in this paper, is defined as the use made of an individual species when the use of the associated standard species is at, or adjusted to, a common level. Covariance analysis was used to evaluate cattle preference for the forage species.

Results and Discussion

Percent utilization of the forage species increased as utilization of bottlebrush squirreltail increased (Fig. 1, 2). Cattle preferences among the forage species within the same vegetation type and season of

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[2] Located at Flagstaff in cooperation with Northern Arizona University; central headquarters are maintained at Fort Collins in cooperation with Colorado State University.

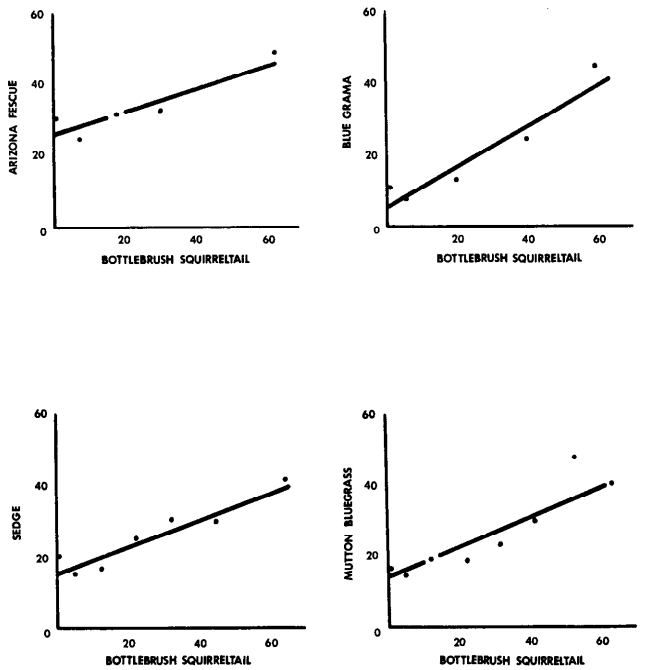

FIG. 1. Percent utilization of several forage species as related to utilization of bottlebrush squirreltail on ponderosa pine ranges.

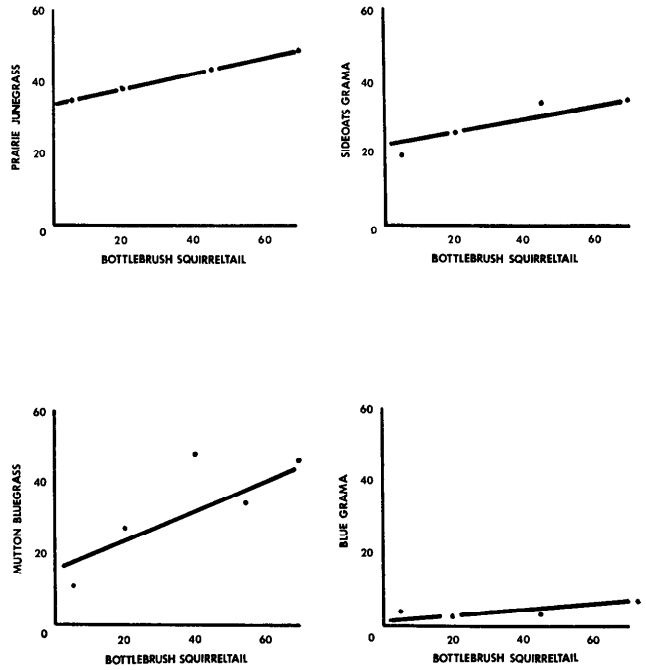

FIG. 2. Percent utilization of several forage species as related to utilization of bottlebrush squirreltail on pinyon–juniper ranges.

use remained similar for different levels of utilization and species compositions. For instance, most of the species in the ponderosa pine type were minor components in one study area or the other (Table 1).

Kentucky bluegrass, Arizona fescue, and mountain muhly were highly preferred in the pine type during the summer season, while blue grama and prairie junegrass were least preferred (Table 1). These results are in general agreement with Johnson (1953) in Colorado, but in disagreement with Humphrey (1958) in Arizona. Humphrey (1958) suggested that Arizona fescue and mountain muhly are less palatable than blue grama or prairie junegrass.

Prairie junegrass was the most preferred species during spring–fall use in the pinyon–juniper type, while blue grama and spike muhly were the least preferred (Table 2).

Table 1. Corrected utilization (preference) under summer use in the ponderosa pine type when associated bottlebrush squirreltail was grazed 20%.[1]

Species	Percent utilization (preference)
Kentucky bluegrass (*Poa pratensis* L.)[2, 3]	39
Arizona fescue (*Festuca arizonica* Vasey)[3]	33
Mountain muhly (*Muhlenbergia montana* (Nutt.) Hitchc.)[3]	31
Black dropseed (*Sporobolus interruptus* Vasey)[2]	28
Sedge (*Carex* spp.)	24
Mutton bluegrass (*Poa fendleriana* (Steud.) Vasey)[2]	23
Bottlebrush squirreltail (*Sitanion hystrix* (Nutt.) J. G. Smith)	20
Blue grama (*Bouteloua gracilis* (H.B.K.) Lag.)[2]	17
Prairie junegrass (*Koeleria cristata* (L.) Pers.)[2, 3]	13

[1] Approximate level of use in the ponderosa pine study areas.
[2] Contributed less than 3% of the total production of perennial grasses on Wild Bill.
[3] Contributed less than 3% of the total production of perennial grasses on Beaver Creek.

Table 2. Corrected utilization (preference) under spring-fall use in the pinyon-juniper type when associated bottlebrush squirreltail was grazed 40%.[1]

Species	Percent utilization (preference)
Prairie junegrass	43
Bottlebrush squirreltail	40
Mutton bluegrass	33
Sideoats grama (*Bouteloua curtipendula* (Michx.) Torr.)	30
Black dropseed	15
Blue grama	5
Spike muhly (*Muhlenbergia wrightii* Vasey)[2]	4

[1] Approximate level of use in pinyon-juniper study area.
[2] Contributed less than 3% to the total production of perennial grasses (data for spring-fall use from Beaver Creek only).

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