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A Modified Utilization Gauge for Western Range Grasses

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Accurate, low cost measurements of forage utilization by livestock are essential in range management and the evaluation of grazing systems. However, because of difficulty in making these measurements, visual estimates often are substituted for measured values. To help land managers better determine use, range utilization calculating charts (Crafts 1938, NRCAB 1962) have been revised into a utilization gauge. Height-weight distributions of two additional southwestern grasses have been measured and incorporated into this gauge.

Keywords: Range management, grass utilization, grazing, livestock

Description

The utilization gauge includes 43 culmed and culmless western grass species (fig. 1). Included in the 43 species, are two new height-weight relationships for species representing Southwest semiarid rangeland sites. These species are alkali sacaton (*Sporobolus airoides* (Torr.) Torr.) and Indian ricegrass (*Oryzopsis hymenoides* (R. + S.) Ricker).

Fifty-four ungrazed plants of each of the two additional species were collected on the Rio Puerco Watershed in northwest New Mexico at the peak of growth after flowering and seed set, and were air dried. Plants

of representative heights from this semiarid rangeland were cut into 10% height segments, and each segment was weighed to the nearest gram. The accumulated weight of each plant, by 10% height segments, was calculated from the top of the culm to the base, and was converted to percent. Each 10% segment for all 54 plants was averaged, and plotted on graph paper. The result was a height-weight distribution curve (fig. 2). Percent use for a given stubble height was then read from the curve and plotted to give an additional set of values for the utilization gauge.

Figure 2 illustrates Indian ricegrass and alkali sacaton height-weight relationships. This curve shows that when 90% of the height growth of Indian ricegrass is taken, 82% of the weight has been removed. For alkali sacaton, when 90% of the height growth is taken, only 66% of the weight has been removed.

The modified utilization gauge was developed primarily for the major southwestern grass species, but it includes several widely distributed western grass and grass-like species. The gauge is field portable and is easily read after measuring the height of both grazed and ungrazed plants. The ungrazed height is set at the top of the dial, the grazed height is read across the dial, and the percent utilization is read in the window by species. Figure 1 shows an ungrazed height of 30 inches.

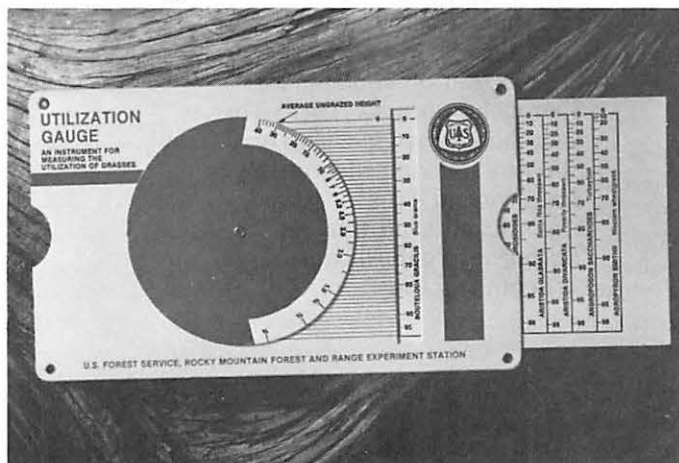


Figure 1.—Utilization gauge showing *Bouteloua gracilis* height-percent utilization relationships.

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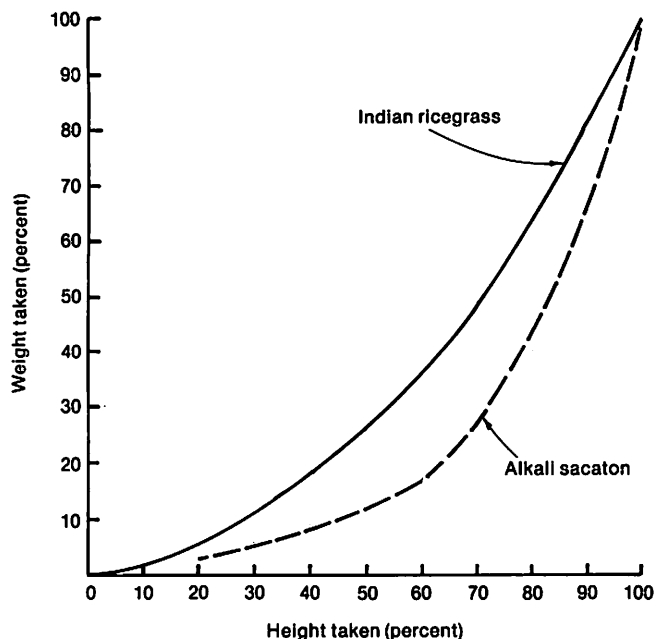


Figure 2.—Height-weight utilization percentages for Indian ricegrass and alkali sacaton.

At a grazed height of 10 inches, utilization of blue grama is 20%. Detailed instructions for field use are printed on the back of the gauge. Gauges are available from the authors.

Literature Cited

- Crafts, Edward C. 1938. Height-volume distribution in range grasses. *Journal of Forestry* 36(12):1182-1185.
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Appendix

Other species (Nickerson et al. 1976) included on the gauge are:

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| <i>Agropyron cristatum</i> (L.) Gaertn. | <i>Festuca arizonica</i> Vasey |
| <i>Agropyron smithii</i> Rydb. | <i>Festuca idahoensis</i> Elmer |
| <i>Agropyron spicatum</i> | <i>Heteropogon contortus</i> (L.) R. + S. |
| (Pursh) Scribn. + Smith | <i>Hilaria belangeri</i> (Steud.) Nash |
| <i>Andropogon gerardii</i> Vitman | <i>Hilaria jamesii</i> (Torr.) Benth. |
| (= <i>Andropogon furcatus</i> Muhl.) | <i>Hilaria mutica</i> (Buckl.) Benth. |
| <i>Andropogon saccharoides</i> Swartz | <i>Koeleria cristata</i> Pers. |
| <i>Andropogon scoparius</i> Michx. | <i>Lycurus phleoides</i> H. B. K. |
| <i>Aristida divaricata</i> Willd. | <i>Muhlenbergia emersleyi</i> Vasey |
| <i>Aristida glabrata</i> (Vasey) Hitchc. | <i>Muhlenbergia montana</i> (Nutt.) Hitchc. |
| <i>Bouteloua chondrosioides</i> (H.B.K.) Wats. | <i>Muhlenbergia porteri</i> Scribn. |
| <i>Bouteloua curtipendula</i> (Michx.) Torr. | <i>Oryzopsis hymenoides</i> |
| <i>Bouteloua eriopoda</i> (Torr.) Torr. | (R. + S.) Ricker |
| <i>Bouteloua filiformis</i> (Fourn.) Griffiths | <i>Poa sandebergii</i> Vasey |
| <i>Bouteloua gracilis</i> (H.B.K.) Steud. | (= <i>Poa secunda</i> Presl) |
| <i>Bouteloua hirsuta</i> Lag. | <i>Scleropogon brevifolius</i> Phil. |
| <i>Bouteloua rothrockii</i> Vasey | <i>Sporobolus airoides</i> (Torr.) Torr. |
| <i>Buchloe dactyloides</i> (Nutt.) Engelm. | <i>Sporobolus cryptandrus</i> (Torr.) Gray |
| <i>Calamagrostis rubescens</i> Buckl. | <i>Stipa columbiana</i> Macoun |
| <i>Carex douglasii</i> Boott | <i>Stipa comata</i> Trin. + Rupr. |
| <i>Carex filifolia</i> Nutt. | <i>Stipa richardsonii</i> Link |
| <i>Deschampsia caespitosa</i> (L.) Beauv. | <i>Trichachne californica</i> |
| <i>Distichlis stricta</i> (Torr.) Rydb. | (Benth.) Chase |