**Effect of Cutting Treatments on the Yield, Botanical Composition, and Chemical Constituents of an Alfalfa-Bromegrass Mixture**

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**Materials and Methods**

A mixture of smooth bromegrass (*Bromus inermis*, Leyss) and alfalfa (*Medicago sativa*, L.) was seeded with a combination grain and fertilizer drill in August 1947. Each crop was seeded at the rate of 10 pounds per acre. The Fischer strain of smooth bromegrass and the Buffalo variety of alfalfa were used. Thirty-two plots (10 by 78 feet) were established in randomized blocks with four replications.

The experiment was located on a Sassafras heavy loam soil. The field, prior to seeding, was uniformly limed and fertilized at a rate of 1 ton of ground limestone and 400 pounds of 5-10-10 per acre. In April 1948, 500 pounds of 0-12-12 per acre was applied and a final application of 500 pounds of 0-12-12 per acre was added on April 1949.

The field was uniformly mowed on June 4, 1948 and the experimental period was begun. The cutting treatments used were as follows:

- Plots were cut when the alfalfa in the mixture was (a) 5 inches high, (b) 10 inches high, (c) in prebud stage, (d) at bud stage, (e) at 1/2 bloom, (f) at 3/4 bloom, (g) at full bloom, and (h) at pods well formed.

Yields, obtained by harvesting the complete plot, were calculated on the basis of pounds of oven-dried herbage. Herbage samples were taken from each plot and hand separations were made to determine the weight of alfalfa, smooth bromegrass, and weeds. 10 to 15 pounds of green herbage was taken and placed in a forced draft oven at 70°C for 72 hours. A sample (100-150 grams) was ground in a Wiley mill to pass a 40-mesh screen, and the replicates of each were stored separately for chemical analysis.

Analyses for total nitrogen were made by the Kjeldahl method (1). The crude protein value was obtained by multiplying total nitrogen by the factor 6.25. Analyses for crude fiber were made according to the method developed by Whitehouse et al. (9). The method as outlined by Toth et al. (7) was used for potassium, calcium, and phosphorus.

The data were analyzed according to the analysis of variance of perennial crops as outlined by Paterson (5).

**Results and Discussion**

**FORAGE DATA**

The yield data in pounds of dry forage during 1948 and 1949 are given in Table 1, together with the least significant difference from the analysis of variance of these data.

Differences in dry matter production for the cutting treatments are significant. The highest yields for total forage and alfalfa were obtained when cuttings were made at the 1/3 bloom stage in both the 1948 and 1949 growing seasons. The 5-inch cutting treatment gave the lowest yields for the same period. The significance of these results can be appreciated to a greater degree only when differences in yield are considered in connection with other effects resulting from varying the time of cutting. The lower yields obtained from the 5-inch, 10-inch, and prebud stages of growth during the 1948 season can be attributed, in part, to elimination of the later period of plant growth during which dry matter is elaborated.