The Response of Four Varieties of Alfalfa to Spring Clipping, Intervals Between Clippings, and Fall Clipping in the Yakima Valley

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SEVERAL investigators (1, 2, 4) have shown spring-clipping, frequent cutting, and cutting at certain critical periods in the fall to be detrimental to alfalfa in the Midwestern states. However, the results of a management study reported by Jackobs (3) indicated that such management practices have little or no effect on the vigor and productivity of irrigated alfalfa in the Yakima Valley in south central Washington. The climate in the Yakima Valley is characterized by low rainfall and high light intensities; the ability of alfalfa in that area to withstand management treatments that are detrimental in the Midwest may be due to differences in such climatic factors and differences in soils.

Since Ladak was the only variety used in the initial study in the Yakima Valley, the question arose whether or not the results would be the same with other varieties. Results of such a study are reported here.

MATERIALS AND METHODS

A field on the Roza Unit of the Irrigation Experiment Station, Prosser, Wash., was selected for this experiment. The soil is Ritzville very fine sandy loam and varies in depth from 4 to 6 feet. The field was first irrigated in 1946, and the following crops were grown: 1946, lima beans; 1947, sweet corn; 1948, navy beans on one half of the field and vetch on the other.

Alfalfa was seeded May 5, 1949. The two replicates located where navy beans were grown in 1948 were successfully established, but the seeding following vetch failed and was replanted on Aug. 24, 1949.

The field was irrigated about once a month, using 24-hour applications of water in rills 3 feet apart. A 2½-inch stubble was left when a plot was cut. Yields were determined from a mower swath cut through the middle of the plot. All yields are given on an air-dry basis.

Main plots, 30 by 60 feet, consisted of 6 treatments including 3 cutting intervals both with and without spring clipping. Subplots consisted of 4 varieties of alfalfa: Ladak, Buffalo, Turkistan 19300, and Ranger. On Oct. 10 one half of each variety sub-plot was cut. The treatments within each division were randomized and there were four replications.

The cutting schedules were so arranged that the spring-clipping was made on May 1. Plots cut at 25-day intervals were cut first on May 26; the 30-day interval plots on June 1; and the 40-day interval plots on June 9. In this way the 5th cutting of the 25-day interval treatments, the 4th cutting of the 30-day interval treatment, and the 3rd cutting of the 40-day interval treatment all fell on Aug. 30. The late fall harvests were made on Oct. 10.

The cutting schedules outlined above were followed in 1950 and 1951. In 1952 all plots were cut on the same date at each of 3 cuttings. Differences in yield obtained in 1952, with the exception of those due to variety, are considered to be due to the residual effects of the previous management treatments.

The yields of the four varieties of alfalfa with the various management treatments are given in table 1. An analysis of variance indicated that there was only one significant interaction in the course of the experiment for spring clipping and interval-between-cutting in 1951.

SPRING CLIPPING

Clipping alfalfa on May 1 in 1950 and 1951 definitely decreased seasonal yield even though the weight of clipping was included. However, spring clipping did not reduce plant vigor permanently, because in 1952 those that were spring-clipped in 1950 and 1951 produced within 0.35 ton per acre of those that had not been spring-clipped, a nonsignificant difference.

INTERVAL BETWEEN CUTTINGS

Increasing the number of cuttings per season from 3 to 4 reduced seasonal yields an average of 0.40 and 0.96 tons per acre respectively. The 1951 data, however, did not indicate an appreciable reduction in vigor due to frequent cuttings.

FALL CUTTING

In 1950 an average yield of 0.40 ton of hay per acre between Aug. 30 and Oct. 10 increased the yield by this amount. In 1951, yields of the two treatments were nearly equal, indicating that the harvest in October compensated for the reduction caused by late cutting in the fall. The 1952 data indicate a small but statistically significant reduction in plant vigor from cutting late in the fall. The 1952 yield data of hay less in 1952 than those not cut after Aug. 30.

VARIETIES

When the various cutting treatments were repeated in 1951, there were significant differences among varieties. The difference between Ladak and Ranger, the check variety, produced less than the other varieties. The difference between Ladak and Turkistan only approached significance.

SPRING-CLIPPING X INTERVAL BETWEEN CUTTING INTERACTION IN 1951

The difference between the spring-clipped and check in 1951 was not the same for different cutting intervals.

Table 2 shows the yields of the six cutting treatments and varieties. The difference in yield between spring-clipped and check varieties. The difference between Ladak and Turkistan only approached significance.

SPRING CLIPPING