YIELD AND CHEMICAL CONTENT OF ALFALFA CUT AT DIFFERENT TIMES OF THE DAY AND NIGHT

CURTIS1 recently reported that cuttings of alfalfa made in the afternoon contained approximately 10% more dry matter per acre and had a carbohydrate content 83% higher than cuttings made either in the morning of the same day or the morning of the following day. During the first cutting of alfalfa at the Beltsville Research Center, a number of time-of-day cutting tests were made; and since these independent tests check so closely and are not in agreement with the results obtained by Curtis, it seems desirable to make the Beltsville results available to other interested workers.

The results here described are from two separate independent experiments—one by the Bureau of Dairy Industry and the other by the Bureau of Plant Industry, Soils, and Agricultural Engineering—on fields approximately 5 miles apart. All of the cuttings were made between May 30 and June 1, 1944.

The weather was partly cloudy on May 27, mostly clear on May 28, and clear with near maximum sunlight intensity (solar and sky radiations over 600 gm-cal per cm²) on May 29, 30, and 31. Air temperatures ranged from 49° to 86° F on May 30 and from 50° to 92° on May 31, with a following minimum of 60° on June 1. Humidity was high at night, with a heavy dew each morning of May 30 and 31, but with very little dew on the morning of June 1. Minimum daytime humidities were 37% on May 30 and 36% on May 31. Relatively little wind occurred during May 30 and 31, the total air movement being 45.75 miles and 45.25 miles, respectively, in 24 hours.

In the experiment by the Division of Forage Crops and Diseases, plots of alfalfa in the regular varietal test were divided into three parts. One part was harvested between 8:30 and 9:30 a.m. May 31, one at 3:30 to 4:15 p.m. May 31, and one at 8:30 to 9:30 a.m. June 1, 1944. Seven varieties, Grimm, Ladak, Cossack, Hardigan, Hardistan, Buffalo, and Ranger, were included in the test, with three plots of each variety being utilized, making a total of 21 replications of the treatment. The original plots were 5 feet by 20 feet, running east and west, making the portions harvested for each treatment 5 feet by 6 feet 8 inches. The ends and center of the plots were randomized with respect to time of cutting, with restrictions so that there were an equal number (seven) of east ends, centers, and west ends in each time-of-cutting treatment. The subplots for each variety were also arranged in this manner. Cuttings were made by hand. There were good stands on all plots in this 2-year-old field. The stage of growth varied from 18% bloom for Buffalo to 42% bloom for Grimm. The crop had been making rapid growth.

The entire yield from each subplot was placed in a burlap bag and weighed immediately. The material was placed in a drier within about an hour after cutting and dried to a moisture-free basis. Weights were again taken and the weight of the bags subtracted from both green and dry weights. The percentage of moisture and the

1CURTIS, O. F. The food content of forage crops as influenced by the time of day at which they are cut. Jour. Amer. Soc. Agron., 36:401-416. 1944.