OBVIOUSLY, varietal appraisals of alfalfa require measurements of adaptability to a wide range of environmental conditions. Like all perennials, this plant is exposed to the extremes of the environmental variability of a locality, not only for a season or a year, but for several years. It is the degrees of adversity in such periods and the frequency of their occurrence which determine the magnitude of the differentials in varietal responses and the immediacy of their expression. Survival is the general characteristic which is most directly associated with differences in the productivity of varieties and strains which are, or promise to be, of commercial significance. This is true in Wisconsin and other regions where the problems of winter injury and bacterial wilt disease are serious. But even in these regions significant differentials in the responses of varieties and of strains may not occur for periods of from 3 to 6 years unless the internal environment is modified by cutting treatments.

This paper reports evidence of a preliminary character to show that cutting schedules may serve to hasten as well as to amplify the evaluation of alfalfas. The data are derived from trials conducted several years ago and from trials begun in 1938 on uniform plots of several varieties which at that time were 5 years old. The plot designs were not such as to lend themselves readily to statistical analysis and only where the contrasts were pronounced were they regarded as being significant in these preliminary trials.

VARIETAL RESPONSES DURING 1920 TO 1925

In a 5-year trial, Graber, et al. (18) found that the yields of Grimm and Kansas Common alfalfa sown in 1920 and cut twice annually (1921-25) at deferred stages of growth averaged 3.26 tons and 3.24 tons, respectively, of oven-dried, weed-free hay per acre, per annum. However, when cut three times annually at earlier stages of growth, Grimm produced 2.44 tons of hay per acre and Kansas Common only 1.91 tons per acre as an average for the 5-year period. Kansas Common produced the same yield as commercially imported Turkistan (an annual average of 1.91 tons of hay per acre) when cut three times annually for the 5-year period, but with two deferred cuttings the productivity of the Kansas Common was 3.24 tons per acre and that of Turkistan only 2.42 tons. In this trial, varietal differences in yields were dependent primarily on variations in cutting treatments.

Such results are much in contrast with those obtained in another series of plots, 40 rods distant, which were sown to several strains of...