CHANGES IN THE PROPORTION AND YIELD OF ALFALFA AND KOREAN LESPEDEZA IN MIXTURES WITH GRASSES

D. W. MAYS, JR.

SINCE each plant in a hay meadow or pasture mixture is influenced in some way by the presence of other plants, the relative abundance of any one species in the mixture may not remain the same seasonally or annually. This change, often undesirable, may in time result in a community very unlike the original one.

This paper reports data on the changes in stand and yield of alfalfa when grown alone and in association with Johnson grass (Sorghum halepense) and of Korean lespedeza (Lespedeza stipulacea) when grown alone and in association with Johnson grass, Dallis grass (Paspalum delatatum), and Bermuda grass (Cynodon dactylon).

METHODS

These experiments were conducted at Pine Bluff, Ark., on Ruston sandy loam, an upland low productive soil with a pH of 5.2, and Trinity clay, a lowland soil with a pH of 7.5. The former soil usually suffers drought in midsummer or early fall or both, and the latter soil is subject to being flooded, usually in late winter or early spring.

On each of these soils, seedbeds were prepared in the late fall of 1934. Superphosphate was applied at the rate of 400 pounds per acre and at a depth of 6 inches below the soil surface by drilling it by hand, following a Georgia stock plow. With the exception of Korean lespedeza, which was sown in early March, seedings were made in late October on plots 4 feet by 4 feet in area surrounded by 2-foot borders. Seeds were broadcast and raked into the upper 1/2 inch of the soil. After seeding the plots received no cultivation until the following spring (1935).

RESULTS

EXPERIMENTS WITH ALFALFA AND JOHNSON GRASS

On the Trinity clay soil, triplicate plots were seeded to alfalfa at the rate of 15 pounds per acre and to an alfalfa-Johnson grass mixture at the rate of 15 pounds each of alfalfa and Johnson grass. On each of the latter plots, Johnson grass roots were planted at the rate of 1.5 tons per acre the following spring (1935). These roots were equally distributed on each plot and forced into the upper inch of the soil by use of fork-pointed sticks. When Johnson grass leaves appeared, which was an indication that the roots were well established, all plots were raked thoroughly. After this cultivation, the plots received no cultivation throughout the experiment.

Three cuttings were made annually, at which time the plants were separated by hand and put into shrinkage bags. Results on an air-dried basis are reported in Table 1.

1Contribution from the Department of Agronomy of the A. M. and N. College, Pine Bluff, Arkansas. Received for publication June 10, 1942.
2Director and Agronomist.