PERSISTENCE OF GRASS AND LEGUME SPECIES UNDER GRAZING CONDITIONS

M. A. HEIN and H. N. VINALL

To evolve a method whereby an accurate determination may be made of the plant population or the area occupied by each plant species is a difficult problem in pasture investigations. The Committee on Pasture Research of the Northeastern Section of the American Society of Agronomy sent out a questionnaire on the subject and the replies received indicated a preference for the method of estimating the percentage of area occupied by each species, these estimates to be made in permanently marked quadrats or from a large number of small areas selected at random. The counting of individual plants appeared impracticable except during the year following the date of seeding before the stoloniferous plants, such as Kentucky bluegrass, developed a turf. In obtaining the data presented here, the plant count method was used in 1929, but after that estimates were made of the percentage of area occupied by each species.

These experiments are located on the farms of the Bureau of Animal Industry and the Bureau of Dairy Industry at Beltsville, Md., where the Bureau of Plant Industry is cooperating with these Bureaus in pasture research. The soils belong to the Sassafras series, are low in organic matter content, and although only slightly acid, they respond to limestone. Prior to the inauguration of the pasture experiments in the fall of 1928, the land had been under general farm cultivation for a number of years.

The experimental pastures were seeded as one field and then divided into their respective paddocks. In making up the mixture, seeds of all pasture plants considered suitable for this region were included, making a complex and heavy seeding. The seeds were mixed and applied at the following rates per acre: Kentucky bluegrass, 12 pounds; redtop, 3 pounds; timothy, 4 pounds; orchard grass, 4 pounds; meadow fescue, 4 pounds; Italian ryegrass, 8 pounds; perennial ryegrass, 4 pounds; red clover, 3 pounds; alsike clover, 2 pounds; white clover, 2 pounds; Korean lespedeza, 4 pounds; and common lespedeza, 10 pounds. This seeding was done in September, 1928, except where otherwise noted.

On the pasture management experiment the seeding emerged to a good stand and made a good fall growth, but the Hohenheim pastures made a slow fall and spring growth, due to late seedbed preparation. This land was not plowed and worked down until a week previous to seeding, while the pasture management land was plowed 6 weeks before seeding and disked twice during that period to kill weed growth. This early preparation made a firm seedbed, ideal for quick and uniform germination, and reduced the loss by winter killing or "heaving."

1Contribution from the Bureau of Plant Industry, U. S. Dept. of Agriculture, Washington, D. C. Also presented at the annual meeting of the Society held in Washington, D. C., November 18, 1932. Received for publication December 16, 1932.

2Assistant Agronomist and Senior Agronomist, respectively.

3Unpublished data.