The Effect of Various Fertilizers on the Botanical Composition and Yield of Grass-Legume Hay

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Research was begun at the Rhode Island Experiment Station in 1911 to determine the relative efficiency of various fertilizer materials as carriers of potash (3, 4, 5, 8). Workers at other stations in the northeast also have done considerable work on fertilizing haylands.

Lyon and Bizzell (7) reported that under New York conditions timothy responded to nitrogen, potash, and phosphorus in that order. They found that alfalfa yields were increased more by the application of 5 tons of manure than by a very light topdressing of superphosphate (200 pounds) and muriate of potash (32 pounds).

Brown (2), in Connecticut, reported that nitrogen, especially that in manure, increased yields but reduced the amount of alfalfa. Phosphorus increased the amount of alfalfa. Potassium, either in manure or muriate of potash, was very beneficial but the chemical form was preferred.

Beaumont, et al. (1) found nitrogen and potash more important than phosphorus for increasing the longevity of hayfields in Massachusetts. A 3:1:2 fertilizer ratio was recommended.

Prince, et al. (9, 10) found that in New Hampshire potassium was the most important element for prolonging the stand and increasing the yield of alfalfa.

DESCRIPTION AND RESULTS OF EXPERIMENT

The purpose of the original experiment was not only to test the efficiency of several sources of potash, but also to determine the effect, if any, of the other ingredients, i.e., sodium, magnesium, and chlorine, on yields. Therefore, carriers of nitrogen and phosphorus were chosen which were low in sodium, magnesium, and chlorine.

Six plots (114 to 119, inclusive) 2/15 acre in size were used for this study. The soil is classified as Bridgehampton very fine sandy loam. The land is practically level and the soil very uniform.

The potash carriers selected for trial were kainite, muriate of potash, sulfate of potash, and double sulfate of potash-magnesia. One plot (116) received no potassium, another (119) received what was considered an optimum amount, while the other plots received sub-optimum amounts of potassium.

During the first 7 years of the experiment there was apparently no potassium deficiency on any plot. At the end of 16 years, however, the yields on the plot which received no potash were so low that the plans were changed to include a small application of potash there also.

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3Figures in parenthesis refer to “Literature Cited”, p. 394.