THE INFLUENCE OF SUPERPHOSPHATE AND LIGHT LIME APPLICATIONS ALONE AND IN COMBINATION ON THE COMPOSITION OF SWEET CLOVER¹

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DURING the past 5 years cooperative experiments were conducted on several soil types in eastern Kansas to determine the value of light lime applications with and without superphosphate on the yield of sweet clover.

Interest in mineral deficiency in livestock feeds grown in eastern Kansas, together with some variation in the results obtained by several investigators studying the effect of fertilizers on plant composition, led to the initiation of the project herein reported. Snider and Hein (⁵) reported results showing the effect of soil treatment on the yield and total nitrogen, phosphorus, and potassium of sweet clover. A paper by Grizzard (²), reporting the results of a similar study with alfalfa, contains a brief review of the recent literature.

A. L. Clapp and F. L. Timmons, who conducted the field trials, harvested the samples from the sweet clover fertility tests and made them available for analysis. Samples have not been obtained since 1933 due largely to unfavorable climatic conditions. However, since the limited data show some interesting relationships, it was decided to present those now available even though more data are desirable. Samples were available from the following treatments: Untreated, ground limestone, treble superphosphate, ⁴ and treble superphosphate plus ground limestone. ⁵ All treatments were applied through a fertilizer attachment on a drill equipped with a grass seeder attachment. This permitted the treatments to be applied in contact with the seed. The sweet clover seed was inoculated, but no observations were made to determine the effectiveness of the inoculation. Both first and second year cuttings were available from most of the successful tests. After harvesting, the samples were dried and the sweet clover separated from the weeds and trash before being ground in preparation for analysis. Total nitrogen, phosphorus, and calcium were determined.

EXPERIMENTAL METHODS

Nitrogen was determined by digesting the samples according to the Gunning-Hibbard procedure and distilling the ammonia into a boric acid solution, after which it was titrated directly by H₂SO₄ in the presence of brom cresol green-methyl red indicator. For phosphorus determination the first-year sweet clover samples were ashed in the presence of Mg(NO₃)₂. The second-year samples were

¹Contribution No. 264 from the Department of Agronomy, Kansas Agricultural Experiment Station, Manhattan, Kan. Received for publication August 24, 1936.

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The authors are indebted to A. L. Clapp and F. L. Timmons for making available samples and yield data from the cooperative experiments.

⁵Figures in parenthesis refer to "Literature Cited", p. 984.

⁴80 pounds per acre drilled in the row.

⁵300 pounds drilled in the row.