EFFECT OF VARIOUS FERTILIZERS AND LIME ON COMPOSITION OF SOYBEANS

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The increased popularity of soybean seed as a source of concentrates for livestock feeding and as a source of oil for industrial purposes has given rise to the question as to whether or not the composition of beans may be influenced by fertilizers. Most investigators have reported that lime increased the protein content of the beans and decreased the oil content, but the results as to other soil amendments have not been so conclusive.

The present investigations were conducted on soybeans grown in the regular rotation on the fertilizer plats of the Delaware Experiment Station for the 1921, 1924, and 1925 crops. These plats have received the same treatment since 1908. The rotation until 1912 was (1) corn followed by a cover crop of rye and vetch, (2) oats, (3) wheat, and (4) clover and timothy. Soybeans have displaced oats in the rotation since 1912. The soil was a sassafras silt loam on which 1,500 pounds of hydrated lime were applied to one-half of each plat before corn planting.

The percentages were corrected for soil heterogeneity according to the following formula \( CY = AY - N + NW \). The corrected percentages were then analyzed and the odds in favor of their significance determined by the modification of Student’s method as given by Love.

It will be seen from a study of Table 1 that fertilizers have caused no significant difference in the percentage of protein in soybeans.

The oil content of the soybeans was changed by the action of fertilizers (Table 2). Single elements did not affect the composition, but when applied in combination they did. Nitrogen and phosphorus caused a very significant decrease in the oil content when applied on unlimed soil. Phosphorus and potassium in combination, as well as nitrogen and potassium, caused a decrease in the oil content upon the unlimed soil. A complete chemical fertilizer had no significant effect on the oil content upon either limed or unlimed soil. Manure, however, caused a small significant loss in oil.