VARIATIONS IN POTASSIUM CONTENT OF ALFALFA DUE TO STAGE OF GROWTH AND SOIL TYPE AND THE RELATIONSHIP OF POTASSIUM AND CALCIUM IN PLANTS GROWN UPON DIFFERENT SOIL TYPES

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Soil type was found to be so important in determining the calcium and magnesium content of alfalfa plants at different stages of growth that a study of its effect upon additional important elements appeared advisable. One of the elements considered was potassium, and data showing the variations in this element which occur in alfalfa plants at different stages of growth when grown upon different soil types are reported in this paper.

This analysis made possible not only a study of variations in the amounts of potassium present in the alfalfa stems and leaves and in their juice, as affected by soil type, but also a comparison of the potassium-calcium ratios in plants obtained from different soil types with a possible explanation of the observed differences.

HISTORICAL

Physiologists are in agreement upon the essentiality and probably universal occurrence of potassium in plant materials. The existing information indicates that potassium does not enter into the actual composition of the structural material of the plant but occurs rather as precipitation and infiltration products within the tissues and as dissolved products in the plant sap. MacCallum (12) found potassium in both the cytoplasm and extracellular structures of plants, in the latter as a product of impregnation and infiltration and in the former as physiological precipitation and physiological or biochemical condensations.

Dowding (4) determined that potassium was absent from the wood of mature spruce roots during the winter but was plentiful in the meristematic tissue. In roots of other plants the meristematic tissue was found rich in potassium and this element appeared to be

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3 Reference by number is to "Literature Cited," p. 750.