5. NUTRITIONAL DEFICIENCY STUDIES ON TOBACCO

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INTRODUCTION

It is important to know the symptoms manifested by the plant when the medium in which it is growing is deficient in one or more elements essential to its proper development. It is possible by this method to use the plant as the indicator of its own nutritional requirements. The tobacco plant, because of its large leaf area which shows definite growth responses, is an excellent plant to use in such studies. When the symptoms are known it is usually easy to correct the trouble in the field by using the proper fertilizers, thus improving the quantity and quality of the product. In some instances the first manifestation may be nothing more definite than decreased growth, but usually careful examination of the plant will disclose well-defined symptoms of malnutrition. It is often difficult in the field to determine the exact element or elements deficient because there are so many factors involved which are not under control and it is often necessary to check observations in the field with water cultures and pot tests in the greenhouse.

The limited time does not permit a discussion of all the elements known to be necessary in the mineral nutrition of tobacco. Since potassium, magnesium, and calcium are related in their biological and chemical effects, and because they are deficient in some soils, they have been selected for consideration. The malnutritional symptoms manifested by the tobacco plant when these elements singly and collectively are deficient in the media in which the plant is grown will be described and illustrated.

POTASSIUM DEFICIENCY

The first of these to be considered is potassium. When the medium, whether it be water culture, soil pot culture, or soil in the field, is deficient in potassium, the growing tobacco plant exhibits characteristic abnormalities in leaf growth. (See Fig. 1.) The specific symptoms of potassium deficiency on this plant are in the early stages a yellowish mottling of the leaves with a bronze or copper overcast appearance. The centers of the mottled areas are usually dead or dying, and in the early stage these dead areas occur as numerous specks at the tip, around the margins, and between the veins of the leaf.