1. THE CHEMICAL APPROACH TO THE STUDY OF PROBLEMS OF TOBACCO FERTILIZATION

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Of the many factors involved in the production of good-quality cigar-leaf tobacco, the potassium requirement is one of the most important. In order that we may understand more clearly its importance, let us first consider several well-established facts of a chemical or biochemical nature which bear directly or indirectly on this subject, and, furthermore, let us formulate a chemical interpretation for a number of otherwise unexplainable observations which have been noted by a number of workers in their investigation dealing with the relationship of potassium to the plant itself and to the quality of the product.

A knowledge of the condition of potassium as it normally occurs in the soil is of fundamental importance in a study of this kind. A small quantity of this element is usually present in either chemical or physical union with the soil organic matter. A portion of this potassium is readily available for plant growth, but complete availability can only be attained by decomposition of the organic matter. It is necessary, therefore, to pay close attention to the biological conditions of the soil and especially to those factors affecting the number and activities of the organisms which decompose organic matter. Work of the Cornell and other experiment stations has shown that the nutrition of these organisms must be provided for even before that of higher plants. The fact that additions of organic matter lead to a temporary depletion of soil nitrogen certainly emphasizes this point. What is true for nitrogen probably is true for other essential plant nutrients, although the effect may not be so apparent. With this in mind, we should profit from the results of investigations of the factors involved in the depletion of soil nutrients and especially with the factor of crop rotation. Moreover, the preceding crop may have a direct or indirect bearing on the activity of soil micro-organisms, apart from its effect on the available supplies of plant nutrients. There is, for instance, the favorable effect of clover as contrasted with the unfavorable effect of timothy, as shown by the work conducted at Cornell and elsewhere.

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