THE EFFECT OF SOLUBLE NITROGENOUS SALTS ON NODULE FORMATION.¹

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INTRODUCTION.

It has been known for a long time that the presence of certain salts in the soil has a tendency to retard the normal development of root nodules. This is especially true of the soluble salts of nitrogen, such as nitrates. If nodule production is retarded in the presence of nitrates or other soluble nitrogenous compounds, it naturally follows that less nitrogen will be assimilated from the atmosphere. Hence the ratio of the yield of dry matter to the gain in nitrogen with legumes grown in soil or sand low in soluble nitrogen will not be the same as that of legumes grown in rich soil. In order to measure accurately the nitrogen-assimilating power of a legume, it seems necessary to determine the amount of soluble nitrogen in the soil. This paper deals with the relation of combined nitrogen to the growth of legumes, i.e., the effect of nitrates and ammonium sulfate on nodule production and nitrogen fixation.

It is apparent that there are many factors other than the soluble nitrogen content of the soil which may influence the nitrogen-gathering power of leguminous plants. Important among these agents may be mentioned soil type, reaction, species of plants, and non-nitrogenous fertilizers. Although the literature contains numerous examples of injury to nodules from soluble nitrogen, it has been noted frequently that in very rich garden soil plentifully supplied with nitrogen some of the common legumes as peas and beans are often abundantly inoculated. If nitrate nitrogen is detrimental, there must be some substance present in rich garden soil which tends to neutralize this action of nitrate.

LITERATURE.

A review of the literature shows that a number of investigators have called attention to the effect of soluble nitrogenous compounds on the formation of root nodules. However, the practical significance of this factor as related to the nitrogen problem of cultivated

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