EFFECTS OF APPLYING COMMON SALT TO A MUCK SOIL ON THE YIELD, COMPOSITION, AND QUALITY OF CERTAIN VEGETABLE CROPS AND ON THE COMPOSITION OF THE SOIL PRODUCING THEM

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MUCH work has been done in both Europe and America in an effort to determine the role of sodium in plant metabolism and its effect when used as a fertilizing constituent. The copious literature on the subject is reviewed by Willis (9). The studies with sodium salts in Rhode Island, first begun by Wheeler and Adams (8) in 1894 and continued by Hartwell and his associates (3, 4, 5), are especially worthy of mention. Miller (6) gives a concise summary of the literature concerning the influence of sodium upon plants.

Numerous recent papers indicate a continued interest in the subject; hence the writers believe that a report of the results of studies begun by the senior author in 1924 and still in progress concerning the use of common salt as a constituent of fertilizers for crops grown upon muck soil, will be of interest. The term muck as used in this paper refers to those soils which contain a very high content of organic matter in a more or less well-decomposed condition. Since muck soils as a class contain very small amounts of both sodium and potassium (2), opportunity to observe the effects of applications of these two constituents is correspondingly greater with them than with mineral soils. Inasmuch as Michigan contains several million acres of muck land (2), is one of the leading producers of celery and sugar beets which are shown in this study to be very responsive to salt, has 13 beet sugar factories well distributed over the state, and ranks first among the states in the production of salt (7), this study becomes one of considerable local economic importance.

EXPERIMENTAL

Although the effects of salt upon numerous crops have been investigated on a number of the muck areas of the state, the data reported in this paper were obtained largely from a series of plots known as the "salt series" (Fig. 1) in the muck

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3Figures in parenthesis refer to "Literature Cited", p. 979.

4Additional studies made on the more peaty types of soils show that the conclusions drawn in this study are applicable to all organic soils of Michigan.