FIELD CROP RESPONSE TO THE INGREDIENTS OF POTASSIUM SALTS

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Under certain conditions carriers of potassium, as well as of the other two fertilizer elements, may have marked crop effects other than those exerted by the fertilizer elements themselves serving directly as nutrients.

It was the purpose in this experiment to use magnesium-potassium sulfate, muriate of potash, sulfate of potash and kainit under such conditions that not only the potassium but also the other ingredients should have an opportunity eventually to exert on crop plants any effect of which they may be capable. Consequently not only potassium, but sodium, magnesium, sulfur and chlorin were reduced to the smallest practicable proportions in the basal applications common to all the plats.

Two-fifteenths acre plats (Nos. 114-118) of the permanent experimental area known as the station plain were selected for this purpose in 1911. They had not all been used exactly alike in previous years, but the new treatments were so arranged that it was believed that a satisfactory comparison could be made of the four potassium salts.

The soil is Miami silt loam which not only contained considerable available potassium but had received fairly liberal amounts of ordinary fertilizer chemicals, in consequence of which all of the elements (except probably magnesium) to be subsequently avoided in the basal applications had been applied. For example, in 1909 and 1910 the fertilizer contained nitrate of soda, acid phosphate, muriate and sulfate of potash, and even in 1911, 1912 and 1914, acid phosphate with its sulfur content was unfortunately applied.

One question of interest, therefore, was concerning the time when, if ever, there would be a depression in growth on the check, or no-potassium plat following the use therein of the basal applications of fertilizer chemicals in which the ingredients of the potash salts were at most no more than inconspicuous constituents.

No farm manure has been used in the experiment. The fertilizer applications, beginning with 1913, are stated in Table 1. In 1911 and 1912 combined, the basal fertilizer contained, besides other materials, 561 pounds of nitrate of soda and 1326 pounds of acid phosphate per

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