MANGANESE, COPPER, AND MAGNESIUM CONTENTS OF SOME COMMERCIAL FERTILIZERS

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The need of supplying one or more of the nutrients, nitrogen, phosphoric acid, and potash to most soils to increase crop production has been recognized for over a century. The fertilizer industry has been developed on the basis of the insufficient supply of these nutrients in an available form in agricultural soils. In recent years, research in plant nutrition has directed attention to the requirement of plants for small quantities of other elements, as copper, manganese, and magnesium. Studies of the soil supply and the role in plant growth of the so-called minor elements have evoked considerable interest, as is evidenced by the voluminous literature on the subject. Since, in some localities, and under certain conditions, it has been found advisable to recommend the application of small quantities of some of these elements as a part of the fertilization practice, it seemed of interest to have some knowledge concerning the amounts of these elements present in commercial fertilizers in common use.

The present investigation was undertaken with this point in mind and sets forth the results obtained from analysis of 11 commercial fertilizers (2-12-6) for manganese, copper, and magnesium.

EXPERIMENTAL

The samples of commercial fertilizers used in this investigation were furnished by the state chemist, Mr. Wm. Geagley, and were portions of samples taken according to standard methods for use in persuance of his chemical control duties in the administration of the fertilizer licensing law.

TREATMENT OF SAMPLES

The equivalent of a 10-gram sample of the oven-dry fertilizer was placed in a casserole and 20 cc of 18 N sulfuric acid added. The mixture was then heated until the material was well charred. The solution was allowed to cool, 16 N nitric acid was added until violent reaction ceased, and the solution was again heated until the fertilizer was thoroughly charred. Again it was cooled, 16 N nitric acid added as before and the solution heated until thick fumes of sulfuric acid were evolved. This procedure was repeated until the solution became clear and remained so when strongly heated. The solution was then evaporated just to dryness, 200 cc of 6 N sulfuric acid added, and the solution boiled. The hot solution was then filtered, the residue was thoroughly washed with hot dilute sulfuric acid, and the filtrate and washings were made to volume and reserved for analysis.

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