RESPONSE OF CORN AND SOYBEANS TO MAGNESIUM FERTILIZERS

Instances of magnesium deficiency are not common, particularly in the North Central Region, and experience with magnesium fertilization is rather limited. Marked symptoms of magnesium deficiency were observed on crops growing on Hagener loamy sand in Kankakee County, Illinois. Samples of this soil were found to have a pH of 4.1 and a cation-exchange capacity of 4.1 me. per 100 grams. Exchangeable soil magnesium varied from 60 to 75 pounds per acre. Records of the farm gave no indication that the field had ever been limed.

Four magnesium treatments consisting of 2 tons of dolomite and 0, 75, and 150 pounds of magnesium per acre as magnesium sulfate were applied at this site in a randomized block design with 4 replications. Adequate nitrogen, phosphorus and a minor element mixture were supplied to all plots (table 1). Plots receiving no dolomite were limed with a high-calcium limestone (98.61% CaCO₃, 0.62% MgCO₃).

Distinct magnesium deficiency symptoms—interveinal striping, bronzing, and chlorosis of the leaves—were obvious on corn seedlings growing on the control plots. These symptoms were less pronounced as the plants became larger, but these control plants remained smaller throughout the season than plants on the magnesium-treated plots. Symptoms were never observed on plants on the magnesium-treated plots.

No symptoms were observed on the soybean plants on any plots. The plants on the magnesium-treated plots, however, were larger throughout the growing season.

No differences in either the corn or soybeans were observed among plots treated with different amounts of carriers of magnesium, although both crops matured somewhat later on plots treated with dolomite.

Plant samples were taken when the soybeans were in the bloom stage and when the corn was just beginning to tassel. Composition of these samples and yields on the different treatments are shown in tables 2 and 3.

Yields of corn and soybeans were greatly increased by magnesium treatment (significant at 1% for corn and at 5% for soybeans). Differences between rates of magnesium or between carriers (magnesium sulfate vs. dolomite) were not statistically significant although yields tended to increase with increased applications of magnesium. The rather large yield differences required for statistical significance in this experiment (C. V. 17.7% for corn and 16.2% for soybeans) were probably a result of highly variable soil properties that are characteristic of the area. Magnesium contents of the vegetative parts of the corn and soybean plants were obviously increased by magnesium fertilizer. Oil and protein contents of the soybean grain were not influenced by the treatments.

A RAPID ENZYME-SMEAR TECHNIQUE FOR THE DETECTION AND STUDY OF PLURAL EMBRYO SACS IN MATURE OVARIES IN SEVERAL PASPALUM SPECIES

In the course of inheritance studies on several grass species of the genus *Paspalum*, an enzyme-smear technique was developed for the observation and study of plural embryo sacs in mature ovaries in florets at late pre-anthesis and early stages of development. By this method, large numbers of plants may be classified for absence of plural embryo sacs. More critical study of plural embryo sacs in mature ovaries, i.e., ovaries in florets at late post-anthesis, is facilitated by this method.