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Some Effects of Fertilization on Nitrification in High-Lime Soils

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limestones were applied at the rate of 3 tons per acre. Rock phosphate alone and in combination was applied at the rate of 250 lbs. per acre. Samples of the treated soils were taken after 4, 10, 16, 22, 28 weeks to determine nitrate accumulation and nitrification.

The addition of limestone increased the nitrate content of the soil, although it was not noticeable until 4 months after the beginning of the experiment. Limestone applied with rock phosphate showed a similar increase, being just slightly higher than the limestone alone. Rock phosphate alone did not affect nitrification to any appreciable extent.

Throughout the experiment, calcium limestone gave slightly higher results than dolomitic limestone. This is believed to be due to the fact that the calcium limestone used was more finely divided than the dolomitic limestone.

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SOME EFFECTS OF FERTILIZATION ON NITRIFICATION IN HIGH-LIME SOILS

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Applications of potassium chloride at the rate of 100, 200 and 500 pounds per acre were made on two soils containing a high calcium content. Oat straw at the rate of 2 tons of dry matter per acre was applied alone and in combination with potassium chloride. Sweet clover at the rate of 2 tons of dry matter per acre was applied alone and in combination with potassium chloride. Samples of the soils were taken 4 weeks after treatment in the greenhouse and again after 5 months for nitrification determinations.

The soils under all treatments as well as the untreated checks contained a high content of nitrate-nitrogen. Nitrification tests showed that several times as much nitrate nitrogen was formed as was added in the form of ammonium sulfate, indicating a complete nitrification of the ammonium sulfate added and oxidation of organic matter or nitrogen fixation. Nitrification was stimulated at first by additions of potassium chloride but was apparently depressed sometime after 4 weeks. Oat straw depressed nitrification at first but the effects had about disappeared after 5 months.

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