INFLUENCE OF VARIOUS NITROGENOUS FERTILIZERS ON AVAILABILITY OF PHOSPHATE

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The availability of phosphate in a soil is influenced to a marked degree by the acidity of the soil. Parker and Tidmore (12) have shown that liming increases the solubility of phosphate in soils receiving superphosphate (acid phosphate) and basic slag. Spurway (17) has shown that the solubility of soil phosphorus is also influenced by the nature of the exchangeable base in the exchange complex of the soil. Pierre (14) and other workers have shown that different nitrogenous fertilizers influence the reaction of the soil and the base saturation of the exchange complex. It seems probable, therefore, that the source of nitrogen would influence the availability of the phosphate of the soil.

The purpose of this investigation was to study the availability of the phosphate in plots of the long-continued sources of nitrogen experiments of the Alabama, Rhode Island, and New Jersey Experiment Stations in order to compare the effect of different sources of nitrogen.

METHODS

Phosphorus availability was studied by determining the solubility as indicated by the phosphate concentration of displaced solution, 1:5 water extracts, and 1:5 carbonic acid extracts. The availability in the plots from the New Jersey Experiment Station was also studied by determining the amount of phosphate removed from the soil by continued leaching, the amount absorbed from a solution of monopotassium phosphate, and the amount removed from the soil by wheat seedlings, using Neubauer's method (8).

In obtaining the displaced solutions, the soils were brought to the desired moisture content, thoroughly mixed, and allowed to stand 48 hours. At the end of that period the soil solutions were dis-

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3Reference by number is to "Literature Cited," p. 292.