

SOIL SCIENCE

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ABSTRACTS

Possibilities for Increasing the Recovery by Corn of Band Applied Phosphate Fertilizers. A. J. OHLROGGE, Purdue University.—The low recovery, often less than ten percent, of band applied fertilizer is widely recognized. Factors necessary for efficient nutrient uptake are discussed. The plant availability of present day fertilizers are poorly matched to the needs of the crop. It is suggested that delayed availability, accomplished through the use of granule coatings of varying solution or decomposition rates, may better fit availability to need and thereby increase fertilizer effectiveness.

Effect¹ of Iron, Aluminum and Humic Acid on Phosphorus Fixation by Organic Soils. J. E. LARSEN, G. F. WARREN, and RUBLE LANGSTON, Purdue University.—Studies were conducted comparing the effects of iron, aluminum, and humic acid on phosphorus fixation in two organic soils which had undergone different degrees of decomposition. It was shown that organic soils fix phosphorus similarly to other reported phosphorus fixing systems. Iron and/or aluminum additions increased phosphate fixation while humic acid resulted in an apparent negative absorption. Further, humic acid prevented absorption of phosphorus in the presence of limited quantities of iron and aluminum.

In recent years many studies have been conducted on the various factors affecting phosphorus fixation in inorganic soils. Hemwall has reviewed these quite adequately. However, such studies have not been conducted on organic soils.

It has been shown previously that large differences exist in the capacities of organic soils to fix phosphorus into a form unavailable to plants and insoluble in water. The ability of organic soils to fix applied phosphorus increased with the length of time the soil had been cultivated. Further, it was shown that the retention of applied labeled phosphorus in leaching studies was closely correlated with the sesquioxide content of the soils and their apparent degree of decomposition. It can be seen that an understanding of the nature of this fixation would be of considerable practical importance.

In this investigation, the effects of iron, aluminum, and humic acid were studied on the fixation of applied labeled phosphorus in two organic soils at different stages of decomposition.

The Influence of Surface Applied Mulches upon Soil Condition and Environment. RONALD B. TUKEY and E. L. SCHOFF, Purdue University.—Mulches which varied in both rate of decomposition and texture were

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applied to the surface of Tippecanoe loam soil in small replicated plots and maintained for five years. Soil samples taken from these plots at the end of this time showed that in comparison with soils under clean cultivation and bluegrass sod, mulched soils were not significantly different in pH, lime requirement or in the availability of calcium and magnesium. However, readily available phosphorus and potassium as well as weakly available were significantly effected by mulches. Increases in the availability of phosphorus were significant only for the loose textured mulches such as legume hay, straw and glasswool while increases in potassium were significant for all mulches excepting sawdust. Soils under mulches were found to be lower in temperature during the summer and higher in moisture. Mulched soils were neither significantly higher in the number of bacteria nor fungi nor were they significantly different from cultivated soils in total pore space. Mulched soils were typically lower in oxygen and higher in carbon dioxide than cultivated soils with the finer materials associated with the lowest oxygen and highest carbon dioxide content.