

## SOIL SCIENCE

Chairman: ANSON R. BERTRAND, Purdue University

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### ABSTRACT

**Some Gaps in Our Information on Potassium.** WERNER L. NELSON, American Potash Institute.—Potassium is perhaps one of the least understood of the major elements both in the soil and in the plant. There are a number of research areas that need further exploration. Potassium is an important factor in Indiana soils as 74% of the soils are low in available K. Continuous cropping studies have shown that most of the added K can be taken up. However, as K is added at intervals for top production how much of the K which goes into the non-exchangeable form will be taken up? K availability is essentially an equilibrium reaction. With the trend toward one or two heavy applications of K in the rotation more information is needed as to residual effects. Part of this is related to compensation to the tenant if he moves off the farm. Dr. A. G. Norman has suggested that nutrient levels in plants be maintained at the point of slight luxury consumption. This simply means that nutrients should be eliminated as a limiting factor in crop production. Much needs to be done to establish these levels. The N-K relationship needs much clarification. Of course as higher yields are obtained with higher rates of N more K is removed. There is an indication that higher N increases the exchange capacity of the roots with subsequent lower capacity to absorb K. Buildup of N-compounds in the plant particularly  $\text{NH}_4\text{-N}$  tends to make K deficiency more pronounced. K deficiency symptoms can be produced by injecting putrescine in the plant. K deficiency causes a buildup of reducing sugars as well as P and N compounds in the plant. This makes a media more favorable for the growth of certain microorganisms particularly the fungal diseases and certain viruses. Much is yet to be learned as to effects of nutrition on incidence of disease. As genetic material is developed which will consistently produce 200-250 bushels of corn and 6 to 8 tons of alfalfa what level of K in the soil is needed? What content of K in the plant is needed for such yield levels?