MUCK soils as a rule are naturally deficient in potash or soon become so when cropped. This makes it necessary to apply potash fertilizers to maintain high crop yields. The amount, kind, and placement of the fertilizer not only depends upon the crop needs but also upon the soil characteristics. The affinity of certain soils for soluble phosphate has prompted some investigators (2, 15) to recommend that it should be applied in a restricted area near the seed. Other investigators (5) have found that under intensive cropping conditions a sufficient amount of potash cannot be safely placed near the seed without some danger of reducing germination. Since fixation can be either beneficial or detrimental, the most desirable method of applying fertilizer depends partially on the degree to which it is fixed.

In a study on low moor soils, Krugel, Dreyspring, and Heinerich (6) found that, in certain cases, the absorptive fixation of potash salts caused by the action of humic substances was very great. It was so great that 267 pounds of K₂O per acre were insufficient to produce good crops and it was necessary to make an additional application of one-half the original quantity before barley would grow normally. Such evidence would indicate that muck soils of this country might possess high potash-fixing ability.

Volk (16), in his work on several mineral soils, found that by using single extractions with dilute salt solutions or even weak acids, it was impossible to remove all of the potassium he had applied, if the soils had been either dried or dried and heated after the addition of potash salts. He concluded that a portion of the potash was converted into muscovite which is only slowly soluble.

Likewise, Frear and Erb (4) found that a portion of the potash applied to Hagerstown silt loam on the Pennsylvania State College fertility field was fixed in a form that could not be leached out in a short time nor cropped out in a season.

McCool (8) claims that mucks with the greatest amount of mineral matter show the greatest fixation. Others (3, 7, 9, 10) think that the acidity may be an important factor affecting the fixation of potash.

Fixation studies have usually been made by chemical methods. The assumption is then made that such a chemical measure of potash fixation is a good indication of the amount of potash which is unavailable to plants.

The study reported here was made in the greenhouse by growing four crops in pots fertilized with potassium chloride by two methods, viz., in a layer and mixed with all of the soil. The difference in the