BASIC concepts concerning the nature of a fertile soil have been undergoing significant changes. It is now recognized that for a soil to be fertile it must contain, in the available form, 5 to 20 times as much of an immobile nutrient as the crop will remove in one season. In general all nutrients, except nitrogen and water, in the soil are immobile, and taking potassium as an example, it has been shown (1) that a soil must contain 150 ppm of exchangeable potassium for maximum yields. Thus corn, for example, needs 600 pounds of exchangeable potassium in the top 14 inches of soil to achieve maximum yields when planted three to a hill in 40-inch rows, yet the corn itself will remove less than one-tenth of this amount. This indicates that large soil areas, especially those between the hills, are not being effectively contacted for potassium by the corn roots. Although some corn roots extend between the rows, the greatest root density and most intense feeding occur just below the hill. Therefore, plants of another crop growing between the corn rows will not compete for immobile nutrients except in limited regions where the root systems of the two crops are in actual contact.

A soil fertile enough in immobile nutrients for a maximum corn crop should also be capable of supplying these nutrients to an intercrop without greatly affecting the corn yields.