

fertilizer in the soil, so that the increase in yield was small as the rate of fertilizer was increased above the minimal application used.

Corn, crotalaria, lupine and oats gave significant responses to phosphate fertilizer for the five-year period. Corn and oats for green manure gave a significant response to nitrogen, but only a small response to potash. Peanuts gave no response to nitrogen, while peanuts, crotalaria and lupine gave a small, non-significant response to potash.

Lime gave a significant increase in the first year in the yield of peanuts, crotalaria, lupine and oats for green manure.

For the five-year period, continuous peanuts hogged-off, followed by native cover, yielded about the same as continuous peanuts harvested and followed by lupine for green manure.

Increasing the rate of phosphate and potash applied to the soil increased the phosphorus and potassium contents of the soil and peanut plants, but did not increase yield of peanuts.

As the rate of dolomitic lime applied to the soil was increased, the phosphorus, calcium and magnesium contents of the soil and the phosphorus and magnesium contents of the peanut plants were increased, but yield was not increased. The potassium and calcium contents of the soil and plants as well as the yield of peanuts were lower where peanuts were grown continuously than where peanuts were grown once in a three-year rotation.

Chemical analysis showed soil phosphorus to be available, but plant analysis showed that continuous corn did not take up as much of the phosphorus as corn in the rotation. It may be that legumes could use this phosphorus; when they were turned under, they added to the soil considerable organic phosphorus that did not show in the chemical soil test for available phosphorus. As this organic phosphorus decomposed slowly, it was used by the corn plants before it could be fixed in unavailable form. On the other hand, part of the inorganic phosphorus was fixed by the soil before it could be used by the corn crop.

The soils of all plots declined in moisture equivalent and in organic matter content for the five-year period, even though comparatively large amounts of plant residue were returned to the soil. The greatest loss of organic matter in continuous cropping systems occurred in the peanut plots. The smallest loss took place in the corn plots.