

When lupine was grown only once in a two-year rotation the increase in yield was highly significant. In the fifth year lupine yielded higher following corn each year than in peanut rotations, except where lupine and peanuts were each grown only once in three years.

**Oats.**—Yields of oats in the rotation and continuous-crop experiment are given in Table 5. Oats following crotalaria turned under for green manure made higher green weight yields than oats following corn, but the difference was significant only in the first year. The green weight yield of oats in 1951 was so low because of cold weather that it was not measured.

### FERTILIZER EXPERIMENT

The fertilizer experiment was a randomized block designed with four replications and three levels each of nitrogen (N), phosphoric acid ( $P_2O_5$ ) and potash ( $K_2O$ ) applied to all crops in a three-year rotation. The rotation used was as follows: First year—peanuts, lupine under; second year—corn, oats for grain; third year—crotalaria under, oats under. The fertilizer applied to each crop appears with the yield data in Tables 6 to 11. All six crops were grown each year in each replication. This was accomplished by alternating the six crops among three sets of plots each year.

**Corn.**—Yields of corn with various rates of fertilizer are shown in Table 6. Since this experiment was started on virgin soil, the highest response to fertilizer in the yield of corn was shown in the first year. During the five years there was a build up of residual fertilizer in all plots. By the last year the response to higher rates of fertilization was not significant. Probably about 20 percent of the increase in yield in all plots for the last three years was caused by the use of a higher-yielding hybrid, Dixie 18.

Because of favorable weather, corn yields were exceptionally high in 1949 and 1950 (Table 25). Phosphorus gave a significant response in yield for the first four years, nitrogen for the first three years, and potash for the third and fourth years only. Correlated soil tests not otherwise reported confirmed the phosphorus build up and indicated a decrease in potash level of the virgin soil.

**Peanuts.**—Yields of peanuts with various rates of fertilizer are shown in Table 7. Superphosphate gave a highly significant