approximately equal to that recommended in Bulletin 536A (19). Calcium in the mixed fertilizer had no effect on either trunk diameter or yield of fruit.

The phosphate applications increased the phosphorus level in the leaves. The high nitrogen level resulted in increased leaf nitrogen, decreased leaf potash, and increased leaf calcium. The application of calcium in the fertilizer increased leaf calcium and decreased leaf magnesium.

Concentration of feeder roots at various depths to 4 feet was not affected by phosphate applications (Table 5). Even phosphoric acid at rates equivalent to 2 and 8 percent P_2O_5 did not detrimentally affect root growth when applied to this previously unfertilized soil.

Soil analyses for extractable phosphorus indicated that considerable amounts of fertilizer phosphorus had moved into the subsoil (Table 6). The soil pH ranged from 5.2 to 5.5 but was not significantly affected by treatments. Analyses of soil samples obtained prior to fertilization and their significance are reported in a subsequent section on soil testing.

TABLE 6.—DISTRIBUTION OF PHOSPHORUS IN SOIL UNDER YOUNG TREES AFTER APPROXIMATELY TWO YEARS' FERTILIZATION WITH DIFFERENTIAL PHOSPHATE RATES (EXPERIMENT 4).

	P Extracted by Bray P_1 Test, lb. P/A			
Phosphate Rate	0–6 in.	6–12 in.	12–18 in.	0–18 in.
None	56	56	56	168
2% P_2O_5 fertilizer	108	80	55	243
8% P_2O_5 fertilizer	204	180	146	530
200 lb. P_2O_5/A broadcast	75	64	49	188

The application of phosphate also increased tree growth and leaf phosphorus content in Experiment 5 (Table 7). Results with one application annually were comparable to four applications of phosphate.

Figure 1 shows the trunk diameter of young trees in Experiments 4 and 5 at various dates as affected by phosphate applications. Differences in growth due to phosphorus mainly occurred during the first two growing seasons, and growth during the third year was approximately the same regardless of phosphate