EFFECT OF VARIETY AND STAND OF SOYBEANS ON
RELATIVE YIELD AND PERCENTAGE OF TOTAL
NITROGEN IN TOPS AND ROOTS

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The purpose of the experiment reported in this paper was to determine the percentage of the total weight and total nitrogen of the soybean plant contained in the roots of several varieties and the percentage of nitrogen in the tops and roots. From these data conclusions may be drawn as to the relative effect of varieties of soybeans on soil fertility.

Borst and Thatcher (2) found the top-root ratio of Manchu and Peking soybeans at maturity when grown in cans at Columbus, Ohio, to be 13 to 1 and 10 to 1, respectively. Wiancko and Mulvey (4) found 10.9 pounds of nitrogen in the roots of soybeans where 81.8 pounds were found in the tops. Piper and Morse (3) report 165 pounds of nitrogen in the tops of soybeans and 9 pounds in the roots.

Andrews (1) found the yields of the roots of Laredo, Mammoth Yellow, and Otootan soybeans grown in pots to be 13.2 ± 1.01%, 20.2 ± 0.69%, and 19.0 ± 0.68% of the total yield, respectively. The nitrogen contained in the roots was 16.9 ± 1.33%, 20.1 ± 0.62%, and 21.9 ± 1.18% of the total.

Soybeans were also grown in the field and the roots were harvested under an area with a radius of 2.5 feet from the plant (1). The yields of the roots of Laredo, Mammoth Yellow, and Otootan were 6.5 ± 1.21%, 10.7 ± 1.35%, and 7.6 ± 0.82 of the total yield, respectively. The nitrogen contained in the roots was 4.3 ± 0.74%, 6.4 ± 1.18%, and 6.5 ± 0.60% of the total nitrogen.

The data obtained on the yield of roots depend upon the method of obtaining them. When cans or jars are used, the roots are not in a normal environment. When roots are harvested from plants grown in the field, it is too often the case that many of the smaller roots are lost, and, as a consequence, the results are inaccurate and the chemical analyses are not representative. After roots have been obtained, it is very difficult to remove all of the soil from them by washing and, therefore, this presents another factor which causes variation in the results. The data of Andrews reviewed above were so affected.

THE PRESENT EXPERIMENT

The data reported in this paper were obtained from the roots of soybeans which were planted 8 to 10 feet apart in May 1933 on Ochlocknee sandy loam. The soybeans were harvested during the first two weeks of September. The earlier varieties were harvested first. The tops were removed at the surface of the ground, then a trench was dug around each stubble at a distance of 3.5 feet. The depth of the trench was 2 to 2.5 feet. The trench was then filled with water and the roots

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2 Associate Agronomist and Chemist, respectively.
3 Figures in parenthesis refer to "Literature Cited", p. 437.