Effect of Straw and Cornstalks on the Yield of Soybeans

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ON the basis of two greenhouse experiments it has been stated by Pinck, Allison, and Gaddy (2) that growth and nitrogen uptake by soybeans are depressed by incorporation of straw in the soil at substantial rates. The addition of fertilizer nitrogen may counteract the effect of the straw, but may also reduce the amount of nitrogen fixed by the crop. The latter is not especially important, however, if the yield of beans is increased.

Three field experiments carried out by us in the course of extended studies on the nitrogen nutrition of soybeans have included straw or cornstalk residue treatments, with and without additions of nitrogen fertilizer. The results of these expressed as yields of threshed soybeans per acre are not in accord with the conclusions derived from the greenhouse experiments cited above. In addition to the straw or residue plots these field experiments included a variety of nitrogen treatments which will form the subject matter of a later communication.

EXPERIMENT 1, AGRONOMY FARM, AMES, 1943

The soil type was Clarion loam. The Richland variety was inoculated and planted in 34 inch rows on May 24. Ten replicates of treatments were arranged in two contiguous 5 x 5 Latin squares. Straw was plowed under on five plots in each square at the rate of 4 tons per acre on May 4 followed by disking. Sulfate of ammonia was applied in split plot applications of 300 pounds per acre broadcast between rows on July 27.

From the data in Table 1 it may be seen that no decrease in soybean yield was caused by spring plowing of straw at a heavy rate. Furthermore, the straw did not cause any significant change in the nitrogen content of the soybeans, or the nitrogen in the crop per acre. The effect of a midseason nitrogen application on the straw plots was however substantial and highly significant.

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2Research Assistant Professor, Research Associate, Research Assistant Professor, and Research Professor, respectively.
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4Figures in parenthesis refer to "Literature Cited", p. 92.