Pre-emergence Control of Weeds in Corn with 2,4-D

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In 1946, the authors, working at the New Jersey Experiment Station, reported effective control of weeds in corn by applying 2.7 pounds of 2,4-D acid to the soil 5 days after the corn was planted. The corn yield from the seven hybrids used was estimated to be equal to that of the check plots which were given normal cultivation. Heavier applications up to 9.1 pounds per acre substantially decreased yields. Control of both dicot and monocot weeds was excellent at all rates up to the fifth week after application. This experiment, which seemed to promise elimination of cultivation, effective weed control during rainy periods when ordinary cultivation is not possible, and lowered cost, aroused such interest that a more comprehensive experiment was conducted in 1947, the results of which are reported here.

MATERIALS AND METHODS

The sodium salt of 2,4-D was used in this experiment; all rates given, however, are in terms of free acid per acre. The 2,4-D was mixed with water and applied with a 5-gallon knapsack sprayer at a volume rate of 150 gallons of total solution per acre. Three rates of application were used, viz., 1 1/2, 2 1/2, and 3 1/2 pounds of active 2,4-D per acre. These were applied at two dates, one the same day the corn was planted and the other 8 days later. At the time of the latter application about 50% of the corn plants were beginning to emerge and some weeds could be seen.

Four corn hybrids, all of which are grown successfully in New Jersey, were planted in this test. The hybrids were Pioneer 332, Ohio C-88, U. S. 13, and New Jersey No. 4. The corn was planted at a depth of 2 inches with a hand planter on May 16. Four kernels were planted to the hill and hills were spaced 42 inches by 42 inches.

The soil in this experiment was Sassafras sandy loam. The preceding crop was alfalfa and the sod was plowed 3 weeks prior to corn planting.

Seedlings were termed affected on the basis of three criteria, viz., (1) leathery coleoptile, (2) abnormal curvature, and (3) onion-top rolling of leaves. Notes were taken on June 2 to determine percentage of affected seedlings. The seedlings were then approximately 4 inches tall.

Entire plots were harvested on November 17. Field weights were determined and samples of grain were taken by a random sampling of 10 ears; two rows of kernels were removed from each ear. These grain samples were allowed to stand 24 hours to permit equalization of moisture, and then moisture percentage was determined with a Tag-Heppenstahl moisture meter.

R. A. Fisher's method of analysis of variance was used in analyzing the data from this experiment. Figures are given for significant differences at the 5% level.

RESULTS AND DISCUSSION

All data gathered from the test of pre-emergence applications of 2,4-D at three rates, at two dates, and on four different field corn

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42,4-D refers to the chemical 2,4-dichlorophenoxyacetic acid.

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