THE EFFECT OF CYANAMID AND POTASH WHEN PLOWED UNDER WITH ORGANIC REFUSE ON THE YIELD OF CORN AND SUCCEEDING CROPS

Abstract

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THREE years' results have been obtained from the plowing down of cyanamid with organic matter under a wide variety of soil conditions in order to study the problem of supplying nitrogen to the corn crop and of building up soil humus as a supply of nitrogen for succeeding crops.

EXPERIMENTAL

These experiments were designed for treatments, which consist of four rates of application of cyanamid and three rates of muriate of potash, to be applied broadcast and plowed under preceding the corn crop on several of Indiana's major corn soils. The plots were square and contained 100 hills of corn; all were fertilized with 300 pounds per acre of 0-16-4 in the row when planted. The 12 variously treated plots resulting from the combinations of the several rates of the two materials were replicated in four blocks the first year. During the last two years however, a modified Latin square with five replicates was used.

CORN YIELDS

From 17 tests to date the corn yields have varied from 5 to 10 bushels increase with 100 pounds per acre of cyanamid plowed under; from 8 to 20 bushels increase with 200 pounds per acre of cyanamid plowed under; and from 14 to 40 bushels with 400 pounds per acre of cyanamid plowed under. In one case where the yield was 92 bushels without a nitrogen fertilizer, the yield was increased over 23 bushels by the use of 80 pounds of nitrogen as cyanamid. The response to the additional potash plowed under varied, but was greatest with the highest levels of nitrogen.

RESIDUAL EFFECT

The residual effects of the cyanamid plowed under for corn were measured in 1939 and 1940 on corn, wheat, oats, and soybeans. Considerable quantities of the nitrogen and potash plowed under remained in the soil for utilization by the crops following in the rotation. On a Crosby silt loam the oats yield was 55.0 bushels per acre with no cyanamid and was 109.8 bushels per acre where 400 pounds of cyanamid had been used for the corn in 1938 and 1939.

ECONOMIC ASPECTS

It was found that on two southern Indiana soils used in this investigation money must be spent for nitrogen before the overhead production costs can be made. From the standpoint of return, an investment $2.10 in cyanamid at Bedford returned a profit of $3.35 in 1938, $7.96 in 1939, and $8.52 in 1940.

CONCLUSIONS

It is apparent from the data presented in the complete paper that the corn crop can utilize fairly efficiently the nitrogen supplied as cyanamid when it is plowed under with organic matter and that considerable quantities of this nitrogen remains in the soil and can be utilized by succeeding crops in the rotation. While this efficiency was much greater and the practice more profitable on the lighter colored soils, very significant increases were obtained in almost all cases.

1 Contribution from the Department of Agronomy, Purdue University Agricultural Experiment Station, Lafayette, Ind. The original paper was part of a thesis presented to the Graduate Council of Purdue University. In accordance with requirements of the University and with the consent of the Executive Committee of the Soil Science Society, the complete paper was released for publication in the Journal of the American Society of Agronomy.

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