CROP SEQUENCE STUDIES IN NORTHWESTERN OHIO

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CROP rotation, in which cultivated crops, small grains, soybeans, and sod crops are grown in definite order, is accepted practice on farms in northwestern Ohio and considerable information has been accumulated regarding the soil-depleting or soil-conserving effects of the individual crops commonly included. It is also possible to evaluate fairly well the effects of the rotation as a whole upon soil productivity. On the other hand, there exists little published information regarding the order in which the cultivated crops and grain crops should occur in the rotation for most profitable returns. For several years, the Ohio Agricultural Experiment Station and the Division of Sugar Plant Investigations of the U. S. Dept. of Agriculture have cooperated in the experiment on the Northwestern Experiment Farm at Holgate, Ohio, designed to determine the effects of certain crops upon the crops following.

The soil in the area where this project is located is a Brookston clay, a heavy, dark-colored soil derived from calcareous glacial drift, of level topography, and considered well adapted to sugar beets, alfalfa, and corn when well tiled. The experimental area is only fairly well drained, the spacing of approximately 4 rods between lines of tile being somewhat wider than is optimum for this land. Other experiments on this farm point to poor physical condition as the chief limiting factor to high crop yields on this soil, fertilizers and even manure being relatively ineffective compared to such practices as the plowing down of deep-rooted legumes as alfalfa and sweet clover.

The number of crops that could be included in this crop sequence experiment was limited because the plan of the experiment and the plot arrangement used made it necessary that the soil preparation of all plots be done at the same time and in the same manner for the various crops. The crops used were sugar beets, corn, oats, soybeans for hay, and soybeans for seed. These crops were planted, cared for, and harvested according to ordinary farm methods. In the disposition of the crop residues, the sugar beet tops, corn stover, and soybean haulm were left on the land producing the crop while the oat straw and soybean hay were removed.

All of the crops were grown under each crop sequence condition each year in order to avoid the possibility of seasonal variations masking the effects that the individual crops might have upon the yields of the crops following. This was accomplished by growing the various crops in narrow, randomized strips in replicated blocks. The strips extended in one direction one season and were at right angles in the next season. Thus, after the first season, each crop followed it-

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