CROP RESIDUE MANAGEMENT IN DRY-LAND CROP PRODUCTION

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Methods of crop production that involve leaving at least a part of the crop residues on the surface have been under trial for many years in cooperative experiments at field stations in the Great Plains and the Columbia River Basin at which the Division of Dry Land Agriculture of the U. S. Dept. of Agriculture has been the operating or cooperating agency. Results at different stations have appeared as parts of general publications from time to time. This paper has been prepared to bring together some typical results and give an over-all perspective to the role of crop residues in dry-land crop production.

The earliest trials were comparisons of the plow and the disk, and were made to determine whether the rather expensive operation of plowing could be omitted for one or more years without reducing yields, rather than for the specific purpose of leaving stubble on the surface. Later, as implements that left more debris on the surface came into wider use and as the need for protection against wind erosion, particularly on land being fallowed, became more apparent, experiments were conducted for the specific purpose of determining the effect on yields of implements leaving surface residues. The extensive use of the combine-harvester, which leaves all the straw on the land, further increased the need for crop residue studies, as it was feared that plowing under the larger quantity of straw and stubble produced in favorable years might leave the soil too loose.

In the results reported here the methods under trial have been divided into three groups, viz., (1) methods that leave all or nearly all of the crop residues on the surface, (2) methods that leave part of the crop residues on the surface, and (3) methods that leave little or no residues on the surface. Other phases of the experiments, such as the time of operations and the use of different types of tillage equipment, have been necessarily omitted. The results presented, however, restrict comparisons to those in which the different initial operation were performed at approximately the same time.

The implements used for leaving as much of the residues on the surface as possible were the plow and the lister without moldboards, the rod weeder, the Noble blade, and different types of sweep implements ranging from comparatively narrow duckfoot shovels to sweeps 30 inches or more in width. The implements leaving part of the residue on the surface were the disk, oneway, and lister. In all cases where the residue was considered completely buried, the plow was the implement used.

1Contribution from the Division of Dry Land Agriculture, Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Dept. of Agriculture. Most of the work was in cooperation with the state experiment station in the respective states. In recent years some of the work was carried on in cooperation with the Soil Conservation Service. Received for publication January 2, 1945.

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