Here has been a great upsurge of interest in tillage methods in recent years. A lively controversy is going on over the relative merits of different systems of tillage. Farmers are being bombarded with advertisements claiming advantages for new types of tillage implements. Unfortunately, there is little basic information available either to support or disprove the many claims made.

The Ohio Agricultural Experiment Station has had an experiment in progress at Columbus since 1937 which compares several different methods of tillage in preparing land for corn. The results of this experiment have proved most useful in answering many queries about tillage which have come into the Agronomy and Agricultural Engineering Departments. The brief description and the data below are not presented with the idea that they will settle the controversies or that they are the best data which might be obtained. They are presented in answer to many requests for such information in the hope that they might serve as a basis of recommendations until such time as more complete data are available.

This experiment was not intended primarily to test different methods of tillage. The object was to find, if possible, the soil conditions which are best for the growth of a corn crop. The experiment was begun in 1937 in an exploratory way and has been continued on that basis. Manpower and labor shortages during the war prevented its expansion into the more elaborate experiment which had been planned.

The experiment is located on the University Farm at Columbus, Ohio, on an almost level area of soils of the Miami Catena. The soil is predominately Miami silt loam but small areas of Brookston silt loam occur in all plots. Six different soil conditions or tillage treatments are compared.

1. The normal or standard soil condition for corn is taken to be that usually followed here and on most Ohio farms—plowing followed by disking.

2. Minimum soil preparation is obtained by plowing with a sod plow with a specially extended wing, like the old "prairie breaker", so that the furrow slice is completely inverted. In so far as it is physically possible, corn is planted directly in the surface of this upturned furrow slice.

3. What is considered to be extreme overworking in soil preparation is obtained by rotary tillage. To obtain anything like a satisfactory seedbed for corn on the 1-year alfalfa-clover-timothy sod which is used in this rotation, it has been found necessary to go over it three and sometimes four times.

4. The treatment consists of standard preparation of the furrow slice. It consists of surface tillage at the depth of 7 to 8 inches with the 7-inch sweeps such as those being used so extensively in Nebraska. Surface treatment consists of rotary skimming with the sweeps to kill vegetation. Residues are left on the surface and the corn is sown directly in this "trash mulch".

5. This treatment has as little tillage as consistent with killing the sod, with all residues left on the surface. In the early years of the experiment the treatment consisted in rototilling just deep enough to kill the vegetation. The soil was neither plowed nor loosened. The treatment was changed in 1943 from skimming with broad sweeps to kill vegetation and in 1944 and 1945 the treatment was modified to preclude by disking only. The disk cuts rather shallow and organic matter is well incorporated in the surface inches.

6. This treatment consists of standard preparation—plowing and disking, as in treatment 1, plus addition of a heavy straw mulch after cultivation.

A 3-year rotation of corn, wheat, alfalfa, and timothy mixed hay is followed. In 1943, 1944, and 1945 all tillage operations were performed on the same day, with corn planted the day following. In the early years of the experiment each tillage treatment was performed when the time seemed best. The exception of seedbed preparation and the mulch on treatment 6, all plots are treated alike throughout the remainder of the season. The data for all treatments are averages of two plots. In one plot the corn stover is removed and on the other it is left and disked down for wheat. Each plot is six rows wide. Since 1942, three of the corn rows receive no fertilizer, the other three receive 300 pounds of 0-14-7 per acre drilled with the corn. Measurements were made on stand, on comparative height of extended leaf in the middle of the season, on shelled corn and of stover by rows, and the yield of wheat by plots. Physical measurements and determinations on the soil are made as frequently as possible during the summer. The corn yields are presented in Table 1 and graphically for four of the treatments in Fig. 1.

The response to fertilizer and height of corn are presented in Table 2.

Representative physical determinations made on the soil at the end of the growing season, October 10, 1944, are presented in Table 3.

Except for the addition of the mulch on treatment 6, there are no differences in treatments of