A CONVENIENT SOIL COMPACTION INTEGRATOR

MECH and Free\(^2\) and also Kuipers\(^3\) developed instruments for measuring soil roughness or micro-relief. Both of these instruments require a very considerable amount of computation to arrive at a satisfactory index of micro-relief or soil roughness.

In connection with a study of apparent soil compaction between corn rows, the authors devised an instrument illustrated below. This instrument gives a single numerical value for compaction with very little calculation. It is 48 inches long and 36 inches high. The \(\frac{1}{4}\)-inch diameter rods are 24 inches long. They are mounted 1 inch apart in a 2- by 6-inch board. The mounting permits the individual rods to slide freely. Three rods at each end of the board were fixed, leaving a 42-inch space in which rods could slide up and down. An angle iron was fitted at the base so that rods would not slide down while lifting the instrument. Two handles were provided at the two ends on the back side of the board. A piece of graph paper the size of the board was fitted on it and clamped as shown.

The instrument is put over the compacted area across the corn rows. The fixed rods at the two ends are aligned with the corn rows. The base of the instrument is leveled with the soil surface at the corn rows. The angle iron is removed slowly from the base. The rods slide down and fit into the curvature of the compacted area. They are tapped gently to ensure that they do not rest on any corn stalk. The tops of rods give the same wavy appearance as the actual compacted area of the soil. The levels of tops of fixed rows are marked.

The piece of the graph paper occupying the area between the line joining the fixed levels and that marked in the field is cut out, and weighed on a chemical balance. A number of graphs are selected at random from the graphs for all plots and 10 square inches are cut out of each. These are weighed together, and the weight of paper of one square inch area is determined. The weight of the graph paper representing the compacted soil is divided by the weight of one square inch. The quotient gives the cross-sectional area of the compacted soil in square inches.

It should also be pointed out that the maximum depth of compaction could also be determined from the tracing before it is destroyed.—DIP N. RAM and P. J. ZWEBMAN, Graduate student (Rockefeller Foundation Scholar) and Associate Professor of Soil Conservation.