A MACHINE FOR EAR CORN MOISTURE SAMPLES

In Michigan and other northern areas, where moisture in corn at harvest is frequently high, moisture percentages based on cob and grain are more accurate for yield calculations in variety trials than moisture based on the shelled grain alone.

A hand-operated sectioning devise that cuts a 1-inch section of cob and grain from an ear has been used successfully in Michigan corn trials since 1943. An ear sectioning machine driven by a 2-h.p. gasoline engine was constructed and used in the 1952 and 1953 corn harvests with considerable success. A 5-man crew averaged 150 samples per hour, and frequently was able to cut 200 samples per hour which was three to four times faster than the hand-operated machine and much easier on the crew.

Figure 1 shows two views of the machine without elevators. The ears for sampling (usually 10 ears from each plot) are placed on a mounted table and are carried on an endless chain to the cutting head. A solid piece of 1-inch steel with four curved arms holds and pushes the ears, one at a time, down on two hard steel blades cutting out a 1-inch section from each ear. The cutting head is welded to a steel shaft and the machine is set up on a long time basis.-C.

The cuts sections fall through a funnel into a 3-pound paper bag punched with 1/4-inch holes. The cut ends of each ear roll down a chute into a small detachable elevator that carries this discard corn into a wagon or crib. The machine is 36 inches long, 52 inches high, and 16 inches wide. Short removable legs allow the machine to fit nicely into the back of a panel truck.

The procedure followed in harvesting and moisture sampling with this machine is as follows: punched paper moisture sample bags are stamped before harvest with the experiment number and plot number on each bag; each plot is picked in a burlap sack; the moisture sample bag for each plot is put inside the burlap sack before the plot is picked; bags for at least one replication are laid out ahead of the picking crew; and after weighing the ear corn in the field, the burlap sacks are loaded on a wagon and hauled alongside the crib where the moisture sampling equipment is arranged.

A 5-man crew has proved to be the most efficient in moisture sampling. Each burlap sack is dumped into a tub; 10 ears are then taken at random and placed in another tub with the paper moisture sample bag. The remaining ears are discarded into the elevator. Two men work at this job. The operator of the machine pours the 10 ears onto the machine table and hands the moisture sample bag to a man, sitting beside the machine, who attaches the bag to the funnel and staples the bags after sampling. One man weighs the samples on a gram scale. The samples are dried in large hot-air ovens at 160° F, and weighed again after drying to a constant weight, usually 6 to 7 days. The oven dries the samples to approximately 2% moisture. Tables have been prepared at the Michigan station to show the moisture contents at the various wet and dry weights.

Blueprints of construction of the machine are available for those interested in details.—C. E. Brown, Sc. and E. C. Rossman, Department of Farm Crops, Michigan State College, East Lansing, Mich.

LITERATURE CITED