

Sugar Beet Weeder

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In an effort to develop and study a new principle in mechanical weed control in sugar beets, the Mechanical Engineering Section of the Colorado Experiment Station has constructed an experimental model of a two- or four-row weeder. This machine, because of its unique action, not only effects a good measure of weed elimination, but also provides a good **mulch** around the plants.

With adjustment of the experimental model of the machine for use on two rows at a time, 23.6 percent of the weeds and 13.7 percent of the beet seedlings were removed. Adjusted for use on four rows, the machine

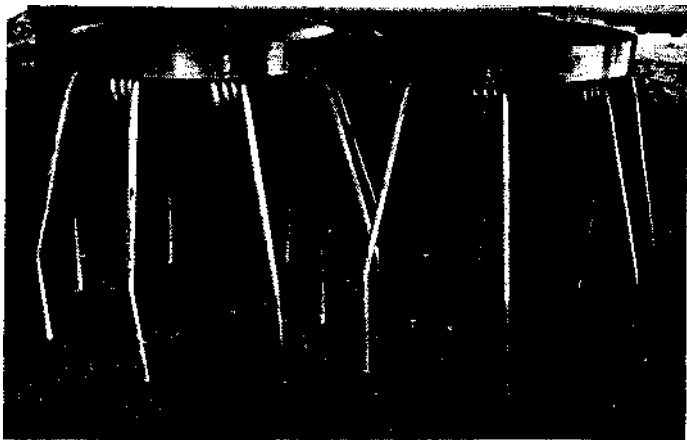


Figure 1.—Close up of "baskets" showing how the spring tines intermesh over the row.

removed 40.1 percent of the weeds and 16.4 percent of the beets. Action of the machine in "selecting" between weeds and beets is based on **the** fact that beets have stronger roots from the time of emergence. This brings up the possibility of using the machine on other root crops.

Weeding is done by flexible tines, mounted on power-driven circular frames, which revolve in a cycloid motion through the beet rows. Arrangement of tines and method by which a row is weeded is similar to that which can be visualized by moving an egg beater in a lateral motion while revolving **the** beater blades.

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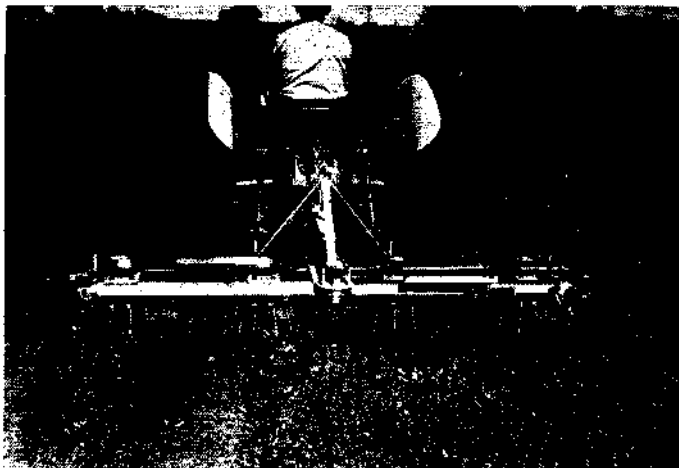


Figure 2.—Unit set up to operate over four rows.

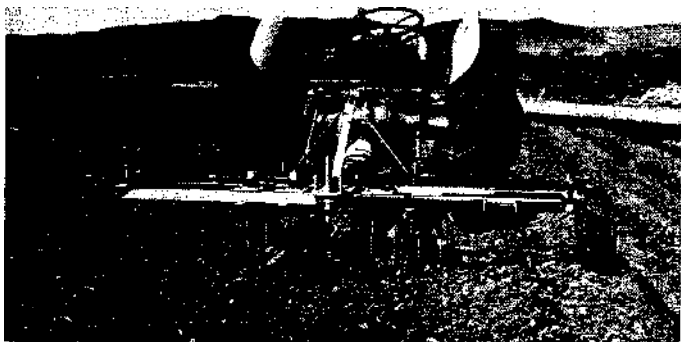


Figure 3.—Unit set to operate over two rows. The teeth of the "baskets" rotate into the row on each side, then pull out producing a "cycloid" pattern on each side.

Development of the newest model comes from an earlier, single-row type which appeared to have practical adaptation. The new model consists of four circular mounts (or "baskets") made up of eight tines each and arranged on a wheeled frame. By adjustment, these can be fitted to operate singly to weed four rows, or in intermeshing pairs to weed two rows at a time. One of the chief advantages of the paired adjustment is the gentle weeding action around the plants, which in turn speeds handwork.

The machine can be operated at about $2\frac{1}{2}$ to 3 miles per hour in second gear on a Ford tractor. By changing gear ratios a more severe action or treatment can be achieved, depending upon the size of beets and the condition of the soil. With the eight tines per basket, a tine goes through the row every two inches when the tractor is in second gear.

Best results have been obtained when the beets were in the two-leaf stage. The size of the beets determines the operating speed and whether the machine should be used as a two-row or four-row unit.