

PERFORMANCE OF FINGER TYPE PICKUP FOR  
GROUND-TOPPED BEETS

by Austin Armer

The finger type beet pickup developed by Mr. E. J. Rimple was completed shortly after Mr. Rimple returned to his private manufacturing business.

This pickup embraces three principal units: a two-wheel steerable chassis, a double-pointed plow with lifting lever, and a gathering element comprising an inclined  $1\frac{1}{2}$ " pitch roller chain, each link of which carries a pair of opposed hinged fingers together with a spring toggle. One set of stationary cams closes each pair of fingers as it passes over the plow points, causing them to grasp the beets. A second set of cams opens the fingers at the upper end of the chain and releases the beets. The chain is ground-driven so that the fingers pass the plow at ground speed. Figures 6 and 7 show the construction and operation.

The machine was tested on Hunt Brothers ranch #9 in the Imperial Valley, May 12-18, 1940. In all tests, the pickup unit was hitched behind the disc topper (Fig. 8), so that only topped beets were plowed and picked up. Observations were made on the following items:

- 1) Number of beets missed.
- 2) Conditions of beets picked up, as
  - a) Bruising or piercing by fingers.
  - b) Condition of taproots.
  - c) Amount of adhering soil.
- 3) Weight of soil delivered with beets.

1) It was possible to adjust the spacing between pickup fingers and plow points so that no beets were ever missed, but much soil delivered with them. The opposite extreme was that spacing which delivered no soil, but almost no beets either. The adjustment adopted for making the tests was that delivering the least amount of soil and at the same time picking up 100% of the beets.

2) As delivered by the finger-chain, the beets bore almost no visible marks. Some beets showed marks where the fingers had gripped them, but only rarely was a skin broken. In most cases each beet was cushioned from the fingers by a layer of soil. When normal care was used in steering the plowpoints, no taproots were broken. Some soil adhered to the beets as picked up, mainly that clinging to the hair roots. The straight upward pull of the fingers closely approximates the action of hand lifting, and the adhering soil may be considered the same as that encountered with hand lifting.

3) Two test runs were made to determine how much soil was delivered with the beets. A canvas apron was trailed behind the pickup, and so located as to receive the entire discharge of the pickup chain (Fig. 9). The following data were observed:

TABLE I

	Run #1	Run #2
Length of row, feet	28	34
Weight of beets, pounds	59.5	66.0
Weight of fine soil, " (passed by 1-1/4" screen)	87.5	139.5
Weight of clods, pounds (retained by 1-1/4" screen)	80.0	52.5
Weight of all soil, pounds	167.5	192.0

The large amount of unscreenable soil delivered makes it clear that a separate soil separation operation must be employed, either manual or mechanical. Toward this end it is proposed to build a unit embodying hand sorting belts, together with a simplified pickup chain designed for lower production cost than that of the present chain. Preliminary trials have indicated that two sorting belts traveling at one mile per hour will enable three men to separate all beets from the soil and trash of <sup>one</sup> row plowed at a forward speed of two miles per hour. The third operator is present for scavenging and hand retopping when needed.