## FIELD TESTS OF MECHANICAL BLOCKING AND THINNING OF SUGAR BEETS

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by

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"Stoop labor" was eliminated on a nine acre field of beets at Fort Collins, Colorado in 1939. Small strips of hand raised beets were used as checks. The results indicate that it is possible to raise beets in this manner without sacrificing tonnage as compared to the customary hand labor methods. The labor requirements are encouraging in two ways, first, that the long-handled hoe method of thinning is less arduous and, second, much less time is required.

The field was laid out with several objectives in mind. The major part was planted with a commercial planter in the ordinary way. The object of this was to actually raise beets in a commercial manner without the usual stoop labor. Experimental data were desired and for this purpose replicated plots were planted making the following comparisons:

1. The single seed ball planter was compared with the commercial planter.

acre -

2. The commercial planter was used with varying amounts of seed per

3. The single seed ball planter was used with varying amounts of seed per acre, (12 lbs. per acre, 9 lbs. per acre, 6.6 lbs. per acre). These variations in seeding rate resulted in distribution of seed in the row, from one seed ball to every inch of row to one seed ball to two inches of row.

4. Various methods of thinning were practiced (a) the customary method of hand thinning, (b) long-handled hoe without any subsequent hand labor, (c) the row blocker followed by the long-handled hoe, and (d) the row blocker followed by no subsequent labor. These methods of thinning were replicated and were practiced on the different methods of planting.

5. At harvest time all the plots were sampled systematically and the results are recorded.

#### RESULTS

1. There is no difference in yield between the beets hand thinned and those which were thinned with the long-handled hoe (no subsequent hand labor).

2. There is a significant loss in yield where the beets are mechanically thinned.

3. All germination stands were relatively poor on account of a poor germination condition in the early spring.

4. The germination stands were approximately proportional to the amount of seed used.

# -257- // CONCLUSIONS

The elimination of stoop labor seems to be practicable. In the first place the yield was not decreased. There were more small beets harvested. Former tests would indicate that equal tonnage and smaller beets would give increased sugar per acre. The increased number of smaller beets would, however, multiply the difficulties in hand harvesting because of the increased number of beets to be topped. This would also be true with some methods of mechanical harvesting. It would not materially hurt the speed of mechanical harvesting when using the mechanical harvester where the beets are lifted by their tops and topped in the machine.

The quality of topping accomplished by the ground type of mechanical topper would probably be lowered because of the increased number of doubles.

In this test the labor time was not conclusive, but from former tests the time of labor involved can be estimated to be approximately one-dalf that of the hand method.

The single seed ball planter demonstrated its ability to increase the number of single plants with the result that thinning is an easier operation. This thinning operation is easier when done either by hand or when done by the long-handled hoe.

The single seed ball planter demonstrated the practicability of using less seed than has been customary with the standard planters.

For several years experimental work has been done on the practicability of "mechanically thinning" beets. The development came as a result of experiences with mechanically blocked beets. It was found that, with the usual mechanical blocking, there remained a large number of single beet plants. With the usual three inch block it was commonly found that twenty per cent of the blocks contained single beets.

The next step seemed logical, if the blocks were reduced to about onethird of the three inch size that there might be expected three times as many singles. The expectation was borne out. With an ordinary stand of beets and using a blocking tool leaving small blocks, we may expect about sixty singles per one hundred feet of row. This is, of course, not enough beets to make a satisfactory crop. It is then necessary to leave enough doubles to make up the usual one hundred beets per hundred feet of row, or whatever is desired.

The procedure at the present time is to have the blocking tool set to such dimensions that twice the desired number of beets are allowed to remain. Then, with a long-handled hoe, cut out sufficient bunches and closely spaced doubles that the remaining stand will give a population of approximately one hundred beets per hundred feet of row.

In the experiments this year three methods were followed:

1. The long-handled hoe was used without any subsequent hand labor.

2. The beets were thinned with a row blocker, the attempt being to leave more than the desired number of beets and then this operation was followed with the long-handled hoe. 3. The row blocker was set to thin the beets in one operation, followed with no hand labor.

These plots were replicated with a check plot of hand-thinned beets.

Naturally the mechanically thinned plots required much less labor, but this year the yield was significantly less than for the methods where the longhandled hoe was used alone.

# CROSS BLOCKING OF SUGAR BEETS by R. T. Robinson, Manager American Crystal Sugar Co. Chaska, Minnesota

Blocking sugar beets mechanically by drawing a cultivator carrying special equipment across the planted rows was undertaken for the first time in Minnesota in 1929. Discs and knives were so arranged that undisturbed blocks of 4 to 5 inches were left on 16, 18 and 20 inch centers, while the balance of the beets and weeds in the row were removed.

In later years the blocks were narrowed to 3 inches and the spacing within the row reduced to 12 to 14 inches. This change resulted in a higher plant population per acre. Discs, if used at all, are now run straight and a special 5 inch knife has been designed which cuts clean and does not accumulate trash. The work is performed shortly after the seedlings emerge.

There is a saving in labor, both as to number of workers required and cost per acre. Competing beets and weeds may be eliminated early in the season and thus moisture and fertility is conserved. A beneficial mulch is left about the block and growth is retarded but little as thinning is accomplished in most instances without the use of a hoe.

Workers find that they can thin the cross blocked beets rapidly and their earnings per day are greater than when the old method is used even though the per acre rate is less. The method was particularly attractive to the grower whose beets were cared for by his own family. Fields that do not lend themselves to wire checking because of irregular borders or uneven contour may be cross blocked with success and at a saving.

## HILL DROP PLANTING

The idea of a Hill Drop Planter was conceived by Joe Wartman in 1932. He proposed to accomplish the result of depositing seed at 10, 12 or 14 inch intervals in the row, saving the seed that would later grow into seedlings that would be blocked out. This first planter performed well, but it was felt that the seed was dropped too much in a clump for rapid thinning.

By 1934 at least three nanufacturers were offering four and six row hill-drop planters at prices ranging from \$160.00 to \$230.00. The one that gained the most favor was the Rassman planter which used a rotor with cut-away spaces for depositing the seed at regular intervals. Spacings were regulated " by using a variety of sizes of drive gears.