

# 1951 Mechanical Thinning of Sugar Beets at Colorado A & M Gives Encouraging Results<sup>1</sup>

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Mechanical thinning tests have been carried on for many years in an effort to get yields comparable to those obtained by hand thinning methods. The test at Colorado A & M College this past year shows no decrease in yield of beets or of sugar from mechanically thinned treatments when compared to the hand thinned check. Furthermore, two mechanically thinned treatments with yields of 16.71 and 16.02 tons per acre respectively had higher yields than the hand thinned treatment which yielded 15.99 tons per acre.

The field for this test was planted at two rates with a John Deere Number 64 planter converted to furrow former openers and "V-shaped rubber presswheels. Each pass of the planter was one of the five replications of a treatment. However, the crossblock treatment was planted in the form of a block. The two seeding rates were a heavy rate of 9.14 seeds per foot with an average emergence of 39.5 beets per 100 inches and a light rate of 1.91 seed per foot with an emergenc of 10.0 beets per 100 inches. The heavy rate was used for a hand blocked and thinned check and all mechanical thinning treatments, including the crossblocking treatment. The emergence from the light rate was insufficient to carry out the light rate thinning test as planned. This was therefore left as a test of planting to the desired final stand.

Four different machines were used plus the hand blocked and thinned check. All of the machines were followed by long-handled hoe trimming.

The down the row machines used were the converted Eversman blocker, an experimental chain blocker, and the Dixie blocker. For cross blocking the Cultro cultivator was used.

The Eversman blocker was converted to a trial model. Two passes were made over each replication of this treatment. The first pass involved use of a blocking head of twelve 2-inch knives to give 32/3 inch block centers. The second pass was made with a 24-prong head. This combination means that a prong had to cut into each of the blocks left by the first pass.

The experimental chain blocker is an integrally mounted machine using the chain saw principle. This machine makes cuts at right angle to the row when driven in second gear of the tractor. It gives a much wider latitude for the driver than the other down the row machines. However, there are many problems to overcome in its design. Knives with 3-inch cuts were used with block centers at 5 1/7 inches.

The only ground-driven machine of the four was the Dixie blocker. The blocker heads had 1 3/4 inch knives and gave block centers of 5 2/3 inches in the field.

With the crossblocking treatment it was necessary to remove 75 percent of the original emergence stand. Since the only knives available for the

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Figure 1. The Eversman blocker converted to a trail model showing the blocking knives used.



Figure 2. The experimental chain blocker.

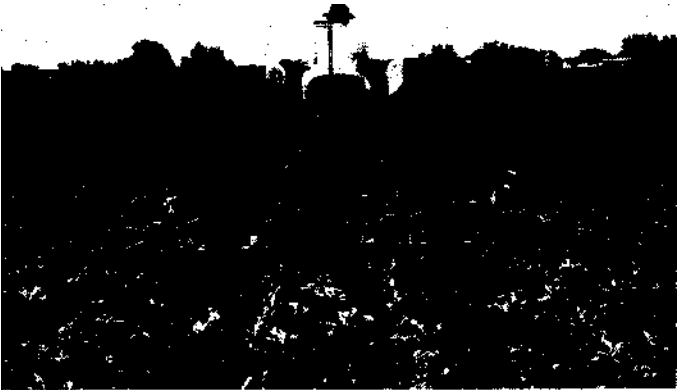


Figure 3. The Dixie blocker.

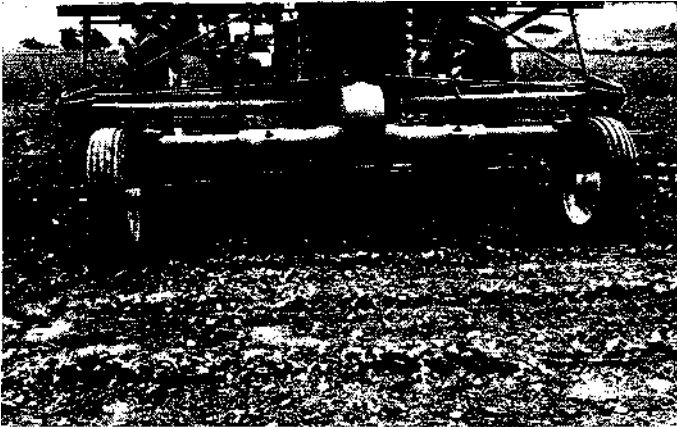


Figure 4. Giossblockiig with the Cultro cultivator.

Table 1.—Results of 1951 Mechanical Thinning Tests.

	Hand Thinned (check)	Eversman Blocker	Chain Blocker	Dixie Blocker	Cultro cross block	Light seeding rate (long handled hoe)	MSD <sup>1</sup> 0.05 (0.01)
Final stand beets per 100 feet	121.0	126.5	113.5	115.0	97.5	70.0	
Tons of roots per acre	15.99	15.62	16.71	15.81	16.02	14.01	2.14 (2.92)
Percent sugar content	13.26	14.70	14.47	13.89	13.18	13.58	1.085 (1.479)
Pounds of sugar per acre	4241	4593	4838	4393	4223	3806	505.7 (689.6)
Percent of check thinning time	100.0	54.58	61.67	72.40	35.98	63.89	
Tons of tops per acre	21.78	20.17	21.05	21.00	20.64	19.48	

<sup>1</sup> The minimum difference for significance at the 0.01 level is shown in parenthesis.

Cultro cultivator varied from 6 to 8 1/2 inches, the corresponding blocks ranged from 1 1/2 to 2 1/8 inches. The resulting block center distances of 7 1/2 to 10 5/8 inches were larger than the optimum as found from experiments of previous years.

As mentioned previously, the thin planting rate was left as a test of planting to the desired final stand. With this treatment the only work done was with a long handled hoe and this was chiefly for weeding.

In analyzing the results it can be seen from Table 1 that the final stands compare closely to the optimum stand of 100 to 120 beets per 100 feet except the light seeding rate, which is low. As for the tonnage per acre, none of the treatments was significantly different from the hand thinned check. Two mechanically thinned treatments, the Eversman and experimental chain blockers, produced significantly higher percent sugar when compared with the check treatment. None of the treatments was significantly lower in sugar content.

In still another respect, pounds of sugar per acre, the experimental chain blocker treatment was significantly higher than the hand thinned check. A further observation from this table shows that all mechanically thinned treatments required less labor than the hand thinned check.

There is a possibility that the mechanically thinned treatments could have given larger yields if it had been possible to thin them at the same time as the hand thinned treatment was thinned. This thinning was impossible due to wet weather the day after hand thinning was completed.

It is possible to achieve the same beet and sugar yields with mechanical thinning methods as with the hand thinning method. In some cases, as shown by this test, mechanical thinning may even give greater yields of sugar than hand thinning. The hand thinning, however, requires 10 to 15 man hours per acre more than the mechanical thinning. This added cost for labor as well as the problem of securing and managing the labor has influenced the increased use of mechanical thinning methods.