

# Thinning Trials in Eastern Montana

E. G. ECKROTH<sup>1</sup>

Progress made in mechanical thinning of sugar beets has been significant and the process is here to stay. It has been demonstrated beyond a doubt that, when properly done, a satisfactory job can be performed. Mechanical thinning has saved many fields which in the past would have been torn up because of weeds, disease, or the inability of labor to get the field worked in time. Some mechanical thinning is becoming a necessity as the labor supply is diminishing yearly, which means we must increase our production per man hour. Since an increase in acreage is in prospect, less labor will have to care for more acres than ever before.

In 1953 a replicated test of 6 row plots the length of the field was laid out. This field had been replanted due to severe frost damage. The germination stand was 24 percent, which was ideal for thinning with the Silver thinner, using the twice over method. Three thinning machines were used: Silver thinner, Pierce row crop blocker and the French thinner. Special interest was shown in the French thinner because of its counter-rotating double head principle, operated from the power take-off. It was thought that the 8- and 16-blade Silver cutting heads could be used at the same time to replace the twice-over system. However, after some experimentation, it was found that satisfactory performance could not be obtained. Plans for the test were changed and the French thinner was then used in four treatments consisting of the use of the 8-blade Silver head in first gear, and the 16-blade Silver head in first gear, with both of these driven at the same rate of speed; and these same cutter heads used in the same way with the tractor driven in second gear at a faster rate of speed. Each of these four treatments was followed by short handle hoe thinning. The Pierce row crop blocker, a ground-driven thinner mounted on the front tool bar, followed by short handle hoe thinning, made up one treatment. The Silver thinner used in the twice-over method, with no hand labor thinning, made up another treatment. The check consisted of hand labor only. Time records were kept on all hand work.

Table 1.—Final Results in Yield, Percent Sucrose, and Percent Stand.

Treatment	per 100 Ft.	per 100 Ft.	Beets Tons	Sucrose Percent	per Acre Gross Sugar
	Final Stand	Doubles			
Hand Thinned (Check)	99	6	12.94	18.77	4,849
Pierce Row Blocker	81	6	12.56	18.79	4,718
French 8-Blade, 1st Gear	88	4	12.57	18.70	4,704
French 16-Blade, 1st Gear	96	6	12.20	18.84	4,597
Silver Twice (Complete)	124	28	12.08	18.68	4,510
French 8-Blade, 2nd Gear	85	4	13.18	18.41	4,846
French 16-Blade	88	4	12.57	18.66	4,690
L.S.D. (0.05 level)			1.94	.62	686

No significant differences were found between the treatments in regard to yield, gross sugar per acre or sucrose content. The final stands for all treatments were good with the one exception—the Silver thinner treatment had too much stand for the growth conditions in Montana. The heavier



Figure 1.—Single unit of a Pierce Row Crop Blocker. Mounts on any tool bar, front or rear, with a single standard clamp for each blocker. The blocker is ground driven and has an adjustable spring tension which automatically maintains required pressure between unit and ground. Block size is determined by openings between knife blades as viewed from the side.

Table 2.—Thinning Time Saved Due to Use of Mechanical Thinners.

Treatment	Thinning Time	Percent
	Man Hours per Acre	Man Hours Saved Compared with Check
Hand Thinned (Check)	13.9	
Pierce Row Blocker	<b>10.2</b>	27
French 8-Blade, 1st Gear	9.0	35
French 16-Blade, 1st Gear	<b>9.4</b>	32
Silver Twice (Complete)	0	<b>100</b>
French 8-Blade, 2nd Gear	<b>9.1</b>	35
French 16-Blade, 2nd Gear	9.3	33

(Short handled hoe)

stands left by the Silver thinner were largely due to beets being quite large and the field being so wet that mud collected on the cutting knives. This allowed numerous beet plants to slide by the knives without being cut off. However, even under these adverse conditions, the completely mechanized treatment compared favorably with the other treatments in yield. In the final stands the Silver twice-over treatment had approximately five times more doubles than the average of the other treatments.

Considerable time was saved where short-handled hoe thinning followed some form of mechanical thinning.

In comparison with the hand thinned check, an average of 32 percent thinning time was saved where short handle hoe work followed mechanical thinning. The Pierce row blocker and the four French thinner treatments were similar in effect on stand reduction, and therefore in thinning time required per treatment.

### Summary

It is possible to obtain the same beet and sugar yields with mechanical thinning methods as with the hand thinning methods.

This test also shows that mechanical thinning gives a great saving in man hours per acre and this should definitely result in a labor cost saving.

Even though the Silver "Twice-Over Method" (completely mechanically thinned) had approximately five times as many doubles as the other treatments, it still compared favorable in yield with all other treatments.