

Hill-drop planting is the accepted method in 20% of the sugar beet area of Southern Minnesota. The seeding rate is between 6 and 7 lbs. per acre, resulting in a saving of approximately 2/3 of the former cost of seed. If the operator uses ordinary care and judgment in planting, skips do not occur making it difficult for a worker to justify poor work.

Workers who are willing to accept changing methods take no exception to working in the hill-drop planted fields. Their earnings per day are greater inasmuch as experience shows that they work an acre in 18% less time.

The method lends itself to rolling, irregular fields, where the check-wire planter does not perform well.

EXPERIMENTS WITH NON-THINNING OF SUGAR BEETS

by

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HARVESTING AND LOADING OF THE BEET CROP

IN

IOWA, SOUTHERN AND NORTHWESTERN MINNESOTA AND EASTERN NORTH DAKOTA

Our experience with cross cultivation has clearly indicated that we have increased the number of acres an adult worker can thin, and realizing that some day mechanical means will be available for reducing the number of workers needed for harvesting, which will then unbalance our seasonable labor requirements.

The first problem confronting us was to find some means whereby a planter would distribute one single seed ball at a desired spacing. After considerable correspondence with implement companies we decided, with their recommendation, to plant in a continuous row with a No. 16 John Deere planter using plate #N2469D, having 54 cells, with false plate #Y2630B and using seed graded between 9/64ths and 11/64ths in size, with a special transmission regulating the speed of the plate to drop one seed 1-1/2" to 2" apart.

A number of plots were planted with this arrangement but resulted in plants being bunched and unevenly spaced which we attributed to the light weight of the seed and height of drop, so the idea of not thinning these plots was abandoned. To overcome this difficulty we decided to try checking one seed in a hill, spacing 18 inches in the row and 18 inches between the row. By use of the check arrangement we would be able to take advantage of the lower valve which is close to the surface of the double valve arrangement in the Deere check-row planter. By reducing the 54 cell plate #N2469D to a 16 cell plate we planted 17.89 acres and cross cultivated them. The only labor used was for hoeing in August to remove the weeds at the cost of \$4.00 per acre. It might be well to mention that this plot was planted two weeks later than the balance of the field which we are using for a comparison.



1938 Comparison of Average Cost per Acre of Cross Cultivated Non-thinned and Cross Cultivated Thinned, not Including Growers' Items such as Planting, Cultivating, Lifting, etc., Based on Totals of A. L. Kiel Field.

<u>NON-THINNED</u>		<u>THINNED</u>	
17.89 acres harvested,	131.4710 tons	189.72 acres harvested,	1604.9410 tons
<u>Average yield per acre</u>	<u>7.35</u>	<u>Average yield per acre</u>	<u>8.46</u>
Seed	.10	Seed	.95
Fertilizer	1.70	Fertilizer	1.97
Hoeing	4.00	Blocking & Thinning	9.50
Topping @ 90¢ ton	6.61	Topping @ 90¢ ton	7.61
Hauling @ 60¢ per net ton	<u>4.42</u>	<u>Hauling @ 60¢ per net ton</u>	<u>5.08</u>
Average cost per acre	16.83	Average cost per acre	25.11
Returns on initial advance of \$4.75 per ton	34.91	Returns on initial advance of \$4.75 per ton	40.18
Cost per acre	<u>16.83</u>	Cost per acre	<u>25.11</u>
DIFFERENCE PER ACRE	18.08	DIFFERENCE PER ACRE	15.07

The difference in returns between the two plots is \$3.01 in favor of non-thinning.

Percentages of stand is based on 19,360 beets per acre, which represents 100% stand for an 18" x 18" spacing which applies to both plots. Percentage of stand was determined by the tareman counting the number of beets in each sample, and having the weight of the sample, we were able to compute both percent of stand and weight of beets, as follows:

Non-thinned 64.35% or 12,548 beets per acre; average weight 1.18 lbs.  
 Thinned 75.34% or 14,586 beets per acre; average weight 1.16 lbs.

We might add that seed planted in the non-thinned plot did not receive a mercury treatment, whereas, the field used for a comparison was treated and this may account for the difference in stand of the two fields.

In 1939 three experimental fields were planted, totaling 36.82 acres, and the same method of planting was used as referred to in our experiment of 1938. The only change made was to have a new plate #H776B made up by the John Deere Company. For brevity we have combined the three plots and our results and comparison are as follows.

Though no definite conclusions can be drawn from our limited experience we feel, as well as growers who have been observing these fields, that results justify further experiments. It appears from growers' remarks that upwards of one hundred acres will be planted and not thinned in 1940 in the Red River Valley area.



COMPARISON OF AVERAGE COST PER ACRE OF CROSS CULTIVATED NON THINNED AND CROSS CULTIVATED THINNED, NOT INCLUDING GROWERS' ITEMS SUCH AS PLANTING, CULTIVATING, LIFTING, ETC.

FIELDS BASED ON TOTALS OF KIEL, LARIVIERE AND ROSS CONTRACTS

NON-THINNED			THINNED		
36.82 acres harvested			335.74 acres harvested		
Average yield per acre		9.418 tons	Average yield per acre		9.673 tons
AVERAGE COST PER ACRE					
83/100 pounds seed @ 15¢		.13	5 - 25/100 pounds seed @ 15¢		.79
65 pounds fertilizer @ \$2.92 cwt.		1.90	65 pounds fertilizer @ \$2.92 cwt.		1.90
Hoeing		4.00	Blocking & Thinning		9.50
Harvesting 9.42 tons per acre		8.23	Harvesting 9.67 tons per acre		8.44
Hauling @ 60¢ per net ton		5.66	Hauling @ 60¢ per net ton		5.80
TOTAL		19.92	TOTAL		26.43
AVERAGE VALUE PER ACRE @ \$4.00 T.		37.67	AVERAGE VALUE PER ACRE @ \$4.00 T.		38.69
DIFFERENCE PER ACRE		17.75	DIFFERENCE PER ACRE		12.26

COMPARATIVE STANDS

GROWER	ACRES HARV.	TONS HARV.	AVG. YIELD	NET WGT.	NUMBER BEETS IN SAMPLES	AVG. WGT.	ACTUAL STAND	PERCENT STAND
				SAMPLES OZ.		PER BEET POUNDS		
THINNED BEETS, Cross cultivated, 18x18 spacing, 100% stand based on 19,360 beets per acre.								
A. L. Kiel	269.84	2558	9.48	128,389	4812	1.668	11365	58.70
Chas. Lariviere	54.76	574	10.48	29,152	1133	1.61	13039	67.35
Walter Ross	11.14	116	10.44	6,976	293	1.49	14028	72.46
TOTALS	335.74	3248	9.67	164,517	6238	1.65	11739	60.64
NON-THINNED Cross cultivated, 18x18 spacing, 100% stand based on 19,360 beets per acre								
#A. L. Kiel	12.16	146	12.00	6,749	268	1.57	15247	78.76
Chas. Lariviere	11.16	87	7.83	4,533	176	1.61	9728	50.25
#Walter Ross	13.50	114	8.41	6,694	241	1.73	9688	50.04
TOTALS	36.82	347	9.42	17,976	685	1.64	11485	59.32

#The week of July 17th, an actual count of plants on each of two of these fields as follows, at the end of each 100 feet turn at a right angle, thus getting a cross section of rows. The results are as follows:

Hills Percent	MISSES	SINGLE PLANT TO HILL	TWO PLANTS TO HILL	THREE PLANTS TO HILL	FOUR PLANTS TO HILL	BUNCHES 5 OR MORE	TOTAL HILLS COUNTED
		591 36.62	452 28.01	394 24.41	139 8.61	10 .62	28 1.73



### EXPERIMENTS WITH HARVESTING MACHINERY

For the past five or six years we have been working on a machine that would lift and pile the beets preparatory to topping. In 1938 we harvested 35 acres with a one row machine and had an experienced Mexican crew topping, who volunteered the statement that one-third of their time was saved in harvesting this field behind the machine. Several machines were built in 1939 but due to a short and backward season and lack of time on the part of the operators we gained little experience from this harvest though intensive work was put on one unit and some changes were made. This unit took out approximately 40 acres and desired changes indicated from this year's operations will be incorporated in the other machines. A scalping device was arranged which removed most of the tops leaving only two or three inches of the stems. This made it possible to accumulate a larger pile and tended to make it a trifle more convenient for labor. Labor topped this field for one-third less than the regular labor rates.

### EXPERIMENTS WITH TRUCK LOADERS

Two different methods of loading were tried out in 1939. One, where labor topped into a low hopper which held between four and five tons of beets with a bottom conveyor driven by a power take-off which loaded the beets into the truck. The other one was a small unit with a 1-1/2 horse power engine operating an inclined conveyor with a small boot located close to the ground. This was attached to the side of the truck and moved with the truck from pile to pile. This arrangement shortened the distance a shoveler had to move the beets as it was only necessary for him to raise the beets about eight inches from the ground. Time studies and costs are lacking on both machines and further experiences and study is needed before drawing any conclusions.

### CROSS CULTIVATION AND CHECK ROW SEEDING PRACTICES IN USE IN IOWA, MINNESOTA AND EASTERN NORTH DAKOTA

by

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### CROSS CULTIVATION OF SUGAR BEETS

The idea of cross cultivation was instigated because it was necessary after the severe decline of sugar prices in 1929, to find some means of reducing cost of production. In the area under discussion, experimentation with cross cultivation was started in 1929 and from these experiments, it was determined that a reduction of costs could be effected, because it eliminated part of the thinning and hoeing costs. It was further found that reductions of cost could be effected without a reduction of yields. As a result, the use of this method increased steadily until at the present time, it is accepted as a standard practice in the Red River Valley area, although its use is by no means universal.