

LABOR SAVINGS RESULTING FROM USE OF SEGMENTED SEED

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The chief objects of the experiment herewith reported were (1) to determine the amount of time required to block and thin sugar beets grown from sheared (segmented) seed and from unsegmented (whole) seed, and (2) to determine the acre-yield of beets, grown from the two types of seed. Incidental data, pertaining to stands of beets, were also obtained. Evidence comparable to that obtained in 1946 was also obtained in 1945, and is reported in the Michigan Agricultural Experiment Station Quarterly Bulletin, Volume 28, November, 1945.*

Procedure

The soil upon which the experiment was conducted is predominantly Brookston sandy clay loam and is tile drained. The beets were grown on 56 plots, each 90 feet long by 14 feet wide, and each comprised six 28-inch rows. The north three rows of each plot were planted with unshaired seed at an average rate of 11.45 pounds per acre. The south three rows of each plot were planted with sheared seed at an average rate of 3.50 pounds per acre. However, the three rows of sheared were planted at different rates - 4.33, 3.33 and 2.83 pounds per acre, respectively. Time, stand, and yield figures were obtained from all three rows planted with sheared seed and from the south row of the three planted with unshaired seed. Laboratory germination of samples of the sheared seed indicated that 79.6 percent of the seed pieces contained one or more viable germs. Of the viable seed pieces, 73.1 percent were single-germed and 26.9 percent were double-germed.

Before planting, manganese sulphate and sodium tetraborate were drilled into the seed bed at the rate of 100 and 25 pounds per acre, respectively.

The beets were planted on April 12. For the unshaired seed, the planter was a commonly-used plate type which places a band of commercial fertilizer $1\frac{1}{2}$ inches beneath and 1 inch to the side of the seed. For the sheared seed, a planter of the same make and model was used. However, the sheared seed was planted through an attachment employing the use of vertical, seed-metering rotors.

Twenty-eight of the plots were treated with 2-16-8 fertilizer at the rate of 500 pounds per acre, the remaining 28 plots at the rate of 200 pounds per acre.

Because of lack of rainfall the beet seedlings emerged very irregularly - some soon after planting, others after rainfall in May.

On June 7 a pre-blocking stand count was made on a 50-inch sample portion of each row.

The beets were blocked and thinned on June 10 and 11. Four sugar-beet workers were employed for this work. All four used short-handled hoes. Each worker blocked and thinned a plot before beginning

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work on the next. Records were kept of the amount of time required to block and thin each row.

On June 11, immediately upon completion of blocking and thinning, and again on October 25 stand counts were made.

The beets were harvested on October 30.

Experimental Results

Table 1 shows the effect of planting unshaired seed at a rate of 11.45 pounds per acre and sheared seed at rates of 4.33, 3.33 and 2.83 pounds per acre upon the amount of time required to block and thin. As might be expected, the greatest saving of labor was effected when the sheared seed was planted at a relatively low rate, 2.83 pounds per acre. However, a marked reduction in labor requirements resulted from the planting of sheared seed at a moderately high rate, 4.33 pounds per acre.

Table 1 - Amount of time required to block and thin beets grown from unshaired and sheared seed.

Type Seed	Planting Rate Per Acre	Time Required to Block and Thin One Acre*	Labor Saved
Unshaired	11.45 pounds	15.18 hours	-----
Sheared	4.33 pounds	10.34 hours	31.9%
Sheared	3.33 pounds	9.27 hours	38.9%
Sheared	2.83 pounds	8.54 hours	43.7%

* 0.10 hours required for significance at 1% level.

The effect of planting seeds of the two types upon post-thinning stands and acre-yields is shown in Table 2. It is especially interesting to note that the acre-yield of beet roots from sheared seed planted at 4.33 pounds per acre was significantly greater than that of beets grown from unshaired seed, even though the stand was nearly 10 percent less. This indicates that, stand for stand, beets grown from sheared seed planted at moderate rates out-yield those grown from unshaired seed. However, when the post-thinning stand dropped below a certain point (as a result of planting at too light a rate) the resulting acre-yields fell below that of unshaired seed planting.

Table 2 - Post-thinning stand and acre-yield of beets grown from sheared and unshaired seed.

Type Seed	Planting Rate Per Acre	Beet-containing Blocks Per 100 Ft. of Row. June 11	Acre-Yield of Roots*	Acre-Yield as % of Beets From Unshaired Seed
Unshaired	11.45 pounds	102.3	13.06	100%
Shaired	4.33 pounds	92.9	13.33	102.1%
Shaired	3.33 pounds	89.0	12.83	98.2%
Shaired	2.83 pounds	81.4	12.14	93.0%

* 0.05 Tons required for significance at 1% level.

As shown in Table 1 the planting of sheared seed at a rate of 4.33 pounds per acre resulted in a saving of labor of 4.84 hours per acre. Applying this figure to Michigan's average planted acreage of sugar beets, 124,000 (1932-41 inclusive), universal use of sheared seed as compared with universal use of unshaired seed, would result in a total saving of over 50,000 man-days of labor each season.

Table 3 indicates the relationship which existed between pre-blocking seedling stand and post-thinning stand. It is interesting to note that a pre-blocking stand of about 25 is necessary if a post-thinning stand of 90 beets per 100 feet of row is to be attained. This checks closely with comparable results obtained in 1945.

Table 3 - Pre-blocking and post-thinning stand

Type Seed	Planting Rate Per Acre	Pre-blocking Stand Beet-containing inches Per 100 inches of Row	Beet-containing Blocks Per 100 Feet of Row June 11
Unshaired	11.45 pounds	60.0	102.3
Shaired	4.33 pounds	28.8	92.9
Shaired	3.33 pounds	23.2	89.0
Shaired	2.83 pounds	17.8	81.4