Effect of Spacing and Doubles on Yield of Sugar Beets in the Michigan Area

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A MAJOR QUESTION in connection with mechanized thinning of sugar beets is the effect on yields of double plants left by the thinning operation. Conclusive data are lacking in our area as to the necessity of thinning meticulously to one beet in fields planted with segmented seed. Information is needed as to the number of double or multiple hills per 100 feet of row which would decrease yields to a point where the expense of hand-thinning mechanically blocked beets would be warranted. Since weed conditions are so variable, such basic data should be obtained from a weed-free field.

The test reported here was conducted in 1946 and again in 1947. These were split-plot experiments with 4 replicated plots of each of the 16 treatments. The test was conducted in an attempt to determine how yields may be effected by a varying number of doubles and a varied spacing in the row. No attempt was made to vary the width of row since, in our area, the 28-inch row is universally used to facilitate overall farm operations.

All spacing and thinning was accurately done by hand to leave the desired number of hills and doubles. The term "double" in this test constitutes 2 beets in a 3-inch block or less. Relatively very few of the so-called doubles originated from one seed piece. All plots consisted of 4 rows 50 feet long. The two center rows were harvested for yield and analysis in all cases.

In 1946 plots were planted May 8, using 2½ pounds per acre of 7-10/64 segmented seed. Planting was done with Cobbley unit attachments on a John Deere No. 55 drill. Plots were thinned June 24 and 25 and harvested November 9 and 10. Duplicate samples were taken from each plot for sugar and purity analysis. Plots were thinned as follows: 6-inch centers with no doubles; 8-inch centers with 0, 10 and 20 percent doubles; 10-inch centers with 0, 10, 20 and 30 percent doubles; 12-inch centers with 0, 10, 20 and 30 percent doubles; 16-inch centers with 0, 10, 20 and 30 percent doubles.

Results are shown in tables 1 and 2.

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Table 1.—Effect of spacing on yield of beets and sugar—1946.

Spacing	Tons beets per acre	Pounds sugar per acre
6-inch	9.54	3162
8-inch	12.14	3930
10-inch	12.52	4098
12-inch	12.89	4182
16-inch	12.72	4106

Table 2.—Effect of doubles on yield of beets and sugar 1946.

Percent doubles	Tons beets per acre	Pounds sugar per acre
0	12.47	4028
10	12.48	4059
20	12.64	4106
30	11.89	3887

The effect of spacing on yield of roots and indicated available sugar was not significant except for the 6-inch spacing which was significantly lower.

The effect of doubles on yield of roots and indicated available sugar was not significant with any treatment.

In 1947, plots were planted May 31 using 3½ pounds per acre of 7-10/64 segmented seed. Planting was done with Cobbley unit attachments on a John Deere No. 55 drill. Plots were thinned June 27 and harvested October 21. Duplicate samples were taken from each plot for sugar and purity analysis. Plots were thinned as follows: 10-inch spacing with 0, 10, 20 and 30 percent doubles; 12-inch spacing with 0, 10, 20 and 30 percent doubles; 16-inch spacing with 0, 10, 20 and 30 percent doubles; 20-inch spacing with 0, 10, 20 and 30 percent doubles.

Results are shown in tables 3and 4.

Table 3.—Effect of spacing on yield of beets and sugar—1947.

Spacing	Tons beets per acre	Pounds sugar per acre
10-inch	8.21	2190
12-inch	8.21	2119
16-inch	8.83	2163
20-inch	8.52	2109

Table 4. Effect of doubles on yield of beets and sugar—1947.

Percent doubles	Tons beets per acre	Pounds sugar per acre
0	8.50	2113
10	8.81	2236
20	8.54	2208
30	7.93	2024

There were no significant differences in yield of beets or indicated available sugar caused by any treatment.