

Sugar Beet Stand Studies

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Introduction

A definite association between after-thinning stands and yield of sugar beets should be stressed in any beet growing area, particularly in northern growing regions. Some uncertainty exists as to what makes up the most desirable stand. There are still some growers who instruct their labor to space the beets more than a foot apart, with many 65 percent stands resulting.

The normal growing season in this northern area is very definitely limited. The Sidney, Montana, factory records show that in 1953 there were 130 frost free days; in 1954, 119 days; and in 1955, 154 days. The long daylight hours experienced during the middle of summer, however, do partially make up for the shorter growing season. Due to the shorter season, it is all the more important that an optimum stand be maintained and every day of the growing period utilized.

Doxtator and Skuderna (1)² obtained evidence from tests conducted in widely separated areas that yields of sugar beets can be increased by thinning to higher acre populations of beets. Frakes (2) found no significant differences in yield of sugar beets when spacings of 10, 12, 16 and 20 inches were used.

Procedure

During each of the past three years, sixty farms of the Sidney, Montana, district were checked for yield, final stands, and other data. Only the association between yield and stand will be discussed in this report.

Ten stand counts per field were made with the assistance of the fieldman in each district. In addition, stand tests were conducted in experimental plots during these three years and will be included in this report.

Results and Discussion

Table I illustrates very well the definite correlation between stand and yield.

It is interesting to note that as the stand improves, the yield increases. The average stand for the 60 farms was 77 percent or 77 beets per 100 feet of row in 1953, 78 in 1954, and 82 in 1955. The stands in the commercial fields need improving. Table I shows a difference of about 4 tons between a 90 percent stand and a 65 percent stand. A 65 percent stand during a short sea-

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² Numbers in parentheses refer to literature cited.

son cannot be expected to yield as high as a 90 percent stand. The 25 percent difference in stand is often too much to make up and even where the season is long, only a part of the difference can be made up. One must have a maximum stand to insure a maximum yield.

To further supplement this summary, controlled stand tests were conducted during the same three years. The results of these tests as shown in Table 2 also demonstrate the importance of a good stand.

In 1953 and 1954 the average stands of 100 to 80 beets per 100 feet of row are significantly higher than a stand of 60 beets in tons and gross sugar per acre. The association is obvious and the importance of a good stand cannot be over emphasized. The

Table 1.—Influence of Stands of Sugar Beets on Yield on 60 Eastern Montana Farms.

Year	Yield in Tons per Acre						65-69
	Beets per 100 Feet of Row						
	95-100	90-94	85-89	80-84	75-79	70-74	
1953	16.63	15.25	15.15	14.11	13.44	12.79	11.65
1954	16.75	15.40	14.68	13.92	12.52	11.82	10.71
1955	18.33	17.17	17.01	17.16	15.88	15.50	13.22
Average 3 years	17.25	15.94	15.61	15.06	13.95	13.37	11.87

Table 2.—Effect of Controlled Stands of Sugar Beets on Harvest Performance.

Year	Number of Beets in 100 Feet of Row ¹						LSD 5%
	110	100	90	80	70	60	
Tons/Acre							
1953	-----	13.07	12.61	12.15	11.89	10.78	1.23
1954	17.16	17.11	17.15	16.85	15.89	14.19	1.99
1955	17.33	17.53	17.09	16.55	16.30	15.91	NS
Gross Sugar/Acre							
1953	-----	4352	4207	4203	4028	3626	434
1954	5881	5890	5816	5726	5390	4805	694
1955	4826	4887	4757	4601	4503	4375	NS
Percent Sucrose							
1953	-----	16.65	16.83	17.05	16.98	16.83	NS
1954	17.15	17.21	16.97	17.04	16.98	16.94	NS
1955	13.92	13.94	13.92	13.90	13.81	13.75	NS

¹ Rows 22 inches apart.

1955 yield for the entire Sidney district was the second highest in its history. The differences in 1955, although not significant, are still present and illustrate the value of a good stand.

Sucrose percent during these three years was at no time affected by stand differences.

To insure better final stands, considerable study must be given the pre-thinned stands. This applies for both mechanical thinning as well as for hand thinning. On fields to be mechanically thinned, a careful study of pre-thinned stands must be made in order to determine the proper procedure with the thinning equipment to be used. Where hand labor is used, supervision of the thinning is an absolute necessity. All too often the beet crop in this region is made or ruined at thinning time.

What can be done about improving the final stands in eastern Montana? A number of things should be done: namely, (a) good seedbed preparation; (b) plant sufficient seed—about six to eight pounds per acre, and not more than an inch deep in heavy soil; (c) drive the tractor slowly while planting; (d) follow good cultural practices with the accent on timeliness; (e) maintain high fertility; (f) give a good cultivation just prior to thinning; (g) supervise the labor; (h) aim for at least 100 beets per 100 feet of row so that after reductions by diseases, insects, and weather, a good stand still remains; (i) make a careful application of water where necessary to irrigate for germination. Throughout the growing season keep the fields at optimum moisture condition for plant growth as the growing season is limited and every day is vital and should be properly utilized.

Literature Cited

- (1) DOXTATOR, C. W. and SKUDERNA, A. W. 1946. Beet population studies. *Proc. Amer. Soc. Sugar Beet Tech.* pp. 156-162.
 - (2) FRAKES, M. G. 1948. Effect of spacing and doubles on yield of sugar beets in the Michigan area. *Proc. Amer. Soc. Sugar Beet Tech.* pp. 269-270.
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