

SUGAR BEET PLANT POPULATION AS IT
AFFECTS QUALITY AND YIELD

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The sources of information for this study were the Northern Ohio Sugar Company Individual Crop Records for the years 1955 through 1962. These crop records consist of informational items relating to each beet grower's individual sugar beet crop.

Our Company has analyzed quite carefully each year these crop records to determine the farming practices which produce the type of sugar beet that yields the greatest return per acre to both the producer and processor.

We have found that population per acre is the most important single factor affecting sugar beet quality and yield.

In 1955, the first year of Northern Ohio Sugar Company, the average row width was almost 35 inches, yielding only about 11,000 beets per acre. The trend toward wide rows was because the farmers wanted the planting and cultivating equipment to be interchangeable among corn, beets and soybeans. The beet crops resulting from these wide rows presented very serious problems to all concerned. The growers were losing an appreciable tonnage per acre and the quality of the very large basketball type sugar beets was inferior for efficient processing.

We have made some progress since 1955 regarding row width and plant population. Our 1962 average row width is now slightly over 30 inches. Our plant population has increased from 11,000 plants in 1955 to more than 13,000 plants per acre in 1962, due mainly to the more narrow rows. Our goal is to increase our plant population from 13,000 to 20,000 beets per acre. Our studies show that this will not only increase our yields and sugar content, but will produce a better quality sugar beet. It is impossible for the present day harvesters to top correctly the huge beets we have been growing. There is too much crown material left on the beets from faulty harvesting. Such beets, when put into storage piles, sprout using sugar as energy. These sprouted, high crown beets make it impossible for our factories to extract the maximum amount of sugar per ton. A greater plant population, yielding smaller beets, would eliminate, to a large extent, these problems.

The result of our Company studies regarding plant population follows very closely the experimental findings of Ohio State University and almost all other experimental data from beet growing areas throughout the world.

In the fall of 1961, our Individual Crop Records for the 7 year period of 1955 through 1961 were submitted to the Ohio State

University Experimental Station. Dr. H. J. Mederski, and his fellow workers, put the information from the crop records, representing over 7,000 contracts, on punch cards and analyzed it by using an IBM 709 Computer. It was found that stand and row width were by far the most important of all cultural practices that affect yield.

In Dr. Mederski's report on the results of the IBM Computer analysis, it shows that yields increase with decreasing row widths, and that row width does not interact with any other practices. This indicates that we would get the same increase irrespective of the kind of other practices used.

Our conclusion is that the most effective way to increase the plant population per acre, and to improve the quality of the sugar beet, is to narrow our average row width.

NORTHERN OHIO SUGAR COMPANY

8 YEAR AVERAGE - TONS/ACRE BY % STAND

<u>% Stand</u>	<u>Harv. Acres</u>	<u>Tons</u>	<u>Tons/Acre</u>
Under 50%	4,396	40,785	9.28
50 to 60%	11,425	139,233	12.19
60 to 70%	25,829	361,697	14.00
70 to 80%	35,407	549,476	15.52
80 to 90%	31,713	530,520	16.73
90 & Above	<u>27,664</u>	<u>488,158</u>	<u>17.65</u>
Totals	136,434	2,109,869	15.46

1962 LBS. SUGAR PER ACRE BY % STAND

<u>% Stand</u>	<u>Harv. Acres</u>	<u>Tons</u>	<u>Tons/Acre</u>	<u>Sugar/Acre</u>
Under 50%	565	6,989	12.37	3,803
50 to 60%	2,156	31,920	14.81	4,586
60 to 70%	4,872	78,196	16.05	4,975
70 to 80%	6,042	104,555	17.30	5,431
80 to 90%	4,554	83,400	18.31	5,760
90 & Above	3,010	58,376	19.39	6,191

8 YEAR AVERAGE - TONS/ACRE BY ROW WIDTH

<u>% of Total Acreage</u>	<u>Row Width</u>	<u>Harv. Acres</u>	<u>Total Tons</u>	<u>Yield</u>
13.71	28" & Under	18701	315849	16.89
17.81	30"	24303	389154	16.01
20.45	32"	27901	427288	15.32
32.82	34"	44778	684706	15.29
15.21	36" & Above	<u>20751</u>	<u>292872</u>	<u>14.11</u>
	Totals	136434	2109869	15.46

1962 % SUGAR BY ROW WIDTH

<u>Row Width</u>	<u>Harv. Acres</u>	<u>% Sugar</u>
28" & Under	6654	15.78
30"	6808	15.73
32"	3603	15.67
34"	3618	15.42
36" & Above	<u>516</u>	<u>15.42</u>
Totals	21199	15.69

1962 SUGAR/ACRE BY PLANTS/ACRE

<u>Plants/Acre</u>	<u>Acres</u>	<u>Tons</u>	<u>Tons/Acre</u>	<u>Sugar/Acre</u>	<u>% Sugar</u>
Below 10000	2185	31034	14.2	4376	15.41
10000 - 12000	5348	85200	15.9	4937	15.49
12000 - 14000	7120	122491	17.2	5382	15.64
14000 - 16000	3851	72344	18.8	5952	15.84
16000 - 18000	1909	37049	19.4	6180	15.92
18000 & Above	<u>786</u>	<u>15318</u>	<u>19.5</u>	<u>6299</u>	<u>16.16</u>
Totals	21199	363436	17.1	5375	15.69