THE EFFECT OF SEED SIZE UPON YIELD AND SUGAR CONTENT

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The use of several different sizes of seed for planting the commercial acreage of sugar beets has raised a logical question, i.e., is there any difference in plant vigor and yielding ability between the various seed sizes of a given variety? Tests in the greenhouse with several sizes of seed showed that there was no difference in seedling vigor between sizes down to 6/64" in diameter. The seedlings from seed below 6/64" did tend to be less vigorous. It was noted in the greenhouse that the smaller grades of seed germinated more rapidly. This fact has also been noted in field work and blotter germination tests. This difference in germination is undoubtedly due to the fact that after processing the small grades of seed have less of the chemicals inhibiting germination left in the seed ball than do the larger sizes.

In both 1961 and 1962, the following sizes of seed were planted to compare the yields and sugar content:

6-7/64"
7-8/64"
8-9/64"
9-9½/64"

The plots were six rows wide and 28' long. The four center rows of each plot were harvested. Two ten beet samples were taken at random from each plot for sugar analysis. Each seed size was replicated four times at each location.

In neither year at any location was there any noticeable difference in seedling vigor or plant vigor of the different sizes throughout the growing season.

The following table shows the 1961 yield results:

Table 1.

Wisconsin

Seed Size	No. of Beets Per Plot	Tons Per Acre	% Sucrose	% Purity	Gross Lbs. Sugar Per Acre
6-7	126	18.6	16.8	86.0	6266
7-8	123	16.8	17.2	85.8	5783
8-9	124	18.9	16.8	84.1	6322
9-9½	109	17.8	16.9	83.8	6001

Table 2.

Michigan Seed Size	No. of Beets Per Plot	Tons Per Acre	% Sucrose	% Purity	Gross Lbs. Sugar Per Acre
6-7	90	23.0	16.3	83.1	7523
7-8	95	22.2	16.7	83.7	7387
8-9	85	23.1	16.5	82.7	7581
9-9½	85	21.7	16.7	82.2	7245

It will be noted that stands were fairly consistent within each test. The maximum difference in tonnage in the Wisconsin test was 2.1 tons with .4 of a percentage point difference in sugar content. The results from the Michigan test showed a maximum difference in yield of 1.4 tons per acre. Sucrose contents again were in a range of .4 of a percentage point. No one seed size was consistently better than the other in all respects.

The yield results from the three locations planted in 1962 are given in the following table:

Table 3.

Location 1 - Michigan

Seed Size	No. of Beets Per Plot	Tons Per Acre	% Sucrose	% Purity
6-7	115	22.0	16.6	83.3
7-8	114	20.9	16.5	81.4
8-9	120	21.1	16.6	84.9
9-9½	112	21.7	16.5	82.5
Location 2 - Michigan				
6-7	100	25.8	16.9	84.6
7-8	107	23.8	16.4	82.2
8-9	105	25.0	16.4	82.5
9-9½	101	23.6	16.5	83.7

(Table 3 - Continued on next page)

Location 1 - Ohio

Seed Size	No. of Beets Per Plot	Tons Per Acre	% Sucrose	% Purity
6-7	76	16.9	13.4	79.8
7-8	76	17.7	13.6	78.9
8-9	76	17.0	13.6	79.8
9-9½	75	16.6	13.7	80.9

In 1962, as in 1961, it will be noted that stands were fairly uniform within a given test. The maximum spread in tonnage between seed sizes at any location was 2.2 tons. The maximum difference in sugar content was .5 of a percentage point and in purity 3.5 percentage points. No single seed size rated consistently highest for any of the characteristics checked.

The following summary table of the results from the three locations illustrates the degree of uniformity in the yielding ability of the four sizes of seed.

Table 4.

Summary - 3 Locations - Seed Size Comparison 1962

Seed Size	No. of Beets Per Plot	Tons Per Acre	% Sucrose	% Purity	Gross Lbs. Sugar Per Acre
6-7	97	21.6	15.6	82.6	6739
7-8	99	20.8	15.5	80.8	6448
8-9	100	21.0	15.6	82.4	6552
9-9½	96	20.6	15.6	82.4	6427

On the basis of these results from two years testing it can be concluded that there is no inherent difference in yielding ability between the sizes of monogerm seed presently being issued to growers for commercial planting.