

Wide Row Plantings of Sugar Beets In California, 1945

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The original trials of the "wide row plan" of sugar beet production were a part of the Holly Sugar Corporation 1944 crop mechanization studies covering total plantings of about 35 commercial acres in three different California districts. The field results with these plantings were satisfactory, and hand labor cost was so significantly lower that considerable further attention was given to the thought that perhaps almost complete elimination of hand labor in the growing and harvesting of beets might be accomplished by the adoption of the principles of our wide row plan.

It was even then apparent that a substantial reduction in hand labor costs was going to be necessary if beets were to compete with other field and vegetable crops for a normal share of the California irrigated crop acreage. There has always been a distinct peak in the hand labor requirements during the spring thinning and hoeing season, and a still greater fall peak during the beet harvesting season. The problems of securing the needed number of field laborers and justifying the high cost of such work in sugar beets has been almost impossible for the average California grower during the past war years.

It was on our realization of these facts that we decided to recommend strongly the wide row plan for mechanized sugar beet production to Holly Sugar Corporation growers in California for the 1945 season. As you might expect there was considerable opposition to the whole idea on first thought. We realized that it would be difficult to convince a practical farmer that the favorable aspects of this system would justify him to risk the possibility of a loss of the expected profit from his beet crop. This is particularly hard to put across to a farmer when he recalls all his past efforts to secure perfect stands and good thinning; also his past efforts to prevent any possible loss of even a few feet of row under his normal planting and cultural methods.

However, one of our California farmers with long and successful beet growing experience did foresee the possibilities of such savings and planted his entire crop of 330 acres on alternate 20- and 40-inch row widths (average 30-inch rows). This had the same effect as cutting out every third row at the first cultivation. His 1945 crop was plagued with several of the usual serious problems such as late planting and the replanting of nearly every acre because of wind damage.

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In spite of all these troubles he produced an average of 22.2 tons per acre on his entire acreage at a marked reduction in costs throughout, during the 1945 season when most growers were producing crops at generally increased costs!

State-wide, we succeeded in getting almost 8,000 acres of beets planted last season in California on various wide row spacings. These plantings covered nearly every possible combination of soil type, irrigation system, seasonal condition, and farming equipment throughout California from Santa Ana in the south to Hamilton City in the north. None of these farmers had to buy any specialized equipment to adopt this system to their own farm. Certainly it is only reasonable to expect that most of the results obtained in 1945, with this radical departure from customary procedure, were not quite as good as can be expected with further experience and anticipated improvement in equipment and details of cultural practices. Considering these facts, with the generally good results actually obtained, we believe there will be additional incentive for our growers to recognize further the convenience and savings of the wide row plan. We currently estimate that more than 75 percent of our 1946 California acreage will be in wide rows.

Following are some of the row widths used on a field basis last year: 24 inches, 26 inches, 28 inches, 30 inches, 32 inches, 34 inches, 36 inches, 38 inches, and 40 inches uniform spacing as well as alternate 20-inch and 40-inch combinations. Considerable of this acreage was planted on single-row beds and some with ordinary flat planting. Numerous types of planters were used, such as sled planters for ridged fields, with Planet Jr. or Cobbley seeder units; John Deere, International, Oliver Superior, and Moline wheel planters were used on flat plantings. The cultivating was done with any and all the standard makes and types of cultivators.

Mechanical weed control and irrigating were both performed more effectively and more economically because of this system of planting. Thinning and hoeing costs were reduced from 10 percent to as much as 40 percent as compared to conventional methods.

Practically all the harvesting on this wide-row acreage (except for 20-inch by 40-inch combination) was done with Marbeet single-row harvesters, all without the use of any hand labor for opening up fields. Considerable latitude in the kinds and sizes of tractors used was possible because of the unusual width between rows.

Satisfactory and efficient performance of the Marbeet single-row harvesters was made possible because of such factors as better traction, less interference from tops and weeds, and less soil to be handled than is inherent with 2-row harvesters. Also, it is going to be easier to adapt some satisfactory beet tap recovering system with wide row

plantings than would ever be possible with standard 20-inch row spacings.

We had in 1945 one large experimental planting on the Holly Sugar Corporation Tracy Ranch which fully confirmed our belief that no significant difference in sugar-per-acre should develop when beets are planted according to our wide row plan.

Table 1—Results obtained! on the Tracy Ranch, Randomized block design, four treatments, 18 replicates.

Plot	Treatment	Yield Tons per acre	% Sucrose	Gross sugar per acre Pounds
A	32-inch rows machine thinned	18.022	12.46	4,504
B	32-inch rows hand thinned	19.401	12.18	4,735
C (Check)	20-inch rows hand thinned	20.011	11.78	4,716
D	20-inch rows machine thinned	19.320	11.63	4,284
General mean		19.190	11.86	4,560
F value		6.904	3.2290	1.5313
5% point		2.79	2.79	2.76
1% point		4.20		
S E of mean		.3165	4.13	4.13
Diff. req. for sig.		.904	.96	486

Recent comparisons of actual costs in Imperial Valley 1945 fall plantings show the following savings on 34-inch row spacing:

	Per acre
Average cost thinning and hoeing on conventional double-row bed plantings averaging 21 inches	\$25.00
Average cost thinning and hoeing on wide row single beds (34 inches)	18.00

It is estimated that an additional \$15 per acre saving will be made in harvest costs on the single-row beds with a Marbeet one-row harvester as compared with conventional double-row beds which must of necessity be hand harvested.

The results of our extensive commercial field experiences, together with our own past experimental results, have led us to decide that there should be no significant difference in the sugar-per-acre production of beets planted in row widths of 26 inches, 28 inches, 30 inches, 32 inches, and 34 inches when properly cared for, as compared with conventional row spacings, so long as both systems are handled to contain approximately the same populations of beets per acre.

From a practical farming standpoint it is apparent to us that any row width from 26 inches to 34 inches can be expected to accomplish the desired savings and the mechanical benefits without materially affecting the sugar per acre yields. The actual wide-row spacing selected should be determined by available farm equipment, irrigation practices, and the mechanical harvesting program to be used.

The acceptance of the principles of the wide row plan, with its obvious savings in man hours for thinning and hoeing, and also its greater adaptability to complete mechanization of harvest, may well be the factors which influence the average beet grower to plant increased acreages of sugar beets on his farm in 1946 and in the future.