

*In Central Arizona . . .*

# Planting Dates Influence Yields of Sugar Beets

*by John M. Nelson and Robert E. Dennis\**

Sugarbeets are now an important crop in Arizona's agricultural economy. This year beets accounted for 17,500 acres of irrigated crop land in central Arizona. In addition, 3,000 acres of spring planted beets will be harvested in late fall in the southeastern part of the state.

As with other crops, the yield per acre for sugarbeets in central Arizona has varied from year to year, but has averaged near 20 tons per acre with a sugar content of 14.5 to 15 percent. Efficient operation of the 20 million dollar beet processing plant near Chandler requires that the tonnage of beets processed each day be at or near capacity and that harvest be extended over the longest possible time.

Most of the beets produced in central Arizona are harvested during May, June, and July. High temperatures that occur during this period make storage of harvested roots for more than several days impractical. Because of this, beets must be dug and delivered to the factory each day during the three month campaign. In order to uniformly program factory operations, growers harvest one-third of their crop during each month of the campaign.

The yield, both in tonnage of roots and pounds of sugar, is usually lowest for the portion of the crop harvested early. Because of the necessity for

starting harvest before maximum yields have been attained, the sugar company is now paying a small bonus for beets dug during the first 20 days of the campaign.

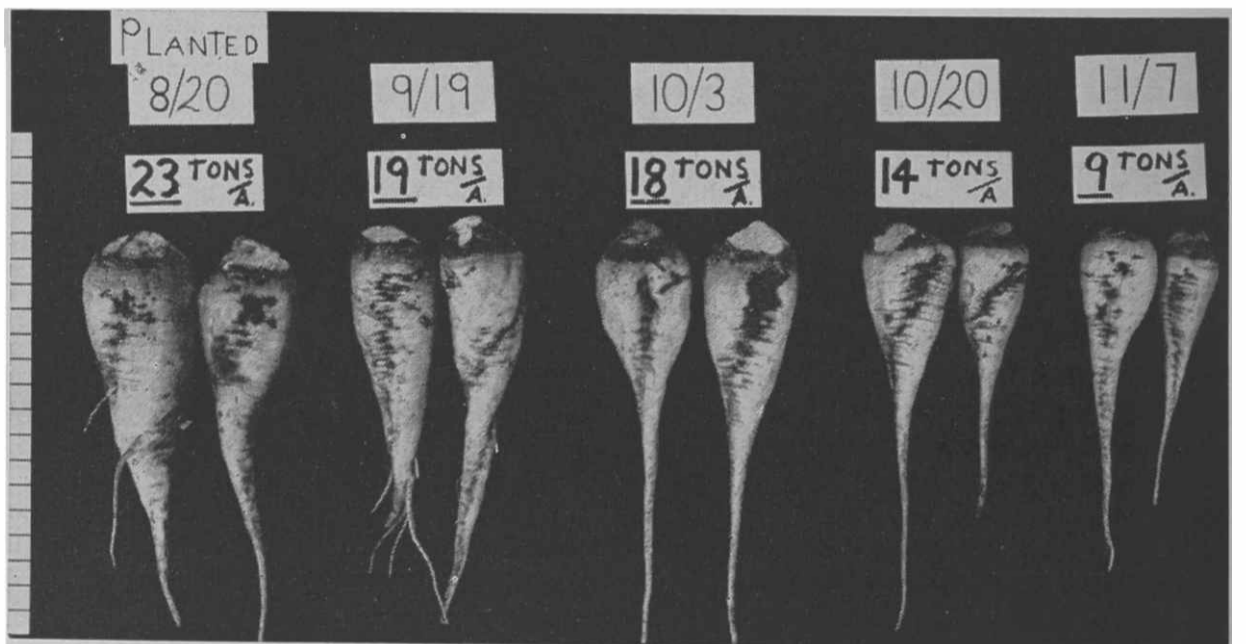
Samples taken by the sugar company from commercial fields have shown that beets planted in late August and early September produce the highest yields, particularly when harvested in May. The results of these sampling studies and University of Arizona planting date research indi-

cate that beets should be planted in September in central Arizona.

## *Planting Date Research*

Data concerning the effect of planting date on root yield and sugar content show the importance of timely planting of beets. The experiments

*\*Farm Specialist, Agricultural Experiment Station, and Extension Agronomist, Cooperative Extension Service, respectively.*



The effect that date of planting has on the relative size and yield of sugarbeet roots harvested in June. (Units of measure in grid at left of photo are in inches.)

on which this information is based were conducted at the University of Arizona Mesa Branch Experiment Farm during two growing seasons.

Two dates of planting were used in the first experiment. Stands were established in a Laveen clay loam soil on September 30 and October 24 in a randomized complete block design. Plantings were made by placing seed of the variety S 302-H in dry soil on 40-inch, double-row beds on the above dates and irrigating immediately afterward.

Plants in each plot were fertilized using a total of 200 pounds of nitrogen and 60 pounds of P<sub>2</sub>O<sub>5</sub> per acre. The amount of irrigation water applied was influenced by the date of planting and harvest. Early planted, late harvested beets received the largest application of water, approximately five acre feet per acre.

The results of this experiment are shown in Table 1. Late September planted beets produced over seven tons more roots per acre than those planted October 24, when beets were harvested in May. The yield advantage of the earlier planting date was statistically significant for May and June harvests, but not for July. In this experiment, root yields increased

an average of nine tons per acre during the 60 day period after the May 12 harvest date. The percent of sugar in the beets was not affected by planting dates. Nearly 15 percent of the beets in the September planting produced seed stalks compared to less than one percent for those planted in October.

In order to further evaluate the influence of planting dates on sugarbeet production in central Arizona, a more comprehensive study was conducted the following year. This experiment included five planting dates and three harvest dates.

The planting plan and establishment methods used for the second experiment were similar to those of the previous year. In this study, S 301-H, a monogerm, non-bolting variety with good curly top resistance, was planted. Results obtained in this experiment are given in Table 2.

Data obtained in the second experiment again demonstrated the advantage of early planting dates. This advantage was greatest when beets were harvested in May. In this experiment, the late planted beets did not produce yields as high as those planted earlier, even at the July harvest. Beets planted at the earliest date and har-

vested May 15 also contained a significantly higher percentage of sucrose than those planted later.

Beets planted as late as October 20 and November 7 produced low yields at all harvest dates. There was but limited root growth of plants in all plots after the June 15 harvest regardless of planting date. Less than one percent of the plants in any plot produced seed stalks during this experiment.

### Summary

Research indicates that sugarbeets should be planted in September in central Arizona. Planting dates earlier than September are not suggested because of the need to maintain at least a 30 day beet free period.

The number of seed stalks produced in these experiments was generally greater for early than for late planted beets. However, the variety now used in Arizona has good bolting resistance and only a small percentage of seed stalks has been produced in commercial fields.

Stand establishment and weed control are generally more difficult for early than for late planted beets. Even with these problems, planting in September is suggested because of greater root and sugar yield potential.

Table 1. Effect of two planting and three harvest dates on root yield, sucrose content, and gross sugar production of sugarbeets at Mesa, Arizona.

Planting Date	Harvest Date								
	May 12			June 9			July 10		
	Root Yield (Tons/A)	Sucrose (%)	Gross Sugar (Lbs/A)	Root Yield (Tons/A)	Sucrose (%)	Gross Sugar (Lbs/A)	Root Yield (Tons/A)	Sucrose (%)	Gross Sugar (Lbs/A)
Sept. 30	22.7	11.4	5,180	26.1	11.9	6,210	28.2	12.4	6,990
Oct. 24	15.2	11.3	3,440	20.4	12.1	4,940	27.8	12.2	6,780
LSD* at 5% Level	2.2	N.S.	590	3.8	N.S.	800	N.S.	N.S.	N.S.

\* Least Significant Difference, LSD.

Table 2. Effect of five planting and three harvest dates on root yield, sucrose content, and gross sugar production of sugarbeets at Mesa, Arizona.

Planting Date	Harvest Date								
	May 15			June 15			July 15		
	Root Yield (Tons/A)	Sucrose (%)	Gross Sugar (Lbs/A)	Root Yield (Tons/A)	Sucrose (%)	Gross Sugar (Lbs/A)	Root Yield (Tons/A)	Sucrose (%)	Gross Sugar (Lbs/A)
Aug. 20	19.4	13.4	5,200	23.4	14.1	6,600	23.6	14.0	6,610
Sept. 19	15.1	12.4	3,740	19.2	13.2	5,070	19.0	13.0	4,940
Oct. 3	14.0	12.1	3,390	18.1	13.4	4,850	17.4	13.3	4,630
Oct. 20	9.5	12.5	2,380	14.3	13.1	3,750	15.6	13.4	4,180
Nov. 7	5.1	10.8	1,100	8.9	13.3	2,370	9.5	14.3	2,720
LSD** at 5% Level	1.0	0.4	800	3.5	0.6	840	2.7	0.6	880

\*\* Least Significant Difference, LSD.