

lignin synthesis in roots of adapted varieties may be triggered by a reproductive stimulus.

Although seedstalks and foliage from beets not properly topped are likely the main source of fibrous material at the processing plant, this study indicates that in some years roots of adapted varieties not producing seedstalks may contain enough lignified tissue to contribute to the problem.

Table 1. Effect of variety, N fertilizer rate and sampling date on lignin concentration of sugarbeet roots.

Variety	Sampled May 10			Sampled July 9		
	N - lbs/A		Variety Ave.	N - lbs/A		Variety Ave.
	110	190		110	190	
	(% lignin - fresh wt. basis)					
GW H23	.168	.193	.181 a <sup>1/</sup>	.119	.173	.146 a
A66194	.126	.121	.124 b	.079	.109	.094 b
US H8	.098	.141	.120 b	.109	.152	.131 a
S-301H6	.125	.139	.132 b	.062	.100	.081 b
Ave.	.129	.149		.092	.134	
Ave. sampling dates			.139			.113

<sup>1/</sup> Means for varieties within a sampling date followed by the same letter are not significantly different at the 5% level according to Duncan's Multiple Range Test.

Table 2. Seasonal changes in the lignin concentration of roots of two sugarbeet cultivars.

Sampling date	S-301H		Seedbeet		Ave.
	(% lignin - wet wt. basis)				
Feb. 14	0.21		0.24		0.23
Mar. 19	0.16		0.20		0.18
Apr. 17	0.15		0.28		0.22
May 16	0.15		0.27		0.21
June 16*	0.25		0.42		0.34
July 14	0.27		--		--

\*Bolting occurred in late May and early June.

### Effect of Delayed Lifting of Sugarbeet Roots After Topping

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#### Summary

The sucrose concentration in beets topped but not lifted decreased significantly by the fifth day. Topped roots showed visible signs of regrowth in three to five days. Root yield was not significantly affected by delaying lifting of topped roots for 15 days. About 12 percent of plants topped but not lifted for 15 days showed rot symptoms compared to less than one percent in plants not topped until harvest.

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The normal commercial practice has been to remove beet tops in advance of the harvester so that topped roots remain in the field for no longer than a few hours. However, mechanical breakdowns, inclement weather and other problems occasionally cause unavoidable delays in lifting topped roots. There has been some interest in increasing the interval of time between the topping and lifting operations. Delaying lifting after topping has been suggested as a method of dehydrating roots in the field, which would increase sucrose concentration of roots and reduce hauling costs. In a study in the Imperial Valley of California, topped roots did not increase in sugar content when lifting was delayed (1). A test was conducted at the Mesa Farm to determine the effect of delayed lifting of topped roots on sugar production.

Sugarbeets for this test were planted in September on 40-inch, double-row beds. On June 22nd half of the planting was topped with a commercial flail type topper. Root samples were dug on June 22, 23, 24, 25, 27, 30 and July 7. On each sampling date beets topped at the start of the test were compared with those topped at the time of harvest.

#### Results

The sucrose concentration in beets topped but not lifted decreased significantly by the fifth day (Table 1). This decrease in sucrose content appears to be associated with regrowth. Topped plants started producing new growth on crowns three to five days after being topped. A very high N fertility level in the test area resulted in large tops and low sucrose percentages and was favorable for regrowth of topped roots.

Root yield was not greatly affected by delaying lifting for 15 days. There was no evidence that a significant loss of moisture occurs when topped plants are left in the field for several weeks.

About 12 percent of topped beets were either entirely or partially rooted after 15 days compared to less than one percent in beets not topped until harvest. Rots were observed in injured crown tissue and in various locations on the tap root. Conditions were generally favorable for rot development during the test. Maximum air temperatures were commonly above 100° F and soil moisture content was high. The absence of rots in untopped beets indicates that topping damage to crowns and secondary roots greatly increases the risk of infection with rot organisms.

#### Literature Cited

- (1) Price, Charles and J. M. Fife. 1946. Effect of delayed lifting after topping on certain chemical constituents of sugar beets. Proc. Am. Soc. Sugar Beet Technol. 4:102-106.

Table 1. Effect of delayed lifting after topping on sucrose concentration, yield and purity of roots.

Date Sampled	Days Delay in Lifting Topped Plots	Sucrose		Root Yield		Purity <sup>4/</sup>	
		Check <sup>1/</sup>	Topped <sup>2/</sup>	Check	Topped	Check	Topped
		%		T/A		%	
Jun. 22	---	11.1	---	27.5	---	79.6	---
Jun. 23	1	11.1	11.2 <sup>3/</sup>	28.4	27.1	79.2	80.2
Jun. 24	2	11.4	11.0	27.4	27.5	79.2	79.7
Jun. 25	3	10.6	10.7	32.3	29.6	79.1	78.4
Jun. 27	5	10.1	9.7	31.0	27.0	78.2	78.9
Jun. 30	8	10.6	9.5	30.2	32.5	77.9	78.2
Jul. 7	15	10.9	9.2	28.3	26.5	79.5	78.6

<sup>1/</sup>Check plots were topped at the time of harvest on each sampling date.

<sup>2/</sup>Topped plots were topped on June 22.

<sup>3/</sup>Means connected by a horizontal line are not significantly different at the 5% level.

<sup>4/</sup>Samples for purity determinations were obtained by bulking samples from all five replications.