

Research Report to Oregon Processed Vegetable Commission
1986

Title of Project: Effects of irrigation and nitrogen rates on yield and size distribution of roots of table beets

Project Leader and Department: H. J. Mack, Horticulture
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Project Status: Terminating, June 30, 1987 (funded by OPVC for 1986 growing season)

Project Funding by Commission for this reporting period \$2,500. Funds were used for establishing and maintaining plots, hourly labor, land use charges, and plant analyses.

- Objectives:
- 1) To determine the effects of differential quantities of irrigation water on growth and yield of table beets.
 - 2) To determine the relationship of nitrogen fertilizer rates to yield and size distribution of table beet roots.
 - 3) To determine N concentrations in table beet leaves as affected by irrigation and N fertilizer rates.

Report of Progress:

A line source irrigation system was used on Detroit Dark Red Table beets to apply differential amounts of water ranging from about 1.1 inches to 16.7 inches for the season. Beets were planted on May 28 in an area where a broadcast application of fertilizer of about 50 lbs N, 150 lbs P₂O₅ and 50 lbs K₂O had been incorporated by discing before planting. Additional nitrogen was also disc-incorporated before planting for rates of 135 and 225 lbs N/A. The available water holding capacity of this silty clay loam soil was about 2.5 inches per foot of depth. Plots were irrigated at 10 day intervals.

There was no difference in total yield of roots when the 135 and 225 lbs N/A rates are compared. Yields were continuing to increase as water applications were about 16.7 inches per season (Table 1 and the figure). Yield increases from increased water applications were primarily in the 1.75 - 2.75 and 2.75 - 3.75 inch diameter sizes. Results from 1986 and 1985 do not show a diminished yield from higher water applications in the range of 15 - 17 inches per season. It appears that water applications can exceed this amount and still result in yield increases. Optimum amounts of water to apply will be influenced by soil type, fertility levels, other grower practices and economics.

Plant analyses have not been completed from this experiment.

Summary:

Yields of table beets were continuing to be increased as water application rates varied from about 1.1 to 16.7 inches during the season. There were no differences in yield between nitrogen rates of 135 and 225 lbs N/A.

Signatures:

Project Leader

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Department Head

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Table 1. Effects of amounts of water applied and N fertilizers on yield and size distribution of table beet roots. 1986.

Water Applied (in.)	N Rate lbs/A	Total	Yield by Grades (Root Diameter) - Tons/Acre				
			-1"	1-1.75"	1.75-2.75"	2.75-3.75"	+3.75"
1.1	135	10.9	1.4	4.6	4.6	0.3	0
	225	11.0	0.8	3.7	4.8	1.7	0
2.5	135	13.1	0.7	4.5	6.1	1.6	0.2
	225	13.4	0.6	3.4	7.6	1.8	0
7.2	135	23.6	1.4	5.0	12.6	4.1	0.5
	225	20.3	0.5	4.6	10.8	4.0	0.4
11.1	135	26.6	1.0	5.2	12.8	6.7	0.9
	225	25.9	0.8	4.2	14.8	5.9	0.2
15.1	135	25.4	0.7	4.6	12.7	6.5	0.9
	225	28.5	1.3	3.8	13.6	8.7	1.1
16.7	135	29.3	1.2	3.9	13.7	8.9	1.6
	225	29.2	0.5	4.5	13.8	9.9	0.5

1986 Table Beets--Irrigation, N Rates

