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Spacing, n rates tested on table beets

Row spacings of table beets were 6, 12, 18, and 24 inches and nitrogen rates were 50 and 200 pounds nitrogen/acre in a 1975 test at the OSU Vegetable Research Farm at Corvallis. Seeds of 'Detroit Dark Red' table beets (morse Strain) were planted with a Stanhay seeder on June 10. A fertilizer rate of 25 pounds N, 75 pounds P_2O_5, and 25 pounds K_2O per acre was banded at planting. Additional nitrogen was broadcast on July 17 to obtain rates of 50 and 200 pounds N per acre. Overhead sprinkler irrigation was provided as needed at 7 to 12-day intervals. Plots consisted of eight 6-inch rows, four 12-inch rows, and three rows each at 18 and 24-inch spacings. Once-over harvests were made on three dates: August 6, 22 and September 25. Beets were topped and roots were graded into various sizes as indicated in Table 2.

There was a decrease in yield (12 percent) as row spacings were reduced from 24 to 6 inches (Table 1). Yield was higher at the 200-pound N rate than for the 50-pound N per acre rate although the overall average increase was only 6 percent.

Data in Table 2 show that size distribution of roots was markedly affected by row spacing. Narrow rows produced a higher percentage of small roots compared to wider spacings. The higher nitrogen rate produeced slightly larger roots than the lower rate (data not shown).

These results agree with those reported earlier in that there can be considerable influence on size distribution of table beet roots by manipulation of row spacing and harvest dates. Yields of roots are generally not greatly influenced by changing row spacing. Of course, economic consideration has to be given to processing usage and potential returns and how these are influenced by harvest date- row spacing combinations. Harvesting equipment limitation and possibly other factors such as chemical weed control also would affect adoption of narrow row spacings of table beets in contrast to the conventioanl row spacings of 20 to 26 inches now used.

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In this issue . . .

Effects of Population on Broccoli. . . . 3

Table 1. Effects of row spacing and N rates on yield of table beets, Corvallis, 1975

Harvest date	N rate/A	Row spacing (inches) 6	12	18	24	Avg
	Lbs.	T/A	T/A	T/A	T/A	
1. August 6	50	5.3	5.6	5.4	6.7	5.7
	200	5.8	6.1	5.8	5.7	5.8
2. August 22	50	12.6	13.6	14.1	14.2	13.6
	200	13.6	14.1	14.6	16.1	14.6
3. September 25	50	18.0	18.1	18.5	20.4	18.6
	200	18.6	18.9	19.4	20.6	19.4
	Avg	12.3	12.7	13.0	14.0	

Harvest Date Means: H1 - 5.8
H2 - 14.1
H3 - 19.0

N Rate Means: 50# -- 12.6
200# -- 13.3

Table 2. Effects of row spacing and N rates on size distribution of table beet roots, Corvallis, 1975

Harvest date	Row spacing inches	Size of roots (Inches in diameter) <1	1 - 1 1/2	1 1/2 - 2	2 - 2 1/2	2 1/2 - 3	>3
		%	%	%	%	%	%
1. August 6	6	44	47	9	0	0	0
	12	26	52	20	2	0	0
	18	15	48	33	4	0	0
	24	19	46	31	4	0	0
2. August 22	6	15	41	33	10	1	0
	12	9	28	45	16	2	0
	18	5	20	40	26	8	1
	24	4	20	39	29	7	1
3. September 25	6	10	28	33	20	7	2
	12	5	22	36	26	10	1
	18	2	13	33	28	20	4
	24	2	14	28	30	20	6

Effects of population on broccoli

Systematic designs were used to study effects of population density on broccoli during 1972-75 at Corvallis. Populations ranged from about 21,000 to 110,000 plants per acre. Varieties and some of the cultural practices varied from year to year and these are included in averages for populations for the four years. In 1972, 'Gem' and 'Green Duke' were used; only 'Morse 4638' was used in 1973 and 1974; and in 1975, 'Morse 4638' and two Oregon State lines, 74-17 and 75-11, were used.

As populations were increased, there was a consistent trend for reduction in head size. The magnitude of this change under population pressure varied from year to year so that yield per acre varied (Table 1). Yield was higher at lower populations in 1972 and 1974. In 1975, yields were increased as populations were increased while no clear trend was evident in 1973.

In 1973, effects of seed size were evaluated on broccoli plant growth. Seed of 'Morse 4638' was separated into three lots - small, approximately 143,800 seeds per pound; medium, 115,200 seeds per pound; and large, 102,000 seeds per pound, and planted with a Stanhay seeder in 12 and 24-inch rows. Although plots were replicated, there was much variation between plants in the same treatment. Data in Table 2 show that in 24-inch rows, plant weight and head weight were highest from the large seed and decreased with a decrease in seed size. In 12-inch rows, there was no definite relationship between seed size and plant or head size.

Table 1. Effect of Plant Populations on Yield of Broccoli, Corvallis

1,000 Plants/Acre	1972	1973	1974	1975	Avg
	T/A	T/A	T/A	T/A	T/A
21.2	8.2	5.4	5.2	3.3	5.5
25.2	8.7	5.4	4.6	4.3	5.8
30.4	8.7	4.8	4.3	3.4	5.3
36.4	7.7	5.7	3.5	4.5	5.4
44.0	7.9	7.1	3.8	4.5	5.8
52.8	6.7	4.3	3.7	5.7	5.1
63.2	6.3	4.5	2.7	4.4	4.5
76.0	5.2	4.6	2.6	6.5	4.7
91.2	7.4	5.1	2.5	6.2	5.3
110.0	4.5	4.4	2.4	6.0	4.3

Table 2. Weight of Plants and Heads of Broccoli as Influenced by Seed Size, 1973

Row Spacing	Small Seed		Medium Seed		Large Seed	
	plant wt	head wt	plant wt	head wt	plant wt	head wt
inches	gms	gms	gms	gms	gms	gms
12	1051	251	953	191	1205	264
24	1304	285	1377	316	1938	465

Other investigators have found some advantages with use of larger seed sizes on plant performance and some have suggested that this might be most important in varieties that are not very vigorous in growth

A higher percentage of seedlings was established in 1974 from use of vermiculite placed over seed at planting than from planting a given quantity of bare seed. A pelleted seed in a vermiculite wafer did not emerge as well as seed with no treatment.

The above results reinforce the concept that yield and head size of broccoli are the result of the interaction, at times complex, of varieties and cultural practices. Careful attention and as much control over these factors as possible can improve consistency of performance and yield.

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