

## PLANT POPULATION AFFECTS BELL PEPPER YIELD

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**ABSTRACT:** Four plant populations were used to evaluate the plasticulture production of ‘Vivaldi’ bell pepper. Marketable yields were not significantly different for the three highest plant populations of 29040, 14520, and 9680 plants per acre. However, marketable yield of the lowest plant population of 7260 plants per acre was significantly lower than the other treatments. Plant population did not affect average fruit weight. Results of this 1-year experiment suggest that 9680 plants per acre is the optimum plant population to maximize yield and reduce costs of production without affecting fruit size.

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**KEY WORDS:** Bell pepper, sweet pepper, *Capsicum annuum*, plant density, plant population, plant spacing.

**MATERIALS AND METHODS:** ‘Vivaldi’ bell pepper plants were grown in our greenhouse for 25 days and transplanted by hand July 12, 2000. The experiment was designed to compare four plant populations: 29040, 14520, 9680 and 7260 plants per acre. These populations are equivalent to in-row spacings of 0.5, 1.0, 1.5, and 2.0 ft between plants within rows. Two rows of plants, spaced 12 in apart, were placed on each plant bed. The two rows were evenly staggered.

The experimental design was a randomized complete block design with three replications. Raised beds were formed six inches high and 24 inches across the top with a press-pan-type bed shaper. Beds were spaced six feet apart, center-to-center. White-on-black plastic mulch and drip irrigation tubing was applied after bedding. Methyl bromide fumigation was not used. No preplant fertilizers were applied. Peters 20:20:20 and CaNO<sub>3</sub> were applied during the experiment via the drip irrigation system to provide a total of 120 lbs N, 80 lbs P<sub>2</sub>O<sub>5</sub> and 80 lbs K<sub>2</sub>O per acre. Weekly irrigation was applied as needed.

Pesticides were applied with a backpack-type mister on a 7 to 10 day schedule. The insecticides Asana XL at 8 fl oz/ac (0.05 lb esfenvalerate per acre), Seven XLR Plus at 32 fl oz/ac (carbaryl) or Malathion 57 EC at 16 fl oz/ac (malathion) were sprayed as needed for insect control.

Peppers were harvested as soon as they reached marketable size or began to change color from green to red. Marketable fruits were separated from culls and then counted and weighed. Number of culls was recorded as sunscald, small, misshapen, and damaged. A total of four harvests began Sept. 5 and ended Oct. 4.

**RESULTS AND DISCUSSION:** Marketable yields were not significantly different for the three highest plant populations of 29040, 14520, and 9680 plants per acre (Table 1). However, marketable yield of the lowest plant population of 7260 plants per acre was significantly lower than the other treatments. Plant population did not affect average fruit weight even though it was expected that crowding due to greater plant populations would lead to lower fruit weights. The highest plant population of 29040 produced significantly more culls, and thus a lower relative number of marketable fruit, than the second highest population of 14520. Many of the cull fruit from the highest population were misshapen.

Results of this 1-year experiment suggest that 9680 plants per acre is the optimum plant population to maximize yield and reduce costs of production without affecting fruit size.

**Table 1. Bell pepper marketable yield and average fruit weight**

Population (plants/ac)	Marketable yield			Avg. fruit wt. (oz)
	(no/ac)	(lb/ac)	(%)	
29,040	118,400	41,760	77	5.7
14,520	118,600	41,020	85	5.5
9,680	109,700	38,400	84	5.6
7,260	90,500	31,300	84	5.6
LSD .05	10,100	3,800	7	NS