



Ohio State HCS News

HORTICULTURE & CROP SCIENCE IN VIRTUAL PERSPECTIVE - THE OHIO STATE UNIVERSITY

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Vegetable Transplant Production Strategies Investigated



Elaine Grassbaugh measures vegetable transplant growth in a greenhouse study.

Vegetable transplant production can be challenging for greenhouse producers and growers producing their own transplants. Vegetable holding strategies, due to spring weather planting delays, can also be a challenge. Oftentimes these strategies result in poor quality plants, which lead to delayed seedling development, reduction in field establishment/survival, and a reduction in final marketable crop yield.

Tomatoes and cabbage are two commercially grown vegetable crops in Ohio that are established with five- to six-week-old transplants. When a delay in planting occurs, holding transplants for longer than a few days can result in weak stems and poor quality plants. Horticulture & Crop Science Professor **Mark Bennett** and research associate **Elaine Grassbaugh** are researching management practices to extend this holding period without affecting final crop yields may assist growers in storing transplants an additional three to 10 days prior to field transplanting.



Professor Mark Bennett is researching management practices to extend the potential holding period for vegetables.

Vine crops such as winter squash and melons - produced mainly from transplants in Ohio - only need three to four weeks of greenhouse growth prior to transplanting. However, the root systems of vine crops are often inadequate after three to four weeks to support the vigorous foliage growth. Methods to increase root growth during the brief growth period of the transplants would likely aid in transplant establishment, field survival, and final crop yield.

Tomato and cabbage transplants were seeded into 288-cell plug trays. Plants were

hardened off for 0, 3, 5, or 10 days prior to transplanting to the field. Hardening off conditions consisted of placing plug trays on a flat bed wagon under a covered storage building. All treatments were planted in four replications.

Standard pesticide applications were applied throughout the growing season. The tomatoes and cabbage were mechanically harvested. There were no differences in marketable yield, average fruit size, or percent red fruit in tomatoes for any of the holding times prior to transplanting. There were no differences in yield, average head weight, or head measurements for cabbage.



Ohio State is researching how to optimize tomato and cabbage transplant production that is delayed by weather.

A preliminary greenhouse study using abscisic acid (ABA) on tomatoes for height control was also conducted. Tomatoes were seeded into 200-cell plug trays. After six weeks, ABA was applied at 200 ppm and 400 ppm along with an untreated control. Plants were measured after 12 days, placed under shade cloth, and measured again after five days. Preliminary results show ABA reduced plant height when applied at both rates of 200 and 400 ppm.

Additional studies are underway to investigate the use of ABA and polyethylene glycol 8000 on processing tomato, fresh market tomato, and fresh market bell pepper transplants for any effect on stand establishment, crop development, and final yield.

'Spin-Out', a copper paint treatment, was applied to the inside of 50-cell plug trays with a sponge brush. Muskmelon and butternut squash were seeded into the flats along with untreated controls and grown in the greenhouse. There were no differences in seed germination in the treated and untreated trays for both crops. Plants were then transplanted to the field. Plants were spaced three feet apart with rows spaced 7.5 feet apart on bare ground. Melons and squash were harvested one month apart.

Copper-treated trays showed a trend for increased yields compared to the untreated control in both the melon and squash. Marketable yields for muskmelon with the copper treatment were 15.3 tons per acre (T/A) compared to 13.6 T/A for the untreated control. Squash marketable yields with the copper treatment were 33.9 T/A compared to 28.8 T/A for the untreated controls. Additional studies will be conducted to confirm these results. Copper trays may be a transplant quality strategy implemented for increased yields.

Grassbaugh photos by Ken Chamberlain. Bennett photos and web publishing by [Victor van Buchem](mailto:Victor.van.Buchem@osu.edu).

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