
Evaluation of Greenhouse Cluster Tomato Cultivars in Florida 98-11

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Introduction

The size of the greenhouse vegetable industry in Florida in 1996 was 57 acres (Hochmuth and Hochmuth, 1996b). Traditionally the Florida greenhouse vegetable industry has consisted of crops of cucumber, tomato, and lettuce. More recently, other crops have become more important, including colored pepper, herbs, especially leafy green vegetables, and strawberry. Cluster tomato is also another example of further specialization within the tomato market. Cluster tomato production in greenhouses worldwide has become very popular in the last three years (Hochmuth, et. al., 1997). This trial was conducted to continue cultivar evaluations of new and standard cluster tomatoes in greenhouse hydroponic culture in North Florida.

Materials and Methods

This trial was conducted at the Suwannee Valley Research and Education Center, University of Florida, near Live Oak, Florida in a single 22' x 60' stand-alone greenhouse with 8' sidewalls. The structure was covered with two layers of 6 mil polyethylene and the area between the two layers was inflated with air. The greenhouse was equipped with an evaporative cooling pad on one end wall and ventilation fans on the opposite end wall. Propane gas was used to heat the greenhouse and provide a minimum temperature of 62°F. Warm air was conveyed by 12" ventilation tubes along the floor between the double rows of tomatoes. The same ventilation tubes were used to recirculate greenhouse air in the crop canopy to minimize free water formation on the tomato plants. In addition, horizontal air-flow fans were located above the crop and also used as recommended, primarily to reduce moisture and disease on the plants (Bartok, 1994).

Seeds of nine cluster tomato cultivars and one beefsteak tomato cultivar (Table 1) were planted into rockwool seeding cubes (1.5 x 1.5 x 1.5 inches) on 3 September 1997. The transplants were grown in the cubes using water and nutrient solution as needed until transplanting. The transplants were planted into lay-flat bags of perlite on 26

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September 1997. The crop was grown in accordance with the University of Florida perlite production practices (Hochmuth, 1991, Hochmuth and Hochmuth, 1996a). Nutrient management followed the program as outlined by the University of Florida (Hochmuth, 1990). The nitrogen level was 70 ppm N at the beginning of the season and raised to 150 ppm by first harvest and was maintained at 150 ppm for the remainder of the crop season.

The tomato crop was maintained with standard practices for training, suckering, pruning lower leaves, and cluster pruning (Hochmuth, 1991). Clusters of fruits were harvested at a range of fruit maturity from "breaker" to "ripe". Clusters were harvested by clipping entire clusters, counting fruit on each cluster and weighing each cluster. The beefsteak cultivar 'Trust', was planted in this trial greenhouse as a standard for comparison to the cluster cultivars. 'Trust' fruits were harvested at the breaker stage, graded as marketable or cull, and weighed.

Results and Discussion

Overall fruit production ranged from 15 to 23 lbs per plant (Table 1). This yield range is somewhat less than yields obtained in other years at the same location but is not unusual for North Florida. Extended cloudy and rainy weather during December through March at this location may have caused reduction in fruit set.

Early yield (November and December) ranged from 2.0 to 3.8 lbs per plant. Highest early yield was from 'Bathsheba', 'Abigail', 'E20.30090', 'Gabriela', 'Tradiro', and 'Campari'. Lowest early yield was from 'Aranca', 'Rougella', and 'Durasol'.

Several cultivars had similar total yields of near 18 to 23 lbs per plant. Only 'Campari', and 'Aranca' had total yields of 15 lbs per plant or less. The standard cluster cultivar 'Tradiro', had intermediate total yield of 18.9 lbs per plant which was not significantly different from the yield of any other cultivar in this trial. 'Trust' plants produced a total marketable yield of 18 lbs per plant. This is the second year that several cluster tomato cultivars have produced as well as the standard beefsteak cultivar 'Trust' (Hochmuth, et. al., 1997).

Total number of clusters produced per plant was highest for 'Aranca' at 33.4 clusters. 'Campari', 'Bathsheba', and 'Rougella' produced over 25 clusters per plant. These top four cultivars, in terms of number of clusters produced, were also the cultivars with the smallest fruit size. 'Aranca' and 'Campari' had average fruit weight of 0.07 and 0.10 lbs per fruit, respectively. 'Rougella' and 'Bathsheba' had similar fruit size of 0.17 and 0.16 lbs per fruit, respectively. All other cultivars had average fruit weight of 0.25 to 0.30 lbs per fruit.

Average number of fruit per cluster was calculated based on total number of fruit and total number of clusters harvested. Most cultivars produced an average of about four fruits per cluster. The small-fruited cultivars of 'Campari' and 'Aranca' had cluster of 5.3 and 6.4 fruits per cluster, respectively.

'Gabriela' was much more susceptible to fruit russetting than any other cultivar. 'Durasol' and 'E20.30090' were slightly more susceptible to russetting than all other cultivars except 'Gabriela'. Observations on calyx quality showed 'Abigail', 'Rougella', and 'E20.30090' had very poor postharvest calyx quality due to drying and shriveling of the calyx.

Literature Cited

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Table 1. Total and early fruit yield and cluster characteristics for several greenhouse cluster tomato cultivars at Live Oak, FL 1997-1998.

Cultivar	Seed Source	Total Yield (lbs/plant)	Early yield ^x (lbs/plant)	No. Clusters per Plant	Avg. No. Fruits per Cluster ^w	Avg. Fruit Wt. (lbs)
Gabriela (FA 593)	Hazera	22.9	3.3	22.1	3.8	0.27
E20.30090	Enza Zaden	21.6	3.5	21.3	3.4	0.30
Abigail (870)	Hazera	21.4	3.5	21.6	3.6	0.28
Durasol	Enza Zaden	20.8	2.7	21.2	3.8	0.26
Tradiro	DeRuiter	18.9	3.1	20.3	3.6	0.26
Rougella	Rijk Zwaan	18.3	2.4	25.3	4.3	0.17
Bathsheba	Hazera	17.9	3.8	28.1	4.0	0.16
Campari	Enza Zaden	15.0	3.0	28.3	5.3	0.10
Aranca	Enza Zaden	14.7	2.0	33.4	6.4	0.07
Significance ^z		*	*	**		**
LSD (p=0.05) ^y		5.3	0.9	3.1		0.03

^z Level of significance was either 5% (*) or 1%(**) or non-significant (NS).
^y Least significant difference, p=0.05
^x Early yield was calculated using all November and December harvests.
^w Average number of fruit per cluster was calculated by dividing total number of fruit by total number of clusters, but was not subjected to analysis of variance.

Industry Cooperators^z

Airlite Processing Corporation of Florida (perlite), 3505 65th Street, Vero Beach, FL 32967

DeRuiter Seeds (seed), PO Box 20228, Columbus, OH 43220

Hazera Quality Seeds (seed), 1369 East Avenue, Chico, CA 95926

Rijk Zwann (seed), PO Box 40, 2678 ZG De Lier, The Netherlands

Chapin Watermatics (drip irrigation), 740 Water Street, Watertown, NY 13601

Enza Zaden (seed). 1188 Padre Dr. #150, Salinas, CA 93901

Paramount Seeds (seed), PO Box 1866, Palm City, FL 34990

^z Contact Extension Service for names and addresses of current Florida representatives. Mention of a specific company or product does not constitute endorsement over other companies or equivalent products.