

**TOMATO VARIETY EVALUATION
FALL 2001¹**

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In 1999-2000, 43,200 acres of tomatoes were harvested in Florida, yielding 62.2 million 25-pound cartons worth over \$418 million. Tomatoes accounted for almost 30% of the total value for all vegetables grown in Florida during 1999-2000, making it the most important vegetable produced in the state. The Palmetto-Ruskin area (west-central Florida) accounted for over 36% of the state's total fresh market tomato production in 1999-2000 (Witzig and Pugh, 2001).

A tomato variety trial was conducted in fall 2001 at the Gulf Coast Research and Education Center-Bradenton located in west-central Florida to evaluate fresh market tomato varieties and breeding lines. The replicated yield trial included 31 entries and an additional 45 entries were evaluated in observational plots.

Materials and Methods

Seeds were sown on 13 July into planter flats (1.5 x 1.5 x 2.5-inch cells) containing a commercial mix (60% sphagnum peat moss and 40% vermiculite with 3 pounds dolomite, 1 pound Micromax [microelements] and 1 pound gypsum per yd³) manufactured by Faford, Inc., Anderson, SC 29621. Transplants were fertilized periodically with a liquid 20-20-20 (N-P₂O₅K₂O) to sustain growth during production. Plants were conditioned before transplanting by limiting water and nutrients in the final phase of production.

The Eau Gallie fine sand in the experimental area was sampled before fertilization and analyzed by the University of Florida Extension Soil Testing Laboratory (Hanlon and DeVore, 1989); pH = 6.8 (target pH is 6.5) and Mehlich I extractable P = 41 (high), K = 14 (low), Mg = 105 (high), Ca = 635 (adequate), Zn = 3.1 (adequate), Cu = 2.4 (adequate), and Mn = 1.9 (response possible) ppm. The land was prepared in early February. Beds were formed and fumigated with methyl bromide:chloropicrin, 67:33 at 2.3 lb/100 lbf. Banded fertilizer was applied in shallow grooves on

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the bed shoulders at 3.24-0-4.50 lb N-P₂O₅-K₂O/100 lbf after the beds were pressed and before the white polyethylene mulch was applied. The total fertilizer applied was equivalent to 282-0-392 lb N-P₂O₅-K₂O/A. The final beds were 32-in. wide and 8-in. high, and were spaced on 5-ft centers with six beds between seepage irrigation/drainage ditches, which were on 41-ft centers.

Transplants were set in the field on 21 August and spaced 24 in. apart in single rows down the center of each bed. Transplants were immediately drenched with water containing 16 fl. oz/acre of imidacloprid for silverleaf whitefly control. Four replications of 10 plants per entry were arranged in a randomized complete block design in the replicated trial and single 10-plant plots were used in the observational trial. Plants were lightly pruned, staked, and tied.

Plants were scouted for pests throughout the season. Lepidopterous larvae, silverleaf whitefly, and russet mites were the primary insects found. *Bacillus thuringiensis*, abamectin, endosulfan, methomyl, and pyriproxyfen were used according to label instructions to manage insect pest populations during the season. A preventative spray program alternating maneb + copper hydroxide, azoxystrobin and chlorothalonil was followed for management of plant pathogens. Tomato yellow leaf curl virus plants were removed and disposed of early in the season, but were allowed to remain after the second tie.

Fruit were harvested at or beyond the mature-green stage on 7-8 and 19-20 November and 3-4 and 14-15 December. Tomatoes were graded as cull or marketable by U.S. standards for grades (U.S. Dept. Agr., 1981) and marketable fruit were sized by machine (see footnotes Tables 2-5 for specifications). Marketable fruits of each size were counted and weighed, cull fruits were weighed.

Results and Discussion

Maximum temperatures were cooler than average in September and October and maximum and minimum temperatures were higher than average in December. Less than average rainfall occurred in August, November, and December whereas September rainfall was above average (Table 1).

Replicated Trial: The replicated trial included 31 entries. Early marketable yields ranged from 530 25-lb cartons for HT-250 to 1417 cartons/acre for 'Solar Set' (Table 2). Early yields were similar to those of 'Solar Set' in 21 other entries. Extra large fruit varied from 441 cartons/acre for HT-250 to 1330 cartons/acre for XTM 0227. Twenty-one other entries had extra large fruit yields similar to those of XTM 0227. Yields of large fruit varied from 38 cartons/acre for 'Florida 91' to 286 cartons/acre for HA 3057. Early harvest average fruit weight ranged from 5.7 oz for HT-310 to 7.5 oz for RFT 0418. HA 3468 had a reduced plant stand from other entries. Cull fruit varied from 9% by weight for EX 1405037 to 27% for HA 3061. The principal fruit defects in the early harvest were rough shoulders, large blossom scars, small fruit, and blossom-end nipples.

Seasonal yields from four harvests ranged from 1658 cartons/acre for HA 3061 to 3268 cartons/acre for NC 99405. Ten other entries had yields similar to those of NC 99405. All entries produced yields greater than the state average yield for fall 1999 of 1053 cartons/acre (Witzig and Pugh, 2001).

Yields of extra-large fruit varied from 960 cartons/acre for HT-250 to 2516 cartons/acre for

‘Sanibel’. Yields of ‘Sanibel’ extra large fruit were not different from those of 18 other entries. Large fruit yields ranged from 254 cartons/acre for HT-320 to 847 cartons/acre for NC 99405. Cull fruit for the entire season varied from 11% by weight for EX 1405037 to 33% for HA 3061. Prominent blossom-end nipples, rough shoulders, and small fruit were the principal defects during the latter part of the season. Average fruit weight was from 5.3 oz for HT-310 to 6.9 oz for Fla. 7943. TYLC- infected plants ranged from 0 for several entries to 15% for RFT 0247 and TX 99963, but those differences were not statistically significant.

Observational Trial: Early yields varied from 481 cartons/acre for Fla. 7960 to 1934 cartons/acre for Fla. 8003. Yield of extra large fruit for these same entries varied from 401 to 1767 cartons/acre. Cull fruit by weight varied from 6% for Fla. 7862 to 40% for TY00-568. Average fruit weight was from 5.3 oz for NC 00242 to 7.5 oz for Fla. 7926. Plant stand was 50% for Fla. 7960; all other entries had 90 or 100% plant stand (Table 4).

Yields for the entire season varied from 1284 cartons/acre for NC 00240 to 3844 cartons/acre for Fla. 7966. Yields of extra large fruits of these same entries ranged from 784 to 2812 cartons/acre. Cull fruit by weight varied from 9% for Fla. 7862 to 39% for TY00-568 and TY00-388. Average fruit weight varied from 5.2 oz for TY00-416 to 6.8 oz for Fla. 7926. TYLC infested plants varied from 0 for most entries to 40% for Fla. 8001.

Summary

Yields in the fall 2001 season surpassed those in recent fall seasons at this location. This was due in part to four harvest instead of the usual three harvests. On the other hand, marketable fruit yields were high despite a high proportion of cull fruit.

Exceptional experimental hybrid performers in fall 2001 were NC 99405, HA 3057, Fla. 7943, XTM 0227, TX 99963, PX 150535, and Fla. 7973.

Note

The information contained in this report is a summary of experimental results. No discrimination is intended and no endorsement implied where trade names are used.

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Literature Cited

Hanlon, E. A. and J. M. DeVore. 1989. IFAS extension soil testing laboratory chemical procedures and training manual. Fla. Coop. Ext. Circ. 812.

U.S. Dept. of Agr. 1981. U.S. standards for grades of tomato. USDA Agr. Marketing Serv., USDA, Washington, D.C.

Witzig, J. D. and N. L. Pugh. 2001. Florida agricultural statistics. Vegetable summary 1999-2000. Fla. Agr. Stat. Serv., Orlando, FL.