MAIN SEASON ROUND TOMATO VARIETY TRIAL RESULTS - 2005

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INTRODUCTION

Commercial varieties and advanced breeding lines of tomatoes for the round tomato market were evaluated for adaptation to New Jersey growing conditions. A total of twenty two promising main season lines were included in the trial conducted at Rutgers Agricultural Research and Extension Center, Bridgeton, NJ.

METHODS

Culture

Seeds were sown on March 29, in 72-cell (1½" X 1½") trays containing peat-vermiculite media formulated for tomato transplant production. Seedlings were thinned to 1 plant per cell. Sixty-five pounds of N per acre plus P_2O_5 and K_2O based on soil tests were disked into the sandy loam soil. Devrinol 50DF (3 lb/A), and Sencor 4F (0.33 lb/A), were applied and incorporated during bedding. Black plastic mulch and drip irrigation tube were laid. Transplants were set 24" apart on raised beds with 5-ft centers on May 10. Plants were grown on four foot stakes. The plants were pruned to allow three axillaries to develop below the main fork. Three applications of 40 pounds/A of N, P_2O_5 and K_2O were applied through the drip system during the growing season. Insects were controlled as required using commercial recommendations for tomatoes. Fungicides were applied for suppression of foliar diseases and fruit rots. Rainfall was 2.22, 2.46, 4.43, 1.52 and 1.07 inches in May, June, July, August, and September respectively.

Experimental, Harvesting and Evaluation

Field plots were replicated two times in a randomized block design. Data were obtained on foliage and fruit characteristics for all of the varieties in the trial. Yields, external and internal fruit characteristics were also obtained for all lines. A hand harvest of each plot was made on July 21st when early fruits were ripening and on August 1, 8/8, 8/15, 8/22, 8/29, September 6, 9/23 and October 5. All fruits with breaker to red maturity were harvested. Fruits were separated into usable, and culls. Major defects were identified and recorded. On August 16th, a sample of 16 representative fruit from each plot was used to evaluate external and internal fruit characteristics using the rating system shown in the table below.

Color	Shoulder Appearance	Fruit Firmness	Blossom Scar	White Tissue
5 = Excellent	5 = Excellent	5 = Firm	5 = Large	5 = Severe
4 = Very Good	4 = Very Good	4 = Medium Firm	4 = Medium - Large	4 = Mod-Severe
3 = Good	3 = Good	3 = Medium	3 =Medium	3 = Moderate
2 = Fair	2 = Fair	2 = Medium Soft	2 = Small - Medium	2 = Slight-Some
1 = Poor	1 = Poor	1 = Soft	1 = Small	1 = None

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RESULTS

The environmental conditions during 2005 growing season were variable. Temperatures were below average after transplanting and early vegetative growth was good. Temperatures were favorable during the early fruit set period, but temperatures were above average during the main season causing stress and reduced vegetative growth and fruit size.

Table 1. Vine Vigor, Early and Total Marketable Yield, Round Tomato Trial - 2005

Variety	Seed Source	Vine[1] Vigor Rating	Early[2] Market Yield Boxes/A	Season Marketable Yield Large &[3] Ex.Large Box/A	Large & Ex.Large %	Total %
Amelia	Harris Moran	3	857	1862	32	55
Biltmore	Seminis	4	895	2338	32	61
BHN 586	BHN	3	890	2224	21	62
BHN 591	BHN	3	1064	2261	27	59
BHN 640	BHN	2	790	1485	29	59
BHN 685	BHN	4	829	2513	13	58
Christa	Harris Moran	4	769	1862	24	50
FLA 47	Seminis	3	847	2037	29	59
Floralina	Seminis	3	949	2130	27	64
FT 4010	Rogers-Syngenta	4	480	3083	16	66
Escudero	Harris Moran	3	975	1935	29	55
Mykonos	Seminis	3	1294	1998	21	58
Mt Fresh plus	Rogers	4	371	2098	15	58
NC 0227	Randy Gardner	3	722	2371	18	65
NC 0236	Randy Gardner	3	798	2361	21	65
NC 0377	Randy Gardner	4	1000	2147	28	54
NC 0392	Randy Gardner	3	911	2052	31	64
Phoenix	Seminis	4	702	2573	30	66
Quincy	Seminis	5	506	2300	20	60
Sunguard	Seminis	3	814	2642	24	68
Sunrise	Seminis	3	1414	2136	28	62
Sunsation	Seminis	2	1560	2683	34	68
LSD 5%		0.9	502	NS	9	NS
HSD 5%		1.7	985		18	

[1]5=Excellent, 3=Good, 1=Poor. [2]Early Yields from harvest 1 and 2. [3]Large = 2.75 – 3.5, Extra Large = > 3.5 size fruit.

Table 1 shows the results of vine vigor ratings and marketable yields. Vine vigor of Quincy was the highest in the trial. Biltmore, BHN 685, Christa, FT 4010, Mt. Fresh plus, NC 0377 and Phoenix were all rated very good for vine vigor. BHN 640 and Sunsation were rated fair and all other varieties in the trial had good vigor.

Early marketable yield (boxes/A) was highest for Sunsation, (1560) Sunrise (1414), Mykonos (1294) and BHN 591 (1064). Mt. Fresh plus (371), FT 4010 (480) and Quincy (506) produced the lowest early yields. All other varieties were intermediate, yielding 702 – 1000 boxes per acre in harvests 1 and 2 combined (Table 1).

Marketable yields for the season did not differ significantly among varieties in the trial. However there were several trends. FT 4010, Sunsation, Sunguard, Phoenix and BHN 685 all produced

over 2500 boxes per acre. BHN 640 yielded 1485 boxes/A and Christa and Amelia yielded 1862 boxes /A. Escudero yielded 1935 and Mykonos yielded 1998 boxes/A. Mykonos had a pronounced split set, with high early yield, low mid-season yield and a good late season yield. All other varieties in the trial produced yields in the range 2047-2371 boxes/A (Table 1).

Fruit size was generally smaller in the 2005 trial compared to most previous years. Sunsation, Amelia, Biltmore, NC 0392 and Phoenix all had 30% or more of marketable fruit in the large and extra large size category (greater than 2.75 inch diameter). NC 0227, FT 4010, Mt. Fresh plus and BHN 685 all had less than 20% of marketable fruits in the large and extra large category. The remaining varieties had 20-29% of the marketable fruits in the large and extra large size category.

There were no statistical differences among varieties for percentage of total fruit that were marketable (Table 1). The range of percent marketable fruit was narrow, 50-68, with most of the varieties between 55 and 64% marketable.

Table 2. Fruit Characteristics, Fresh Market Round Tomato Trial – 2005

Variety	External[1] Color	Internal[1] Color	Firmness[1]	Blossom[1] Scar	Shoulder[1] Appear.	White[1] Tissue
Amelia	3	2.5	3	3	3	2.5
Biltmore	3	2.5	3	2.5	1.5	3.5
BHN 586	2.5	2.5	3.5	2.5	2.5	4.5
BHN 591	2.5	2.5	3	2.5	3	4
BHN 640	3	2.5	2.5	3	2	3
BHN 685	2.5	2.5	2	2	2.5	2.5
Christa	3	2.5	2	3.5	3	3
FLA 47	2	2	3.5	3	2.5	4
Floralina	3	2.5	3	3	3	3.5
FT 4010	3	3	2.5	3.5	4	2.5
Escudero	3	3.5	3	3	3	3
Mykonos	3	3	3	2.5	1.5	2.5
Mt Fresh plus	3	3	2.5	2	3.5	3
NC 0227	3	2.5	3	2.5	3	4
NC 0236	3.5	3	3	3	3	3.5
NC 0377	3	3	3	2	3	3.5
NC 0392	2.5	2.5	3	2.5	3.5	3.5
Phoenix	2.5	2.5	3	3	3	4
Quincy	3	2.5	3	3	3.5	3.5
Sunguard	3.5	3	3	2.5	4	4
Sunrise	3.5	2	3	2	1.5	4.5
Sunsation	3.5	3	3	2.5	3.5	3.5
LSD 5%	NS	0.7	0.7	NS	1.1	1.2
HSD 5 %		1.4	1.4		2.1	2.3

[1]See Table in methods section for a description of ratings.

Fruit characteristics were evaluated on fruit harvested on August 15. The results are shown in Table 2. In general, the range of ratings was relatively narrow. There were no statistical

differences among varieties for external fruit color. There was a trend toward higher fruit color in NC 0236, Sunguard, Sunrise and Sunsation compared to Florida 47.

Escudero was rated very good (3.5) for internal color, significantly higher than Sunrise and Florida 47, both of which were rated fair (2) for internal color. All other varieties were rated fair-good (2.5-3.0) for internal color.

There were several significant differences among varieties for fruit firmness (Table 2). Florida 47 and BHN 586 were rated medium-firm (3.5) compared to medium-soft (2) for BHN 685 and Christa. All other varieties in the trial were rated medium (2.5-3.0) for firmness.

Blossom scar size was not statically different among the varieties. FT 4010 and Christa tended to have larger blossom scars than BHN 685, Mt. Fresh plus, NC 0377 and Sunrise.

There were significant differences in shoulder appearance (smooth, glossy) among varieties. FT 4010 and Sunguard were rated very good (4.0) for shoulder appearance. Mt Fresh plus, NC 0392, Quincy and Sunsation had good-very good shoulders (3.5). Biltmore, Mykonos and Sunrise shoulders were rated fair-poor and all other varieties were rated fair-good or good.

The incidence and severity of internal white tissue was high in the 2005 trial. The following varieties had severe white tissue ratings: BHN 586 and Sunrise. Varieties with some-moderate ratings (2.5) of white tissue were Amelia, BHN 685 and FT 4010. All other varieties were rated moderate (3.0-3.5).

SUMMARY

The growing conditions of the 2005 season resulted in a relatively narrow range of yield and fruit quality. All varieties had some significant limitations in either yield components or fruit quality characteristics. There were high levels of internal white tissue in the fruits of most varieties. No varieties had a “none” or “slight-some” rating for white tissue. Those varieties with “some-moderate” levels of internal white tissue included Amelia, BHN 685 and Christa.