APPENDIX A.1

2002 ROUND TOMATO VARIETY TRIAL SUMMARY[1]

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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 thirty two promising lines were included in the trial conducted at Rutgers Agricultural Research and Extension Center, Bridgeton, NJ.

METHODS

Culture

Seeds were sown on May 15th, 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 June 18. Plants were grown on four foot stakes. The plants were pruned to allow three axillaries to develop below the main fork. Four 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 3.9, 6.1, 2.1, 3.0 and 2.5 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 September 3 when early fruits were ripening and on 9/10, 9/17 10/2 and 10/9. All fruits with pink to red maturity were harvested. Fruits were separated into usable, and culls. Major defects were identified and recorded. A sample of representative fruit from each plot was used to evaluate external and internal fruit characteristics.

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

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RESULTS

Data from the trial are summarized in tables 1 and 2. There were statistical differences among varieties for all characteristics.

Table 1. Early Yield and Fruit Size, Round Tomato Trial-2002

Variety	Seed Source	Early Market Yield Boxes/A	Early % Market Yield	Total Market Yield Boxes/A	% Total Market Yield
AC 17	NJAES	148	38	791	29
BHNX 591	BHN Seed	421	75	1738	58
BHNX 641	BHN Seed	140	55	1270	53
BHNX 648	BHN Seed	155	68	1445	58
FLA 47	Seminis	177	64	1253	58
FLA 91	Seminis	71	36	1575	56
Floralina	Seminis	285	73	1444	63
HMX 0800	HM Seed	317	74	1237	59
Mountain Crest	NC State	117	70	1346	55
NC 0015	NC State	187	58	1431	59
NC 0016	NC State	639	80	1530	66
NC 00245	NC State	482	64	1676	63
NC 96365	NC State	512	69	2097	66
Ramapo	NJAES	149	42	790	32
S – 329	Seminis	149	58	1282	54
S – 334	Seminis	492	60	973	43
S – 336	Seminis	742	72	1442	56
S – 1225	Seminis	373	79	1488	60
S – 1290	Seminis	176	63	1152	54
S – 1291	Seminis	178	62	1252	49
S – 1797	Seminis	300	74	1705	60
S – 3242	Seminis	699	84	1694	68
S – 6095	Seminis	127	51	1204	48
S – 6857	Seminis	52	50	1452	51
S – 7500	Seminis	188	63	1992	53
Sunbeam	Stokes	390	62	1313	51
Sunbrite	Stokes	453	72	1542	59
Sunchief	Seminis	419	70	1231	53
Sunguard	Seminis	214	61	1759	62
Sunsation	Seminis	232	65	1657	62
Sunshine	Seminis	622	53	1201	43
SDWY 10250	Seedway	153	35	1202	42
LSD 5%		154	20	476	10
HSD 5%		314	41	971	20

Table 2. Fruit Characteristics Fresh Market Round Tomato Trial – 2002

Variety	External Color	Internal Color	Firmness	Blossom Scar	White Tissue
AC 17	5.0	4.0	1.0	3.5	3.0
BHNX 591	4.0	3.5	4.0	3.0	4.5
BHNX 641	4.0	4.0	4.5	3.5	5.0
BHNX 648	4.5	4.0	4.5	2.0	5.0
FLA 47	3.5	2.0	4.0	3.5	2.5
FLA 91	3.5	3.0	3.5	4.0	3.5
Floralina	3.5	3.5	4.0	3.0	3.5
HMX 0800	3.0	2.5	3.5	4.0	2.5
Mountain Crest	1.5	2.0	5.0	4.0	3.0
NC 0015	2.5	2.5	3.5	2.5	3.0
NC 0016	3.5	2.5	3.0	2.5	2.5
NC 00245	3.5	2.5	3.5	3.5	2.5
NC 96365	3.0	3.0	3.5	3.5	4.0
Ramapo	4.0	3.5	1.0	3.5	3.5
S – 329	2.0	2.0	3.5	4.5	1.0
S – 334	3.0	3.0	2.5	3.0	2.0
S – 336	1.0	2.5	3.0	3.0	1.5
S – 1225	4.0	3.5	4.5	2.5	4.5
S – 1290	2.0	3.0	3.0	2.0	3.0
S – 1291	2.5	3.0	3.0	1.0	3.0
S – 1797	3.0	2.0	2.5	2.5	3.5
S – 3242	2.0	1.5	3.5	3.5	4.0
S – 6095	1.5	1.5	4.0	4.5	1.5
S – 6857	3.5	2.5	4.5	4.0	3.5
S – 7500	3.0	2.0	2.0	4.0	3.5
Sunbeam	3.0	3.0	2.5	5.0	3.0
Sunbrite	3.0	2.5	2.5	4.0	3.0
Sunchief	3.0	3.0	2.5	1.5	4.5
Sunguard	3.0	2.5	3.5	3.0	3.0
Sunsation	3.5	2.5	3.5	1.5	2.5
Sunshine	3.0	3.0	2.0	4.5	1.5
SDWY 10250	3.0	2.5	3.0	4.5	1.5
LSD 5%	1.4	1.9	1.9	1.7	2.1
HSD 5%	2.2	2.6	3.0	2.4	3.5

Low rainfall and high temperatures during the fruit set and enlargement period reduced yields. Most varieties did set during the high temperature conditions, but vine vigor and the percentage of large fruits was lower than in previous years. Late August and September rains decreased marketable yields due to rain checking of fruits.

Early marketable yield (first harvest) was high in S-336, S – 3242, NC 0016, Sunshine and NC 96365 (Table 1). Total marketable yields (all harvests) were high in, NC 96365, S – 7500,

Sunguard, BHNX 591, S – 1797, S-3242, NC 00245 and Sunsation. AC 17 and Ramapo had the lowest marketable yields and percentage of usable fruits, due to fruit cracking. Varieties with a high percentage of large (2.75-3.5 inch diameter) and extra large fruits (3.5 inch and greater) are listed below (Data not in table). FLA 47, FLA 91, Floralina, HMX 0800, NC 0015, NC 00245, S – 1797, S – 6095, S – 7500, Sunbrite, Sunchief and SDWY 10250. The following varieties had a lower percentage of large and extra large fruits, and may not be suitable for some production operations, Mountain Crest, NC 0016, S – 1225 and Sunshine.

The external color of AC 17, BHNX 591, BHNX 641, BHNX 648, Ramapo and S – 1225 was rated very good or excellent. Mountain Crest, S – 329, S – 5336, S – 1290, S – 3242 and S – 6095 were rated fair or poor for external color (Table 2).

The internal color of AC 17, BHNX 641 and BHNX 648 was rated very good, and BHNX 591, Floralina, Ramapo and S – 1225 were rated good to very good for internal color. Those varieties with fair or poor internal color include FLA 47, Mountain Crest, S – 329, S – 1797, S – 3242 and S – 6095 (Table 2).

Many varieties were rated very good or excellent in fruit firmness. They included BHNX 591, BHNX 641, BHNX 648, FLA 47, Mountain Crest, S – 1225, S – 6095, and S – 6857. AC 17, Ramapo, S – 7500, and Sunshine were rated fair or poor in fruit firmness.

Blossom Scars of S – 1290, S – 1291, Sunchief and Sunsation were relatively small (Table 2). FLA 91, HMX 00800, Mountain Crest, S – 329, S – 6095, S – 6857, S – 7500, Sunbeam, Sunbrite, Sunshine and SDWY 10250 had large blossom scars.

Shoulder characteristics were evaluated, but data are not shown. Frequent rainfall during the late growing and harvest period in combination with below average vine vigor resulted in decreased shoulder smoothness. Those varieties with the best shoulder quality were NC 0016, NC 00245 and SDWY 10250. Those with the poorest shoulder quality were S – 336 and S – 1291.

Internal white tissue was observed in fruit samples of many varieties in the trial (Table 2). Those varieties with the least white tissue (high rating number) include BHNX 591, BHNX 641, BHNX 648, NC 96365, S – 1225, S – 3242 and Sunchief. Those varieties with a high level of white tissue (low rating number) were S – 329, S – 334, S – 336, S – 6095, Sunshine and SDWY 10250.

Based on this trial, the commercially available varieties FLA 47, FLA 91, Floralina, Sunsation, Sunguard and Sunbrite had a good combination of yield and fruit characteristics. The experimental hybrids BHNX 591 and NC 96365 were among the best in the trial. These two and several other experimental hybrids will be evaluated again in 2003.