2010

Tomato Variety Observations

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Abstract
We continued our yearly evaluation of tomato varieties for commercial growers. Each year the major fruit problems are uniformity, consistent shape and size, ripening disorders, and vegetative plant size and foliage cover. Our objective was to examine early-, mid-, and main-season maturities. All were large fruited fresh market varieties.

Keywords
RFR A9017, Horticulture

Disciplines
Agricultural Science | Agriculture | Horticulture

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RFR-A9017

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Introduction

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Materials and Methods

The major soil type at the Horticulture Research Station, Ames, IA, is a well-drained, fine textured loam. The herbicide Treflan 4E was applied to the soil surface on May 5, rotovated 4-in., and SRM-red (wavelength selective) polyethylene mulch applied the same day. Tomato transplants were set May 8. The experimental design was completely randomized with two replications. Other cultural practices included fertilizer according to soil test results, trickle irrigation, pruning the plants to the first flower cluster, and staking and tying according to the Florida stake and weave system. Disease pressure was heavy (mostly *Septoria*) and a weekly fungicide program was followed.

Harvest commenced July 24 and ended August 31. Ripe fruit was picked twice per week and sorted into marketable and unmarketable categories. Unmarketable, or cull, was considered small (< 1 7/8 in.), ripening disorders (cat-face, blotchy), pronounced bullet shape, cracks, and rots.

Results and Discussion

The early growing season temperatures of late April through May were 1.1°F below normal with above normal rainfall (1.24 in.). For the most part, it was a very cool, if not cold, vegetable growing season with only six days with maximum air temperature > 90°F. The month of July averaged 7°F below the normal temperature of 77°F. Rainfall was generally below normal, except for August, which was near normal at 4.26 in. The last spring frost was April 15 at 30°F although nighttime lows were in the low 30s on April 27, May 2, 16, and 17. The first fall light frost occurred on October 9 and a hard freeze, 26°F, on October 10. The respective normal 25% chance of frost is May 9 and October 6.

Sunshine was the earliest variety with fruit production occurring on July 24, or 80 days from the transplant date of May 5 (Table 1). Only eight varieties produced fruit by August 3. The other seven fruited either August 6 or 10 (Table 2). Cull fruit, as a percentage of total harvested fruit, was 23% in the first two pickings compared with 40% for the same eight varieties for the entire 5-week harvest period. Most of the cullage (radial and concentric cracking) occurred on the August 24 and 31 harvests as the result of increased rainfall frequency from August 24 to 27 (13 days of rain). Red Defender and Nico were two of the eight early varieties that maintained a high percent of marketability. Days to maturity averaged 91 days for the 15 varieties compared with the catalog listed 74 days because of the very cool growing season—a 17 day delay. The other very cool growing season was 1992 with May to August 31 average temperature of 64°F or cumulative 27°F below normal (-6.8°F/month). Similar time period averages for 2009 were 68°F with cumulative of 13°F below normal (-3.3°F/month). In 1992 tomato transplants were set May 20 and first harvest occurred August 7, or 80 days from

transplanting (note: of the 12 varieties tested in 1992, none were in the 2009 trial).

Highest marketable yield, and the least cull fruit (approximately 27%), occurred for Nico, Red Defender, and Mountain Crest. Other high yielding varieties, but with more overall cullage (approximately 40%) were: Sun Leaper and the heirloom Box Car Willie. Five varieties (Sunshine, PolBig, Biltmore, Scarlet Red, and Florida 91) had particularly high quantities of unmarketable fruit. Primo Red had high total yield, but after early harvest the percentage of small and bullet shaped fruit increased considerably reducing overall marketable yield.

Fruit size varied from 5.4 ounce (Tasti-Lee, a high lycopene type) to 12.1 ounce (Scarlet Red). For a smaller tomato market consider Tasti-Lee, Sun Leaper, and PolBig.

The major foliar disease was *Septoria* with some bacterial speck/spot. Foliage was visually rated on August 24 for disease pressure. Heavy disease was evident in PolBig, Primo Red, Sunshine, Fletcher, and Sun Leaper. Those with low incidence on this date included Scarlet Red, Red Defender, Florida 91, and Box Car Willie. Disease incidence seemed to be associated with fruit load.

A subjective taste test performed on the August 27 harvest indicated most varieties were bland, except Box Car Willie, PolBig, Fletcher, and Primo Red, which had a somewhat distinctive taste. Internal incidence of white core was noted and Primo Red, Nico, Florida 91, and Red Defender were more affected than other varieties. However, cut fruit indicated wide variability within a variety.

Most all varieties production peaked on August 24, except Mountain Glory, Tasti-Lee, and Fletcher where production peaked a week earlier, August 17. Varieties worthy of trial include: Nico, Red Defender, Box Car Willie, and Mountain Crest. For a more detailed report with graphs and photos of cut fruit go to: www.public.iastate.edu/~taber/Extension/progress%20Rpt%2009/Contents09.htm

Acknowledgements

We wish to thank Pliant Corporation (www.pliantcorp.com/prodmkt/pm_agricultural/index.php) for donating the mulch film and the following seed companies for providing the seed for the trial:

- Rispens Seeds, Inc., Beecher, IL (Derrill Kregel)
- Rupp Seeds, Inc., Wauseon, OH (Barry Rupp)
- SeedWay, Elizabethtown, PA (Mark Pflumm)
- University of Florida, Wimauma, FL (J.W. Scott)

Table 1. **Tomato variety early performance (July 24 to August 3 harvests), as lb/10 plants, at the Horticulture Research Station, Ames, IA, 2009. Transplants set May 5.**

Variety	Marketable	Cull	% Marketable
Sunshine	21.1	12.5	62.8
Primo Red	13.4	1.9	87.6
Red Defender	11.6	4.1	73.9
Nico	11.1	0.7	94.9
Mtn. Glory	9.4	1.1	89.5
Tasti-Lee	4.6	3.6	56.1
PolBig	3.4	1.3	72.3
Fletcher	2.7	0.8	77.1

Table 2. **Total seasonal tomato variety performance, as lb/10 plants, at the Horticulture Research Station, Ames, IA, 2009. Harvest period from July 24 to August 31.**

Variety	First pick	Days to harvest (DTH)	Catalog DTH	Marketable	Total	% Marketable	Marketable fruit size, oz.
Sunshine*	Jul 24	80	66	41.9	92	45.4	11.0
Red Defender	Jul 31	87	78	99.0	136	73.2	10.1
Primo Red	Jul 31	87	67	81.1	132	61.5	9.7
Nico	Aug 3	90	76	112.3	153	73.2	8.7
Fletcher	Aug 3	90	74	74.5	122	61.0	9.2
Mtn. Glory	Aug 3	90	72	72.4	116	62.5	9.6
PolBig	Aug 3	90	61	66.9	137	48.8	8.4
Tasti-Lee	Aug 3	90	75	64.5	118	54.5	5.4
Sun Leaper	Aug 6	93	80	100.4	159	63.3	8.4
Box Car Willie	Aug 6	93	80	97.7	157	62.3	10.4
Mtn. Crest	Aug 6	93	75	92.3	128	72.2	9.0
Shady Lady*	Aug 6	93	75	29.2	54	54.0	9.5
Biltmore	Aug 10	97	80	65.7	114	57.8	11.2
Scarlet Red *	Aug 10	97	75	27.9	47	60.0	12.1
Florida 91*	Aug 10	97	72	15.0	30	50.0	8.5

*Stopped picking on August 17 because of high amount of cull fruit; thus, total fruit yield low for these varieties.