

Final Report FNE01-355

Heirloom Tomato Variety Trials

2. Goals of project— To evaluate yield, consistency of appearance, and flavor for tomatoes grown in greenhouses and in the field. The aim will be to discover one or more variety which has the most potential in each of several color/size categories.
3. Farm info—has remained the same since the start of the project.
4. Cooperators were Ruth Hazzard and Vern Grubinger of UMass and UVM Extension—Their role was mostly in the dissemination of results.
- 5-10. See Below.

Introduction and Methods

Heirloom tomatoes are currently enjoying a huge surge in popularity. The wide range of colors and flavors make them extremely appealing for restaurant chefs and for fresh-market customers. Their special handling requirements make them an ideal niche crop for small, direct-market oriented farmers. However, the thousands of varieties available and the wide variability make for some difficult choices for farmers. This project evaluated 38 varieties for yield and quality under typical organic market farm management.

We were looking for varieties within each of several color classes which had high yields of marketable fruits and good flavor. Yellow/orange, black/purple, and bi-color (yellow with red stripes) tomatoes were evaluated at Simple Gifts Farm (SGF) in Belchertown, MA, and yellow/green, black/purple, and pink tomatoes were evaluated at the Big Red Barn (BRB) in Winchendon, MA. The black/purple color class was grown at both farms to compare site differences. In addition, 10 varieties in several color classes were evaluated in a high tunnel at SGF.

The sites differed considerably in conditions. Though less than 50 miles apart geographically, BRB is at a higher elevation, and experienced cooler conditions. First field harvest was on August 1st at SGF and on August 12th at BRB. Localized rainfall and a heavy soil provided adequate moisture at SGF, while BRB had drought conditions for much of the summer. Tomatoes at BRB were grown at a 3-foot spacing, with 2 plants per plot; at SGF, plants were at an 2-foot spacing, with 2 plants per plot. Both sites were set up in a randomized complete block design to compensate for variations within the field. Weight harvested, number of tomatoes per harvest, and average weight per fruit was measured at BRB. Only marketable fruits were weighed, so yield figures are marketable yield only. At SGF, number of fruits was not measured, so average weight was not calculated. However, both first-quality and cull fruits were weighed, so cull rates are presented. In all of the following tables, numbers within the same column followed by the same letter are not significantly different. Columns without letters indicate no significant differences. The field trials at SGF exhibited very high levels of variation which eliminated statistically significant differences in many of the categories. Early yield indicates yield within the first three weeks of harvest.

Black Tomatoes

Black tomatoes were grown on both farms. The black tomatoes performed very well at BRB, and very poorly at SGF. BRB found that the black tomatoes had the

strongest yields and best flavor of any of the tomatoes. At SGF, the usually strong performance of the black tomatoes was not observed in 2001. Most of the black tomatoes had lower yields, paler color and less remarkable flavor than SGF usually observes for the same varieties in other seasons. There must have been some site condition which disadvantaged the black tomatoes at SGF this year (note that yields were higher at SGF in general due to the longer season; black tomato yields were higher at SGF than at BRB, but low relative to other tomatoes at SGF). Cherokee Purple and Black Prince were noted at BRB for their good flavor and uniformity. Black Plum and Russian Black both had high yields but small fruits and unremarkable flavor.

Black Tomato Variety	Early Yield SGF (lbs./100 row ft.)	Total Marketable	
		Yield SGF (lbs./100 row ft.)	% Marketable Yield SGF
Black Brandywine	11.4	133.7	55.2%
Black	30.0	111.5	40.8%
Russian Black	37.9	103.2	41.2%
Black Prince	27.3	93.9	48.6%
Black Krim	33.2	88.9	49.8%
Black from Tula	29.1	74.3	35.3%
Marizol Purple	21.1	68.6	60.1%
Cherokee Purple	20.0	44.0	39.4%
Black Early	13.2	37.6	26.2%

Black Tomato Variety	Early Yield BRB (lbs./100 row ft.)	Total Marketable	
		Yield BRB (lbs./100 row ft.)	Average Weight Per Fruit (lbs.)
Russian Black	63.9	104.2a	1.73bc
Black Brandywine	56.9	98.6ab	2.82a
Cherokee Purple	50.0	86.1abc	1.68bc
Black Plum	52.8	83.3bc	0.85c
Black from Tula	52.8	69.4c	1.85b
Black Prince	33.3	43.1d	1.07bc

Yellow/Green Tomatoes

Yellow to green tomatoes were grown at BRB. Green Pineapple was the most surprising variety, with beautiful fruit, great flavor, and high yields. Tasty Evergreen and Green Zebra are dependable and flavorful. Garden Peach and Plum Lemon are distinctive in appearance even though their flavor is not the best. Yellow Brandywine and Aunt Ruby's Green were particularly low-yielding and inconsistent in appearance.

Yellow/Green Tomato Variety	Early Yield (lbs./100 row ft.)	Total Marketable	
		Yield (lbs./100 row ft.)	Average Weight Per Fruit (lbs.)
Garden Peach	41.7ab	111.1a	1.04
Green Pineapple	45.8a	106.9ab	1.40
Plum Lemon	27.8abc	90.3abc	1.42

Tasty Evrgreen	22.2bcd	73.6abcd	2.83
Yellow Brandywine	0.0e	41.7bcd	1.72
Green Zebra	2.8de	38.9cd	1.06
Aunt Ruby's	13.9cde	20.8d	1.25

Yellow/Orange Tomatoes

Yellow/Orange tomatoes were grown at SGF. This class did especially well, with many of the varieties exhibiting very good uniformity, yield and flavor. Nebraska Wedding, Moonglow, Russian Persimmon, and Amana Orange were all quite similar in appearance, being relatively round, defect free, and a nice bright orange color. Golden Sunray was disappointing—a strange off-orange color, and inconsistent shape. Elberta Girl was supposed to be a striped tomato, but came out practically identical to Garden Peach—pale yellow, small and fuzzy, with pleasant but not dramatic flavor.

Yellow/Orange Tomato Variety	Early Yield (lbs./100 row ft.)	Total Marketable Yield (lbs./100 row ft.)	% Marketable Yield
Nebraska Wedding	65.0a	221.3	78.4%
Goldie	27.1ab	219.3	48.0%
Amana Orange	72.4a	195.5	55.9%
Golden Sunray	41.5ab	176.5	76.0%
Moonglow	38.6ab	146.6	68.2%
Russian Persimmon	21.2ab	137.8	70.8%
Elberta Girl	10.4b	102.5	78.0%
Azoychka	31.6ab	85.7	68.4%

Striped Tomatoes

Striped tomatoes were grown at SGF. These were the highest yielding tomatoes due to their large fruits. The large fruits can be somewhat hard to sell at a premium retail price. The varieties were fairly similar in flavor and appearance, with the exception of Georgia Streak, which turned to be an orange tomato with no stripes and very inconsistent appearance. Gold Medal had slightly less distinct stripes than the other varieties, but had a very uniform appearance.

Striped Tomato Variety	Early Yield (lbs./100 row ft.)	Total Marketable Yield (lbs./100 row ft.)	% Marketable Yield
Marizol Gold	62.0	326.9	53.0%
Gold Medal	13.2	305.6	60.7%
Striped German	31.0	219.8	59.3%
Northern Lights	47.0	207.4	67.3%
Hillbilly	13.8	168.2	50.6%
Georgia Streak	28.5	153.1	61.6%
Pineapple	3.3	115.0	44.5%

Pink Tomatoes

Pink Tomatoes were grown at BRB. This category seemed to be affected by the drought more than the other two categories. Eva's Purple Ball was the best variety in this trial, with good flavor and yield and extraordinarily consistent. Caspian Pink was also very free of defects, and had the highest yield, but had less flavor. The beefsteak varieties all performed poorly in one category or another. Pruden's Purple was the best of the pink beefsteaks but the pinks should be re-tested under more favorable conditions.

Pink Tomato Variety	Total Marketable		
	Early Yield (lbs./100 row ft.)	Yield (lbs./100 row ft.)	Average Weight Per Fruit (lbs.)
Caspian Pink	68.1	108.3	2.49
Eva's Purple Ball	36.1	98.6	2.51
Brandywine	26.4	97.2	3.68
Crnkovic	31.9	95.8	3.43
Pruden's Purple	40.3	88.9	3.33
Marizol Purple	25.0	55.6	2.17

Hoophouse Tomatoes

Tomatoes from several color classes were grown in the high tunnel at SGF. First harvest was 3 weeks earlier than the field tomatoes, and the early harvests were heavier than the earliest field harvests. Fruit quality was higher, and cull rates lower, than in the field. Most culls came later in the season, due to a hornworm infestation. Hybrid tomatoes were also grown in the high tunnel—while they were not included in the trial, yields were higher than the heirlooms, but not so much higher that the heirlooms were unprofitable. In our marketplace, unheated high tunnels do not produce the earliest tomatoes, so the colorful heirlooms help to differentiate our product from the earlier greenhouse tomatoes. Cherokee Purple and Black from Tula were lower-yielding than they had been in previous seasons, as were most of the black tomatoes in the field at SGF in 2001. Tigerella had decent yields, but was uninteresting in appearance and flavor. All of the other varieties had great results in the hoophouse.

Hoophouse Tomato Variety	Total Marketable		
	Early Yield (lbs/100 sq. ft.)	Yield (lbs/100 sq. ft.)	% Marketable Yield
Persimmon	31.2a	134.6a	97.1%a
Marizol Gold	0.0c	119.3a	78.5%ab
Black Plum	13.7bc	113.1a	95.0%a
Nebraska Wedding	8.6bc	110.8a	95.8%a
Green Zebra	5.4c	99.9ab	77.8%ab
Tigerella	20.5ab	93.6ab	90.5%a
Moonglow	11.4bc	93.6ab	97.4%a
Gold Medal	13.6bc	78.8ab	85.3%
Cherokee Purple	13.9bc	50.1b	55.7%b

Black from Tula 10.6bc 47.9b 77.9%ab

11. Outreach component

The final report has been sent to *Hortideas*, *Growing for Market*, and to cooperators Vern Grubinger and Ruth Hazzard of UVM and UMass Cooperative extension for possible publication.

12. Jeremy Barker-Plotkin and Don Franczyk

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