

# Tomato Variety Trial, 2010

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## Introduction

In recent years, Daviess County, Indiana and the surrounding region have seen an increase in small and medium-scale vegetable production. Growers are producing vegetables for sale and distribution through a variety of marketing venues. Tomato is a frequently grown vegetable crop in the region. Additionally, fresh market tomato is a leading product for many local roadside stands and produce auctions. Tomato growers are offered numerous variety options. However, it has been observed locally that growers tend to use older fresh market varieties. While many newer commercial varieties are available, locally generated performance data that would encourage growers to switch to these varieties is lacking. Our goal was to evaluate several of the fresh market tomato varieties available to local growers in an effort to identify those that are best suited to production in our region.

## Materials and Methods

Seeds of 40 fresh market tomato varieties were sown into 73-cell flats on April 1. Seeds were germinated and resulting transplants were grown in a greenhouse at the Southwest Purdue Agriculture Center near Vincennes, Indiana. Tomato varieties consisted of globe, saladette, and Campari types, as well as both determinate and indeterminate varieties.

Transplants were planted into a field on a local farm. Six months prior to transplanting, poultry litter at the rate of 1 ton per acre and agricultural lime at the rate of 3 tons per acre were applied to the field. On May 7, transplants were planted into rows arranged on 6-foot centers. Each row was covered by a 3-foot strip of black plastic mulch with drip irrigation installed. Individual varieties were transplanted into plots of ten plants. Spacing between plants was 24 inches. The trial simulated production at 3,630 plants per acre. Plots were arranged in a randomized complete block design with three replications of each variety. Following transplanting, plants were grown in accordance with accepted commercial practices and were trellised using the Florida Weave System.

Individual plots were harvested between June 14 and October 4. Following harvest, fruit from each plot were graded as number one, number two, or culls, in accordance with USDA Standards. All number one and number two fruit were counted and weighed, while culls were only counted. For most harvests, two tomatoes that were graded as number ones were selected from each plot. These tomatoes best represented the average size for all number one fruit from the individual plot, based on visual observation. Selected fruit were measured to find length and width. Also, the percentage of soluble solids was determined for one of the selected fruit using a handheld refractometer. Data were then compiled and subjected to appropriate statistical analysis.

## Results and Discussion

Following compilation, data were subjected to an analysis of variance (ANOVA). Additionally, treatment means were subjected to a mean separation procedure (Fisher's LSD). The trial contained saladette, globe, and Compari-type varieties. In general, differences were noted in the data among fruit types. The largest yield was seen in 'Mt. Magic,' the lone Compari-type variety, followed by the various saladette and globe varieties. Yield data are summarized in Table 1.

The ANOVA indicated highly significant varietal differences in the yield of number one fruit ( $\alpha = 0.05$ ). Mean yield of number one fruit ranged from 16,819-770,770 fruit/acre, with 'Mt. Magic' yielding the largest quantity of fruit and 'BHN 961' yielding the lowest. The mean yield of number one fruit among saladette varieties ranged from 67,155-169,763 fruit/acre, with 'Picus' and '#55293' being the highest and lowest yielding saladette varieties, respectively. Mean number one fruit yield among globe varieties ranged from 16,819-58,443 fruit/acre with '#01522942 PS' having the largest and BHN 961 having the smallest mean yield.

Overall, the mean weight of number one fruit produced ranged from 6,534-40,293 lbs/acre, with 'Mt. Magic' being the largest yielder. Among saladette varieties, the mean weight of number one fruit ranged from 32,156-11,843 lbs/acre. The highest and lowest were 'Picus' and '#55293,' respectively. The range of mean number one fruit weights for globe varieties was 24,291-6,534 lbs/acre. '#01522942 PS' produced the largest weight of number one globes, while 'BHN 961' produced the smallest.

When selling into large wholesale marketing channels, growers frequently do not differentiate between number two fruit (or seconds) and culls. However, in local markets and produce auctions, number two tomatoes are routinely identified and sold. While this class of tomato generally commands a lower price in the marketplace, the ability to move tomatoes of this class beyond the farmgate presents growers with an opportunity to not only maximize income, but also to prevent losses associated with unmarketable fruit. Consequently, when evaluating fruit from this trial, yields of number two fruit were taken into consideration. ANOVA results indicated significant differences in the weight of number two fruit produced, as well as highly significant differences ( $\alpha = 0.05$ ) in the quantity of number two fruit among varieties. In general, saladette varieties produced more seconds than the globe varieties. As saladette varieties tended to be the largest yielders, one would expect a corresponding increase in the quantity of number two fruit produced. The mean quantity of number two fruit ranged from 27,165-126,808 fruit/acre, with '#830700112' producing the lowest quantity and '#5897' producing the highest. For these varieties, number two production constituted 32.6 and 42.2 percent of mean total yield, respectively.

Culls, defined as fruit not classed as number one or number two, and being unmarketable, were counted at harvest. Statistical analysis indicated highly significant differences ( $\alpha = 0.05$ ) in the mean number of culls/acre (as a percent of mean total yield) among varieties. 'Mt. Magic,' produced the lowest percentage of culls, followed by the various saladette varieties. Among globe varieties, the percentage of culls ranged from 21.7-42.2, with 'BHN 876' and '#830700112' having the lowest and highest percentages, respectively.

**Table 1.** Yield data for three replications of 40 commercial tomato varieties evaluated in 2010.

Variety	Seed Source <sup>1</sup>	#1 Fruit <sup>2</sup>	#1 Fruit Weight <sup>3</sup>	Percent #1 <sup>4</sup>	#2 Fruit <sup>2</sup>	#2 Fruit Weight <sup>3</sup>	Culls <sup>2</sup>	Percent Culls <sup>4</sup>	Total Yield <sup>2</sup>
Mt. Magic <sup>5</sup>	BE/SW	770,770	40,293	84.7	62,678	3,721	77,561	8.5	911,009
Picus <sup>6</sup>	SG	169,763	32,156	53.2	104,423	23,293	48,642	14.8	322,828
Patria <sup>6</sup>	HM	137,093	29,827	49.5	107,448	21,864	29,766	11.0	274,307
Rubia <sup>6</sup>	SG	133,463	23,323	42.3	114,224	22,067	58,201	19.9	305,888
#5897 <sup>6</sup>	SG	117,854	23,368	39.3	126,808	27,543	56,023	18.6	300,685
Pony Express <sup>6</sup>	HM	102,003	23,958	48.8	75,504	18,695	32,307	15.4	209,814
Rodeo <sup>6</sup>	SG	99,942	21,456	42.0	101,092	22,877	36,865	15.5	237,901
Plum Regal <sup>6</sup>	BE/SW	99,825	23,414	40.6	84,942	19,768	62,194	25.2	246,961
#55293 <sup>6</sup>	SG	67,155	11,843	33.2	85,305	16,048	47,432	24.5	199,892
#01522942 PS	SG	58,443	24,291	41.0	48,400	21,447	34,606	24.6	141,449
BHN 876	RU	57,173	17,893	48.6	36,542	12,350	29,040	21.7	122,755
Tribute	SG	50,639	21,432	34.1	54,208	26,786	42,713	29.0	147,560
HM 8849	HM	50,336	20,706	40.0	44,286	24,518	30,976	24.7	125,598
#830702103	SG	46,101	17,893	35.2	55,297	28,042	29,040	21.9	130,438
Tasti-Lee	BE	42,229	14,838	32.7	48,340	18,747	29,706	26.0	120,274
Florida 91	CT	39,930	17,885	36.2	44,468	23,194	26,015	23.3	110,413
BHN 589	SG	39,688	14,051	39.8	33,033	13,885	28,435	27.9	101,156
Nico	HM	39,083	14,081	29.4	40,172	16,456	33,638	31.2	112,893
#830700573	SG	37,813	13,514	27.5	47,856	20,608	41,443	33.4	127,111
Rocky Top	SG/SW/RU	36,421	16,093	30.2	40,535	19,799	42,471	34.1	119,427
Fletcher	SW	35,453	14,928	30.8	40,656	18,437	40,777	34.5	116,886

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Table 1 (continued)

Variety	Seed Source <sup>1</sup>	#1 Fruit <sup>2</sup>	#1 Fruit Weight <sup>3</sup>	Percent #1 <sup>4</sup>	#2 Fruit <sup>2</sup>	#2 Fruit Weight <sup>3</sup>	Culls <sup>2</sup>	Percent Culls <sup>4</sup>	Total Yield <sup>2</sup>
#01721400 SVR	SG	35,211	13,915	29.2	39,486	22,135	43,318	37.3	117,975
Red Defender	HM/SW	33,154	11,177	28.9	40,051	15,715	40,051	33.9	113,256
#830700572	SG	32,973	13,976	26.9	47,614	22,990	45,920	35.3	126,506
Charger	SG	32,731	14,565	36.0	36,603	20,562	29,282	28.0	98,615
FL 200	SG	32,186	11,314	26.4	40,172	17,227	51,425	38.9	123,783
Applause F1	RU	31,944	10,890	30.9	44,407	20,706	29,524	27.3	105,875
Primo Red	HM/SW	30,734	13,219	25.7	44,770	22,582	35,332	34.2	110,836
LD0978	SG	30,734	11,087	26.6	37,268	16,426	48,037	40.8	116,039
#830700903	SG	30,311	11,435	29.0	36,058	14,868	39,083	37.5	105,452
BHN 963	SG	27,225	10,028	29.5	33,759	15,080	30,976	33.8	91,960
BHN 962	SG	26,257	10,875	27.5	35,816	18,074	39,325	37.6	101,398
Scarlet Red	HM	26,257	11,979	25.1	35,211	17,742	37,147	38.7	98,615
BHN 1009	SG	26,015	9,680	26.6	38,962	18,392	34,969	34.5	99,946
Mt. Spring	CT	25,773	10,300	29.1	40,051	18,816	24,442	26.0	90,266
Mt. Glory	RU	25,652	9,257	30.9	32,549	14,490	25,773	29.8	83,974
SecuriTY 28	HM	24,321	10,799	34.5	27,225	14,490	19,118	28.0	70,664
#830700890	SG	23,232	11,435	27.0	31,702	17,530	29,887	33.8	84,821
#830700112	SG	17,606	7,245	22.4	27,165	13,227	38,599	42.2	83,369
BHN 961	SG/SW/RU	16,819	6,534	17.5	40,051	18,430	39,083	40.6	95,953
lsd ( $\alpha=.05$ )		41,882	8,704	10.7	24,081	9,755	22,983	11.0	72,685

<sup>1</sup>SG=Sieger's, SW=Seedway, RU=Rupp, HM=Harris Moran, BE=Bejo Seeds, CT=CropTech Seeds.

<sup>2</sup>Mean yield (fruit/acre) of three replications.

<sup>3</sup>Mean weight (lbs/acre) of three replications.

<sup>4</sup>Quantity of indicated grade of fruit as a percentage of total yield (fruit/acre).

<sup>5</sup>Compari-type variety.

<sup>6</sup>Saladette variety.

Following the statistical analysis of yield data, physical measurements and percent soluble solids were pooled for all replications within varieties. Mean values for each variety were then calculated. Additionally, yield data were used to calculate the mean weight of individual number one fruit for each variety. These results are summarized in Table 2.

**Table 2.** Physical dimensions, percent soluble solids, and fruit weights for 40 tomato varieties evaluated in 2010.

Variety	Seed Source <sup>1</sup>	Length <sup>2</sup> x Width <sup>3</sup> (cm), (n)	%SS <sup>4</sup> , (n)	Individual #1 Fruit Weight <sup>5</sup> (Lbs)
Mt. Magic <sup>6</sup>	BE/SW	3.6 x 3.4, (48)	6.0, (10)	0.052
Picus <sup>7</sup>	SG	8.0 x 4.9, (54)	4.2, (10)	0.189
Patria <sup>7</sup>	HM	7.3 x 5.0, (54)	4.2, (11)	0.218
Rubia <sup>7</sup>	SG	7.2 x 4.7, (52)	4.7, (9)	0.175
#5897 <sup>7</sup>	SG	7.7 x 4.7, (52)	4.2, (9)	0.198
Pony Express <sup>7</sup>	HM	7.5 x 4.9, (49)	4.0, (10)	0.235
Rodeo <sup>7</sup>	SG	7.3 x 4.7, (32)	4.1, (6)	0.215
Plum Regal <sup>7</sup>	BE/SW	7.8 x 4.9, (54)	3.8, (10)	0.235
#55293 <sup>7</sup>	SG	7.5 x 4.6, (50)	4.4, (10)	0.176
#01522942 PS	SG	6.9 x 6.9, (49)	4.0, (11)	0.416
BHN 876	RU	6.0 x 6.3, (48)	4.8, (9)	0.313
Tribute	SG	6.4 x 7.1, (49)	4.1, (11)	0.423
HM 8849	HM	6.7 x 7.0, (52)	4.4, (11)	0.411
#830702103	SG	6.9 x 6.7, (47)	4.1, (8)	0.388
Tasti-Lee	BE	6.2 x 6.7, (44)	3.7, (10)	0.351
Florida 91	CT	6.5 x 7.2, (45)	4.2, (10)	0.448
BHN 589	SG	6.5 x 6.7, (50)	5.0, (11)	0.354
Nico	HM	6.0 x 6.9, (43)	4.5, (11)	0.360
#830700573	SG	6.5 x 6.6, (51)	4.3, (10)	0.357
Rocky Top	SG/SW/RU	6.6 x 7.1, (47)	4.4, (10)	0.442
Fletcher	SW	6.2 x 6.5, (41)	4.3, (6)	0.421
#01721400 SVR	SG	6.9 x 7.1, (52)	3.9, (9)	0.395
Red Defender	HM/SW	6.3 x 6.4, (48)	4.3, (11)	0.337
#830700572	SG	7.0 x 6.8, (49)	3.9, (10)	0.424
Charger	SG	6.5 x 7.1, (47)	3.6, (9)	0.445

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**Table 2** (continued)

Variety	Seed Source <sup>1</sup>	Length <sup>2</sup> x Width <sup>3</sup> (cm), (n)	%SS <sup>4</sup> , (n)	Individual #1 Fruit Weight <sup>5</sup> (Lbs)
FL 200	SG	6.5 x 6.8, (52)	4.0, (10)	0.352
Applause F1	RU	6.3 x 6.9, (53)	3.9, (11)	0.341
Primo Red	HM/SW	6.9 x 6.9, (35)	4.1, (9)	0.430
LD0978	SG	6.5 x 6.7, (50)	4.4, (10)	0.361
#830700903	SG	6.5 x 6.6, (48)	4.4, (10)	0.377
BHN 963	SG	7.0 x 6.8, (54)	3.8, (10)	0.368
BHN 962	SG	6.9 x 6.8, (52)	3.6, (10)	0.414
Scarlet Red	HM	6.7 x 7.2, (38)	4.6, (11)	0.456
BHN 1009	SG	6.9 x 6.6, (50)	3.9, (10)	0.372
Mt. Spring	CT	6.6 x 6.8, (44)	4.5, (8)	0.400
Mt. Glory	RU	6.4 x 6.7, (46)	4.4, (11)	0.361
SecuriTY 28	HM	6.7 x 7.0, (50)	4.2, (11)	0.444
#830700890	SG	7.0 x 7.5, (50)	4.5, (10)	0.492
#830700112	SG	6.7 x 6.9, (43)	4.5, (10)	0.412
BHN 961	SG/SW/RU	6.6 x 6.8, (48)	4.5, (10)	0.388

<sup>1</sup>SG=Sieger's, SW=Seedway, RU=Rupp, HM=Harris Moran, BE=Bejo Seeds, CT=CropTech Seeds.

<sup>2</sup>Mean length of tomato fruits measured from stem to blossom ends.

<sup>3</sup>Mean width of tomato fruits measured at the equator, midway between stem and blossom ends.

<sup>4</sup>Percent soluble solids.

<sup>5</sup>Weight of #1 fruit divided by quantity of #1 fruit (from Table 1).

<sup>6</sup>Compari-type variety.

<sup>7</sup>Saladette variety.