

Yield and Income of Spring Staked Tomato Cultivars in Eastern Kentucky

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Introduction

Kentucky growers produce approximately 1,200 acres of staked, vine-ripe tomatoes for local and national sales. Kentucky tomatoes have an excellent reputation for quality among produce buyers. This trial evaluated new and existing cultivars to identify those that might produce well as an early season (spring) tomato with heat tolerance and resistance to various disease problems. Cultivars were evaluated for yield, appearance, and potential return to growers. We wanted to see which tomato cultivars would produce good yields of attractive fruit, acceptable to the industry.

Materials and Methods

Fifteen fresh market, red-fruited tomato cultivars were evaluated at Quicksand, Kentucky (Table 1). According to soil test results (Table 2), the plot received 100 lb K₂O and 50 lb N/A pre-plant. An additional 75 lb of N/A was applied through the drip irrigation lines during the growing season. Pest control was based on recommendations from ID-36, *Vegetable Production Guide for Commercial Growers*. Fungicides were applied weekly and insecticides were applied as needed.

Trays were seeded in the greenhouse at Quicksand on March 25. Black plastic mulch and drip tape were laid on April 23 and tomatoes were transplanted on May 6. Cultivars were replicated four times with six plants per replication. Plants were spaced 18 inches within rows. Rows (bed centers) were 11 feet apart to allow the sprayer to be driven between beds.

Eight harvests were made during this trial. The tomato cultivars were harvested when the fruit was at the breaker stage. Data collected included: grade, weight, and count for jumbo and extra large (>3.5 in.), large (>2.5, <3.5 in.), No. 2, mediums (<2.5, >2.0 in), and cull tomatoes. Reasons for culling included catfacing, concentric or radial cracks, disease, scars, and blotchy ripening. Incomes were calculated based on the prices received by growers for staked tomatoes at the Lincoln County Produce Auction in 2008 (Table 3).

Results and Discussion

The 2008 growing season was dry and much warmer than normal. Rainfall totals for May through August were: 3.24, 3.94, 6.13, and 1.16 inches for a total of 14.47 inches. Extreme heat and other weather related problems may have contributed to blotchy ripening in two of the late tomato harvests. Because of two heavy rains in July, some early blight and bacterial speck were present in the planting.

Nico had the highest total marketable yield and income, but it was not significantly different from SRV1400, Red Defender, Fletcher, or Mountain Glory in total marketable fruit or income (Table 4). Nico also had the highest number of boxes of jumbo and extra large tomato fruit. It was not significantly different from SRV 1400, Red Defender, and Fletcher. Because of early

fruit production, the early season cultivar Pole Big did not differ significantly from the top income producers. Conestoga, an heirloom cultivar had significantly more (27.3%) cull tomatoes than the other cultivars (Table 4). There was no significant difference among the cultivars in #2 tomato fruit. Looking at the prices received for fall tomatoes in Table 3 it can be seen that cultivars that produced a lot of fruit early in the season (July 15, 21, and 25) when prices were higher, were favored in income produced. SRV 1400, DSS832, Applause, Mtn. Fresh Plus, Nico, and Red Defender had the highest percentage of jumbo and extra large fruit (Table 5).

SRV 1400, Applause, DSS832, Mtn. Fresh, Red Defender, and Nico had the largest fruit size (Table 5). In the past, Amelia and Crista have done well in our trials but for some reason did not do as well during this growing season. Growers should use caution when selecting any vegetable cultivar based on one year's results at a single location.

Table 1. Tomato cultivars, descriptions and reported disease resistance, grown at Quicksand, Ky., 2008.

Variety Name (Company)	Comments/Description ¹
1. Fletcher (SW)	Determinate compact plant; 74 days; high yield; smooth, red fruit. Resistance to FW 1, 2, 3; VW; GLS; TSWV; nematodes.
2. Nico (HM)	Determinate, mid-maturity, dark red fruit. Resistance to VD, FW 1, 2; ASC; Nt; TSWV.
3. Red Defender [HMX 5825] (HM)	Determinate, mid-maturity, dark red fruit. Resistance to VD; FW 1, 2; ASC; TSWV.
4. Mt. Fresh Plus (HM, SW)	Determinate, red, 78 days. Resistance to FW 1, 2; Nt; Vd.
5. Mtn. Crest (SW)	Determinate; 74 days; medium plant; crack resistant, smooth, red fruit. Resistance to VW 1; FW 1, 2.
6. Crista [NC 0256] (HM)	Determinate, red, 75 days. Resistance to FW 1, 2, 3; VD; TSWV; Nt.
7. Amelia VR (HM, SW)	Determinate, red, 80 days. Resistance to FW 1,2; TSWV; Nt; Vd; ST.
8. Conestoga (SW)	Indeterminate specialty Heritage type; good size; soft red, fruit. High tunnel and greenhouse suitable
9. Mtn. Glory [NC 0392] (SW)	Determinate large red fruited Mt. Spring type. Resistance to FW1, 2; VW 1,2,3; ST; TSWV (tol.).
10. Applause (SW, Ru)	Determinate medium plant, oblate red fruit. Resistance to ASC; FW 1, 2; VD; bacterial speck.
11. SRV1400 (Seminis)	Determinate fresh market; L-XL oblate, red fruit. Resistance to TSWV; ASC; FW 1, 2; VW 1; GLS.
12. Pole Big (SW)	61 days, determinate plants, medium size, cold tolerant, crack resistant, red beef type fruit. Resistance to FW 1, VW.

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Table 1 (continued)

Variety Name (Company)	Comments/Description ¹
13. Florida 7514 (RU)	Determinate 75 days, large red fruit. Resistance to BW; FW 1, 2; ST; BSR; VW; BSR.
14. Townsville (SW)	65 days, early determinate, cold tolerant, beef with globe shaped red fruit. Resistance to VW 1; FW 1, 2.
15. DSS832 (Bejo)	Main season large beef type with red fruit. Excellent yield and quality but little disease resistance.

¹VW 1=Verticillium wilt 1, 2, 3; FW 1=Fusarium wilt R1; FW2=Fusarium wilt R2; GLS=gray leaf spot; Nt=nematode tolerant; ASC=Alternaria stem canker tolerant; ST=Stemphylium tolerant; 9=Fusarium wilt R3; TSWV=tomato spotted wilt virus; ED=early blight tolerant; VD=Verticillium dahliae; BW=bacterial wilt; BSR=bacterial speck resistant.

Table 2. Results from soil test at Quicksand, Ky., 2008.

pH	Buffer pH	P	K	Ca	Mg	Zn
5.71	6.82	95	332	2814	177	7.1

Table 3. Prices used to calculate incomes — average farm gate prices paid at the Lincoln County Produce Auction in 2008.

Week	US#1 Price per 25 lb Box ¹	Canner Price per 25 lb Box ²
July 15	9.64	4.23
July 21	8.43	4.10
July 25	11.23	5.67
August 1	7.81	2.66
August 8	4.68	1.55
August 13	5.59	1.87
August 15	8.39	6.95

¹Yields for large, extra large, and jumbo grades were multiplied by the US#1 prices per box for the appropriate harvest dates to calculate “part of the total income per acre” for each cultivar.

²Yields for medium and #2 tomato grades were multiplied by the price for canners to obtain and combined with the income from the US #1 boxes to obtain the total income per acre for each cultivar.

Table 4. Spring fresh market tomato yields at Quicksand, Ky., 2008. Data are means of four replications.

Cultivar	Jumbo & Extra Large (boxes/acre) ³		Pounds Extra Large ³		Total Marketable Yield (lbs) ^{1,3}		Income (\$)		Pounds No. 2 Tomatoes ³		Percent Culls ^{2,3}	
Nico	1,537.9	A	31,755	A	43,960	A	12,486	A	3,472	A	4.5	D
SRV1400	1,380.6	AB	23,779	BCD	36,925	ABC	10,701	ABC	3,641	A	11.9	BC
Red Defender	1,309.7	ABC	26,631	AB	38,110	AB	11,464	AB	2,578	A	9.0	CD
Fletcher	1,204.1	ABCD	25,768	AB	36,952	ABC	10,563	ABC	2,210	A	4.8	D
Mtn. Glory	1,133.4	BCD	24,148	BC	35,607	ABC	10,541	ABCD	2,841	A	8.2	CD
Mtn. Fresh Plus	1,123.7	BCD	23,937	BCD	32,249	BCDE	9,113	BCDEF	2,052	A	8.7	CD
Pole Big	1,017.2	CDE	22,832	BCDE	33,670	BCD	11,187	AB	6,850	A	11.7	BC
Applause	949.1	DEF	16,551	EF	26,946	DEF	9,520	BCDE	7,113	A	10.39	CD
DSS832	915.8	DEF	17,929	CDEF	25,368	DEF	7,984	EFG	4,872	A	17.6	B
Mtn. Crest	913.7	DEF	20,528	BCDE	28,777	CDEF	8,985	BCDEF	3,598	A	9.63	CD
Amelia	768.9	EFG	18,150	CDEF	23,790	EF	6,284	G	1,999	A	13.3	BC
Conestoga	743.3	EFG	16,761	DEF	24,305	EF	8,234	CDEFG	1,294	A	27.3	A
Crista	671.7	FG	15,015	F	20,938	F	6,657	FG	2,125	A	11.0	BCD
Florida 7514	624.2	FG	14,015	F	22,327	F	8,061	DEFG	2,199	A	7.8	CD
Townsville	537.0	G	13,331	F	25,494	DEF	9,511	BCDE	2,178	A	8.5	CD
Minimum Significant Difference (MSD 5%)	344.83		7,204.8		8,537.2		2,495.20		6,327		6.807	

¹Includes all grades except culls.

²A small amount of blotchy ripening was seen in some cultivars during the last three harvests in July and August.

³Means within a column, followed by the same letter are not significantly different, as determined by MSD (5%).

Table 5. 2008 Spring Tomato Cultivar Trial, average fruit weight and % jumbo and extra large. Quicksand, KY.

Cultivar	Avg Fruit Wt (oz)		% Fruit Jumbo and Extra Large	
SRV1400	9.5	A	93.3	A
DSS832	8.7	AB	89.80	AB
Applause	9.4	A	87.65	ABC
Mtn. Fresh Plus	8.4	ABC	86.69	ABCD
Nico	9.7	A	85.74	ABCD
Red Defender	7.6	ABCD	84.23	ABCD
Amelia	7.1	BCD	80.70	BCDE
Mtn. Glory	7.6	ABCD	79.8	CDE
Crista	6.4	CD	79.7	CDE
Fletcher	8.4	ABC	78.46	CDEF
Mtn. Crest	6.8	BCD	78.01	DEF
Conestoga	6.1	D	74.62	EF
Pole Big	6.8	BCD	74.59	EF
Florida 7514	5.6	D	69.75	F
Townsville	6.4	CD	53.51	G
Minimum Significant Difference (MSD 5%)			9.5843	