Tomato Cultivar Trial, Eastern Kentucky

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Introduction

Kentucky growers produce approximately 1200 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 a premium tomato with resistance to a potentially serious virus problem (Tomato Spotted Wilt Virus, TSWV). Cultivars were evaluated for yield and potential returns to growers. We wanted to see if two new tomato cultivars with resistance to TSWV would also produce high yields of attractive fruit.

Materials and Methods

Eleven fresh market red fruited tomato cultivars were evaluated at the Robinson Station at Quicksand, Kentucky (Table 1). According to soil test results, the plot received 100 lb P_2O_5, 60 lb of K_2O and 50 lb N/A preplant. An additional 50 lb of N/A (half from ammonium nitrate and half from potassium nitrate) was applied through the drip irrigation lines during the growing season. Potassium nitrate was included to reduce risk of ripening disorders. Pest control was based on recommendations from ID-36, *Vegetable Production Guide for Commercial Growers.* Fungicides were applied weekly and insecticides as needed.

Trays were seeded in the greenhouse at Quicksand on March 28th. Black plastic mulch and drip tape were laid on May 5th and the tomatoes were planted the same day. Cultivars were replicated four times using ten plants of each cultivar per replication. Plants were spaced 18 in. in the row with rows were 7 ft. apart on center. This spacing between bed centers was to allow our sprayer to be driven between beds.

Ten harvests were made during this trial from July 12 to August 12. 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 (>3.0 in.), large (>2.5, <3.0 in.), No. 2, small (>2.0, <2.5 in.). Reasons for culling included catfacing, concentric or radial cracks, disease, scars, blossom end rot and uneven ripening.

Prices received at Cumberland Farm Products cooperative were extremely low in 2004 compared to the previous five years and 2004 prices were not available after 29 July; in addition, there were few differences in prices among early and later harvest dates. For these reasons we used 2003 prices (Table 2) which were similar to those from 1999-2002. These weekly tomato market prices were multiplied by yields from the different size classes for each variety. Higher prices used for the first three weeks of harvests favor earlier-maturing varieties. Higher prices were also obtained for the extra large and larger size class. Yields of No. 2 fruits were also used in these calculations but usually with lower prices than No. 1 fruits. We consider the incomes per acre

together with fruit quality observations to provide the best indications of overall variety performance.

Results and Discussion

The 2004 growing season was wetter and slightly cooler than normal. Rainfall totals for May through August were: 5.9, 8.2, 4.4 and 5.5 inches. Heavy rains and high humidity in late May and June led to reduced fruit set in the first cluster in many cultivars. Replication I was slightly lower in elevation than the other replications and even though the plants looked normal tomato fruit yield was lower in this block throughout the harvest season. The appearance of fruit harvested in 2004 was better than it was in 2003.

In 2003 and 2004, BHN 444 had the highest full season marketable yield, but it was not significantly different from the yields of the other ten large-fruited cultivars in 2004 (Table 3). Cash return for BHN 444 was significantly higher than those of three other cultivars (Sebring, Sunchief and Mt. Crest). BHN 444 did not perform well in a similar trial located in Lexington. The largest average tomato fruit size in 2004 was 8.7 oz. This was much smaller than the 13.9 oz/fruit. in 2003. All the cultivars that were tested both years had smaller fruit in 2004 (Table 3).

There were no significant differences in total marketable yield or yield of jumbo/extra large tomatoes among the cultivars tested. There were, however, significant differences among the percentages of total marketable yields that were jumbo and extra large (Table 3). Mountain Crest and Sunguard had significantly lower percentages than the other eight cultivars. Sebring's percent of jumbo/extra large was significantly lower than BHN 444, Amelia, and BHN 543 but significantly more than Mt. Crest. The summer of 2004 at the Robinson Station was cooler than normal (second coolest ever recorded) with excessive rain and many cloudy, overcast days. This weather increased tomato yield variability in our plots.

Growers should use caution when selecting any vegetable cultivar based on one year's results at one location and should also examine results (also in this *Research Report*) from a similar trial of the same varieties in central Kentucky at Lexington.

Table 1. Tomato cultivars, their descriptions and reported disease resistance, planted at Quicksand, KY in 2004.

Variety Name (Company)	**Comments/ Description**[1]
Amelia VR (SW,HM)	Determinate, red, 80 days, resistant to 1,2,3, 12
BHN444 (SW)	Determinate, red, 80 days, resistant to 1,2,3,12
Sunchief (SW)	Determinate, red, 68 days, resistant to 1,2,3,6,7
Sunguard (SW)	Determinate, red, 77 days, resistant to 1,2,3,6,7,9
BHN591 (SW)	Determinate, red, 71 days, resistant to 1,2,3,4
Mt. Spring (SW)	Determinate, red, 72 days, resistant to 1,2,3
Mt. Fresh (SW)	Determinate, red, 78 days, resistant to 1, 2, early blight tolerance.
Mt. Crest (Ru)	Determinate, red, 75 days, crack resistant, resistant to 1,2,3
Sebring (Ru)	Determinate, 75 days, resistant to 1,2,3
Florida 7514 (SW)	Determinate, red, 72 days, resistant to 1,2,3,4
BHN 543 (SW)	Determinate, red, 72 days, resistant to 1,2,3,4

[1]1-Verticillium Wilt, 2-Fusarium Wilt R1, 3-Fusarium Wilt R2, 4-Nematode tolerant, 5-TMV tolerant, 6-Alternaria Stem Canker Tolerant, 7-Stemphylium Tolerant, 8-Bacterial Speck Tolerant, 9-Fusarium Wilt R3, 10-Late Blight, 11-Bacterial Leaf Spot, 12- Tomato Spotted Wilt Virus. Rogers Brand = Novartis, Seedway = SW, HM = Harris Moran

Table 2. Actual farm gate prices received by Cumberland Farm Products Cooperative growers in 2003.

	#1 Jumbo & X-large	#1 Large	#2's (Jum,X-lg,Lg,Med)
Week ending	----------price per pound----------		
22 July	$0.34	$0.21	$0.22
29 July	0.30	0.17	0.22
5 Aug	0.29	0.15	0.19
12 Aug	0.20	0.11	0.09
19 Aug	0.12	0.09	0.08
20 Aug-28 Sept[z]	0.10	0.05	0.06

[z]Cumberland Farm Products Cooperative discontinued packing on 19 August. We used a prices slightly lower than their 19 Aug prices for income calculations for all trial harvests after that date.

Table 3. 2004 Staked Tomato Full Season Yield at Quicksand, KY.

Cultivar	Jumbo & extra large (boxes/acre)	% jumbo & Extra large		Total marketable yield (lbs)[1]	Income ($)		Average fruit wt (oz.)[1]		Comments
BHN 444	2,431	98	A[3]	62,069	14,423	A	8.7	A	nice fruit, green shoulders until ripe
Amelia	2,399	98	A	61,272	12,353	AB	8.0	ABC	nice looking some blotchy ripening[2] late season
Mt. Spring	2367	98	AB	61,254	12,499	AB	8.5	AB	nice looking fruit
BHN 543	2349	98	A	60,213	12,063	ABC	8.4	AB	
BHN 591	2238	97	AB	57,590	12,013	ABC	7.6	CD	
Mt. Fresh	2218	96	ABC	57,489	12784	AB	8.3	ABC	some blotchy ripening on fruit late in season
Mt. Crest	2165	91	D	59,208	11,240	BC	6.2	E	attractive but smaller fruit than others
Sunguard	2164	95	C	57,071	11,843	ABC	7.1	D	nice looking fruit
Sunchief	1902	97	AB	49,198	10,637	BC	8.4	ABC	green shoulders at breaker
Florida 7514	1816	97	AB	46,967	11,589	ABC	7.8	BCD	
Sebring	1721	95	BC	45,345	9,114	C	8.4	ABC	not very attractive
Duncan-Waller LSD (P = 0.05)	ns	1.9		ns	3,106		0.8		

[1] Includes all grades except culls.

[2] A small amount of blotchy ripening was seen in two cultivars during the last two harvests in August

[3] Numbers followed by the same letter are not statistically different.