

# Testing Tomato Cultivars with Resistance to Beet Curly Top Virus (BCTV)

Spring 2004, Bixby, Oklahoma  
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**Introduction and Objectives:** The 2003 tomato variety trial at Bixby was devastated by beet curly top virus (BCTV). No resistance was seen among 10 commercial determinate cultivars, most of which had previously performed well in our trials. Only a few BCTV resistant cultivars are known. We were able to obtain seeds of three red-fruited fresh market cultivars jointly released in the 1960's by the USDA and Washington State University. Objectives were to evaluate the potential adaptation of these cultivars to Oklahoma, and to compare them to a BCTV-susceptible commercial standard, 'Florida 47'.

**Materials and Methods:** Plants were started in the greenhouse on March 10, 2004. Peat pots 2¼ inches in diameter were used with a peat-based plug and seedling mix. Transplants were watered and fertilized with 15-30-15 at a rate of 200 ppm two times while in the greenhouse. One week prior to transplanting, plants were removed from the greenhouse to be 'hardened off'. On April 2, 13N-13P-13K fertilizer was applied at a rate of 200 lbs./acre on the field area. Plants were transplanted to the field at the Bixby research station on April 20. There were 6 plants per plot and two plots per replication, arranged in a randomized complete block design with 4 replications. Plots were 9' x 11.8' (between-row spacing was wider than normal) with plants spaced at 24" within rows. Plants received one cup of starter solution consisting of 12 lbs. 15-30-15 fertilizer plus 1 pint diazinon per 200 gallons water. Six seedlings that did not survive transplanting were replaced on April 29 in order to ensure full stands. All plants were caged in early May. Supplemental water was supplied by trickle irrigation. All plots were given additional nitrogen fertilizer on May 27 at a rate of 30 lbs. N / acre. Fungicides and insecticides were applied as needed. Plants were monitored weekly for BCTV symptoms. Harvest began on June 28. Plants were generally harvested on a Monday and Thursday schedule, and final harvest was on July 26.

**Results and Discussion:** Results are shown below. Although BCTV was confirmed elsewhere on the Bixby station, no symptoms ever developed in this trial. However, we still were able to study potential adaptation of the resistant cultivars. 'Columbia' was closest in performance to 'Florida 47'. However, 'Columbia' had a lower marketable yield and smaller fruit than 'Florida 47'. 'Roza' usually was statistically similar to 'Columbia', but 'Roza' had more problems with cracked fruit. 'Saladmaster' was a salad-type tomato with fruits roughly the size and shape of an egg. It was early, but suffered severe cracking and produced over 50% cull fruit by weight (excluding the final harvest of green fruit). Based on this study, only 'Columbia' would be worthy of further trial in Oklahoma. Future studies are planned to examine different cultural strategies for BCTV control.

**Table 1.** Tomato BCTV-Resistant Variety Trial Spring 2004, Bixby, Ok

Variety/line	Seed source	Yield (ctns/A) <sup>z</sup>					Average marketable fruit wt. (lbs.)
		Marketable	Early mkt <sup>y</sup>	Culled <sup>x</sup>	Green <sup>w</sup>	Total <sup>v</sup>	
Florida 47	Seminis	924	66	322	658	1904	0.59
Columbia	Washington State	700	57	382	666	1749	0.48
Roza	Washington State	573	64	523	623	1718	0.46
Saladmaster	Washington State	582	195	615	276	1474	0.11
	Mean	695	95	461	556	1711	0.41
	LSD <sub>0.05</sub>	128	43	143	119	256	0.03

<sup>z</sup> One ctn (carton) = 25 lbs.

<sup>y</sup> Early harvest: 6/28/04 through 7/8/04 (4 picks).

<sup>x</sup> Predominant reason for culls was cracking.

<sup>w</sup> Green fruit harvested on 7/26/04.

<sup>v</sup> Total=marketable + culls + green.