

## Grape Tomato Cultivar Evaluation for Northern Indiana, 2003

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Four grape tomato varieties were evaluated in a replicated trial at the Pinney-Purdue Agricultural Center in Wanatah, Indiana. A fifth grape variety and one cherry variety were observed in unreplicated plots.

**Materials and Methods.** The trials were conducted on a Tracy Sandy Loam, fertilized in fall 2002 with 90 lb./A K<sub>2</sub>O from 0-0-60 and before planting in spring 2003 with 120 lb./A N from urea. The replicated trial was arranged in a randomized complete block design with 3 replications. A single plot consisted of 8 plants spaced 2 ft. apart. Rows were centered 7 ft. apart on top of 30-in. beds covered with black plastic mulch. The unreplicated plots were located in an outside row. Tomatoes were seeded on April 15 (April 22 for Jolly Elf) into trays with 72 square cells. Fertilizer was supplied weekly to seedlings in irrigation water, beginning at a concentration of 250 ppm N on April 26 and then at 500 ppm N for subsequent applications. Seedlings were moved outside on May 14 and transplanted to the field on May 22 using a waterwheel transplanter. A 9-45-15 starter fertilizer mixed at a concentration of 12 oz./50 gal. water was applied at transplanting. In early August, an additional 15 lb./A N and K<sub>2</sub>O from 15-0-15 was applied through drip irrigation in three weekly installments. Weeds were controlled with a row-middle application of Sencor 4F at 1 pt./A on May 30, and handweeding. Foliar diseases were controlled with applications of Bravo Weatherstik at 1.37 pt./A (7/2, 8/1, 8/15, 8/22); Kocide 4.5 LF at 5 oz./A (7/10) and Quadris at 6 oz./A (7/25). Tobacco hornworm and other caterpillars were controlled with Dipel 2X at 8 oz./A (8/1, 8/15, 8/22). Irrigation was applied as needed through drip irrigation beneath the plastic. Plants were supported using a stake and weave system.

On June 28 plants were damaged by hail. One plant from each plot was chosen at random and removed to estimate the degree of damage (data not shown), reducing the number of plants per plot to 7. Harvest began on July 23 and continued weekly through Sept. 12. One replication only was harvested on Sept. 30. For all harvests except Sept. 30, a sample of 100 fruit per plot (or all fruit if less than 100) were graded into marketable and cull, and number and weight in each category determined. Culls were classified according to their type, and the number of each type recorded. The sample was used in combination with total weight per plot to estimate cull percentages. On the fifth harvest of each plot, the length and width 20 fruit were determined. Observations of plant and fruit characteristics were recorded once during the harvest season. Yield data were subjected to analysis of variance followed by mean separation using Fisher's protected LSD.

**Results and Discussion.** Hail damaged early fruit and knocked off some flower clusters and branches (data not shown). Total yield ranged from 12 to 16 lb. per plant in the replicated trial (Table 1). Chiquita produced more than the other grape varieties. The cherry type Sweet Baby Girl was also prolific, producing 20 lb. per plant in an unreplicated plot. An indication of potential yield in years when frost comes late is provided by the Sept. 30 harvest data: Red Grape produced an additional 10 lb. per plant between Sept. 12 and Sept. 30, while Tami-G produced only 3.8 lb. additional. Chiquita had the largest tomatoes, averaging just under 1/2 oz., followed by Sweet Olive and Tami-G a little under 1/3 oz., and then Red Grape at 1/4 oz. Jolly Elf was a little larger than Sweet Olive. Among the replicated varieties, Sweet Olive was the earliest, with more than half of the yield harvested by Aug. 25, followed by Chiquita. Red Grape was the latest, with less than 25% of the yield harvested by Aug. 25. Culls represented 5% of total yield by weight in the replicated trial, and the percentage did not differ among the varieties. The reason for culls did differ among varieties. Eighteen percent of Sweet Olive culls were rejected due to hail damage, while only 2% of Red Grape tomatoes were rejected for that reason. This reflects the earlier maturity of Sweet Olive: more fruit were present at the time of the hail storm. Chiquita had the highest percentage of culls due to cracking or splitting. This variety was more likely to split. The cherry Sweet Baby Girl was also very prone to splitting, reflected in the 62% of culls in that category. Tami-G was the most likely to be undersized, with 23% of culls in the too-small category. The percent of culls rejected because they were green was highest for Red Grape: 70%. Although harvesters intended to pick only tomatoes at the turning stage or beyond, sometimes immature green tomatoes would fall off or accidentally be picked and so they were included in the harvest. Red Grape tomatoes were especially easy to pick because they detached from the vine easily. The higher percentage of greens probably reflects this trait. Plant and fruit characteristics are reported in Table 2. Tami-G and Red Grape were tall indeterminate varieties; Sweet Baby Girl was not quite as tall. Chiquita and Jolly Elf were medium height, and Sweet Olive was the shortest and least vigorous. Chiquita fruit had a unique dusky pink color. Tami-G fruit was variable in shape, and the plants were also variable in growth habit (data not shown). The most promising variety in the replicated trial was Sweet Olive. Chiquita is also of interest, but because of its unusual color may not be suitable for all markets. Red Grape and Jolly Elf are worth continued consideration. Tami-G was more variable than has been observed in previous years, making it less desirable. Sweet Baby Girl is too soft to recommend for typical commercial production.

Table 1. Total yield, average fruit weight, harvest timing and cull percentages for four replicated grape tomato varieties, one unreplicated grape variety, and one unreplicated cherry tomato variety, Wanatah, Indiana, 2003.

Variety	Seed Source*	Total Yield		Mkt. Fruit Wt.	Percentage of total yield thru 9/12 harvested:			Culls % by wt.	Percent of Culls Due to:													
		thru 9/12	9/30		7/24-8/6	8/12-8/26	8/29-9/12		Hail	Crack	Small	Other	Green									
		lb./plant		oz./fruit					% of culls by no.													
<i>Replicated Plots</i>																						
Chiquita	JS	16.1	6.0	0.470	4	36	60	6.6	7.9	42	1	7	42									
Sweet Olive	JS	12.0	5.4	0.306	5	46	49	4.0	18.0	18	16	9	38									
Red Grape	JS	12.9	10.0	0.252	1	23	76	5.7	2.0	2	9	17	70									
Tami-G	ST	12.0	3.8	0.292	2	29	69	3.5	4.9	20	23	25	26									
	LSD .05**	1.9		0.021				NS	5.6	11	14	NS	27									
<i>Unreplicated Plots</i>																						
Sweet Baby Girl	SM	20.3	2.9	0.419	4	32	64	15.6	6.1	62	0	21	10									
Jolly Elf	SG	12.2	4.8	0.347	1	28	71	5.4	2.9	24	0	36	36									

\*JS=Johnny's Selected Seeds; ST=Stokes Seeds; SM=Seminis; SG=Siegers Seeds

\*\*Means of replicated plots differing by more than this amount differ significantly at  $P \leq .05$  based on Fisher's protected LSD. NS=not significant.

Table 2. Plant and fruit characteristics for four replicated grape tomato varieties, one unreplicated grape variety, and one unreplicated cherry tomato variety, Wanatah, Indiana, 2003.

Plant Characteristics	Plant Characteristics		Fruit Characteristics*		Firmness**	Overall Appearance**			
	Vigor**	Height <i>m</i>	Length <i>cm</i>	Diameter <i>cm</i>			Color	Skin	Shape
<i>Replicated Plots</i>									
Chiquita	8.0	1.4	3.1	2.7	dull pinkish red	dull	oval	5	5
Sweet Olive	3.7	1.1	2.7	2.4	red-orange	matte	oval	5	7
Red Grape	7.7	1.9	3.0	2.1	red	shiny	blocky oval to teardrop	5	7
Tami-G	7.0	2.2	2.8	2.1	red-orange	shiny	variable	7	3
<i>Unreplicated Plots</i>									
Sweet Baby Girl	8	1.6	2.8	3.0	red-orange	dull	round	3	7
Jolly Elf	7	1.4	no data	no data	red-orange	matte	top-shaped to blocky oval	8	4

\*Fruit characteristics evaluated for one replication only, except for length and diameter, which were evaluated for three replications.

\*\*Plant vigor, Firmness and Overall Appearance: 1=least vigorous, very soft, or very unattractive, 9=most vigorous, extremely firm, or very attractive.

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