

Ohio Bicentennial Tomato.

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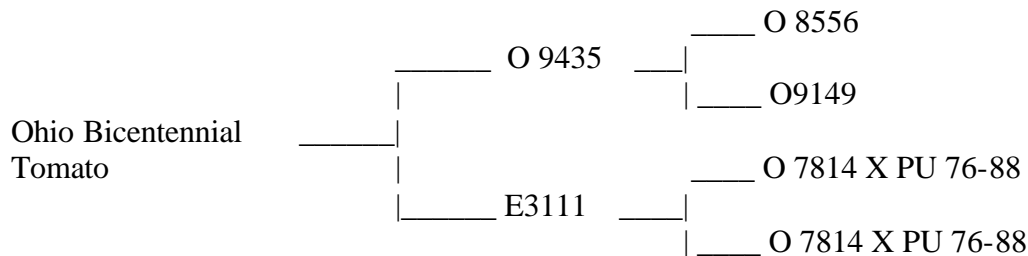
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Introduction. This Ohio Bicentennial Tomato is being released to celebrate Ohio's role in the history of tomato cultivation: "American views toward the tomato were transformed ...largely through the efforts of two Ohioans", (Smith, 1998). John Cook Bennett and Archibald Miles were medical doctors who independently espoused the benefits of tomatoes. A third Ohioan, A. W. Livingston of Reynoldsburg, is credited with being the first to methodically develop "original and distinct varieties". Ohio and the history of tomato cultivation in the United States are therefore closely allied.

The Ohio Bicentennial Tomato was developed as a multi-use "Roma" style tomato for the home gardener. It is suited for fresh consumption and home canning. It was selected based on its ability to produce quality fruit under the humid growing environment of Ohio's summer.

Origin . Seed for Ohio Bicentennial Tomato was increased at the F₇ generation. The variety is derived by single seed descent from a single F₂ selection resulting from a cross between O 9435 and E3111. O 9435 and E3111 were chosen as parents for the cross due to their excellent color (Sacks and Francis, 2001). The line O 9435 was derived from a cross between O9149 (Montagno et al., 1989) and Ohio 8556 (Berry et. al. 1993). The line O9149 is a selection from a population of Ohio 832 (Berry and Gould, 1986) regenerated from cotyledon cultures. The line E3211 was derived from Ohio 7814 (Berry and Gould, 1993) and Purdue 76-88. Both O 9435 and E3111 carry the *og^c* allele which imparts excellent color and high lycopene.



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Administration & Director, OARDC

Description. Primary selection criteria for the Ohio Bicentennial tomato were for color and flavor. Color selection was based on chromaticity values in the CIELAB color space (Commission Internationale de L'Eclairage, 1978) measured using a CR300 colorimeter (Minolta, Ramsey, N.J.). Measurements of fruit flesh were taken as described in Sacks and Francis (2001) with sampling expanded to include 24 fruit per plot, two plots per location. A consumer panel evaluated varieties for flavor and appearance with judging based on a hedonic scale. Panelists were also asked to choose their favorite tomato in side-by-side comparisons to VF Roma and Roma-style tomatoes purchased in a local store.

The Flavor of two entries, Bicentennial-1 and Bicentennial-3 was judged superior to VF Roma and Roma style tomatoes purchased in a local market ($p=0.05$; Figure 1, Table 1). In the category of appearance, Bicentennial-1 was the top ranked tomato tested, significantly outperforming VF Roma and store purchased tomatoes. The appearance ranking was not significantly better than Bicentennial-3. Despite a slight edge in flavor ratings to Bicentennial-3 (Table 1), Bicentennial-1 was favored in side-by-side comparisons (Table 3). Although the "Sweetness" of Bicentennial-1 and Bicentennial-3 was not judged significantly different, the relative ranking reflects objective measurements of sugar content based on soluble solids (Table 1, Table 4). Likewise, panel ratings on size were also consistent with objective measures. Based on these tests we propose to release Bicentennial-1 as the Ohio Bicentennial Tomato.

Ohio Bicentennial Tomato vines are medium in size and determinate (sp). Foliage cover is excellent for ensuring good fruit quality and the vines cover the row area uniformly at maturity. Fruit are ovate in shape and average 2.8 oz with two to three locules. Fruit have a small stem scar and core, are uniform ripening (u), are attached by a jointless pedicel (j^2), and are crimson (og^c).

Disease resistance. The Ohio Bicentennial Tomato is resistant to fusarium wilt caused by *Fusarium oxysporum* Schlecht f. sp. *Lycopersici* (Sacc.) S. & H. (*I-1*) and verticillium wilt caused by *Verticillium dahliae* Kleb (*ve-1*). The vine shows good field tolerance to early blight (*Alternaria solani* spp.) and bacterial diseases. Fruit have tolerance to anthracnose fruit rot (*Colletotrichum* spp.) and weather related cracking.

Availability . Material transfer agreements are available from the Office for Technology Licensing, The Ohio State University, 1960 Kenny Road, Columbus, OH 43210-1063, (614)292-3911; FAX (614)292-8907. Small samples of seed are available from the corresponding author.

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Figure 1. Graphical representation of results from the consumer panel, rating for over-all degree of liking.

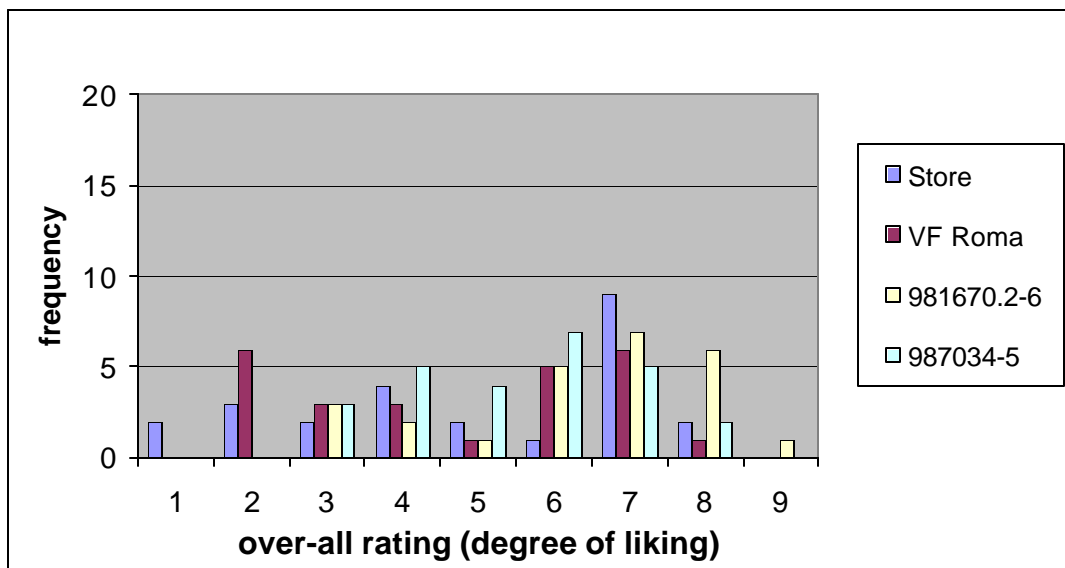
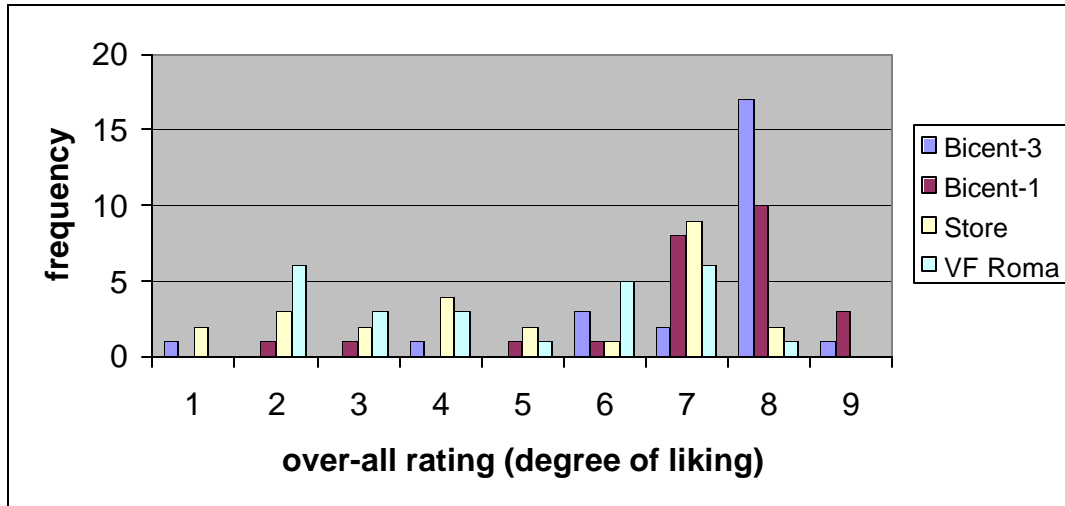


Table 1. Panel rating of tomatoes for flavor.

	D. of liking	Color	Aroma	Sweetness	Tartness	Flav. Int	Firmness	Juicyness
Scale	0-9	1-5	1-5	1-5	1-5	1-5	1-5	1-5
Optimum	9	3	3	3	3	3	3	3
Variety								
Bicent-3	7.28	3.16	2.80	2.76	2.92	2.92	2.76	3.08
Bicent-1	7.16	3.12	2.84	2.68	3.04	2.84	2.92	2.92
981670.2-6	6.32	2.64	2.52	2.50	2.76	2.48	2.64	2.76
Store	5.00	1.88	2.68	2.04	2.44	2.28	3.32	2.48
987034-5	5.56	2.68	2.52	2.08	2.64	2.40	2.60	2.64
VFRoma	4.72	2.72	2.76	2.36	2.92	2.68	1.64	2.76
Mean	6.01	2.70	2.69	2.41	2.79	2.60	2.65	2.77
LSD 0.05	1.03	0.28	NS	0.39	0.45	0.47	0.36	0.36

Table 2. Panel rating of tomatoes for appearance.

	appearance	size	shape	ext. color	int. color	Flesh/seed ratio
Scale	(1-9)	(1-5)	(1-3)	(1-5)	(1-5)	(1-5)
Optimum	9	3	3	3	3	3
Variety						
Bicent-3	7.16	2.79	2.63	3.11	3.26	3.26
Bicent-1	7.79	3.11	2.84	3.16	3.21	3.00
981670.2-6	7.37	2.89	2.68	2.95	3.05	3.21
Store	5.32	3.05	1.58	2.21	1.89	3.05
987034-5	6.79	3.11	2.32	2.74	2.58	3.53
VFRoma	5.53	2.58	1.63	2.79	2.21	3.21
Mean	6.66	2.92	2.28	2.82	2.70	3.21
LSD 0.05	0.89	0.30	0.38	0.31	0.37	0.39

Table 3. Judge Ranking frequency for best and second best tomatoes.

	Commercial	VF Roma	987034-5	981670.2-6	Bicent. 3	Bicent. 1
First Choice	1	0	0	3	6	8
Second Choice	1	1	1	3	6	6

Table 4. Objective measurements of quality

variety	L	a	b	Ldiff	adiff	bdiff	force	pH	Acid	Brx	Wt oz.
bicent-1	38.05	30.61	24.18	2.85	2.16	2.60	4.27	4.57	5.30	4.73	2.82
bicent-3	38.74	31.55	24.52	2.65	2.22	2.50	4.26	4.46	6.17	5.23	2.63
981670.2-6	42.69	25.85	24.99	4.44	4.38	2.79	5.29	4.47	5.34	5.30	1.98
987034-5	41.05	26.67	24.82	4.15	2.98	3.58	5.10	4.41	4.88	5.18	1.88
VF Roma	41.56	25.10	24.31	3.35	2.20	2.17	3.40	4.35	6.06	4.57	2.18
Mean	40.42	27.96	24.56	3.49	2.79	2.73	4.46	4.45	5.55	5.00	2.30
LSD 0.05	0.87	0.78	NS	NS	NS	NS	0.38	0.11	NS	NS	0.25