

Research Note

YIELD AND ACCEPTABILITY OF EIGHT FRESH MARKET TOMATO CULTIVARS¹

Per capita consumption of fresh market tomato during fiscal year 1984-85, ranking third among vegetable crops consumed fresh in Puerto Rico, reached 4.96 kg². Because of favorable climatic and market conditions, most of the local production is mainly from January to April. In that same fiscal year, more than half of the production was exported to the United States.²

The identification of cultivars showing superior yield and fruit quality under local conditions is necessary if we want to increase production of fresh tomatoes for the local and export markets.^{3,4,5,6} For this reason, during the 1985-86 growing season eight cultivars were evaluated at the Fortuna agricultural substation in southern Puerto Rico. Standard cultivars Duke, Sunny and Flora-Dade were included for comparison.

Seedlings were transplanted 10 December 1985. The experiment was laid out

on a nearly level San Antón clay loam (Cumulic Haplustolls).⁷ A partially balanced incomplete blocks design with four replications was used. The experimental plots consisted of two beds, each bed 1.5 m wide and 7.3 m long. Plants were spaced approximately 51 cm apart in single rows in the center of each bed.

One month later, plants were staked and tied. They were all grown and managed according to the recommendations of the UPR Agricultural Experiment Station.⁸ Sencor 50 WP,⁹ was applied before transplanting and once again after the weeds began to emerge. All cultivars under evaluation were hybrids except Flora-Dade and Hayslip, the only two open pollinated entries.

Fruits were harvested by hand when showing some color change (breaker stage or beyond). Six packings were made: 24 February; 4, 10, 16 and 24 March; and 1 April 1986. Tomatoes were graded as cull

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²Medrano, H., 1986. Hortalizas, p. 95-103, *In: Empresas Agrícolas de Puerto Rico: Situación y Perspectivas/1985-86*. Dept. Econ. and Rural Sociol. Coll. Agric. Sci., Univ. P.R.

³Kader, A., 1985. Quality factors: definition and evaluation for fresh horticultural crops, p. 119. *In: Postharvest technology of horticultural crops*. Univ. California. Div. of Agric. & Natural Resources, Spec. Publ. 3311.

⁴Maynard, D., 1985. Selection of vegetable varieties for use in Florida. Univ. Fla. IFAS, Vegetarian Nwsl. (85-5).

⁵Price, H. C., and B. H. Zandstra, 1987. Cultivar testing: public point of view. *Hort-Science* 22: 1211-212.

⁶Thompson, H. C. and W. C. Kelly, 1957. *Vegetable Crops*, McGraw-Hill Co.

⁷Gierbolini, R. E., 1979. Soil survey of the Ponce area of southern Puerto Rico. USDA Soil Conservation Service, in cooperation with Univ. P.R. College Agric. Sci.

⁸Estación Experimental Agrícola, 1979. Conjunto tecnológico para la producción de hortalizas. Univ. P.R. Agri. Exp. Stn. Publ. 102. end. ed.

⁹Trade names are used in this publication solely for the purpose of providing specific information. Mention of trade names does not constitute a guarantee, warranty or endorsement by the Agricultural Experiment Station indicating superiority to other similar products not mentioned.

TABLE 1.—Seed source, appearance evaluation, cumulative marketable yields and average marketable fruit weight of eight fresh market tomato cultivars evaluated during the 1985-86 growing season

Cultivar	Seed source ¹	Whole fruit appearance	Cumulative yield after			Average fruit weight
			Two harvests	Four harvests	Six harvests	
		Sum of ranks ²	kg/plot ³	kg/plot	kg/plot	g
President	Petoseed	74 b ⁵	78.4 a	137.1 b	161.7 b	173.7 a
Winner's Circle	Ferry-Morse	58 b	74.4 a	151.5 ab	163.1 b	171.5 a
Celebrity	Petoseed	53 b	73.2 a	138.5 ab	164.5 b	181.1 a
Royal Flush	Ferry-Morse	60 b	71.3 a	144.5 ab	162.0 b	165.9 a
Sunny ⁴	Asgrow	44 a	56.4 b	167.7 a	184.5 ab	159.3 a
Duke ⁴	Petoseed	55 b	47.4 bc	154.1 ab	178.7 ab	162.7 a
Flora-Dade ⁴	Ferry-Morse	65 b	41.6 bc	159.2 ab	194.9 a	153.4 a
Hayslip	Petoseed	75 b	39.9 c	146.9 ab	180.2 ab	173.4 a

¹Seed companies which supplied the seed samples used in this evaluation.

²Sum of ranks based on a 10 point scale: 10 = inferior; 1 = superior. Average of two evaluations, first and second harvest, with extra large, firm-ripe fruits.

³Plot = 14.6 linear meters of bed, 1.5 m wide.

⁴Cultivars considered as standards for comparison purposes at the time of this evaluation.

⁵Values in columns followed by the same letter do not differ statistically ($P=0.05$) according to Duncan's multiple range test.

TABLE 2.—Sensory evaluation of sliced fruits from eight fresh market tomato cultivars evaluated during the 1985-86 growing season

Cultivar	Mean value ¹				
	Appearance ²	Aroma ²	Sweetness ²	Acidity ³	Off-flavors ⁴
Duke	4.55 a ⁶	3.51 a	2.39 a	4.06 a	4.00 a
Sunny	4.56 a	3.71 a	2.79 a	4.13 a	4.00 a
Celebrity	4.59 a	3.46 a	2.95 a	4.28 a	3.89 a
President	4.63 a	3.65 a	2.42 a	3.95 a	3.95 a
Flora-Dade	4.45 a	3.83 a	2.55 a	4.11 a	4.00 a
Winner's Circle	4.43 a	3.44 a	2.67 a	4.24 a	3.91 a
Hayslip	4.25 a	3.42 a	2.28 a	4.14 a	4.00 a
Royal Flush	4.27 a	3.74 a	2.73 a	3.77 a	3.96 a

¹Average of 6 evaluations.

²5-point scale: 5 = high; 1 = low.

³5-point scale: 5 = low; 1 = high.

⁴4-point scale: 4 = none; 1 = high.

⁶Values in columns followed by the same letter do not differ statistically ($p = 0.05$) according to Duncan's multiple range test.

or marketable. Marketable fruits were counted and weighed. Samples of extra large (5x6) firm-ripe fruits from the first and second harvests were evaluated for whole fruit appearance and sliced to be sensory evaluated by a trained taste panel at the Food Technology Laboratory in Río Piedras. Sliced fruits were appraised for appearance, aroma, sweetness, acidity and off-flavors.

Sunny's sum of ranks for whole fruit appearance was significantly the lowest, thus superior to all others (table 1). President, Winner's Circle, Celebrity and Royal Flush presented the highest cumulative yield after the first two harvests, with 78.4, 74.4, 73.2 and 71.3 kg/plot, respectively. Therefore, they could be considered as the early yielder cultivars within this group. Under average conditions of market price and fruit quality, most tomato fields are harvested in four pickings. At the end of the fourth picking, President had the lowest cumulative yield (137.1 kg/plot), significantly lower than that of all other cultivars.

Two more pickings were made and at the end of the sixth picking, the one showing

the highest yield per plot was Flora-Dade (194.9), followed by Sunny (184.5), Hayslip (180.2) and Duke (178.7). At this time, the average fruit weight was determined for all marketable fruits harvested throughout the experiment. There were no significant differences in average fruit weight among cultivars.

Table 2 presents data on the sensory evaluation of tomato slices. Appearance for all cultivars was acceptable; no significant differences were observed. No significant differences were reported in sweetness, acidity and off-flavors.

When the standards Duke, Sunny and Flora-Dade were compared with the other cultivars, the results showed that the best non-standard cultivars were Hayslip, Celebrity and Winner's Circle. In this trial, none of these could be considered superior to the standards.

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