'FLORA-DADE', A FRESH MARKET TOMATO FOR SOUTH FLORIDA WITH RESISTANCE TO VERTICILLIUM WILT

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Abstract. **'Flora-Dade' is an inbred fresh market tomato of determinate plant habit and was selected primarily for its adaptation to the calcareous soils of South Florida. It differs from other Florida fresh market tomato cultivars (cvs) in its combination of disease resistances and fruit characteristics. It is resistant to Verticillium wilt, race 1 and 2 of Fusarium wilt, gray leafspot and graywall. The fruit is firm and detaches from the plant free of stems.**

'Flora-Dade' compares favorably with previously released cultivars in yield, nutritional and chemical composition, flavor, texture and resistance to bacterial soft rot.

During the past 5 seasons Dade County has produced from 25 to 29 per cent of Florida's fresh market tomatoes (1). Despite the recent decline in tomato acreage in Dade County the dramatic increase in yield per acre has more than off-set the loss of production area. Such an increase in production per acre has resulted from numerous, improved cultural procedures as well as from improved fresh market cultivars.

Various selections of the tomato cv. 'Homestead' were at one time the dominant cvs. grown. Preference for 'Homestead' has waned however due to: (a) susceptibility to Verticillium (*Verticillium albo-atrum* Reinke and Berth.) and other fungous diseases such as gray leafspot (*Stemphylium solani* Weber), (b) susceptibility to graywall and (c) a decline in buyer acceptance because of less than desirable fruit quality. The cv. 'Walter' has replaced the 'Homestead' selections in production preference primarily because of its improved fruit quality which includes a marked decrease in the prevalence of graywall (4). 'Walter' is also resistant to gray leafspot but it is susceptible to Verticillium wilt, an important disease in the Homestead area. Also 'Walter' possesses the "J_0" gene for jointed fruit stems, as does 'Homestead,' which results in many stems being retained on the fruit at picking and causing damage during handling and shipping. Although the cultivars 'Tropi-Red' and 'Tropi-Gro' are resistant to Verticillium wilt, gray leaf spot and gray wall, they have not been grown extensively and are now preferred only as home garden types or for roadside sales (3). 'Tropic' is also resistant to Verticillium wilt, is of indeterminant plant habit and is produced for the trellis, vine ripe market (4). 'Florida MH-1' was released in 1971 primarily for fresh market machine harvesting, however it has been grown to a limited extent for hand harvest (2). The fruit is firm and has superior quality. 'Florida MH-1' has the "J_2" gene for jointless fruit stems however it is not resistant to Verticillium wilt and it does not seem well-adapted to the calcareous soils of Dade County.

'Flora-Dade' was released to provide a fresh market cultivar with good fruit quality that is well-adapted to Dade County conditions and that is resistant to Verticillium wilt and other important tomato diseases. It produces well-sized, firm fruit with good ripening capability and possesses the jointless stem characteristic.

Origin and Description

During its development 'Flora-Dade' was known as selection 908-1-DSpBk-BG1-D4-DSpBk-DSpBk-DSpBk CAVStWd, an inbred line in the eighth generation. It was derived from a mating between 'Walter' and the Verticillium wilt resistant breeding stock 2153-D2. Line 2153 resulted from a mating of a sister line of 'Tropi-Red' and line 407, a selection of 'Florida 556' (5). Breeding lines 2153, 407 and 'Tropi-Red' all have resistance to Verticillium wilt and gray leafspot. Line 2153 contributed the jointless pedicel and firm fruit traits. 'Walter' was used as a parent because of its highly desirable fruit characteristics and resistance to gray leafspot and Fusarium wilt (race 1 and 2).

'Flora-Dade' was developed and selected for mature-green harvest. It produces a determinant vine with abundant foliage which provides good fruit cover. In addition to being resistant to Verticillium wilt and graywall it is resistant to gray leafspot and Fusarium wilt races 1 and 2 (*Fusarium oxysporum* f. *lycopersici* (Sacc.) Snyder and Hanson). All of these diseases are, or

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have the potential of being limiting factors in tomato production in the Homestead area.

Yield and Fruit Characteristics

'Flora-Dade' is best suited for conditions in Dade County. In replicated trials in Homestead conducted in the Fall of 1972 and 1973 there was no significant difference between marketable fruit yield and average overall size of 'Flora-Dade,' 'Florida MH-1' and 'Walter' (Table 1). In the Fall of 1971 marketable yield of 'Flora-Dade' was less than 'Walter' but greater than 'Florida MH-1' whereas fruit size and yield of large fruit exceeded both 'Walter' and 'Florida MH-1.' Marketable and large fruit yield of 'Flora-Dade' exceeded both 'Walter' and 'Florida MH-1' during the Fall of 1974. The advantage of 'Flora-Dade' is most evident in tests where Verticillium wilt was prevalent. During the Fall of 1971, Winter

Table 1. Marketable yield and size of mature-green tomatoes from 'Flora-Dade', 'MH-1' and 'Walter', Homestead Agricultural Research and Education Center.

Yield and size (30 lb boxes/A)	Cultivar		
	Flora-Dade	MH-1	Walter
Marketable yield			
Fall 1971	1457ab[z]	1166 c	1521a
Winter 1971	531a	292 b	--
Fall 1972	1095a	969a	884a
Fall 1973	1166a	1008a	1132a
Fall 1974	1627a	1383ab	1197 b
Yield lge. + extra lge.			
Fall 1971	726a	425 b	448 b
Winter 1971	--	--	--
Fall 1972	375a	370a	251a
Fall 1973	489a	495a	477a
Fall 1974	989a	828ab	595 b
Fruit size (oz./frt.)			
Fall 1971	4.03a	3.63ab	3.55 c
Winter 1971	3.77a	3.78a	--
Fall 1972	5.95a	5.89a	5.73a
Fall 1973	4.32a	4.62a	3.68ab
Fall 1974	4.96a	4.88a	4.46a

[z]Values across each line not followed by the same letter are different at P = 0.05 according to Duncan's Multiple Range Test.

Table 4. Number of persons indicating cultivar preference when allowed to compare 'Walter' and 'Flora-Dade' in a taste panel[2].

Cultivar	No. of persons			
	general preference	flavor	texture	flavor and texture preference
Walter	38	11	9	18
Flora-Dade	31	9	5	14

[2]Triangle Test conducted by Dr. J. R. Hicks, Dept. Veg. Crops, IFAS, Gainesville, Florida. Figures represent total number of panelists showing preference for fruit harvested mature green and sampled 5, 6 and 7 days after first color developed.

'Flora-Dade' is recommended for culture in the Rockdale soils of Dade County. It matures from 4 to 6 days later than 'Walter' and about 8 days later than 'Florida MH-1'. It produces a large, erect plant and may be grown under ground culture or supported on short stakes and pruned. It is intended for mature-green or U-pick markets. South Florida growers should evaluate this new cv. on a limited basis under their own environmental and cultural conditions.

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CHANGES IN NUTRIENTS RESULTING FROM FARMING THE HOLE-IN-THE-DOUGHNUT, EVERGLADES NATIONAL PARK[1]

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Abstract. **Twenty-eight soil samples were collected in the Hole-in-the-Doughnut and 20 from adjacent Everglades National Park. Of the three major nutrients (N, P, and K) determined, phosphorus accumulated to the greatest extent. This was due to P fixation by native calcium carbonate (lime) in the soil. On the average, samples from the unfarmed Park land contained 260 ppm total P, 610 ppm total K, 6400 ppm total N, 0.5 ppm water soluble P, and 8 ppm nitrate N. Farming in the Doughnut increased total P about 500%, total K 17%, water soluble P 150% and nitrate N 12% while total N decreased 30%. Micronutrients also increased; total Cu increased four times to 48 ppm and Zn increased three times to 35 ppm.**

The "Hole-in-the-Doughnut" is an area of approximately 9,000 acres within the boundaries of Everglades National Park which has been in winter vegetable production for many years. Farming began in that area about 60 years ago, but now all this land has been purchased for the Park. Only about 3,000 acres were under cultivation during the 1974-75 crop season.

A group of Dade County farmers anticipating economic loss both to themselves and others from removing these acres from production contracted with Ecoimpact Inc. to evaluate residual effects farming has had on Everglades National Park, and possible repercussions removal of this acreage from production would have on Dade County. Soil sampling and analysis was one part of this impact study (3). Samples were collected by Mr. Kevin Atkins, Field Ecologist with Ecoimpact, who worked with Park personnel in planning the sampling. The Institute of Food and Agricultural Sciences (IFAS) of the University of Florida, as an independent agency, was asked to process and analyze the samples. This is a report of the nutrient elements determined in these samples.

Materials and Methods

Eleven sampling sites were selected, four in unfarmed Park land and seven from areas which had been farmed at various times, Fig. 1 and Table 1. (The Hole-in-the-Doughnut is the area

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[1]The assistance of Mr. Kevin Atkins in doing the sampling and of Dr. Herman Breland in supervising analysis of many of the extracts is gratefully acknowledged.