

INTRODUCTION

Fresh-market tomato is the No. 1 vegetable crop in Florida, with 32,200 acres harvested for a total farm-gate value of \$453.1 million in 2015. Cultivars from the UF/IFAS tomato-breeding program have been a primary reason for tomato's commercial success in Florida, and several of its varieties have had major impacts worldwide. The Florida tomato industry faces several challenges today, including import competition, water-use concerns, low market prices, and increasing costs to produce the crop.

FROM THE BEGINNING

The UF/IFAS tomato-breeding program began in 1922 when a grower donated five acres of land to the University of Florida for the purpose of developing disease-resistant cultivars. Early work resulted in the release of a variety resistant to nailhead rust. As a result, the disease was eradicated before the full-fledged tomato-breeding program was established in 1942.

UF/IFAS plant breeders released 'Walter', the first cultivar with resistance to Fusarium wilt race 2, in 1969. The discovery and use of the Fusarium wilt race 2 gene saved the Florida tomato industry an estimated \$200 million or more per year in losses and is among the most widely used gene in tomato breeding worldwide. The program discovered resistance to Fusarium wilt race 3 in the 1980s, and this gene is now widely deployed in varieties grown in Florida and around the world.

Cooperative work between the UF/IFAS tomato breeding program and the H. J. Heinz Company in the 1960s resulted in the development and release of 'Florida MH-1', the first fresh-market cultivar that allowed for mechanical harvest because of its high fruit firmness and jointless pedicels. More recently, the Tasti-Lee® brand 'Fla. 8153' hybrid, released in 2006, is being marketed in supermarkets in the eastern U.S. with considerable success as a vine-ripened, high-lycopene tomato with superior flavor and internal color.

TODAY AND TOMORROW

A marker-assisted, hybridization program is under way primarily to incorporate disease-resistant genes into elite, recurrent parental lines and select for resistance in new breeding materials. Considerable progress has been made with respect to resistance to begomoviruses (such as tomato yellow leaf curl virus). UF/IFAS breeders and a cooperating lab in the Netherlands have identified one of the major genes for resistance (Ty-1), and the program has recently developed horticulturally improved materials containing this gene.

An exciting recent development in the UF/IFAS tomato breeding program has been the discovery of the Ty-6 resistance gene, a gene that is being widely used commercially and provides resistance against a broad range of begomoviruses.

Genomic markers are also being used to facilitate breeding for resistance to bacterial spot, bacterial wilt, and graywall.

The UF/IFAS tomato breeding program is also focusing on releasing more heat-tolerant cultivars and developing compact growth habit (CGH) tomatoes that do not require staking, pruning, or tying. These CGH lines have concentrated fruit set, firmness, and jointless pedicels that could allow for once-over mechanical harvest and much less labor input.

The UF/IFAS program has also initiated work to provide a portfolio of superior varieties (such as 'Garden Gem' and 'Garden Treasure' with superior flavor and high yield) to the home gardener. Several additional varieties are in advanced trials. The program utilizes hybrids between modern, high-yielding parents and the best-tasting heirloom varieties.



TOMATO VARIETIES RELEASED SINCE 2006

Release Date	Cultivars
10/04/06	Fla. 000592-2 (Gc9), Fla. 024525-9 (Gc171), Fla. 024652-Y1 (Gc173)
10/04/06	Tasti-Lee® Brand 'Fla. 8153', Fla. 7907, Fla. 8059
01/08/08	Fla. 8000, Fla. 678, Fla. 685, Fla. 701, Fla. 707, Fla. 726, 'Tribeca'
06/18/13	Fla. 8233
09/14/13	Fla. 8111B
11/13/13	'Garden Gem' (US PVP 201400052), 'Garden Treasure' (US PVP 201400065)
12/01/14	Fla. 8638B, Fla. 8624, Fla. 8923

HIGH IMPACT RELEASES

'Manalucie' (1953): This variety has a combined resistance to more than five diseases and was one of the earliest releases from the UF/IFAS tomato breeding program.

'Walter' (1969): This was the first tomato variety with resistance to fusarium wilt race 2, a discovery that saved the Florida tomato industry an estimated \$200 million or more per year in losses.

'Florida MH-1' (1971): This variety was the first machine-harvest, fresh-market tomato variety ever released. It combined firmness with the jointless pedicel trait that allowed stemless harvesting.

'Floramerica' (1977): This variety won a bronze medal in the All America Vegetable Trials and has been widely grown for decades by home gardeners throughout North America.

'Solar Set' (1989): This variety was released due to its exceptional heat tolerance, a trait that improved fall crop yields. It was widely grown commercially in the 1990s.

'Fla. 7804' (2002): This disease-resistant inbred line has been used widely as a parent in several commercial hybrids bred by seed companies. It has been popular due to its resistance to Fusarium wilt races 1, 2, and 3; Verticillium wilt race 1; and gray leafspot. It also has the recessive crimson gene that provides high lycopene.

Tasti-Lee® 'Fla. 8153' (2006): This hybrid has been very popular due to its superior flavor, beautiful internal color, and excellent performance as a field-grown, vine-ripened tomato. The branded marketing program and high consumer acceptance of this variety led to it becoming the No. 1-selling round tomato nationally (Nielsen, 2015).

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