

Performance of Strawberry Cultivars in Florida

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Three field trials were conducted to compare strawberry (*Fragaria xananassa* Duch.) cultivar performance in multiple locations throughout Florida (Balm, Homestead, and Quincy). Tested cultivars were ‘Camarosa’, ‘Albion’, ‘Treasure’, ‘Winter Dawn’, ‘Carmine’, ‘Camino Real’, ‘Strawberry Festival’, and ‘00-51’ (at Balm only). In Balm, the highest early yield was obtained with ‘00-51’, followed by ‘Winter Dawn’, ‘Carmine’, ‘Albion’, and ‘Strawberry Festival’. ‘Winter Dawn’ had the best performance over the whole season. In Homestead, ‘Strawberry Festival’, ‘Carmine’, and ‘Camino Real’ provided the highest early yields, whereas ‘Winter Dawn’ and ‘Camarosa’ had the same early production as ‘Camino Real’ and ‘Carmine’. The total yield of ‘Winter Dawn’, ‘Strawberry Festival’, and ‘Camarosa’ were not significantly different from each other. In Quincy, ‘Strawberry Festival’ and ‘Winter Dawn’ provided the highest early yield, and ‘Camarosa’ and ‘Strawberry Festival’ provided the largest season-long production. The results indicated that the Florida cultivars Winter Dawn and Strawberry Festival consistently were among the cultivars that provided the highest early and total marketable yield in all three experimental sites. The total yields produced by ‘Camarosa’ were comparable to those of ‘Strawberry Festival’ in all three locations.

Strawberry production represented approximately \$240 million in gross sales in Florida during the 2006–07 season (US Department of Agriculture, 2007). Although the majority of the production areas are located in west-central Florida, there is a considerable number of small farms in the northern and southern part of the peninsula. In all those locations, climatic conditions greatly change, especially in late fall and winter when most strawberries are planted in Florida. These environmental differences could translate into variations on cultivar performance.

Most of the strawberry cultivars planted in the United States and adopted worldwide come from breeding programs in California and Florida, which are the leading producing states in the country. Those cultivars have been bred to satisfy specific horticultural, flavor, and marketing requirements in each state. For instance, most California cultivars tend to maximize yields under warm weather, which make these unsuitable for Florida conditions, where production occurs during winter. This justifies the existence of different breeding programs across the country. During the last two decades, several Florida-bred cultivars have been released and extensively planted, including ‘Sweet Charlie’, ‘Earlibrite’, ‘Carmine’, ‘Strawberry Festival’, and ‘Winter Dawn’. One of the most important requirements for strawberry production is yield earliness, because it allows growers to have fruit when premium prices are available. Therefore, finding cultivars with high early yields is a desirable trait. The objective of this study was to compare cultivar performance in multiple locations throughout Florida.

Materials and Methods

Three field studies were conducted between Oct. 2006 and May 2007 in Balm, Quincy, and Homestead, FL. In Balm, the

trial was established at the Gulf Coast Research and Education Center of the University of Florida. The soil was a sandy, siliceous, hyperthermic Oxyaquic Alorthod with 1.5% organic matter and pH 7.3. Planting beds were 32 inches wide at the base, 28 inches wide at the top, 8 inches high, and spaced 5 ft apart on centers. Finished beds were fumigated with methyl bromide plus chloropicrin (67:33 v/v) at a rate of 350 lb/acre to eliminate soilborne diseases, nematodes and weeds in the soil. Simultaneously, beds were fertilized pretransplant with 50 lb/acre of a 15N–0P–30K granular formula, planting beds were covered with black high-density polyethylene mulch, and drip irrigation tubing (T-Tape Systems International, San Diego) was buried 1 inch deep on the bed center. Plant nutrients were supplied to the crop through the drip lines following statewide recommendations (Peres et al., 2006). In this experimental site, plots were established under 12-ft-high passively ventilated tunnels. Planting dates were 27 Sept. for ‘Camarosa’; 4 Oct. for ‘Albion’, ‘Treasure’, and ‘Winter Dawn’; 10 Oct. for ‘00-51’, and 22 Oct. for ‘Carmine’, ‘Camino Real’, and ‘Strawberry Festival’.

In Quincy, the soil at the North Florida Research and Education Center of the University of Florida was a fine-loamy, siliceous, thermic, Typic Paleudults with pH 6.4 and <1% organic matter content. Planting beds were 34 inches wide on base and 8 inches tall. ‘Albion’, ‘Treasure’, and ‘Winter Dawn’ were planted on 16 Oct.; ‘Carmine’ and ‘Strawberry Festival’ were established on 18 Oct.; and ‘Camarosa’ and ‘Camino Real’ were planted on 26 Oct.

The Homestead trial was established in a grower’s field and the soil was classified as a very gravelly loam, carbonatic, hyperthermic Lithic Udorthents with pH 6.5 and <2% organic matter content. Planting beds were 36 inches wide on base and 6 inches tall. Two drip irrigation lines separated 14 inches from each other were placed on each bed. Planting dates were 13 Oct. for ‘Albion’, ‘Carmine’, ‘Strawberry Festival’, ‘Treasure’, and ‘Winter Dawn’; and 26 Oct. for ‘Camarosa’ and ‘Camino

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Table 1. Comparison of early and total marketable yield of strawberry cultivars in three locations in Florida, 2006–07.

Cultivars	Balm		Homestead		Quincy	
	Early yield ^z	Total yield	Early yield	Total yield	Early yield	Total yield
	----- ton/acre -----					
Winter Dawn	6.4 b	34.4 a	1.5 bc	7.4 a	3.9 a	8.0 bc
Carmine	6.2 b	24.8 b	1.8 ab	5.8 b	2.0 bc	5.6 de
Albion	5.2 b	22.9 bc	1.0 d	3.6 c	1.1 d	4.4 e
Strawberry Festival	5.4 b	21.6 bc	2.2 a	7.4 a	3.9 a	9.7 ab
Camarosa	2.2 c	20.7 bcd	1.6 bc	6.2 ab	2.6 b	11.6 a
Treasure	2.9 c	18.2 cd	1.2 cd	4.5 c	1.2 cd	5.3 e
Camino Real	0.9 d	15.9 d	1.9 ab	6.0 b	2.3 b	7.4 cd
00-51	8.4 a	21.0 bc	---	---	---	---

^zValues followed by the same letter within each fruit category do not differ at the 5% significance level.

Real'. In Quincy and Homestead, mulching, soil fumigation, drip irrigation and fertilization were similar to those procedures previously described.

Bare-root transplants from nurseries in Canada were established 15 inches apart in double rows in Balm and Quincy, and triple rows in Homestead. The tested cultivars were 'Albion', 'Camino Real', 'Camarosa', 'Carmine', 'Strawberry Festival', 'Treasure', 'Winter Dawn', and the advanced line '00-51' from the University of Florida strawberry breeding program. The latter was only established in Balm. In all three locations, the treatments were distributed in a randomized complete-block design with four replications. The crop was harvested 22, 27, and 16 times in Balm, Homestead, and Quincy, respectively. Early yield was defined as the total marketable fruit of the first eight harvests. Resulting data were examined with analysis of variance and treatment means were compared with Waller–Duncan test at the 5% significance level (SAS Institute, 2000).

Results and Discussion

There was a significant cultivar effect on strawberry early and total yield at all three locations. At Balm, the highest early yield was obtained with '00-51' (8.4 ton/acre), followed by 'Winter Dawn', 'Carmine', 'Albion', and 'Strawberry Festival', which ranged between 5.4 and 6.4 ton/acre (Table 1). 'Winter Dawn' had the best performance over the duration of the whole season, producing more than 34 ton/acre. There were no differences in the total yields of 'Carmine', 'Albion', 'Strawberry Festival', 'Camarosa', '00-51', which ranged between 20.7 and 24.8 ton/acre.

At the Homestead location, 'Strawberry Festival', 'Carmine', and 'Camino Real' had the highest early yields, ranging between 2.2 and 1.8 ton/acre (Table 1). 'Winter Dawn' and 'Camarosa' had the same early production as 'Camino Real' and 'Carmine'. The total yield of 'Winter Dawn', 'Strawberry Festival' and 'Camarosa' were not significantly different. In Quincy, 'Strawberry Festival' and 'Winter Dawn' had the highest early yield (3.9 ton/acre) among all cultivars, whereas 'Camarosa' and 'Strawberry Festival' had the highest season-long production, ranging between 9.7 and 11.6 ton/acre.

These results indicated that the Florida cultivars Winter Dawn and Strawberry Festival consistently were among the ones with the highest early and total marketable yield at all three experimental sites. The total yields of the California cultivar Camarosa were comparable to those of 'Strawberry Festival' in all three locations. The advanced line '00-51' seems to be a promising strawberry germplasm due to its earliness and total yields, but further evaluations are needed.

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