Evaluation of Bell Pepper (*Capsicum annuum*) Cultivars Grown Under an Open Shaded Structure

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**Background & Objective**

Florida produces nearly 20,000 acres of green bell peppers in the field annually. Field grown Florida bell peppers are not available in large supply during the late summer and early fall (July-September) due to high temperature, high humidity and frequent rainfall during these times. The marketplace prefers that growers consistently supply high quality fruit for as long as possible. This entitles large wholesale growers to produce in multiple field locations to extend their season. Small, direct market farmers extend the season through the adoption of season-extending cultural practices rather than changing locations. Most of the season extension practices lengthen the season into the cooler part of the year. Yet, few practices are used to extend the season into the hottest part of the year.

This research trial was conducted to continue the initial work with bell peppers under shade production and to evaluate several bell pepper cultivars for their performance in this system.

**Materials & Methods**

The trials were conducted under an open 40x40 ft commercial shade structure (Atlas, Alapaha, GA) (Figure a). Peppers were grown in 3-gallon plastic pots filled with a soilless media. Pots were arranged in single rows with 4 foot spacing between the centers of the rows. Plants were spaced 12 inches apart in the row (Figure b). The bell pepper crop was established on April 5, 2012 using transplants. The trial was established with one transplant per pot. Pepper cultivars were selected because of their performance as a vigorous field cultivar and likelihood to perform well over a long production period of 7 to 8 months with mature green fruit as the target maturity for harvest. The crop was irrigated and fertilized using standard hydroponic production practices.

Plants were trellised with string and plastic plant clips supporting each plant to an overhead cable trellis system. Three weeks after transplanting, the pepper plants were pruned to form a double stem system over each row. Plant height measurements were taken on 20 June, 5 July and 15 Aug, and mature green fruit were harvested every two to three weeks from 11 June through 16 Nov 2012. Fruit were graded into USDA grades and each grade was counted and weighed. The yield for the peppers grown under shade was converted to yield per acre.

### Results & Discussion

Production of bell peppers in an open shade structure resulted in mostly US Fancy fruit, especially during the early and mid-season harvests, but much less during late season harvests. Fruit length was significantly different among cultivars and varied from 3.35 inches in ‘Phoenix’ to 4.17 inches in ‘Olympus’ (Table 1). Several cultivars had fruit length similar to ‘Olympus’.

Total season marketable yields ranged from 1967 to 3315 boxes per acre (28-54 boxes), but yield differences were not significant (Table 2). The total season marketable fruit were mainly in the Fancy category. Total season Fancy yields varied from 1332 boxes per acre with ‘Tomcat’ to 2553 boxes per acre with ‘Godzilla’ (Table 2). Nine cultivars had similar total season Fancy yields to ‘Godzilla’.

Yields reported here were lower than in a 2006 trial due to increased number of days with extended cloudy and rainy weather, especially during June and July, including tropical storm Debby.

Differences in early and mid-season yields among cultivars were significant, however, late season yields were similar among cultivars (Table 3). Overall fruit size decreased in the late summer and early fall harvests. The percentage of the total fruit graded as Fancy was typically over 95% among all cultivars during early season harvests, but decreased to 80% during mid-season harvests, and was about 35% or less during late season harvests.

During the long growing season another important factor in selecting a cultivar is plant height. In this trial, the plant heights did not show significant differences. There was a trend in plant height among cultivars, but a high degree of variability within cultivars, largely due to stem breakage during storms, led to no significant differences (Table 1).

Overall top performers are listed in Table 4. The results from this trial were presented at educational field days (Figure c). Shade structures allow small farmers to extend the growing season of not only peppers (Figure d) but with other crops as well (Figure e).