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## GROWTH AND YIELD RESPONSE OF SWEET PEPPER CULTIVARS IN THE US VIRGIN ISLANDS

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**ABSTRACT:** Sweet pepper (*Capsicum annuum* L.) is a major vegetable for producers in the US Virgin Islands and is grown for fresh market. Challenges in sweet pepper productions in the US Virgin Islands are high cost of labor and management, limited water resources, weeds, diseases and pests, limited land and natural disasters. This study was conducted at the horticultural field plots of the University of the Virgin Islands Agricultural Experiment Station in growing seasons of 2011-2012. The objective of the research was to conduct field evaluations of sweet pepper cultivars that are suitable to grow in the local soil and climate of the islands. Thirteen cultivars, ‘Aristotle’, ‘California Wonder’, ‘Declaration’, ‘Dulce’, ‘Intruder’, ‘Jupiter’, ‘Mecate’, ‘Naples’, ‘Sweet Cherry’, ‘Sweet Banana’, ‘Sweet Savannah’, ‘White King’, and ‘Vanguard’ were tested in the field. Cultivars selected with the traditional lobe or bell shape fruits as well as longer, pointed shape known as banana peppers. Specialty ‘colored’ peppers, orange, yellow and red were also tested. Transplants of all the pepper cultivars were planted into rows four feet apart. Spacing in plants was one foot within the row. The trial was laid out by using a randomized complete block design with three replications. ‘White King’ was the early maturity cultivar (65 days) and produced the highest total marketable yield (33.4 oz/plant). ‘Aristotle’ produced biggest fruit (5.8 oz). ‘Intruder’ fruits were smallest (1.1 oz.) and maturity of 76 days. ‘Sweet Cherry’ produced smallest fruit (0.48 oz.) and lowest yield (8.7 oz/plant) expected from the cherry type. Fruits were graded by size and condition. No serious pests and diseases were observed in the crop. All thirteen cultivars set fruits during the season and were rated good or excellent in disease tolerance, yield, taste and adaptability. Frequent rainfall during the growing period affected quality production at some extent. This paper presents results on plant growth, marketable yield, marketable fruit weight and maturity of thirteen cultivars of sweet pepper.

Keywords: *Capsicum*, marketable yield, peppers, production, specialty

## INTRODUCTION

Sweet pepper (*Capsicum annuum* L.) is an important fresh-market vegetable crop in the U.S. Virgin Islands. 2007 Census of Agriculture (2007 Census of Agriculture, 2009) reported that production and acreage planting of peppers have been increased in the U.S. Virgin Islands (Table 1). Vegetable variety trials have always been a component of the Horticulture Program at the University of the Virgin Islands Agricultural Experiment Station and several varieties of sweet peppers have been tested in the 80s and 90s (Ramcharan C., 1981; Palada et al., 1993). There is continuous need for new variety testing in sweet peppers for high yield, production, marketability, insect pests and disease resistance and overall suitability to grow in the U.S. Virgin Islands. Several reports on variety trials of sweet peppers are available in the literature, which includes bell types, specialty ‘colored’ peppers and banana type (Rowell et al., 2001; Evans et al., 2006; Hutton and Handley, 2007; Juroszek and Tsai, 2009).

The main objective of the current study was to conduct field trials of sweet pepper cultivars for growth, adaptability and yield potential in the U.S. Virgin Islands conditions.

## **MATERIALS AND METHODS:**

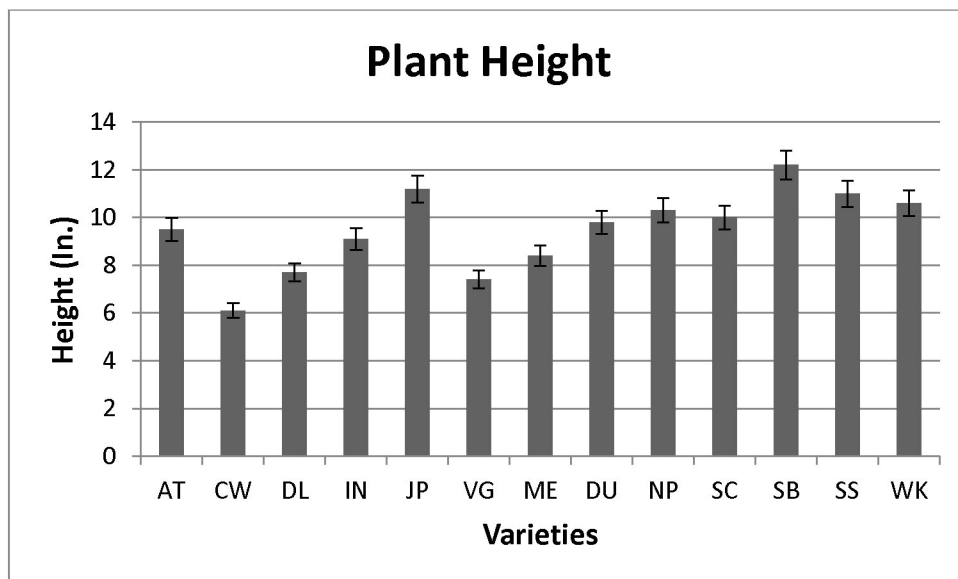
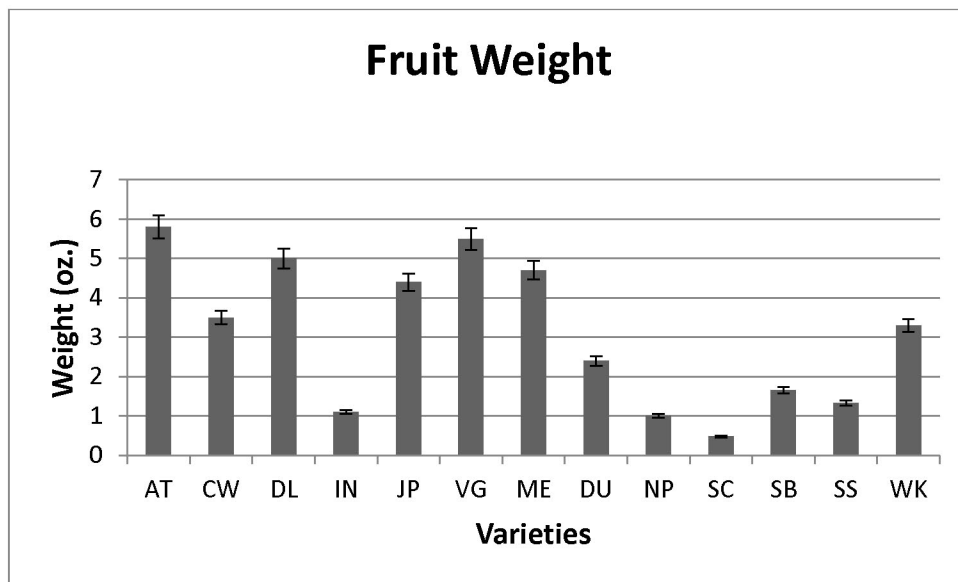
Experiments were conducted in field plots at the University of the Virgin Islands Agricultural Experiment Station, Kingshill in growing seasons of 2011-2012. Thirteen cultivars traditional bell type fruits, long pointed banana types and specialty colored peppers selected. 'Aristotle' (AT), 'California Wonder' (CW), 'Declaration' (DL), 'Intruder' (IN), 'Jupiter' (JP), 'Mecate' (ME), 'Vanguard' (VG), and 'White King' (WK) were the bell types. Specialty peppers 'Naples' (NP), 'Sweet Cherry' (SC), 'Dulce' (DU), and two banana types, 'Sweet Banana' (SB) and 'Sweet Savannah' (SS) were selected for the study. Seeds were procured from Stokes Seeds Co., NY and planted in seedling trays containing 'Pro Mix' potting mix. Seedlings were transplanted in the field approximately six weeks after germination. Plots were consisted of three rows spaced four feet apart, with 12 plants per row and spaced one foot between the plants within a row. The experimental design was a randomized complete blocks, with three replications. Plants were drip irrigated two to three times in a week (Figure 1). Data collected from plants #2-11 from center row on maturity were plant height, fruit weight, marketable fruits (US#1), and yield from six harvests. Fields were periodically scouted and monitored for insect pests and diseases by the Extension entomologist. One application of Malathion and Venom was used to control insect pests. No preplant fertilizers were applied. A complete fertilizer 20-20-20 was applied during the experiment through drip irrigation system (fertigation) to provide a total of 120 lb N, 80 lb P<sub>2</sub>O<sub>5</sub> and 80 lb K<sub>2</sub>O per acre. Weekly irrigation was applied as needed (Berke et al., 2003).

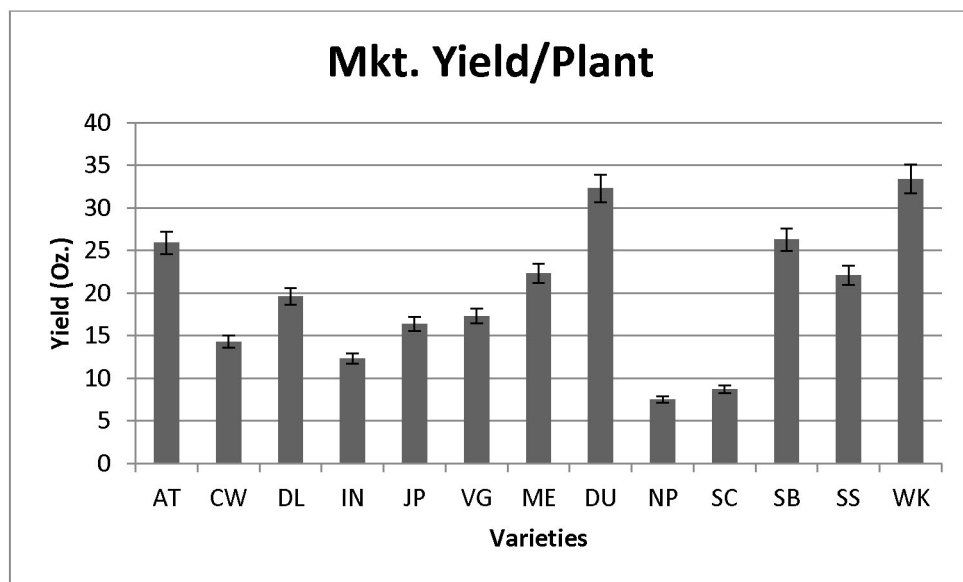
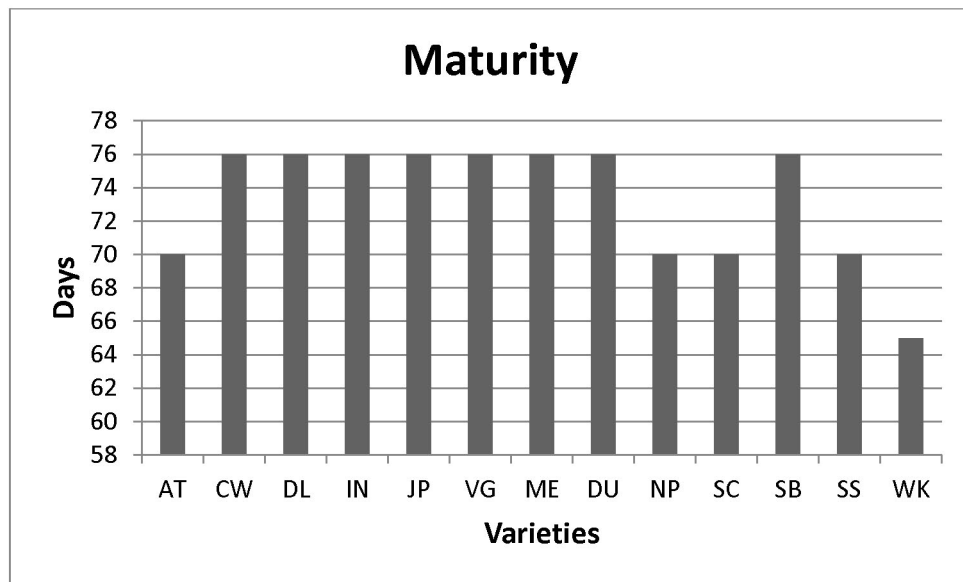
## **RESULTS AND DISCUSSION**

All thirteen cultivars performed well and produced fruits in the USVI soil and climate conditions. Peppers were harvested as they reached marketable size (firm and full size) at green color stage before turning color to yellow or red. Marketable fruits were separated from culls and then counted and weighed. Number of culls was recorded as sunscald, small, misshapen, and damaged. Data on marketable yield (US#1), fruit weight, plant height and maturity are presented in Table 2. Grading of harvested peppers was done according to United States Department of Agriculture's standards (United States Standards for Grades of Sweet Peppers, 2005). 'White King' was the first variety harvested among the bell types. 'White King' produced the highest total marketable yield (33.4 oz/plant) and early maturity (65 days). 'Aristotle' produced biggest fruit (5.8oz.). 'Intruder' fruits were smallest (1.1 oz.) and maturity of 76 days. 'Sweet Cherry' produced the smallest fruit (0.48 oz) and lowest yield (8.7 oz/plant) in cherry type. No serious diseases occurred during the trial; however, much of the common pests, such as hornworms, armyworms, stink bugs, and leafminer were observed. Venom and Malathion were effective in keeping the pest population low.

Field evaluations of sweet pepper varieties have been reported in the literature (Evans et al., 2006; Hutton and Handley, 2007; Rowell et al., 2001; Juroszek and Tsai, 2009). Earlier reports on sweet pepper variety trials conducted in the U.S. Virgin Islands indicate that 'Jupiter', 'California Wonder' and 'Yolo Wonder' performed best under local growing conditions (Ramcharan C., 1981; Palada et al., 1993). In the current study, all bell types tested were blocky, green, orange, red and yellow color and also, specialty peppers such as cherry and banana types. Results suggest that the cultivars may have production potential to fulfil local market needs for fresh peppers grown

locally, if consumers are interested on special color, taste, or are interested in the fresh local peppers. Banana types may have the potential for processing or pickling peppers. The program shall continue testing new sweet pepper cultivars for high yield, production, marketability, insect pests and disease resistance and overall suitability to grow in the U.S. Virgin Islands.





**Table 1:** Production and acreage of peppers in the U.S. Virgin Islands\*.



Year	Production (lb)	Planting (acres)
2002	14,750	8
2007	31,475	12
*2007 Census of Agriculture, 2009		

**Table 2:** Growth, marketable yield and fruit weight of sweet pepper cultivars grown at UVI-AES.

Cultivar	Type	Average Fruit Weight (oz)	Maturity (days)	Marketable yield/plant (oz)	Plant height (in)
Aristotle (AT)	Bell	5.8	70	25.9	9.5
California Wonder (CW)		3.5	76	14.3	6.1
Declaration (DL)		5	76	19.6	7.7
Intruder (IN)		1.1	76	12.3	9.1
Jupiter (JP)		4.4	76	16.4	11.2
Vanguard (VG)		5.5	76	17.3	7.4
Mecate (ME)		4.7	76	22.3	8.4
White King (WK)		3.3	65	33.4	10.6
Dulce (DU)	Jalapeno	2.4	76	32.3	9.8
Naples (NP)	Italian	1	70	7.5	10.3
Sweet Cherry (SC)	Cherry	0.48	70	8.7	10
Sweet Banana (SB)	Banana	1.66	76	26.3	12.2
Sweet Savannah (SS)		1.37	70	22.1	11



**Fig. 1.** Field production of peppers at research plot at UVI-AES.

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