

# High Tunnel Pepper Variety Trial, 2011

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## Introduction

Peppers offer a viable option to tomatoes for commercial production in high tunnel greenhouses. In 2011 the Cornell Vegetable Program partnered with Harris Seed, Inc. to evaluate five varieties in a cooperating grower's unheated high tunnel.

## Materials and Methods

Pepper varieties Alliance, Gordo, Sandpiper, Vanguard and Yellow Crest were seeded in a heated greenhouse on March 1, 2011, into seedling trays and then 50 count trays at cotyledon stage. These were transplanted into the high tunnel soil, a Lima Silt Loam, on May 6, at the four true-leaf stage. The high tunnel, fabricated on farm, is a 30 by 120 foot galvanized steel structure, covered with Tuff Lite IV 6 mil polyethylene. No supplemental heat was used in growing the crop post-transplant. The trial was arranged as a randomized in-row block design with four replications. Each replicate consisted of four plants, transplanted into black plastic mulch with a 24-inch double staggered row with a single drip irrigation tape per bed. The grower cooperator maintained the trial site for fertilization, irrigation and weed control to their standards (see appendix 1). Plants were trellised with twine and stakes to prevent lodging. Peppers were harvested from June 25 to October 25. The weight and number of marketable fruit was recorded at each harvest date. Mean yield (lbs) per plant, mean fruit per plant and mean fruit weight were calculated (table 1). Data was analyzed using statistical software Analysis of Variance (ANOVA) procedure, and treatment means were separated using Fishers Protected Least Significant Difference Test ( $p < 0.05$ ). One replicate of Gordo was removed from statistical analysis due to Tobacco Mosaic Virus infection.

## Results

Yield, as measured by pounds of fruit per plant, was not significantly different among the five varieties. Sandpiper was the highest yielding as measured by pounds per plant, although there were not statistical differences amongst the other varieties (table 1). However there were significant statistical differences in number of fruit per plant. Yellow Crest was by far the highest yielding with 35.44 fruit per plant. Significant differences were detected in fruit weight, with Yellow Crest the lightest and Gordo the heaviest. These numbers are inversely correlated with fruit number per plant. These findings are consistent with the results of a single grouping of mean pounds yield per plant without differences.

## Discussion and Conclusions

The peppers evaluated in 2011 performed very similar in total yield per plant as measured by pounds. When we look at fruit size and weight we do find differences that can help growers make choices in variety. When selling by the piece, in a retail setting, varieties such as Yellow Crest would work well.

For wholesale accounts varieties such as Gordo will fill bushel boxes faster. Sandpiper, a slightly smaller fruit than the other bell peppers in this trial, gave very good yields and offers a nice color spectrum (Figure 3). High tunnels are a great tool for vegetable growers to increase quality and color of bell peppers. Total economic performance per square foot is much less than tomatoes. However, labor inputs are also lower. Although not a perfect rotational crop with tomatoes, peppers are not a host for Fulvia Leaf Mold, and are less likely to harbor Two Spotted Spider Mites. We encourage growers to consider peppers in high tunnels for increased quality and yield.

The Cornell Vegetable Program and cooperating grower express gratitude to Harris Seed, Inc. for their collaboration in this project.

**Table 1. Yield data: Standard Fertility**

<b>Pepper Variety</b>	<b>Average Fruit Weight (lbs)*</b>	<b>Average No. Fruit per Plant</b>	<b>Average Yield per Plant (lbs)</b>
<b>Alliance</b>	0.49 b	15.88 c	7.86
<b>Gordo</b>	0.56 a	13.12 c	7.26
<b>Sandpiper</b>	0.33 c	26.29 b	8.70
<b>Yellow Crest</b>	0.24 d	35.44 a	8.45
<b>Vanguard</b>	0.52 b	15.71 c	8.10
<b>LSD</b>	<b>0.0000</b>	<b>0.0000</b>	<b>NS</b>

\*Means with different letters (groupings) are significantly difference with a p test value  $\leq 0.05$ .



Figure 1. Alliance at Harvest



Figure 2. Gordo at Harvest



Figure 3. Sandpiper at Harvest

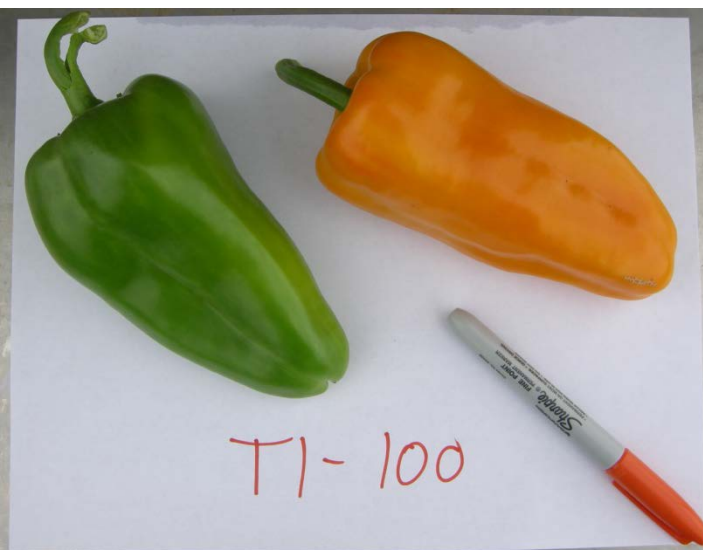


Figure 4. Yellow Crest at Harvest

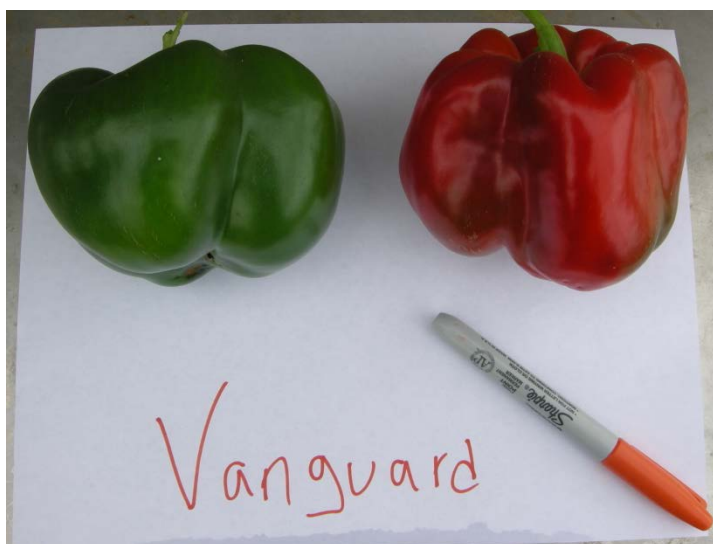


Figure 5. Vanguard at Harvest





Figure 6. Alliance, Gordo, Sandpiper, Yellow Crest, and Vanguard (pictured left to right).



Figure 7. Pepper trail in High Tunnel with Cucumbers and Tomatoes.

Appendix 1. Fertilizer schedule for 2011 high tunnel peppers.

10-May	20-20-20 *	0.19	
21-May	20-20-20	0.30	
25-May	20-20-20	0.31	
30-May	20-20-20	0.30	
1-Jun	20-20-20	0.31	
4-Jun	20-20-20	0.36	plus 0.02 fluid oz. 66% sulfuric acid
15-Jun	Epsom salt (magnesium sulfate)	0.24	
16-Jun	9-15-30	0.27	
17-Jun	9-15-30	0.42	
21-Jun	9-15-30	0.42	
24-Jun	9-15-30	0.42	plus 0.03 fluid oz. 66% sulfuric acid
25-Jun	Epsom salt (magnesium sulfate)	0.06	
27-Jun	9-15-30	0.45	
28-Jun	9-15-30	0.21	
30-Jun	Epsom salt (magnesium sulfate)	0.30	
1-Jul	9-15-30	0.30	
5-Jul	Epsom salt (magnesium sulfate)	0.18	
6-Jul	9-15-30	0.24	
7-Jul	9-15-30	0.18	
9-Jul	9-15-30	0.39	
12-Jul	9-15-30 to 4 tunnels	0.51	
13-Jul	Epsom salt (magnesium sulfate)	0.15	
14-Jul	9-15-30	0.21	
16-Jul	9-15-30	0.24	
19-Jul	9-15-30	0.15	
20-Jul	9-15-30	0.09	
21-Jul	20-20-20	0.42	
22-Jul	20-20-20	0.36	
23-Jul	20-20-20	0.12	
26-Jul	9-15-30	0.30	
28-Jul	9-15-30	0.24	
29-Jul	9-15-30	0.37	
30-Jul	9-15-30	0.30	
5-Aug	20-20-20	0.24	
8-Aug	9-15-30	0.37	
11-Aug	9-15-30	0.22	
13-Aug	9-15-30	0.15	
27-Aug	9-15-30	0.18	
	*Miller's Greenhouse Grade 20-20-20 (N-P-K) plus micronutrients In irrigation water sufficient to moisten the rootzone.		
	**Miller's Greenhouse Grade 9-15-30 (N-P-K) plus micronutrients In irrigation water sufficient to moisten the rootzone.		