

2012 High Tunnel Cucumber Trial

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Greenhouse cucumbers, if marketed successfully, can be a high revenue crop in tunnels. Advantages include:

- High quality fruit
- Decreased downy mildew
- Quicker yields than tomatoes

Disadvantages include:

- Powdery Mildew
- Spider Mites
- Higher labor than tomatoes

The Cornell Vegetable Program worked with several seed companies to conduct a variety trial of high tunnel cucumbers in 2012.

Materials and Methods

Cucumber varieties Lisboa, Manny and Taurus were seeded in a heated greenhouse on April 9 into 50 count trays. These were transplanted into the high tunnel soil, a Lima Silt Loam, on May 15. The high tunnel is a 30 by 120 foot galvanized steel structure, covered with Tuff Lite IV 6 mil polyethylene. 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 drip irrigation. The grower cooperators maintained the trial site for fertilization, irrigation and weed control to their standards. Plants were trained to a single growing-point, with no fruit pruning. On June 5th 50,000 thrips predators (*Amblyseius cucumeris*) and a mixture of 500 aphid parasitoids (*Aphelinus abdominalis*, *Aphidius colemani* and *Aphidius ervi*) were released. An in-row application of imidacloprid (Admire Pro) was applied on July 12 for control of Striped Cucumber Beetles and Squash Bugs. Cucumbers were harvested from June 12 to July 31. 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. Data was analyzed using statistical software Analysis of Variance (ANOVA) procedure, and treatment means were separated using Fishers Protected Least Significant Difference Test ($p < 0.05$).

Results

Yield as measured by pounds of fruit per plant were significantly different among the three varieties, although very closely grouped. Lisboa was the highest yielding as measured by pounds although in the same statistical grouping as Taurus, which shared a grouping with Manny (Table 1). Number of fruit per plant were also statistically separate with Lisboa and Manny in a higher group than Taurus. Fruit weights were broken into three separate groupings; with Taurus heaviest, followed by Lisboa then Manny.

Discussion

All three varieties grown provided acceptable levels of production; although, the cucumber season was truncated by high insect and mite pressure on the trial. Pest management of high tunnel cucumbers continues to be one of the greatest constraints.

We caution against making direct comparisons in this trial as each variety represented a different type of cucumber. Manny is a Beit-alpha, smooth skinned fruit, about 6-inches in length. Lisboa is a parthenocarpic, American slicing cucumber with 8-inch long fruit with small spines. Taurus is a Japanese, smooth skinned greenhouse cucumber with 10" fruit.

Market preference is the deciding factor in cultivar choice. In this situation the grower-cooperator found the market most receptive of fruit aesthetics of Lisboa. However, there exist other markets that would respond to smooth-skinned types of different lengths.

We do caution against longer greenhouse cucumbers in high tunnels. As this is a passively ventilated structure, there is considerably more wind and pollinator visitation than in controlled environment greenhouses. These factors lead to misshapen fruit.

Conclusions

Cucumbers remain an underutilized crop in Northeast high tunnels. The varieties in this trial exceeded 10 lbs of fruit in just 10 weeks of production. As more tunnel growers look to create rotations which accommodate cool season greens, cucumbers provide greater flexibility than tomatoes, which require 6-7 months in the soil to reach maximum economic return. However, cucumbers are more likely to suffer from pests such as mites and thrips, which increases input costs for control measures. Labor on cucumbers is also higher than that of tomatoes.

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

Table 1. Cucumber Yield.

Variety	Average Fruit Weight (lbs)	Total Fruit per Plant	Plant Yield (lbs)
Lisboa	0.59 b	22.69 a	12.91 a
Manny	0.42 c	23.69 a	10.03 b
Taurus	0.66 a	16.25 b	10.78 ab
<i>lsd</i>	<i>0.0001</i>	<i>0.0090</i>	<i>0.0583</i>