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## No 4 2013 Tomato High Tunnel Variety Trial

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TOMATO HIGH TUNNEL TRIALS 2013

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## Short Report: Tomato Variety Trial in High Tunnels of 2013, Kingston, RI

(For detailed methods and results, see: Long Report: Tomato Variety Trial in High Tunnels of 2013, Kingston, RI)

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### Introduction

Season extension practice using high tunnels has made possible ever earlier tomato sales in temperate climates, but the potential of these structures is far from being realized. Growers may be familiar with field varieties for fresh direct marketing but are less aware of varieties that perform especially well under cover. One purpose of this trial is to demonstrate a number of such varieties in several fruit classes in order to provide ideas for a more diverse product line in direct market settings such as farmers' markets and roadside stands. Another is to demonstrate "lean and lower" trellising and intensive organic plant nutrition techniques. These varieties were also tested for performance and marketability by three participating growers.

### Methods

Seedlings of 13 varieties, provided by Johnny's Selected Seeds, Albion, Maine, were transplanted into high tunnels on April 18, 2013. Soil was amended with compost, organic 7-5-7 fertilizer, and lime, and transplants were watered in with a dilute fish emulsion solution. Plants were pruned of sideshoots and maintained as single stems throughout the season. Each stem was clipped to a string trellis and when the growing tips reached the overhead structure which held the plant hangers, string was let out, lowering the growing tips, and plants were unhooked and moved further down the row to accommodate the additional vine growth. This was repeated throughout the season as the vines lengthened. Plants were drip irrigated and fertigated throughout the season with several organic amendments. Four to six inches of rye straw mulch was applied to the entire floor space of the tunnels. Leaf tissue was sampled to assess plant nutritional status in early June and early July. Tomato harvest started June 18 and continued until hard freeze on October 25. Total tomato yields represent production on 2,240 square feet of high tunnel ground.

### Results

A diverse range of tomatoes were grown using a space efficient and productive trellising and management system. The objective was to display a number of interesting varieties and a trellising and fertility management system for growers to observe. Characteristics of the tomato varieties are shown in Table 3, arranged in order of fruit size. Note that yield data reflects marketable yield.

The standout varieties, according to opinions from the participating growers, the principal investigator, and experiment station farm crew include:

- ✓ **Golden Sweet:** fruity flavor with great acid/sweet balance and very attractive appearance, though not exceptionally productive
- ✓ **Black Cherry:** delicate thin skin with a burst of flavor and beautiful fruit color, though splitting reduces marketable yield
- ✓ **Golden Rave:** intriguing because of its distinctive shape and color, and highly acclaimed for fresh-eating qualities; very productive
- ✓ **Pink Beauty:** uniform fruits with great Brandywine-like flavor were very productive
- ✓ **Sakura:** consistent high productivity, excellent flavor

Early in the season, fruits were all of marketable quality. In July, effort was made to pick all fruits in order obtain a sense of percent marketability. For most varieties, this percentage remained high (upper 80s to low 90s). Two varieties were exceptions. **Pozzano** suffered from sunscald, particularly on fruits that were on the south-facing row which were partly or completely lying down on the mulch. Many of these did not get as much foliage cover as those inside the vine canopy, but the fruit sides may also present a larger exposed surface area and thus, were more vulnerable. Fruits were not dangling in the air because the vigorous vines needed to be lowered frequently. This is because they were planted in a side row rather than center row, where the trellis was only about seven feet high. Thus, the fruits were not ripe when the plants needed to be lowered because of lack of vertical space. **Rebelski** fruits had internal discoloration in the form of a green “core” that ran through to the blossom end, although the outside of fruits themselves were often fully colored. This may be a result of potassium deficiency in combination with intense heat, particularly in July, but this variety was very sensitive to these conditions. Generally, it was felt that insufficient potassium uptake led to a noticeable amount of internal discoloration, along with green shoulders on all of the **paste tomatoes** and yellow shoulders on the **Suzanne** cherries. A pre-season soil test showed that potassium was required but not severely lacking, and potassium was applied in several forms prior to and during the season. However, the heavy fruit loads and rapid growth, especially during hot weather, most likely prevented the roots from meeting the needs of the shoots.

**Black Cherry** was highly rated for flavor and visual appeal, but fruits are thin skinned, and splitting and keeping quality were problems all season. The same can be said for **Golden Sweet**, though splitting was not as frequent. All growers put these varieties into their future plans.

The highest yield per plant was achieved by **Clermon**, at 23.3 lbs. When clusters are pruned to 5 fruits, their size within the cluster is uniform, and the older fruits in the clusters hold well while waiting the younger ones to ripen. They remain firm at red-ripe and the flavor is good.

**Granadero** is a very sturdy and productive variety, with nearly 100% saleable fruit and excellent keeping quality. It is not especially good for fresh eating but is excellent for saucing.

**Indigo Rose** has intrigued people with its unusual marbled ripe color of purple into orange into red, but most find the flavor lacking, although chef-customers of growers love its color appeal in salads. Two of the three grower participants will not grow it again but one had a very favorable customer reaction.

**Juliet** is an exceptionally consistent producer with a simple sweet flavor and good texture for chopping since it is not very watery.

**Sakura** and **Suzanne** are both excellent large red cherry tomatoes with similar flavor, size and overall productivity. Sakura may have an edge in production consistency, and also because during conditions of heat stress, it did not develop yellow shoulders while Suzanne did.

**Red Pearl** has a simple sweet flavor and a delicate “crunch” which is appealing. However, its overall productivity is comparatively low.

**Rebelski** has a very attractive and substantial fruit, is very productive, and has very strong plants. These qualities don’t make up for the relative lack of flavor and poor ripening in the form of a green core. No one recommended this variety.

## Plant tissue tests

Leaf tissue nutrient concentrations showed little variation between tomato varieties and classes. Because of this, it appears that different classes of tomatoes do not vary in their demands for nutrients, so mixed plantings can be managed evenhandedly.

**Table 1: Tomato variety descriptions, arranged by fruit size according to catalog rating**

Tomato Variety	Fruit Type	Size (oz.)	Fruit Notes	Vine Vigor
<b>Rebelski F1</b>	Medium to large slicer	7 to 8	Large, lobed, extra firm	Vigorous
<b>Pink Beauty F1</b>	Medium slicer	6 to 8	Pink like Brandywine, firm	Moderate
<b>Clermon F1</b>	Greenhouse "Truss" type	5	Prune back to 5 per cluster	Moderate to vigorous
<b>Pozzano F1</b>	San Marzano type	4 to 6	Red, long, firm	Vigorous
<b>Granadero F1 (OG)</b>	salsa/sauce/drying	4 to 5	Red, broad, firm	Moderate to vigorous
<b>Golden Rave F1</b>	salsa/sauce/drying	2	Small yellow, med firm	Vigorous
<b>Indigo Rose</b>	Cocktail	1 to 2	Ripens to purple/orange/red	Moderate
<b>Juliet F1</b>	salsa/sauce/drying	1.5 to 2	Mini red firm	Vigorous
<b>Suzanne F1</b>	Cherry	1/2	Red, firm	Vigorous
<b>Sakura F1 (OG)</b>	Cherry	1/2	Red, firm	Vigorous
<b>Black Cherry (OG)</b>	Cherry	1/2 to 3/4	Purple/black, med firm	Vigorous
<b>Golden Sweet F1</b>	Grape	1/2 to 3/4	Deep yellow, firm	Moderate to vigorous
<b>Red Pearl (OG)</b>	Grape	1/2 to 3/4	Red, extra firm	Vigorous

**Table 2: Yield and other variety data (arranged by fruit weight) for all trial varieties in high tunnels, Kingston, RI**

Variety	1st pick date	Actual days to 1st pick	Catalog days to 1st pick	Net Wt. (lbs.)	Total Pints	lbs per plant	Pints per plant	Fr. Wt. (oz)
<b>Rebelski</b>	1-Jul	76	75	407		21.4		10.7
<b>Pink Beauty</b>	1-Jul	76	74	331		17.4		8.9
<b>Clermon</b>	3-Jul	78	70	420		23.3		6.0
<b>Pozzano</b>	1-Jul	76	72	364		20.2		4.9
<b>Granadero</b>	1-Jul	76	75	437		23.0		4.5
<b>Golden Rave</b>	1-Jul	76	67	324		17.0		2.5
<b>Indigo Rose</b>	5-Jul	80	75	84		5.6		2.2
<b>Juliet</b>	25-Jun	70	60	321	354	16.9	18.6	1.1
<b>Suzanne</b>	18-Jun	63	60	260	289	16.3	18.1	0.7
<b>Sakura</b>	12-Jun	57	55	296	327	15.6	17.2	0.7
<b>Black Cherry</b>	27-Jun	72	64	174	195	9.2	10.2	0.6
<b>Golden Sweet</b>	18-Jun	63	60	144	159	7.6	8.4	0.5
<b>Red Pearl</b>	18-Jun	63	58	144	158	7.6	8.3	0.3
<b>Total:</b>				3707	1482			