

Title: High Tunnel Trellised Cucumber Variety Trial: 2014
Report to: Pennsylvania Vegetable Marketing Research Program

Personnel:

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Introduction:

Cucumbers mature quickly and produce high yields but are extremely sensitive to frost. As the demand for locally grown cucumbers has increased from major grocery chains and consumers in central Pennsylvania, many growers are seeking to extend the cucumber growing season to take advantage of periods where local market supply is relatively low. It has been shown that the most cost effective way to extend the growing season is by using unheated, plastic covered, high tunnels. This is a reason why, after tomatoes and peppers, cucumbers are the most significant high tunnel crop. Additionally, high tunnels allow the grower to be extremely efficient with space as trellising is a viable option in high tunnels. Trellising also increases the likelihood of the production of long, thin, straight, fruit which will more readily meet the high standards of large grocery chains. For the benefit of plant health, trellising increases air flow between plants, reducing incidence of disease by keeping leaves dry.

As many growers know, choosing the right variety can result a large difference in yields and market value. This is especially true in the high tunnel environment because some varieties are specifically bred to tolerate higher temperatures and trellising.

Objectives:

- Identify parthenocarpic slicing cucumber cultivars that perform well in a high tunnel environment.
- Rate cultivars on their resistance and susceptibility to powdery and downy mildew while using a standard disease management program.
- Identify cultivars considered superior in flavor and appearance.
- Evaluate the difference between using standard 5 gallon (nominal) nursery pots and similarly sized "Smart Pots".

Methodology:

The varieties listed below were replicated 3 times in 2 plant blocks in #5 containers and 12" Smart Pots filled with a high coir potting media (Frey Brothers #300) in a 25'x48' Ledgeswood high tunnel at the Penn State Southeast Research and Extension Center (SEAREC). Pots were installed against each other in rows providing an approximate plants spacing of 12" in rows 5' apart on landscape fabric. Cucumbers were trellised vertically using #2100 polyethylene twine dropline and 3/4" vine clips.

Fruit was harvested regularly for yield, individual weight, and grade. Fruit was graded as being marketable or cull. Tissue samples were submitted to Agri-Analysis for nutrient recommendations. Soluble fertilizers were chosen based on these recommendations and applied through the drip irrigation system as needed. Two ounces of an Evereiss pelleted slow release fertilizer was applied evenly to the tops of the potting media.

Sources of seeds for this trial:

Variety	Company
Bejo 2943	Seedway
Corinto	Johnny's
Excelsior	Seedway
Green Finger	High Mowing
Iznik	Johnny's Seeds
Lisboa	Seedway
Manny	High Mowing
Picolino	Seedway
Unistar	Johnny's Seeds
USACX 0330	US Agriseeds - Seedway
USACX0329	US Agriseeds- Seedway
USACX8835	US Agriseeds- Seedway

Data Overview (Totals from 2 plants per plot x 3 replications. 100 plant yields were extrapolated from these plots):

Variety	Count 6 pots	Weight 6 pots	Count 100 pots	Weight 100 pots	Culls count	Culls weight	Culls percentage total by wgt.
USACX 0330 Smart Pot	81	#32.6	1,350	#543.44	15	#5.61	17%
USACX 0330 plastic	61	32.44	1,017	#540.8	12	6.83	21%
USACX 0329 Smart Pot	111	58.2	1,850	#970.2	19	10.21	17%
USACX 0329 plastic	92	44.92	1,534	#748.82	33	15.65	34%
USAC 8835 Smart Pot	76	38.91	1,267	#648.7	26	12.6	32%
USAC 8835 plastic	109	59.16	1,817	#986.2	33	13.06	22%
Bejo2943 Smart Pot	70	31.62	1,167	#522.1	17	6.02	19%
Bejo 2943 plastic	73	38.58	1,217	#643.1	16	5.54	14%
Picolino Smart Pot	81	41.31	1,350	#688.6	21	8.94	21%
Picolino plastic	81	31.38	1,350	#523.1	23	7.36	23%
Lisboa Smart Pot	74	44.81	1,234	#746.9	10	3.71	8%
Lisboa plastic	72	46.07	1,200	#768	23	11.99	26%
Green Finger Smart Pot	14	12.03	233	#200.5	5	2.27	19%
Green Finger plastic	10	7.24	167	#120.7	6	4.1	56%
Unistar Smart pot	118	42.39	1,967	#705.4	41	13.94	32%
Unistar plastic	102	37.45	1,700	#624.3	42	14.46	39%
Izник	91	43.95	1,517	#732.7	24	8.38	19%

Smart Pot							
Izник plastic	69	31.06	1,150	#517.8	21	8.21	26%
Corinto Smart Pot	58	38.46	967	#641.1	8	4.84	13%
Corinto plastic	66	41.36	1,100	#689.5	21	12.75	31%
Manny Smart pot	79	43.47	1,317	#724.7	20	9.26	21%
Manny plastic	81	48.51	1,350	#808.7	26	12.64	26%

Variety Comments:

Bejo 2943: This is the first time that we've had this variety in our trials program. It is easily the spiniest cucumber that we've ever seen outside of wild types. While the yields and cull rate were adequate, it's hard to see what market this very spiny variety would fit into.

Corinto: This slicer was bred specifically for the greenhouse environment which partially explains its superior performance, flavor, and durability. Skin is an attractive deep, smooth, green. Corinto is a very good option for a grower looking for a relatively disease resistant cucumber with high yields and relative disease resistance. Unlike the majority of the parthenocarpic varieties, these fruit look like the highest quality, field-grown fruit, so would meet the requirements of many rural and auction markets.

Green Finger: This variety performed very poorly in this cooler season, high tunnel environment. What few fruit we had were fair in appearance.

Izник: Very good yields of smaller cucumbers for an urban marketplace. The fruit quality is good, the appearance is good and they vines are easy to manage.

Lisboa: This variety is very similar to Corinto in appearance and production characteristics and is highly recommended. Excellent yield and quality.

Manny: Nice looking Beit Alpha type with light green skin, good flavor favorable trellising characteristics. The sole weakness in this variety is the higher cull rate as compared to other similar types.

Picolino: Picolino is the earliest yielding of the full length Beit Alpha types and has excellent flavor and appearance. Very early yielding with consistent harvests over the entire production run.

Unistar: Very high yields of small fruit that are ideal for packing into quarts. The only downside to this variety was the high cull rate which could have been caused by the cooler season.

USAC0330: Nondescript and typical was USAC0330. Low yields and high cull rates plagued this dark skinned variety. This variety did not perform well in this program. This is the second season for this variety. USACX0329 performs better overall under our production systems.

USACX0329: High yields (both weight and number of fruit), superior in both flavor and appearance. An excellent variety in both years it's been in our program.

USACX08835: While not impressive in 2013, this variety seemed to like the cooler conditions of 2014. We had good yields of high quality fruit.

Notes:

- 1) Powdery and Downy Mildew: PM only appeared on high tunnel plants as they started to senesce and had been harvested for 3 weeks or more. Downy mildew was a short term challenge as there were only about 3-4 weeks this past growing season when DM on cucumbers was an issue.
- 2) We ran a limited fall production run that began with direct seeded cucumbers in late July that produced fruit until late-October in an unheated tunnel. We also doubled the plant population in the fall run to two plants per pot and reused the potting media except for what came out with the roots when the spring run was removed. Doubling the plant population to one plant every 6" looks very promising as a method to increase production.
- 3) The primary challenge in the fall run was Botrytis / Gray Mold as there were prolonged cool, damp periods in the last 3 weeks of October when there was substantial vegetation, but the temperatures were too cool for the ventilation fans to kick on. The addition of a humidistat controlled heater is part of our plans for the coming season. This will allow earlier and later harvests along with effective humidity control.
- 4) Even with the very moderate temperatures during our late spring / summer production run, there is a benefit to using the Smart Pots for most varieties. Yields are better in most varieties with a lower cull rate. In some varieties the cull rate difference is profound. The Smart Pots do require about 15% more potting media, but since it appears that reusing the media at least one time is acceptable, this extra expense should be manageable.
- 5) The 2014 spring – summer production run reflected in this report was cooler and cloudier than average. Be sure to look at the 2013 report on this same project to compare season to season varietal differences.

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