

2017 Tennessee Home Vegetable Trials: Summary Report for All Crops

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Introduction and Overview

Determining success in residential vegetable production is not just a matter of yield. Success can often depend on crops being able to produce acceptable yields without extremely high management requirements. Yield and management criteria certainly differ by gardener, but a key facet is disease resistance that enables gardeners to produce crops without heavy losses to soil-borne disease or the burden of frequent pesticide applications for leaf diseases. Currently, there are some newer disease resistant cultivars being introduced to the market, but their quality for the home gardener is not well known. So, this preliminary trial was undertaken to assess a range of crops and cultivars for suitability and performance in Tennessee vegetable gardens.

Materials and Methods

Transplant Production and Crop Establishment

Transplanted crops were started in bay 1 of the UT Greenhouse in open seedling trays on 4 March, 2017. At the appearance of true leaves, seedlings were transplanted to 36 count, deep cell trays. Transplanting was done between 21 March and 25 March, 2017. Prior to transplanting in the field, plants were grown in a plastic covered heated greenhouse and hardened off in a shaded cold frame or outdoors.

Trial plots were located at the East Tennessee Research and Education Center (ETREC), Organic Crops Unit (OCU) in plot L, which is a non-certified plot. Soil tests were taken ETREC personnel and fertilization was applied according to soil tests results prior to plot establishment. The study area consisted of eight 175 ft long black plastic, drip irrigated rows with spacing indicated below. All cultivars were replicated once.

Table 1. Summary of crops and management

Crop (# cultivars)	Date Seed(s)/ Transplant(t)	Row spacing	In-row spacing	Plants /plot	First harvest	Last harvest	Notes
Peppers (21)	5/9 (t)	6 ft.	2 ft.	6	7/5	10/1	
Eggplants (6)	5/9 (t)	6 ft.	2 ft.	5	6/26	9/16	
Tomato (29)	5/8 (t)	6 ft.	3 ft. (2 ft. for dwarf)	6	7/6	8/28	
Beans (8)	6/9 (s)	5 ft.	2-4 in.	20 ft. plot	7/27	---	Uneven harvest led to poor yield data
Cucumbers (7)	6/6 (s)	8 ft.	1 ft.	10	7/20	8/21	
Muskmelon(4)	6/8 (s)	8 ft.	2 ft.	6	8/18	9/2	
Squash (8)	6/6 (s)	8 ft.	2 ft.	6	7/11	8/11	
Pumpkin (8)	6/8 (s)	8 ft.	3 ft.	5	8/28	---	
Corn (6)	6/9 (s)	3-4 in.	5 ft.	20 ft. plot	8/9	---	Rodent damaged led to poor data

Crop Management

No herbicides were used in the plot, but weed pressure was minimized by the use of plastic mulch and straw in the isles. Disease pressure was minimized by applications of labeled fungicides (Mancozeb and Daconil) to control *Alternaria*, *Septoria*, and powdery mildew. Applications of Spinosad were used to address yellow striped armyworms and tobacco hornworms, while neem oil was used to address spider mites. Fertilization (20-10-20) soluble fertilizer was provided approximately 10 times during the each growing season. Combined estimated irrigation volume and rainfall were 22.13 for 2017, although seed and harvest dates altered the total for crops.

Data collection and analysis

Yield was collected throughout the season for fruiting crops. All fruit per plot were counted and weighed at each harvest. Useable fruit were counted and weighed, and unusable fruit was counted and discarded. Sorting was done with the home gardener in mind. Data presented below are useable fruit that may have minor surface blemishes or small cracks, but does not have damage or decay that would prevent the use of the whole fruit. There are no standard error or statistical measures due to single plot replication.

Results

Table 2. Total useable fruit weight and number for tomato, pepper, eggplant (presented by plant).

Crop	Cultivar	Disease resistances	Wt./plant (lb)	Fruit/plant	Fruit wt. ounce	Comments
Eggplant	Hansel		8.5	39	3.5	Purple elongated fruit
Eggplant	Patio Baby		6.1	41	2.4	Small, egg-shaped purple fruit
Eggplant	Gretel		6.5	31	3.3	White elongated fruit
Eggplant	Bride F1		5.7	23	4.0	
Eggplant	Eggplant F1		4.5	16	4.7	
Eggplant	Crescent Moon F1		9.9	20	8.0	
Pepper	Alliance	BLS, PYMV, PMV, CMV, TMV	9.6	31	5.0	Traditional green bell
Pepper	Gourmet	TMV	4.7	17	4.6	Ripens yellow
Pepper	Big Bertha	TMV	10.1	31	5.2	Elongated bell
Pepper	Eros		5.9	94	1.0	Ripens yellow, baby bell
Pepper	Candy Cane		4.8	54	1.4	Striped fruit and leaves
Pepper	Pretty n Sweet		3.9	111	0.6	Ornamental and edible
Pepper	Carmen		8.8	49	2.9	Ripens red
Pepper	Sweet Sunset	BLS	9.9	88	1.8	
Pepper	Escamillo		7.3	36	3.3	Ripens yellow
Pepper	Spicy Slice	BLS, Tobacco Etch	6.1	66	1.5	
Pepper	Pepper Jalapeno F1		4.9	59	1.3	
Pepper	Emerald Fire	BLS	6.9	56	2.0	
Pepper	La Bomba II	BLS, TMV, PVY	3.8	43	1.4	

Pepper	Flaming Flare	TMV	3.5	61	0.9	
Pepper	Cheyenne F1		4.2	44	1.5	
Pepper	Pepper Cayenne F1		3.8	115	0.5	
Pepper	Ristra Cayenne F1		6.3	42	2.4	
Pepper	Zavory		1.0	39	0.4	Yields low due to fewer harvests in the late season
Pepper	Pepper Habanero F1		2.7	49	0.9	
Pepper	NuMex Suave Orange		1.2	34	0.6	
Pepper	Hot Sunset	BLS	9.1	80	1.8	
Pepper	Trial Hungarian Hot F1		5.9	60	1.6	
Pepper	Super Hungarian Hot F1		7.2	54	2.2	
Pepper	Trial Hungarian Semi Hot F1		6.3	53	1.9	
Tomato	Mountain Merit	EB, LB, F, N, TSWV	9.3	42	7.8	17% cull
Tomato	Defiant	LB, EB, F,V	11.2	103	3.8	5% cull
Tomato	Stellar	EB, LB, F, V, Sep.	14.5	100	5.1	8% cull
Tomato	Brandywine		11.1	26	14.8	19% cull (cracking)
Tomato	Big Brandy		11.6	31	13.1	24% cull (cracking)
Tomato	Genuwine		13.9	50	9.7	9% cull
Tomato	Tomato Red F1		12.5	53	8.3	16% cull
Tomato	Red Brandywine		14.5	73	7.0	8% cull
Tomato	ChefsChoice Yellow	TMV, scab, cracking	10.2	25	14.3	18% cull
Tomato	Yellow Brandywine		5.5	9	14.1	27% cull (cracking)
Tomato	Chef's Choice Orange	TMV, cracking, A	8.6	39	7.9	30% cull (armyworm hot spot)
Tomato	Pink Berkeley Tie Dye		7.1	28	9.1	33% cull (cracking)
Tomato	Cherokee Purple		10.4	39	9.5	20% cull (cracking)
Tomato	Cherokee Carbon		10.4	34	10.8	28% cull (cracking)
Tomato	Tomato Black F1		9.5	60	5.6	32% cull (cracking)
Tomato	Marnero F1	F, V, TMV	9.3	44	7.6	17% cull (cracking)
Tomato	Jolly Girl	F, V	4.0	341	0.4	

Tomato	Tomato Grape F1	EB	6.7	773	0.3	
Tomato	Sugar Rush	F, TMV	2.8	289	0.3	
Tomato	Little Napoli	F, V	3.0	46	2.3	
Tomato	Tidy Treats	F, V	2.6	543	0.2	
Tomato	Little Bing	F, V	1.4	106	0.5	
Tomato	Tidy Rose		2.4	13	6.4	30% cull
Tomato	Little Sicily	F, V	2.4	22	2.5	
Tomato	Homeslice	F, V	5.0	26	4.6	10% cull
Tomato	Sweet Scarlet Dwarf		0.5	2	8.3	44% cull
Tomato	Tasty Wine		1.5	4	10.0	45% cull
Tomato	Fred's Tie Dye		1.2	3	10.5	59% cull
Tomato	Dwarf Orange Cream		0.5	3	6.4	50% cull

Table 3. Total useable fruit weight and number for melon, squash, pumpkin (presented by plot).

Crop	Cultivar	Disease resistances	Wt./plot (lb)	Fruit/plot	Fruit wt. ounce	Comments
Melon	Athena	F, PM	26.0	7	59	
Melon	Sarah's Choice	F, PM	22.4	7	51	
Melon	Ambrosia	PM	10.9	5	35	
Melon	Trial		4.5	2	36	
Cucumber	Saladmore	CMV, A, PM, scab	20.7	86	8	
Cucumber	Fanfare	CMV, A, PM ALS	24.9	115	8	
Cucumber	Diva	PM, CVYV, scab	15.0	67	8	Seedless, thin skinned
Cucumber	Cool Breeze	CMV, PM, scab	20.5	185	4	Seedless, many spines
Cucumber	Straight eight elite		12.4	52	8	
Cucumber	SV4719CS	DM, PM, A, ALS, scab, ZYMV	12.3	61	7	Did show delayed leaf damage from downy mildew
Cucumber	Corinto	CMV, CVYV, PM	13.5	60	8	Early and productive
S. squash	Raven		39.2	80	17	Dark green zucchini
S. squash	Spineless Perfection	WMV, PM, ZYMV	39.8	67	21	Dark green zucchini
S. squash	Eight Ball		34.5	59	21	Small round fruit zucchini
S. squash	Lucky Eight		23.4	46	18	Small round fruit zucchini
S. squash	Bossa Nova	WMV, ZYMV	48.6	103	17	Mottled green/gray fruit
S. squash	Magda		43.2	59	26	Light green fruit
S. squash	Multipik		34.3	102	12	Yellow crookneck

S. squash	Zephyr		50.3	119	15	Yellow crookneck with green tip
Pumpkin	Howden		----	4	----	
Pumpkin	Cargo PMR	PM	----	7	----	Powdery mildew resistant
Pumpkin	Jarrahdale		----	3	----	Heirloom blue
Pumpkin	Lil pump-ke-mon		----	35	----	F1 Compact plant
Pumpkin	Moonshine		----	7	----	F1 white
Pumpkin	Valenciano		----	1	----	Heirloom white

* Yields represent values across all plants seeded in the plot.

Overview of Season

Summer conditions in 2017 were relatively moist and moderately warm. Leaf diseases in the tomatoes increased in July with early blight (*Alternaria solani*) and *Septoria lycopersici* present. Powdery mildew was present in the summer squash and pumpkins. Cucumbers did decline due to downy mildew. Insect and mite pests were likely more detrimental to yields than leaf diseases. Spider mites increased in mid-July and reached damaging levels in the tomato crop. Even with frequent sprays of neem oil, populations were challenging to control. Spinosad applications managed damage from yellow-striped army worms and tobacco hornworms. Squash bugs and striped cucumber beetles produced feeding damage in the cucumber, squash, and pumpkin crops and there was evidence of bacterial wilt spread by these vector insects.