2018 Summary for Knoxville Location of Tennessee Home Vegetable Trials

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Introduction

There are many factors other than yield that contribute to success in vegetable gardens. Taste, appearance, novelty, and ease of management as well as how the cultivar fits in garden space is important. These various factors mean that trials for gardeners need to address the growing habit of crops, ease of establishment and disease resistance that contributes to ease of management, appearance, and productivity. Currently, there are many novel and/or disease resistant cultivars being introduced, but their quality for the home gardener is not well known. These preliminary single replication trials seek to assess a range of crops and cultivars for suitability and expanded trialing in Tennessee vegetable gardens.

Materials and Methods

Transplant Production and Crop Establishment

Transplanted crops were started in bay 1 (glass greenhouse with automatic shading and mist bench) of the UT Greenhouse in open seedling trays on 10 March, 2018. At the appearance of true leaves, seedlings were transplanted to 36 count, deep cell trays. Transplanting was done on 28 March and 29 March, 2018. 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 on the UT campus.

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 that allows for the use of conventional management practices. 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
Peppers (16)	5/14 (t)	6 ft.	2 ft.	6	6/30	10/4
Tomato (60)	5/9, 5/15 (t)	6 ft.	3 ft. (Ind.) 2 ft. (Det.)	6	6/30	8/31
Cucumbers (8)	5/29 (s)	8 ft.	1 ft.	10	7/2	8/17
Muskmelon (7)	5/29 (s)	8 ft.	2 ft.	6	7/29	8/23
Watermelon (7)	5/30 (s)	8 ft.	3 ft.	5	7/29	8/23
Summer squash (11)	5/30 (s)	8 ft.	2 ft.	6	6/26	8/17
Winter squash (5)	5/30 (s)	8 ft.	2 ft.	6	7/13	8/23

Crop Management

No herbicides were used in the plot, but weed pressure was minimized by the use of plastic mulch in the planting rows and wheat straw in the isles. Disease pressure was minimized by applications of labeled

fungicides (Daconil) to control *Alternaria, Septoria,* and powdery mildew. Applications of Spinosad were used to address yellow striped armyworms and tobacco hornworms. Sevin was used to address cucumber beetles on the cucurbits, while neem oil, Azamax, and Malathion (tomatoes only) was used to address spider mites. Fertigation (20-10-20) soluble fertilizer was provided approximately 11 times during the each growing season. Combined estimated irrigation volume and rainfall were 24.6 for 2018, 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).

AAS= All American Selection award winners; TTP= Tennessee Home Garden Variety Trial Top Performer

Crop	Cultivar (F1s are hybrids)	Disease resistances	Wt./plant (lb)	Fruit/ plant	Fruit wt. (oz.)	Comments
Pepper	Sweetie Pie F1 (AAS)		4.48	29	2.5	Nice smaller bell that ripened quickly
Pepper	Round of Hungary		2.69	16	2.7	Novel appearance-heirloom
Pepper	Candy Cane		3.57	53	1.1	Beautiful, novel fruit and plant
Pepper	Red Knight F1	BLS, PVY	4.41	19	3.6	No visual different in disease pressure were apparent. Red Knight did have noticeably smaller fruit.
Pepper	Alliance F1	BLS, PYMV, PMV, CMV, TMV	4.86	15	5.3	
Pepper	Mecate F1	BLS, TMV, PMV	4.70	17	4.6	
Pepper	Corno di Toro		3.60	29	2.0	OP Italian red bull horn thinner walls, larger plant.
Pepper	Mama Mia Giallo F1 (AAS)	TMV	6.14	30	3.3	Large yellow Italian roasting, late summer peak.
Pepper	Ajvarski		4.59	23	3.2	Heirloom that did well in taste trials, thick walls
Pepper	Yellow Sparker F1		3.60	70	0.8	Small fruit extended picking time
Pepper	Just Sweet F1 (AAS)	Tm0	3.73	50	1.2	Fruit was nice sized, performed well in tasting, slightly taller plant
Pepper	Cornito Giallo F1 (AAS)		5.75	46	2.0	Smaller Italian roasting, slighter earlier, performed well in tastings
Pepper	Yummy		2.65	72	0.6	Small fruit extended picking time

Pepper	Red Ember F1 (AAS)		3.42	96	0.6	Small cayenne, productive, but time consuming to pick, compact plant
Pepper	Aji Rico F1 (AAS)		0.82	23	0.6	Mild heat, crisp, thin walled fruit, larger plant
Pepper	Mad Hatter F1 (AAS)		0.56	11	0.8	Lower yield, unique fruit, floral, sweet fruit, larger plant
Tomato	Damsel F1	LB, V,F,N	14.73	28	8.5	Smoother smaller pink fruit
Tomato	AAS pink trial F1		13.52	18	12.0	
Tomato	Chef's Choice Pink F1 (AAS)	TMV, F,N,S, Cracking, Scab	15.90	16	16.2	Very large fruit, heirloom look
Tomato	Black Krim		16.18	27	9.8	Heirloom
Tomato	AAS black tomato trial F1	TMV, Cracking, A, F	19.15	35	8.8	Trial cultivar actually Chef's Choice Black
Tomato	Early Choice Black F1 (AAS)	TMV, Cracking, F,V	20.24	53	6.1	Indeterminate, many medium sized fruit, soft texture, some cracking
Tomato	Big Beef F1 (AAS)	V,F,N, TMV, GLS	16.58	35	7.7	Indeterminate, large red fruit
Tomato	Livingston's Favorite		15.93	64	4.0	Indeterminate, med. Red fruit, heirloom
Tomato	Arkansas Traveler		18.48	118	2.5	Indeterminate, small pinkish fruit
Tomato	Garden Treasure F1		15.09	30	8.0	UF bred for taste, pointed plum fruit, indeterminate
Tomato	Brandywine		10.28	15	11.0	Indeterminate, pink heirloom
Tomato	German Johnson		17.64	23	12.5	Indeterminate, heirloom look and flavor, but productive
Tomato	Cherokee Carbon F1		21.20	24	14.1	Indeterminate, hybrid with Cher. Purple parent, has done well in taste trials in 2 years
Tomato	Little Bing F1	F,V	2.93	16	2.9	Det. cherry for container
Tomato	Little Sicily F1		4.35	47	1.5	Det. small slicer for container
Tomato	Little Napoli F1	F,V	3.01	7	6.9	Det. small plum for container
Tomato	Patio Choice Yellow F1 (AAS)	TMV, F,V	11.41	32	5.7	Prolific large yellow cherry fruit, det. plant for container
Tomato	Garden Gem F1		12.04	-	-	UF bred for taste, pointed plum fruit, determinate
Tomato	Valentine F1 (AAS)	EB	11.09	-	-	Firm, deep red mini plum fruit with high lycopene.
Tomato	Juliet F1 (AAS)	EB, LB	22.09	-	-	Indeterminate, Large grape, productive, healthy plant.
Tomato	Tomatoberry		15.29	-	-	Indeterminate, Unique shape, did not perform well in tastings

Tomato	Atomic Grape		16.27	-	-	Indeterminate, Unique color, did not perform well in tastings
Tomato	Sun Gold F1	F, TMV	8.40	-	-	Indeterminate, small yellow cherry fruit, performed well in taste trials
Tomato	Black Cherry		10.47	-	-	Indeterminate, larger cherry fruit, more acidic or stronger tomato flavor
Tomato	Cherry Bomb F1	LB	14.39	-	-	Indeterminate, productive, small red cherry fruit, performed well in tastings in 2 years
Tomato	Plum Regal F1	V, F, LB, TSWV	7.35	29	4.1	All determinate roma tomatoes were impacted to some degree by early blight and spider mites. Fruit in most cultivars was quite firm. Main observed differences in cultivars was fruit size.
Tomato	AAS roma trial F1	V,F,N, A, GLS, LB, BacSP,BacC	10.68	80	2.1	
Tomato	Heinz Super Roma F1	V,F,N, Phy, TSWV	7.39	30	4.0	
Tomato	Pony Express F1	F,V,N, BacSp, TMV	9.48	47	3.3	
Tomato	AAS roma trial F1	V,F,N,A,GLS	9.52	90	1.7	
Tomato	Little Napoli F1	F,V	5.71	49	1.9	
Tomato	AAS roma trial F1	V,F,N,BacSp	13.09	62	3.4	
Tomato	Defiant F1	LB, EB, F,V	12.67	59	3.5	Determinate, medium sized fruit, did well in tasting
Tomato	AAS trial red Det. F1	EB, LB. V,F,N, TMV, TSWV, GLS	9.59	26	5.9	Determinate, EB resistance was apparent, fruit was firm
Tomato	Mountain Merit F1 (AAS)	EB, LB, F, N, TSWV	11.07	24	7.3	Determinate, firm fruit, has not performed well in tastings
Tomato	AAS trial red Det. F1	LB, V,F,N	11.20	28	6.4	Determinate, lack of EB resistance was apparent
Tomato	BHN 871 F1	V,F, TMV	10.50	29	5.8	Determinate, yellow fruit, spider mite damage limited production
Tomato	Celebrity F1 (AAS)	V,F,N,A, TMV	14.37	34	6.8	Determinate, consistent performer, large red fruit
Tomato	Stellar F1	EB, LB, F, V, Sep.	13.65	46	4.7	Determinate, medium sized firm fruit
Tomato	W UF F1		13.22	41	5.1	Determinate, bred for flavor, but did not do taste trialing this year

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
Cucumber	Salaldmore F1	CMV, S, A	105.9	165	10.3	Bush type, smoother fruit

Cucumber	Patio Snacker F1		116.3	211	8.8	Very compact plant, prolific flowers, pretty traditional cucumber appearance
Cucumber	Diva F1 (AAS, TTP)	DM, PM, S, CVYV	64.9	165	6.3	Thin skinned, cucumber beetle damage was present
Cucumber	Trial cucumber F1		155.0	378	6.6	Thin skinned, prolific, cucumber beetle damage was present
Cucumber	Iznik F1	PM, S	106.3	321	5.3	Smaller fruit, hard to pick fast enough, cucumber beetle damage
Cucumber	Amiga F1	CMV,PM, PRV, ZYMV, DM	86.4	173	8.0	Dark skinned, stronger taste
Cucumber	General Lee F1 (TTP)	CMV, DM, PM, S	139.2	232	9.6	Good production, vine durability, slightly later than other cultivars
Cucumber	Olympian F1		125.6	230	8.7	
Muskmelon	Sugar Cube (TTP)	F, PM	154.7	56	44.2	Prolific small fruit, easy to pick
Muskmelon	Minnesota Midget	F	56.1	21	42.7	Much more loss, ripened rapidly to soft and damaged
Muskmelon	Savor F1		12.3	7	28.2	There were no outstanding producers among these French melons, animals did cause fruit damage
Muskmelon	French Melon F1	F, PM	52.1	15	55.6	
Muskmelon	Escorial		66.1	37	28.6	
Muskmelon	AAS French Melon F1	F, PM	34.8	13	42.8	
Muskmelon	Infinite Gold		21.1	7	48.3	Seemed to ripen slowly and incompletely
Watermelon	Mini Love F1		188.3	35	86.1	Smaller melon, ripened faster and more completely
Watermelon	Sugar Pot F1		18.8	5	60.2	Slower to ripen, harder to determine ripeness, dark skin, round, very compact plant
Watermelon	Top Gun F1		84.8	17	79.8	
Watermelon	Trial watermelon F1		100.9	26	62.1	Performed well, nice size
Watermelon	Shiny Boy F1		81.3	14	92.9	
Watermelon	New Orchid		100.0	25	64.0	Many smaller fruit, nice sweet colored flesh
Watermelon	Starlight		24.2	5	77.4	Crisp flesh
Summer Squash	Acorn squash F1	PM	60.8	44	22.1	
Summer Squash	Harlequin		71.4	63	18.1	
Summer Squash	Sunburst (AAS)		105.5	96	17.6	
Summer Squash	Su. squash trial F1		99.4	113	14.1	Acorn shaped summer squash
Summer Squash	Zephyr		166.2	189	14.1	Good production, long harvest season, green tipped light yellow fruit

Summer Squash	Raven (TTP)		68.8	57	19.3	Darker skin, poor germination in these plots
Summer Squash	Tigress (TTP)	WMV,ZYMV,PRSV	110.0	83	21.2	Lighter green flecked skin
Summer Squash	Slick Pik YS 26		104.6	125	13.4	Nice slim fruit, easy to pick
Summer Squash	Tempest (TTP)		145.5	160	14.6	Variegated yellow/white, slightly ribbed fruit
Summer Squash	Bossa Nova (AAS, TTP)		89.2	77	18.5	Mottled green and light green fruit
Summer Squash	Flamino		18.8	18	16.7	Traditional
Winter Squash	Butterscotch F1 (AAS)	PM	68.5	60	18.3	Prolific production, early August harvest, smooth texture
Winter Squash	Butterbush		30.0	23	20.9	Stringy texture, neck was harder to handle when cooking
Winter Squash	Honeynut		42.7	50	13.7	Small, personal sized, darker skin
Winter Squash	Sunshine (AAS)		158.8	51	49.8	Great production, large vine
Winter Squash	Bush Delicata (AAS)		31.6	27	18.7	More compact plant,

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

Overview of Season and Management

Summer conditions in 2018 were relatively moist and moderately warm with a few hot weeks. Consistent moisture made weed pressure more severe than in recent years. Leaf diseases in the tomatoes increased in July with early blight (*Alternaria solani*) being the most prevalent. Powdery mildew was present in the summer squash and pumpkins, but not a large factor. Cucumbers did show downy mildew pressure and show some leaf loss and decline, but still had a long production season. Insect and mite pests were likely more detrimental to yields than leaf diseases. Spider mites were present early in the summer and were not completely controlled by sprays. By late July, the damage was quite noticeable. Spinosad applications managed damage from yellow-striped armyworms and tobacco hornworms, which were not widely present, but severe in a couple hot spots on the tomatoes. Squash bugs and striped cucumber beetles produced some feeding damage in the cucumber, squash, and pumpkin crops. Early season insecticide sprays reduced the impact of bacterial wilt with only the loss of a couple plants.