

# Heat Stress Tomato Trial 2019 Results

## Summary

- The most common number of tomatoes that a person took was two.
- Fifty-one different people participated.
- 333 tomato plants were given out.
- Response rate was 84% in June, 84% in August, and 82% in September. Thank you to all that responded!
- In terms of survival and continued tomato set from June to September “Valley Girl” was judged the best, but it’s reported production wasn’t as high as other varieties.
- “Big Beef” had the highest production, survival and continual set, but all the plants were taken by just one person, who could just be an awesome tomato grower.
- For grower comments, please see the appendix section.

## Survival

- No plant deaths were reported for the June survey, except for “Tasti-lee”, “Phoenix”, “Porter” and “RS8”.
- Varieties that were not planted by the August survey were counted as “dead” for simplification reasons for the remainder of the experiment.
- By August, varieties “Porter”, “RS8”, “Picus”, “Black Prince”, “Black Krim”, “Estiva” and “Fall 2018-253” were reported to have survival under 50% with five or more responses (aka tomato plants in the experiment).
- In September the varieties “Bolseno”, “Rally”, “Better Bush”, “BHN1021”, “Valley Girl”, “Prudens Purple”, “Big Beef”, “Amelia” and “Bella Rosa” had survival above 50% with five or more responses (tomatoes given out).
- Some tomato plants may have been pulled as part of phasing out their garden for the fall. This likely had an impact upon the survival percentage for the experiment in September.

## Tomato Set

- In the June survey, the tomatoes with the lower days to maturity had the highest set and the varieties with the highest days to maturity had the least amount of set. This is normal.
- In August, all of the tomatoes except “RS 8” had set.
- Varieties that reported 100% set were “Big Beef”, “BHN 1021”, “Estiva”, “HM1823”, “Rally”, “Tasti-lee” “Bella Rosa”, “Black Prince”, “Black Krim”, “Dixie Red”, and “Amelia”. It should be noted that in August “Black Krim” and “Black Prince” only had two surviving plants reporting, and that the “Estiva” had been pulled up because it did not look good.
- Tomatoes that had 50% set or less in August included “Arkansas Traveler”, “Prudens Purple”, “Heatmaster”, “Manalucie”, “Wisconsin 55” and “RS8”.
- In September, “Bella Rosa”, “Black Prince”, “Tasti-Lee” and “Homestead”, reported all their surviving tomato plants as setting, but the number of surviving plants for these varieties wasn’t higher than two except for “Bella Rosa”.

- Overall, the tomato variety with the highest survival and set was “Valley Girl”, followed by “Big Beef”. It should be noted that all “Big Beef” tomato plants went to the same person.
- The variety “RS 8” did not have any reported fruit set throughout the experiment.

## **Production**

- Production is thought to be most accurately reported as of the August survey date.
- “Tasti-Lee”, “Black Prince”, and “Big Beef” were rated highest in production. It should be noted that “Black Prince” is a cherry variety and therefore would be expected to produce a lot of tomatoes. All ten of the “Big Beef” variety went to the same person, so this may not demonstrate the variety accurately.
- Varieties that were medium high in production were “Picus”, “Porter”, and “Amelia”. Only one variety did not produce, “RS8”. Varieties “Summerpick”, “Skyway”, “Valley Girl”, “Pruden’s Purple”, “Homestead”, “HM1823”, “Manalucie”, “Fl 91”, “Carbon”, “Black Krim”, “BHN 589”, “BHN 1021”, “Arkansas Traveler”, and “Bella Rosa” had low production. Of these varieties, “Skyway”, “Summerpick”, and “FL 91” did not have many survey responses, so the low production rating may not be an indicator for these plants.
- Overall, if you look at continual set, survival and total production, “Bolseno”, “Valley Girl”, “Tasti-Lee” and “Big Beef” had at least one surviving plant in September set tomatoes, with “Valley Girl” having the most plants survive until the end and with continual set.
- See appendix for more detailed information.

## **Conclusions**

- “Valley Girl” may have handled the heat stress and survived the longest, being the easiest to grow, it wasn’t reported as the most productive.
- “Tasti-lee” had the highest production for a variety that went to multiple people and was not a true cherry variety. However only two plants survived until September.
- In terms of survival, “Big Beef” had high survival and set that continued through August. The problem with this variety though is that they were all grown at one location.
- The low number of tomatoes given out per variety was a huge hurdle for some of the varieties in this experiment. Some of these varieties may not be bad, but not enough of them were given out to different people for that to be determined.

## **Changes for Next Year**

- Basic growing recommendations will be given with the plants. On the first survey, you’ll be asked to note if plants are growing in the ground, if in raised beds or in pots.
- Plants will continue to be Free\*. I’m going to emphasize that while there is no charge for these plants, they are intended to be taken home and research done upon them, so they are not technically free.
- Data expectations will be given out when the plants are given away.

- Surveys will go out June, July, August and September.
- Transplants will be much healthier before being given out.
- A control variety, such as “Celebrity”, will be added as to have a better comparison for data. Every participant will be asked to take at least one “Celebrity” plant in addition to the other tomato plants they will be taking.
- There will be a limit on the number of tomatoes that can be taken. Participants will be limited to four plants max per each variety per garden site, and ten plants total per garden site. The minimum number of tomatoes to be taken will be two (one “Celebrity”, one other variety).
- Participants will be asked to keep tomatoes in the garden until they are dried down dead but this will not be required.
- The number of tomato varieties will be reduced to nine, to allow for more plants per variety and because of lack of growing space.
- Dispersal date will not change. This is due to growing space and because the intent of this experiment is to test which tomato is the easiest to grow in our summer conditions. These tomatoes aren’t intended to replace your normal crop or to grow during the ideal season. They are intended to find out which varieties can survive and produce. Tomatoes should be planted at least two weeks before the dispersal date.
- An effort will be made to include other counties besides Kerr and Gillespie County, including Kimble, Kendall, Llano and Blanco.

## Appendix

### Tomato Trial Production Scale Explanation

If you replied:	I interpreted that into:			
	1	2	3	4
None	X			
A few		X		
Very few		X		
Five or less		X		
Some			X	
Nothing special			X	
6-14			X	
Lots				X
Prolific				X
Good Producer				X
15 or more				X
Productive				X

Each tomato plant that I got a response back was given a number from the scale above. These numbers were then averaged by variety, and a production rating was given based on those numbers, with very low (0-1), low (1-1.5), low/medium (1.5-2), medium (3-3.5), medium/high (3.5-4) and high (4). A problem with doing it this way is that cherry varieties, which naturally produce high amounts of fruit, may have an inaccurate representation of their production. This information is from August 2019.

Variety	# Survey Responses	Currently Alive	Alive Percent Set	Production Rating of Set Tomatoes
Amelia	10	60%	100%	Medium/High
Arkansas Traveler	9	100%	44%	Low
Bella Rosa	8	75%	100%	Low
Better Bush	10	100%	80%	Low/Medium
BHN 1021	10	100%	100%	Low
BHN 589	10	80%	75%	Low
Big Beef	10	100%	100%	High
Black Krim	10	20%	100%	Low
Black Prince	10	20%	100%	High (Cherry)
Bolseno F1	9	100%	78%	Medium
Carbon	10	80%	75%	Low
Dixie Red	6	83%	100%	Medium
Estiva	10	0%	100%	Medium
Fall 2018-253	6	17%	83%	High (Cherry)

FL 91	2	100%	50%	Low
Heatmaster	10	80%	25%	Medium
HM1823	8	100%	100%	Low
Homestead	10	90%	70%	Low
Manalucie	9	100%	22%	Low
New Girl	9	78%	78%	Medium
Phoenix	9	89%	78%	Medium
Picus	10	30%	67%	Medium/High
Porter	10	40%	75%	Medium/High
Prudens Purple	10	70%	29%	Low
Rally	8	100%	100%	Low/Medium
RS 8	5	40%	0%	Very Low
Skyway	3	100%	67%	Low
Summerpick	4	100%	100%	Low
Tasti-lee	8	75%	100%	High
Tribeca	2	100%	50%	Medium
Valley Girl	6	100%	83%	Low
Wisconsin 55	9	100%	22%	Medium

Table 2. Very Low=0 tomatoes. Low=5 or less tomatoes per plant, Medium=6-14 tomatoes per plant, High= greater than 15 tomatoes produced per plant.

## Comments by Variety

(Comments do not generally include production amounts)

### Amelia

- Plants short, tend to crack. Taste ok. Not as productive compared to regular tomatoes. (8/1)
- Great little plant. Pulled them out a week ago. (8/1)
- Doesn't like it. Stopped cracking. Picked up in production, but behind other varieties.

### Arkansas Traveler

- Plants are huge, blooming, no set except for two, used earthworm casting as a fertilizer. (6/24)
- Plants fried (8/1)
- Use for cooking. Some are nice looking. Some have sunscald. Yellow splotchy, no red sheen on some. (8/1)
- Not crunchy. First one mushy texture, but improved. Not big. Good for slicing. Not pretty.

### Bella Rosa

- All set. on-1 in particular not as well as the others. I am enjoying having them (6/24)
- Three tomatoes on plant. Pretty good size. very close to being ripe.

### **Better Bush**

- The tomatoes hide under the foliage. The plants look like little trees. (6/24)
- Small to medium size (8/1)
- Cute patio tomatoes. Picked a few. Small to medium size. (8/1)
- Not as productive as other variety, not worth their time. Does make a nice green bushy plant. (9/5)

### **BHN 1021**

- Flowering, but only 3 tomatoes on one, 4 on the other (6/24)
- Medium to large size. Plants look healthier but still dying back (8/1)
- Hornworm infestation (8/1)
- Sorry tomatoes, very few. Not very many blossoms. (8/1)
- Needs a cage. I stole it for a different vegetable. (9/5)

### **BHN 589**

- Only 10 inches in size, but healthy (6/24)
- Only grew, max 14 inches (8/1)
- Died before setting fruit (8/1)

### **Big Beef**

- Skin is thick and chewy (8/1)
- Healthiest, hardiest (9/5)

### **Black Krim**

- Eaten down, just stubs (6/24)
- About 2 1/2 foot now, very vigorous, started blooming a week ago (6/24)
- 5 large on vine, plus more flowers (8/1)
- Grows vigorously in every direction (9/5)

### **Black Prince**

- Not bigger than planted size (6/24)
- Eaten down to ground (8/1)
- 20 per plant. A lot of splitting. Few that were edible were good. (8/1)
- Split vertically, had issues with this. Would pick before split and let ripen on counter. (9/5)

### **Bolseno**

- Only 10 inches in size, but healthy (6/24)
- Trailing, not as bushy (6/24)
- Healthy, both have fruits with a bit of yellow tinge on them. (8/1)
- sun burn issues (8/1)
- 2 ripe, eight green (8/1)
- Very tasty. (8/1)

### **Carbon**

- Set several fruit 1/2 to 3 inch across, does not mind heat (6/24)
- Healthy but dropping flowers. In pots and getting fertilized. (6/24)
- 12-15 ripening (Has two plants) (8/1)
- Currently vegetative, had excellent flavor and beefsteak texture. Prone to stem end cracking. Not a continuous producer. Prefers Juliet, which has good taste, vigorous, never cracks and bears non-stop. (8/1)
- Thin foliage compared to other plants. (8/1)
- Set late, only two tomatoes. Suffered from heat stress. (8/1)
- Not recommended. (9/5)
- Taste was slightly acidic, but enjoyable. (9/5)
- Lost to bugs (9/5)

### **Dixie Red**

- Plant got hit with some herbicide somewhere, but it's still okay. Unusually tall. (6/24)
- About 1 1/2 tall now, looks healthy, no buds, looked sickly almost didn't survive so this is progress.
- Struggled early but caught up. 3 feet tall. Other varieties are taller. Had drip irrigation and lots of good rain in May and June. Healthy and doing well. (6/24)
- Big and green still (8/1)
- 7 medium ones on plant, still blooming (8/1)
- One set two. Ate one, very good, skin not too tough, it was tart. Other set 9 tomatoes, two are ripening on windowsill(harvested), others on vine very green. (8/1)
- Small and tidy plants (9/5)
- Delicious. A bit crowded in the garden. (9/5)

### **Estiva**

- Several reds a week (9/5)

### **Fall 2018-253**

- Golfball size tomatoes (6/24)
- Has 12 tomatoes on it so far!
- Ball tomato, little larger than a cherry but still a small tomato (8/1)
- Good flavor. Plant gave in to a "late blight ending". (8/1)
- Very tasty (8/1)

### **FL 91**

- No blooms yet. Planted in a raised bed. (6/24)
- Production got eaten by a squirrel. Plant did not get very big and did not produce much. (9/5)

### **Heatmaster**

- Blooms and golfball size tomatoes (6/24)
- Not bigger than planted size (6/24)
- Have about 6 green tomatoes each (8/1)
- One is 2 feet tall; rest are 8-12 inches tall. No flowers or fruit but are growing. (8/1)

### **HM1823**

- Large tomatoes already (6/24)
- Poor size. Plant is nearly dead. Doesn't look great. Tomatoes are small. (8/1)
- Not as many as Rally, but they like it. Nice large size. (8/1)
- First of my tomatoes to die (9/5)

### **Homestead**

- No flowers, scrawny looking. Used an slow release organic fertilizer. Going to try worm casings. (6/24)
- 5 ripening (8/1)
- No flowers, no tomatoes. Scrawny. Leaving in the ground for fall tomatoes. (8/1)
- Got infested, removed plant. (8/1)
- Some sunburn (8/1)
- Produced the most. Low and thick. (9/5)

### **Manalucie**

- Only 10 inches in size, but healthy (6/24)
- Only two that turned red (8/1)
- Lots of leaves, few blossoms. Sorry plants! (8/1)
- No production (9/5)

### **New Girl**

- Rough first life, doing better now. (6/24)
- Lots of green tomatoes and blossoms. (8/1)

### **Phoenix**

- Alive, but no blooms. None of their other tomatoes are doing well either. (8/1)
- Favorite, large tomatoes, large enough to use on a hamburger. Lots of green tomatoes (8/1)
- Grown this variety before and those had bigger fruit. They are still an ok size. (8/1)
- No edible fruit (9/5)

### **Picus**

- Flowering, set, at least 14 but probably more (6/24)
- Not bigger than planted size (6/24)
- Looking healthy (6/24)
- Tomatoes were larger in early season. Now throwing smaller ones. Prolific. Doesn't ripen all at once. (8/1)

- Yielded first, but slowed down and pretty much no production right now (8/1)
- Just one alive still (8/1)
- Small, unlike romas at HEB. (8/1)
- It's starting to perk up and flower again. Might be a keeper. (9/5)
- Started best, gave fruit, now half brown (9/5)

### **Porter**

- 1 tomato died recently. All plants showing signs with chlorotic and some brown dried up basal leaves. (6/24)
- The plants got sick about 7/11 and burned up in the heat. Lack of air circulation may be an issue. (8/1)
- Plants did flower, but they never set. (8/1)
- First three had blossom end rot (8/1)
- None produced any fruit. Grew very well, flowered initially, but with the heat production of flowered ceased and plants died. Tomatoes were in an area with no air circulation (between two houses separated by a wooden fence). (9/5)

### **Pruden's Purple**

- Small tomatoes, not ripe. Plants seem to be slow growers, behind other tomatoes, not as many leaves. (6/24)
- About 2 feet tall, healthy, few blooms just opened. (6/24)
- One has a huge tomato, still green (8/1)
- Harvested one, 3 more on vine, still blooming (8/1)
- Wish that they could have gotten tomatoes. (9/5)
- Slow to produce but the tomatoes obtained were big and delicious. Did not fertilize in July or August, might have done better if I fertilized. (9/5)
- Moderate sized plant (9/5)

### **Rally**

- Healthy (6/24)
- Taste is just ok. Size is small medium. Slow to get going. Not as productive as other usual tomatoes (celebrity, whopper, abe lincoln). Plants are short. (8/1)
- Likes this variety. (8/1)
- Didn't produce as much as other tomato varieties. (9/5)

### **RS 8**

- Plants wilted, pulled them up. Left one. (6/24)
- Dead. (8/1)
- Never produced fruit (8/1)
- Frequently watered, but never flowered or produced. Did not like heat. (9/5)

### **Skyway**

- Lot of growth, multiple blooms but no set yet. (8/1)
- Did well, lost two tomatoes to bugs. (8/1)

- Says it's an indeterminate (8/1)
- Lost to bugs (8/1)

### **Tasti-lee**

- Planted May 15th. All same size, very consistent. Loaded with blooms. Good year for tomatoes. (6/24)
- Looks like it is a cherry (6/24)
- They seem to like them. (8/1)
- Great for the heat, still producing, favorite. (8/1)

### **Tribeca**

- All plants struggled initially due to watering issues, but now are adjusting to new home. Tribeca and Skyway have blooms. Phoenix is struggling but looking better. (6/24)
- Didn't like the transplant, fertilize once a week with 24-8-16. (6/24)
- Yes it lived, bloomed, have one tomato. Medium size and green, in large container. (6/24)
- Lost top of plant to windstorm. Says it is setting a few blooms. (8/1)
- Lost a couple to insects. (8/1)
- No edible fruit (9/5)

### **Valley Girl**

- Tomatoes are not big. Plant has some kind of infestation. (8/1)

### **Wisconsin 55**

- Never produced (8/1)
- Healthy. One is barren, one has a few green fruits. (8/1)
- Potted them up, but they have not flowered yet. (8/1)