

# Watermelon variety trial evaluation 2019



## **Watermelon variety trial evaluation 2019**

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## Crop management and watermelon varieties

**Location:** Tifton, GA

**Entries:** 27 varieties and advanced selections

Table 1. List of watermelon varieties evaluated in 2019.

<b>Syngenta</b>	<b>Seminis</b>	<b>Sakata</b>	<b>Enza Zaden</b>	<b>Harris Moran</b>	<b>Nunhems</b>	<b>Seedway</b>
Captivation	Tailgate	Kingman	Red Garnet	Turnpike	7197	SW1981
Exclamation	Road Trip	Charismatic	Red Amber	Troubledor	Embassy	SW2004
Excursion	Joyride	Unbridled	E26C.00063		Warrior	
Fascination	Bottle rocket	Secretariat			Declaration	
Sweet Gem	Summer Breeze					
WDL 6404	SV 0241					

**Planting Date:** Watermelon seeds were planted into 200 cell trays filled with soilless media on 02/12/2019, seedlings were grown in greenhouse until transplant on 03/25/2019.

**Plant Spacing:** 6-ft centers black TIF plastic mulch, 42-in in-row spacing (2074 per acre pop.)

**Plot size:** 10 plants per plot (2-row plots with 5 plants per row) with 10.5' alleys between adjacent plots, with 3 replicates of each variety. Missing plants replaced within 1 week of planting, complete stand for harvest.

**Fumigation:** Pic-Chlor 60 with black TIF plastic applied in Feb.

**Fertilization:** 500 lbs 10-10-10 under plastic when laid. Drip irrigation applied roughly 1 inch of water per week. Fertigation provided with 7-0-7 at a rate of 12 lbs. of N/acre week for 12 weeks (approx. 172 lbs N total).

**Herbicide:** Row middle applications of Curbit and Dual Magnum.

**Pest Control:** Weekly fungicide and insecticide sprays according to UGA recommendations.

**Pollenizer:** Wild Card (Sakata) placed after every 3<sup>rd</sup> and 5<sup>th</sup> plant in a plot (4 per plot, 2/row).

**Pollination Services:** 6 honeybee hives located approximately 500 feet from planting.

## Data Collection

**Harvest Dates:** watermelon fruit were harvested on 19 June and 3 July – 86 and 100 days after transplant. Fruit were harvested when tendrils had turned brown and ground-spots were yellow. Each fruit was weighed and graded into 60, 45, 36, and 30-count classes. The following classes and weights were determined by the National Watermelon Research and Development Group to be used for watermelon variety trials to aid in unifying trial results:

**60 count: 9-13.5 lb, 45 count: 13.6-17.5 lb, 36 count: 17.6-21.4 lb, 30 count: 21.5+ lb  
Fruit greater than 27 lb were not included in yield analysis.**

Fruit from the second harvest (4 fruit per variety per replicate) were utilized for quality measurements. Average firmness was determined using an 11 mm probe with a hand-held firmness tester from 2 locations in 4 melons (8 readings) per replication. Average brix was obtained from a teaspoon sample of flesh from each of the 4 melon subset per replicate which was crushed using a hand-held lemon press and read using a hand-held refractometer. Average number of hard seed was determined by counting the total number of hard seed per 4-melon subsample. Each melon was quartered and the number of black, hard seed counted in all 4 quarters of each melon (light colored pips were not included in this rating, but black/dark brown large pips were).

Average hollow heart was rated by slicing melons in half (length-wise) and ranking melons on a 0-5 scale (See Figure 1 below). On this scale: 0= no visible cracking in melons; 1 < 0.25 inch-wide, cracking in one direction, still marketable; 2 =0.25-0.5 inch, cracking in a single or multiple directions marketable; 3= 0.5-1.0 cracking in one or multiple directions, not marketable; 4 > 1.0 inch cracking in multiple directions with fruit center still intact, not marketable; and 5 > 1.5 inch cracking with center cavity of fruit exposed.

Statistical analysis were performed using the software RStudio Version 1.0.136 (RStudio Team, 2016). Analysis of variance (ANOVA) followed by a least square means comparisons were performed using the Fisher's least significant test adjusted at *p-value* of 0.05.

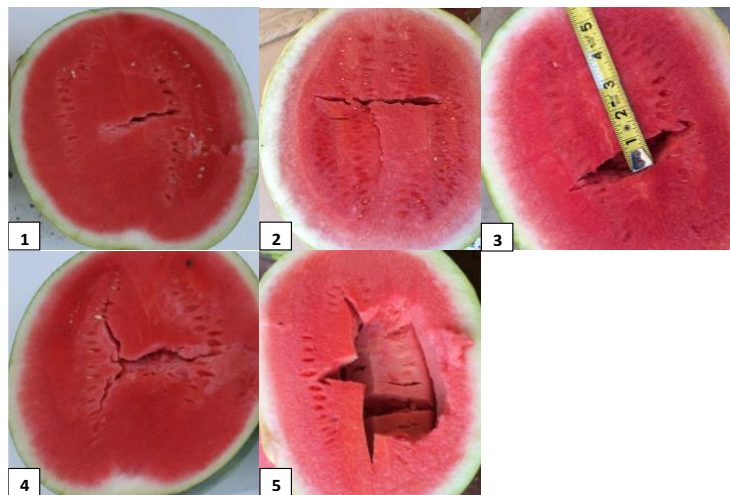


Figure 1. Hollow heart ratings from 1-5. A rating of “0” would indicate no hollow heart while ratings of 1-5 indicate varying degrees of severity. Fruit with obvious pollination issues were not harvested.

## Results

**Total yield:** Watermelon total yield varied from 52,959 to 99,924 lb./acre in 2019. Exclamation was the highest yielding variety, but it was not significantly different from eleven other varieties (SW1981, Captivation, Embassy, Secretariat, Charismatic, WDL6404, 7197, SV0241, Tailgate, Summer Breeze, Red Amber). Exclamation had a yield that was 25.3% of 60 count, 31.6% of 45 counts, 13.5% of 30 count, and 29.7% of 30 count.

**60-count:** Sweet Gem had the highest percentage (47.3%) of 60 count watermelon fruit with 25,044 lb./acre.

**45-count:** SV0241 had the highest percentage (52.3%) of 45 count watermelon fruit, although Captivation was a close second with 51.1% of 45 count. Average yield of 45 count watermelon fruit was 39,767 lb./acre for SV0241 and 46,426 lb./acre for Captivation.

**36-count:** Turnpike had the highest percentage (47.4%) of 36 count watermelon fruit followed by Charismatic (43.8%). Average yield of 36 count watermelon fruit was 35,593 lb./acre for SV0241 and 39,333 lb./acre for Charismatic.

**30-count:** Exclamation had the highest percentage (29.7%) of 30 count watermelon fruit with 29,780 lb./acre.

**Brix:** brix readings varied from 9.9% to 12.2%. Charismatic had the highest brix, but it was not significantly different from twelve other varieties (Excursion, Fascination, Bottle rocket, Road Trip, E26C.00063, Sweet Gem, 7197, Unbridled, Kingman, Red Garnet, SW1981, and WDL6404).

**Firmness:** firmness reading varied from 2.6 to 3.6 lbs. Secretariat had the highest firmness, but it was not different from thirteen other varieties (Fascination, Excursion, Troubadour, Red Garnet, SV0241, Unbridled, E26C.00063, Exclamation, Embassy, Road Trip, Turnpike, Bottle rocket, Declaration, Warrior)

**Hollow heart:** hollow heart was significantly lower in 2019 compared to previous year (2018). Particularly, there was no hollow heart in 2019, except for warrior (score of 0.3).

**Hard seeds:** the highest average of hard seeds was 6 for Fascination, however, there was no significant difference among varieties and all varieties did not have more than 10 hard seeds per fruit, attending the USDA standard of 10 hard seed per fruit for individual fruit that were tested.

**See the proceeding tables for results.**

**We would like to thank participating companies for their continued support.**

Table 2. Total yield and average weight for watermelons grown in Tifton, GA 2019. Ranked in descending order based on total yields.

Variety	Total yield	60 count	45 count	36 count	30 count
lbs./acre					
Exclamation	99,924 a	25,112 abcde	31,602 abcdef	13,431 cdefg	29,780 a
SW1981	96,120 ab	23,699 abcdef	25,611 bcdefg	19,631 cdefg	27,179 ab
Captivation	91,995 abc	17,647 cdefg	46,426 a	23,926 bcde	3,996 cd
Embassy	91,857 abc	30,745 a	36,242 abcd	19,487 cdefg	5,383 cd
Secretariat	90,541 abcd	27,942 abc	33,201 abcdef	25,832 bcd	3,565 cd
Charismatic	89,448 abcd	19,255 bcdefg	24,407 bcdefg	39,333 a	6,452 cd
WDL6404	87,634 abcde	18,278 bcdefg	29,187 bcdefg	26,563 abc	13,606 bcd
7197	78,141 abcdef	23,994 abcdef	38,325 abc	11,144 efg	4,678 cd
SV0241	76,490 abcdefg	17,604 cdefg	39,767 ab	14,582 cdefg	4,537 cd
Tailgate	76,165 abcdefg	21,221 abcdefg	35,846 abcd	13,163 cdefg	5,935 cd
Summer Breeze	75,647 abcdefg	16,523 defg	31,940 abcdef	19,650 cdefg	7,533 cd
Red Amber	75,491 abcdefg	25,912 abcd	34,812 abcde	14,767 cdefg	0 d
Turnpike	73,858 bcdefg	14,485 efg	19,255 efg	35,593 ab	4,525 cd
E26C.00063	73,193 bcdefg	19,994 abcdefg	31,649 abcdef	13,028 defg	8,522 cd
Unbridled	70,761 cdefg	16,757 defg	18,643 efg	21,600 cdef	13,760 bcd
Warrior	70,041 cdefg	27,736 abc	25,204 bcdefg	12,060 efg	5,042 cd
Fascination	67,917 cdefg	24,746 abcde	21,808 defg	13,685 cdefg	7,678 cd
Bottle rocket	67,585 cdefg	17,410 cdefg	22,966 cdefg	17,166 cdefg	10,043 cd
Troubadour	66,699 defg	28,903 ab	23,657 bcdefg	14,139 cdefg	0 d
SW2004	65,728 defg	13,896 fg	15,132 g	18,957 cdefg	17,744 abc
Excursion	63,884 efg	16,285 defg	28,891 bcdefg	15,888 cdefg	2,821 d
Road Trip	58,440 fg	22,072 abcdef	22,464 cdefg	13,904 cdefg	0 d
Red Garnet	58,184 fg	25,354 abcd	17,590 fg	15,240 cdefg	0 d
Declaration	57,886 fg	18,638 bcdefg	25,191 bcdefg	9,479 fg	4,577 cd
Kingman	56,895 fg	11,236 g	25,456 bcdefg	13,610 cdefg	6,593 cd
Sweet Gem	53,625 fg	25,044 abcde	21,274 defg	7,308 g	0 d
Joy Ride	52,959 g	17,511 cdefg	22,852 cdefg	9,827 fg	2,768 d

Numbers within the same column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD test  $P < 0.05$ .

Table 3. Total yield and percentage of fruit in all counts ranked in order of percentage of 45 count fruit.

Variety	Total yield	60 count	45 count	36 count	30 count
	lbs./acre	%			
SV0241	76,490	23.1 efgh	52.3 a	18.7 cd	5.9 de
Captivation	91,995	19.8 h	51.1 ab	25.3 cd	3.8 e
7197	78,141	30.2 bcdefgh	49.6 abc	14.6 d	5.6 de
Tailgate	76,165	28.1 cdefgh	47.4 abcd	17.0 cd	7.4 cde
Kingman	56,895	20.9 fgh	44.3 abcde	25.8 cd	8.9 cde
Red Amber	75,491	36.3 abcdef	44.0 abcdef	19.7 cd	0.0 e
Declaration	57,886	32.3 abcdefgh	43.5 abcdef	17.0 cd	7.2 cde
Excursion	63,884	28.9 cdefgh	43.1 abcdef	24.6 cd	3.4 e
E26C.00063	73,193	27.2 cdefgh	42.4 abcdef	18.7 cd	11.7 bcde
Summer Breeze	75,647	23.2 efgh	41.6 abcdef	24.8 cd	10.4 bcde
Joy Ride	52,959	33.8 abcdefgh	40.4 abcdefg	19.4 cd	6.3 de
Embassy	91,857	33.2 abcdefgh	39.4 abcdefg	21.3 cd	6.0 de
Sweet Gem	53,625	47.3 a	39.2 abcdefg	13.5 d	0.0 e
Road Trip	58,440	37.6 abcde	38.5 abcdefg	24.0 cd	0.0 e
Secretariat	90,541	30.9 bcdefgh	37.0 abcdefg	27.9 bcd	4.2 e
Warrior	70,041	39.5 abcd	36.2 abcdefg	17.4 cd	6.9 de
Troubadour	66,699	44.8 ab	33.8 bcdefg	21.4 cd	0.0 e
Bottle rocket	67,585	25.9 defgh	33.6 cdefg	25.6 cd	14.9 abcde
WDL6404	87,634	21.2 fgh	33.1 cdefg	30.6 bc	15.1 abcde
Exclamation	99,924	25.3 defgh	31.6 defg	13.5 d	29.7 a
Fascination	67,917	35.7 abcdefg	31.3 defg	23.8 cd	9.2 cde
Red Garnet	58,184	42.0 abc	30.5 defg	27.5 cd	0.0 e
SW1981	96,120	25.7 defgh	28.0 efg	23.9 cd	22.3 abc
Charismatic	89,448	21.8 fgh	27.3 efg	43.8 ab	7.1 cde
Turnpike	73,858	20.5 gh	26.9 efg	47.4 a	5.1 de
Unbridled	70,761	25.8 defgh	26.6 fg	27.8 bcd	19.8 abcd
SW2004	65,728	21.4 fgh	24.0 g	29.0 bcd	25.5 ab

zNumbers within the same column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD test P<0.05.

Table 4. Total yield and percentage of fruit in all counts ranked in order of percentage of 36 count fruit.

Variety	Total yield	60 count	45 count	36 count	30 count
	lbs./acre	%			
Turnpike	73,858	20.5 gh	26.9 efg	47.4 a	5.1 de
Charismatic	89,448	21.8 fgh	27.3 efg	43.8 ab	7.1 cde
WDL6404	87,634	21.2 fgh	33.1 cdefg	30.6 bc	15.1 abcde
SW2004	65,728	21.4 fgh	24.0 g	29.0 bcd	25.5 ab
Secretariat	90,541	30.9 bcdefgh	37.0 abcdefg	27.9 bcd	4.2 e
Unbridled	70,761	25.8 defgh	26.6 fg	27.8 bcd	19.8 abcd
Red Garnet	58,184	42.0 abc	30.5 defg	27.5 cd	0.0 e
Kingman	56,895	20.9 fgh	44.3 abcde	25.8 cd	8.9 cde
Bottle rocket	67,585	25.9 defgh	33.6 cdefg	25.6 cd	14.9 abcde
Captivation	91,995	19.8 h	51.1 ab	25.3 cd	3.8 e
Summer Breeze	75,647	23.2 efgh	41.6 abcdef	24.8 cd	10.4 bcde
Excursion	63,884	28.9 cdefgh	43.1 abcdef	24.6 cd	3.4 e
Road Trip	58,440	37.6 abcde	38.5 abcdefg	24.0 cd	0.0 e
SW1981	96,120	25.7 defgh	28.0 efg	23.9 cd	22.3 abc
Fascination	67,917	35.7 abcdefg	31.3 defg	23.8 cd	9.2 cde
Troubadour	66,699	44.8 ab	33.8 bcdefg	21.4 cd	0.0 e
Embassy	91,857	33.2 abcdefgh	39.4 abcdefg	21.3 cd	6.0 de
Red Amber	75,491	36.3 abcdef	44.0 abcdef	19.7 cd	0.0 e
Joy Ride	52,959	33.8 abcdefgh	40.4 abcdefg	19.4 cd	6.3 de
E26C.00063	73,193	27.2 cdefgh	42.4 abcdef	18.7 cd	11.7 bcde
SV0241	76,490	23.1 efgh	52.3 a	18.7 cd	5.9 de
Warrior	70,041	39.5 abcd	36.2 abcdefg	17.4 cd	6.9 de
Tailgate	76,165	28.1 cdefgh	47.4 abcd	17.0 cd	7.4 cde
Declaration	57,886	32.3 abcdefgh	43.5 abcdef	17.0 cd	7.2 cde
7197	78,141	30.2 bcdefgh	49.6 abc	14.6 d	5.6 de
Exclamation	99,924	25.3 defgh	31.6 defg	13.5 d	29.7 a
Sweet Gem	53,625	47.3 a	39.2 abcdefg	13.5 d	0.0 e

zNumbers within the same column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD test P<0.05.



Table 5. Average firmness, brix, hollow heart and hard seed ratings for watermelons grown in Tifton, GA, 2019. Ranked from highest to lowest brix.

Variety	Brix	Firmness	Hallow Heart	Hard seed
	%	lbs	Score	# per fruit
Charismatic	12.3 a	2.8 ghi	0	2
Excursion	11.8 ab	3.4 abc	0	0
Fascination	11.6 abc	3.6 ab	0	6
Bottle rocket	11.5 abc	3.2 abcdefgh	0	0
Road Trip	11.5 abc	3.2 abcdefgh	0	1
E26C.00063	11.5 abc	3.3 abcdefg	0	0
Sweet Gem	11.5 abc	2.9 defghi	0	0
7197	11.4 abcd	3.0 cdefghi	0	1
Unbridled	11.2 abcde	3.3 abcdef	0	3
Kingman	11.2 abcdef	3.0 cdefghi	0	4
Red Garnet	11.2 abcdef	3.4 abcd	0	0
SW1981	11.1 abcdef	2.8 efghi	0	5
WDL 6404	11.1 abcdef	2.6 i	0	3
Warrior	11.0 bcdefg	3.1 abcdefghi	0.3	1
Joy Ride	10.9 bcdefg	3.0 cdefghi	0	0
SV0241	10.7 bcdefg	3.3 abcde	0	0
Declaration	10.7 bcdefg	3.1 abcdefgh	0	0
Summer Breeze	10.7 bcdefg	2.7 hi	0	3
Exclamation	10.6 bcdefg	3.3 abcdefg	0	3
Troubadour	10.6 bcdefg	3.4 abcd	0	1
Secretariat	10.5 cdefg	3.6 a	0	2
Tailgate	10.5 cdefg	3.0 cdefghi	0	1
Red Amber	10.4 cdefg	3.0 cdefghi	0	1
Embassy	10.2 defg	3.3 abcdefg	0	4
Captivation	10.2 efg	3.1 abcdefghi	0	1
Turnpike	10.0 fg	3.2 abcdefgh	0	0
SW2004	9.9 g	2.8 fghi	0	0
<i>p-value</i>	0.08	0.07	0.50	0.10

<sup>z</sup> Firmness is the average of 8 readings per replication and 3 replications (24 total readings per variety) using a Wagner hand-held firmness tester.

<sup>y</sup> Hollow Heart determined using the rating scale in Figure 1. Values represent the average of 4 fruit per replication and 3 replicates (15 fruit total).

<sup>x</sup> Hard seed counts represent the *average* number of seed counted in 4 quarters of 4 melons per replicate with 3 replicates (48 quarters of fruit).

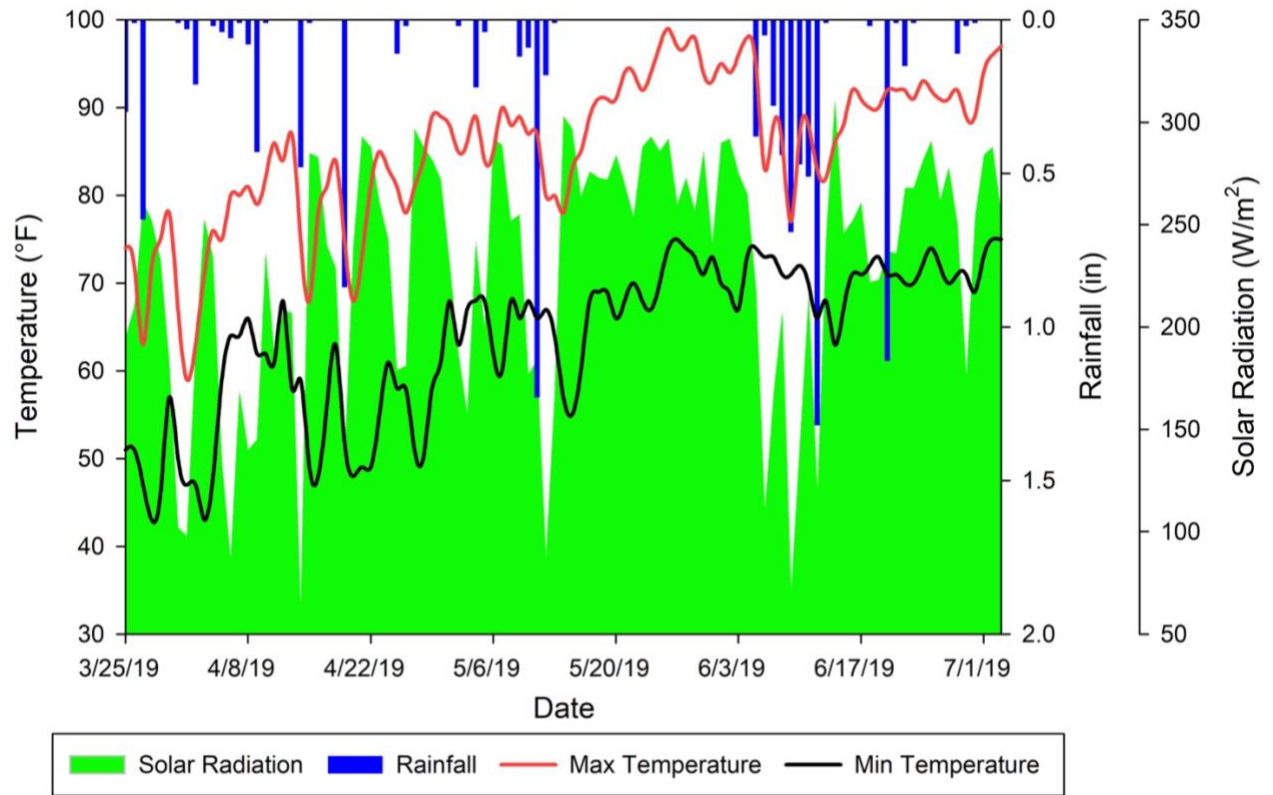


Figure 2. Weather conditions of maximum and minimum temperature, rainfall, and solar radiation during the watermelon season 2019 in Tifton, GA.