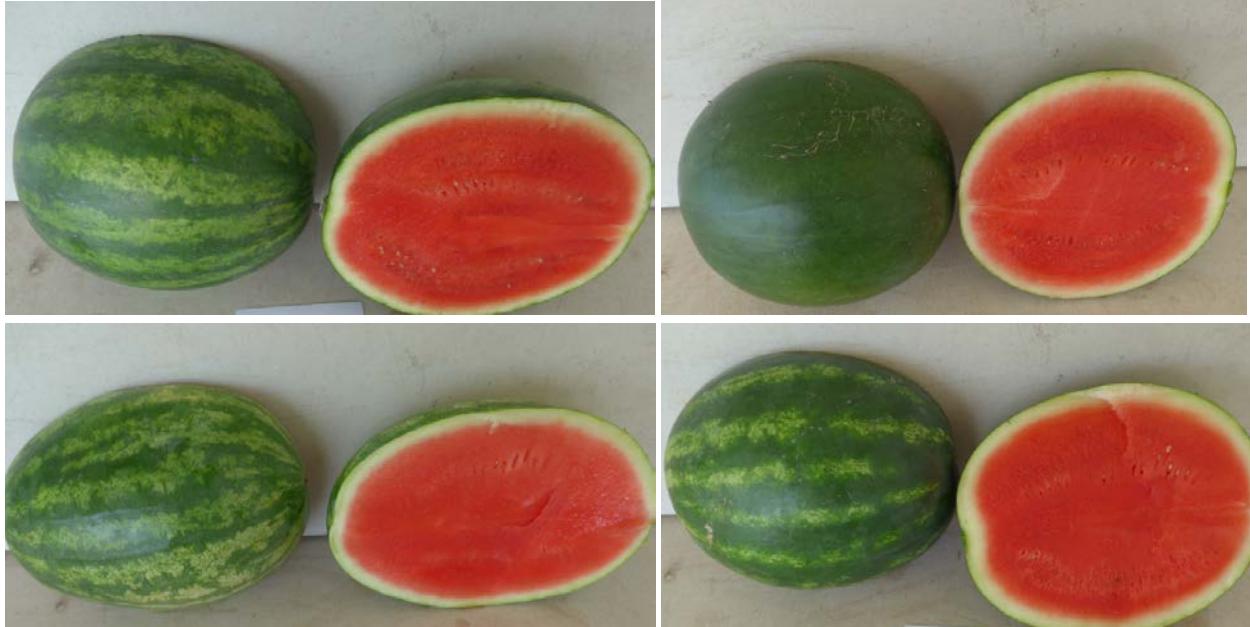




Cooperative Extension  
COLLEGE OF AGRICULTURE &  
NATURAL RESOURCES



# Seedless Watermelon Variety Trial Results 2016

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## **2016 University of Delaware Seedless Watermelon Variety Trial**

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### **Introduction**

The 2016 Seedless Watermelon Variety Trial included 35 varieties from ten participating companies. The purpose of this trial was to evaluate seedless watermelon varieties for yield, quality and maturity.

### **Materials and Methods**

#### *Location*

Grower's field (Mineral Springs Field #22) next to the University of Delaware, Carvel Research Center, Gary Calloway, Calloway Farms, cooperating grower.

#### *Cultural Practices*

Grower practices for commercial production were used. The field was fertilized and limed according to soil test results. Preplant fertilizer was 80-31-144-27 (N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O-S). Black plastic mulch and trickle irrigation were laid on 7' centers between rye windbreaks. Additional 4-0-8 fertilizer was applied by fertigation during fruiting (additional 20-0-40 N and K<sub>2</sub>O).

There were 35 entries in the trial in 2016. Plants were seeded in the greenhouse on April 4, 2016. Plants were transplanted to the field on May 9, 2016. Field plots were one row (7 ft) wide and 27 ft long. Plots were arranged in a randomized complete block design with three replications. In-row spacing was 3ft or 9 plants per plot. Three plants of the in-row pollenizer variety 'Sp-6' were planted in each plot and one between plots in the following arrangement: s 6 s s 6 s s 6 s s 6. "6" designates Sp-6 and "s" designates the seedless plants. The border rows next to the drive rows, which separated the replications, were planted in the triploid variety 'Troubadour', with Sp-6 as the pollenizers, in the same arrangement as the experimental plots. There were 2 grafted treatments, grafted Fascination at the same planting arrangement and grafted Fascination planted with 7 plants per plot. This is designated as "Grafted Fascination lp" for the lower population.

Herbicides used in row middles included Sandea (halosulfuron) 0.75 oz/A + Dual (metolachlor) 1 pt/A + Sinbar (terbacil) 2 oz/A. In addition, Gramoxone (paraquat) 2 qt/A was applied with a hooded sprayer to terminate rye windbreaks.

Disease, insect and mite control programs were as follows:

- 5-31: Provoke (imidacloprid) 1.5 oz./a
- 6-15: Echo (chlorothalonil) 3 pt/A, Cueva 1.5 pt/A
- 6-22: Echo 3 pt/A, Cueva 1.5 pt/A Incognito 20 oz/A, Manzate 3 lbs/A
- 6-29: Echo 3 pt/A, Cueva 1.5 pt/A, Oberon 8 oz/A
- 7-6: Echo 3 pt/A, Cueva 1.5 pt/A, Zampro 14 oz/A, Portal 1 qt/A
- 7-13: Echo 3 pt/A, Cueva 1.5 pt/A
- 7-20: Echo 3 pt/A, Cueva 1.5 pt/A, Revus 8 oz/A
- 7-29: Echo 3 pt/A, Cueva 1.5 pt/A, Presidio 4 oz/A, Assail 4 oz/A

Irrigation was determined by the grower and was the same as the rest of the commercial field. Temperatures during the early growth period were below average and growth was slow in May.

### ***Harvest***

Due to the late spring, plots were not harvested until August. Fruit were harvested three times. The first harvest was on August 2 and 3, the second harvest was on August 10 and 11, and the final harvest was on August 28. The weight of each watermelon harvested was recorded individually. Five marketable watermelons from each plot were cut and evaluated for presence of hollow heart, hard seeds and soluble solids levels. Watermelons were cut lengthwise and then crosswise and the number of hard seeds visible on the surface of the four pieces were counted. Soluble solids were measured using a hand-held refractometer. Hollow heart was rated on a 1-5 scale with 1 being no hollow heart and 5 being severe hollow heart.

### **Results**

Total yield, marketable yield excluding misshapen culls and fruit less than 9 lbs (Marketable Yield I) and marketable yield excluding misshapen culls, fruit less than 9 lbs and fruit over 24 lbs (Marketable Yield II) are reported in Tables 2 and 3 in both pounds per acre and fruit per acre for each variety. Yields in the trial ranged from 49,686 to 124,647 lbs/A.

The highest yielding varieties in the trial in terms of Marketable Yield I in lbs/A were: Maxima, Talca, Premont, 7187, Crunchy Red, Grafted Fascination low population, Road Trip, SV7112WA, Wolverine, and Cut Above.

The highest yielding varieties in the trial in terms of Marketable Yield I in fruit/A were: Maxima, Talca, Premont, 7187, Crunchy Red, Grafted Fascination low population, Road Trip, SV7112WA, Wolverine, Cut Above, Unbridled, 7197, Wayfarer, Grafted Fascination, Traveler, ORS 6151, Razorback, and Neptune.

The highest yielding varieties in terms of Marketable Yield II in lbs/A were: Talca, Premont, Crunchy Red, Maxima, Grafted Fascination LP, 7187, Wolverine, Road Trip, Cut Above, Unbridled, Wayfarer, and 7197.

The highest yielding varieties in terms of Marketable Yield II in fruit/A were: Talca, Premont, Crunchy Red, Maxima, Grafted Fascination LP, 7187, Wolverine, Road Trip, Cut Above, Unbridled, Wayfarer, 7197, Grafted Fascination, Razorback, Neptune, ORS 6151, Poseidon, and ORS 12154a.

Table 4 reports the percent of total harvest for each harvest. The following varieties produced more than 50% of their yield on the first harvest: SV7112, Unbridled, 7197, Wayfarer, Traveler, Excursion, Secretariat, and Sweet Dawn. Those varieties with greater than 35% of their yield on the last harvest were: Maxima, Premont, Low Population Grafted Fascination, Grafted Fascination, ORS 6042b, Fascination, and ORS 12154A.

Grafted Fascination (using interspecific Cucurbita rootstock) planted at 78% of population of ungrafted Fascination yielded 22% higher. Fruits were heavier and there were significantly more fruits in the second and third harvests compared to ungrafted Fascination. Yields of grafted Fascination planted at the same population as ungrafted Fascination were not statistically different from ungrafted plots.

Table 5 lists the varieties according to average fruit weight and gives the percentage of fruit in each of four weight classes: 60 count (9.0-13.5 lbs), 45 count (13.6-17.5 lbs), 36 count (17.6-21.4 lbs) and 30 count (>21.5 lbs). Table 6 lists the varieties according to average fruit weight and gives the yield of fruit in each of the weight classes. Maxima, ORS 6042b, and SV 7112 had the largest average fruit size while Wayfarer, ORS 12154b, and Cut Above had the smallest fruits.

ORS 12154a, Wayfarer, Cut Above, Poseidon, and ORS 12154b produced over 50 % of the melons harvested for those varieties in the 60 count class. Joy Ride, ORS 6151, Unbridled, Road Trip, ungrafted Fascination, and Secretariat also produced high numbers of fruit in the 60 count class.

Those varieties with more than 40% of the fruit harvested in the 45 count class included Summer Breeze, Crunchy Red, Charismatic, Tri-X 313, Sweet Dawn, Grafted Fascination LP, Kingman, Sugar Fresh, USA90020, 7197, Warrior, Premont, Captivation, Embasy, Razorback, Grafted Fascination, ungrafted Fascination, and Neptune.

Varieties with high numbers of 36 count fruit were Maxima, ORS 6042b, Excursion, SV7112, and Talca. Maxima and ORS 6042b produced over 30% in the 30 count class.

Table 7 lists the varieties according to their soluble solid measurements. Soluble solids averages are based on a 15-fruit sample (5 fruit per replication). There were significant differences in soluble solids among the varieties. Summer Breeze, Joy Ride, Road Trip, 7197, SV7112, Poseidon, Charismatic, Crunchy Red, ORS 6042b, Talca, and Sugar Fresh had the highest soluble solids level. All of the varieties had average soluble solids of over 10% with the exception of Neptune and ORS 12154a.

Table 8 lists the varieties according to average severity of hollow heart. Hollow heart averages are based on a 15-fruit sample (5 fruit per replication). No hollow heart was observed in Neptune, Premont, SV7112, Sweet Dawn, Talca, Traveler, and ungrafted Fascination. Low population grafted Fascination had high levels of hollow heart. Those additional varieties with one or more fruit with major or severe hollow heart (5-13% unsaleable) were USA90020, Charismatic, Embasy, Grafted Fascination, Joy Ride, ORS 6151 and Wolverine.

Table 9 lists the varieties according to the percent of fruit with enough hard seeds to render them unmarketable. Neptune, Sweet Dawn, Grafted Fascination low population, Fascination, ORS 12154a, Exclamation, Embasy, Wayfarer, and Grafted Fascination all had significant numbers of fruit over standard for hard seed.

Photographs of the varieties included in the trial are in Appendix A.

## **Acknowledgements**

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Gary Calloway, Calloway Farms for donating land, plastic mulch, drip tape, fertilizer, and for providing pest control and irrigation.

Harris Moran and Syngenta for donation of seed for border rows and pollenizer seed.

**Table 1. Entries in the 2016 Watermelon Variety Trial**

Variety	Entering Company
Premont	Clifton Seed Co.
Cut Above	Clifton Seed Co.
Tri-X 313 (historical check)	Syngenta
Fascination (industry standard)	Syngenta
Exclamation	Syngenta
Captivation	Syngenta
Sweet Dawn	Syngenta
Excursion	Syngenta
Sugar Fresh	Syngenta
Grafted Fascination	Syngenta/TriHishtil
Embassy (Nun31208)	Nunhems
Warrior (NUN01009)	Nunhems
7197	Nunhems
7187 (check variety)	Nunhems
USAW90020	Siegers/US Agriseeds
Joy Ride	Seminis
Road Trip	Seminis
Summer Breeze	Seminis
SV7112WA	Seminis
Neptune	Seedway
Poseidon	Seedway
Charismatic	Sakata
Kingman	Sakata
Secretariat	Sakata
Unbridled	Sakata
Crunchy Red (check)	Harris Moran
Traveler	Harris Moran
Wayfarer	Harris Moran
Talca	Origene Seeds
Maxima	Origene Seeds
ORS 6042b	Origene Seeds
ORS 6151	Origene Seeds
ORS 12154a	Origene Seeds
Wolverine	Highmark Seed Co.
Razorback	Highmark Seed Co.

**Table 2. 2016 Seedless Watermelon Variety Trial: Varieties by Marketable I Yield (all marketable fruit) in Lbs/a and Fruit/a and Fruits per Harvest**

Variety	Yields and Harvest Distribution					
	Marketable I lbs/a	Marketable I Fruits/a	Fruit per harvest			
			Harvest 1 85 DAT	Harvest 2 95 DAT	Harvest 3 111 DAT	
Maxima	124647 a	6607 abcd	2305	1844	2458	
Talca	121848 ab	7068 abc	3303	2074	1690	
Premont	110750 abc	7529 a	2843	1690	2996	
7187	106175 abcd	6607 abcd	2766	1690	2151	
Crunchy Red	105152 abcde	6607 abcd	2919	2382	1306	
Grafted Fascination LP	104522 abcdef	6761 abcd	615	2843	3303	
Road Trip	101075 abcdefg	7068 abc	3227	2382	1460	
SV 7112	100435 abcdefgh	5608 abcdefg	2151	1076	1076	
Wolverine	99108 abcdefghi	6377 abcde	2843	2151	1383	
Cut Above	98290 abcdefghij	7375 ab	3073	2843	1460	
Unbridled	90026 bcdefghijk	6223 abcdef	3303	1306	1613	
7197	89819 bcdefghijk	5992 abcdefg	3150	1613	1229	
Wayfarer	88899 cdefghijk	7298 ab	3995	1690	1613	
Grafted Fascination	84768 cdefghijkl	5839 abcdefg	1690	1537	2612	
Traveler	84585 cdefghijkl	5608 abcdefg	2843	1306	1460	
ORS 6151	83840 cdefghijkl	5762 abcdefg	1460	2382	1921	
Tri-X 313	82712 cdefghijkl	5301 cdefgi	2074	1460	1767	
Razorback	81896 cdefghijklm	5608 abcdefg	2228	2074	1306	
Charismatic	81730 cdefghijklm	5224 cdefgi	2074	1844	1306	
ORS 6042b	81100 cdefghijklm	4302 fgi	1767	922	1613	
Excursion	80708 cdefghijklm	4610 efgi	2382	1229	999	
Neptune	80278 cdefghijklm	5762 abcdefg	3073	1690	999	
Warrior	77755 defghijklm	5224 cdefgi	2382	1229	1613	
Sugar Fresh	74868 defghijklm	4917 defgi	2305	1076	1537	
Poseidon	73649 efghijklm	5455 bcdefg	2535	1767	1152	
Fascination	72491 fghijklm	5070 defgi	1076	1997	1997	
90020	68873 ghijklm	4533 efgi	1844	1537	1152	
Summer Breeze	68547 hijklm	4302 fgi	1767	2382	768	
Kingman	67936 ijkml	4456 efgi	1537	2151	1152	
Exclamation	67400 ijkml	4610 efgi	1229	1997	1383	
ORS 12154a	66716 ijkml	5455 bcdefg	1076	1767	2612	
Secretariat	65990 jklm	4917 defgi	2996	999	1613	
Joy Ride	62614 klm	4149 gi	1767	1537	845	
Captivation	59890 klm	4072 gi	1037	2074	1306	
Sweet Dawn	54724 lm	3534 i	1997	691	845	
Embassy	49686 m	3380 i	1383	999	999	
p-value	0.0002	0.0002				
LSD <sub>0.05</sub>	30732	1925				

**Table 3. 2016 Seedless Watermelon Variety Trial: Varieties by Marketable II Yield (excluding fruit less than 9 lbs and over 24 lbs) in Lbs/a and Fruit/a and Fruits per Harvest**

Variety	Yields and Harvest Distribution					
					Fruit per harvest	
	Marketable II lbs/a	Marketable II Fruits/a	Harvest 1 85 DAT	Harvest 2 95 DAT	Harvest 3 111 DAT	
Talca	115779 a	6837 abcd	3227	2074	1537	
Premont	106786 ab	7375 a	2843	1613	2919	
Crunchy Red	105152 ab	6607 abcde	2919	2382	1306	
Maxima	104565 abc	5839 abcdefgh	1844	1767	2228	
Grafted Fascination LP	104522 abc	6761 abcd	615	2843	3303	
7187	100015 abcd	6377 abcdef	2689	1690	1997	
Wolverine	99108 abcd	6377 abcdef	2843	2151	1383	
Road Trip	98885 abcd	6991 abc	3227	2382	1383	
Cut Above	98290 abcde	7375 a	3073	2843	1460	
Unbridled	90026 abcdef	6223 abcdefg	3303	1306	1613	
Wayfarer	88899 abcdef	7298 ab	3995	1690	1613	
7197	87821 abcdef	5916 abcdefgh	3150	1613	1152	
SV 7112	83301 bcdefg	4994 defghijk	2151	922	999	
Tri-X 313	82712 bcdefg	5301 cdefghij	2074	1460	1767	
Grafted Fascination	82540 bcdefg	5762 abcdefgh	1690	1537	2535	
Razorback	81896 bcdefg	5608 abcdefgh	2228	2074	1306	
Neptune	80278 bcdefgh	5762 abcdefgh	3073	1690	999	
ORS 6151	79969 bcdefgh	5608 abcdefgh	1460	2305	1844	
Excursion	78575 bcdefgh	4533 fghijk	2305	1229	999	
Charismatic	77884 bcdefgh	5070 cdefghijk	1997	1844	1229	
Warrior	77755 bcdefgh	5224 cdefghij	2382	1229	1613	
Traveler	77210 bcdefgh	5378 bcdefghi	2843	1306	1229	
Poseidon	73649 cdefgh	5455 abcdefghi	2535	1767	1152	
Sugar Fresh	70873 defgh	4763 efghijk	2305	1076	1537	
Fascination	70455 defgh	4994 defghijk	1076	1997	1921	
Exclamation	67400 efgh	4610 fghijk	1229	1997	1383	
ORS 12154a	66716 fgh	5455 abcdefghi	1076	1767	2612	
90020	66568 fgh	4456 fghijk	1844	1537	1076	
Secretariat	65990 fgh	4917 defghijk	2766	922	1306	
Kingman	65883 fgh	4379 ghijk	1537	2074	1152	
Joy Ride	62614 fgh	4149 hijk	1767	1537	845	
Summer Breeze	62531 fgh	4072 hijk	1767	2382	615	
Captivation	59890 fgh	4072 hijk	1037	2074	1306	
Sweet Dawn	54724 gh	3534 ijk	1997	691	845	
ORS 6042b	53011 gh	3227 k	1076	615	1537	
Embassy	49686 h	3380 jk	1383	999	999	
<i>p-value</i>	0.0003	0.0002				
LSD <sub>0.05</sub>	29598	1930				

**Table 4. 2016 Seedless Watermelon Variety Trial: Percent of Total Harvested at Each Harvest by Weight**

Variety	Percent of Total Harvested at Each Harvest by Weight		
	Harvest 1 85 DAT	Harvest 2 95 DAT	Harvest 3 111 DAT
Maxima	34.9	27.9	37.2
Talca	46.7	29.3	23.9
Premont	37.8	22.4	39.8
7187	41.9	25.6	32.6
Crunchy Red	44.2	36.1	19.8
Grafted Fascination LP	9.1	42.0	48.9
Road Trip	45.7	33.7	20.7
SV 7112	50.0	25.0	25.0
Wolverine	44.6	33.7	21.7
Cut Above	41.7	38.5	19.8
Unbridled	53.1	21.0	25.9
7197	52.6	26.9	20.5
Wayfarer	54.7	23.2	22.1
Grafted Fascination	28.9	26.3	44.7
Traveler	50.7	23.3	26.0
ORS 6151	25.3	41.3	33.3
Tri-X 313	39.1	27.5	33.3
Razorback	39.7	37.0	23.3
Charismatic	39.7	35.3	25.0
ORS 6042b	41.1	21.4	37.5
Excursion	51.7	26.7	21.7
Neptune	53.3	29.3	17.3
Warrior	45.6	23.5	30.9
Sugar Fresh	46.9	21.9	31.3
Poseidon	46.5	32.4	21.1
Fascination	21.2	39.4	39.4
90020	40.7	33.9	25.4
Summer Breeze	35.9	48.4	15.6
Kingman	31.8	44.4	23.8
Exclamation	26.7	43.3	30.0
ORS 12154a	19.7	32.4	47.9
Secretariat	53.4	17.8	28.8
Joy Ride	42.6	37.0	20.4
Captivation	23.5	47.0	29.6
Sweet Dawn	56.5	19.6	23.9
Embasy	40.9	29.5	29.5

**Table 5. 2016 Seedless Watermelon Variety Trial: Varieties by Average Fruit Weight and Percent of Fruit in Each Size Class**

Variety	Mean Marketable I Weight (lbs)	Percent of Fruit in Each Size Class			
		60 Count 9.0-13.5 lbs	45 Count 13.6-17.5 lbs	36 Count 17.6- 21.4 lbs	30 Count 21.5 lbs plus
Maxima	18.87 a	15.1	22.1	32.6	30.2
ORS 6042b	18.85 a	19.6	21.4	25.0	33.9
SV 7112	17.91 ab	30.4	39.3	30.4	7.1
Excursion	17.51 b	15.0	35.0	33.3	16.7
Talca	17.24 bc	17.4	35.9	33.7	13.0
7187	16.07 cd	27.1	40.0	27.1	5.9
Summer Breeze	15.93 d	23.4	35.9	21.9	9.4
Crunchy Red	15.92 de	25.6	43.0	23.3	8.1
Charismatic	15.64 def	30.9	41.2	22.1	5.9
Tri-X 313	15.60 def	30.4	42.0	20.3	7.2
Wolverine	15.54 def	33.3	33.3	30.9	2.5
Sweet Dawn	15.49 defg	26.7	44.4	26.7	2.2
Grafted Fascination LP	15.46 defg	28.4	45.5	22.7	3.4
Kingman	15.25 defg	32.8	44.8	17.2	5.2
Sugar Fresh	15.23 defg	40.3	41.9	11.3	0.0
90020	15.19 defg	32.8	43.1	15.5	8.6
Joy Ride	15.13 defgh	38.9	33.3	20.4	7.4
Traveler	15.09 defgh	40.8	36.6	18.3	4.2
7197	15.08 defgh	37.2	42.3	16.7	3.8
Warrior	14.99 defgh	37.3	43.3	14.9	4.5
Premont	14.88 efghi	35.4	44.8	14.6	5.2
Captivation	14.71 efghi	35.8	47.2	15.1	1.9
Embassy	14.71 efghi	38.6	45.5	15.9	0.0
Exclamation	14.70 fghij	39.0	39.0	20.3	1.7
Razorback	14.62 fghij	37.0	45.2	12.3	5.5
ORS 6151	14.60 fghij	45.9	31.1	17.6	5.4
Grafted Fascination	14.55 fghijk	40.5	44.6	10.8	4.1
Unbridled	14.52 fghijk	45.7	43.2	11.1	0.0
Road Trip	14.47 ghijk	48.9	33.7	14.1	3.3
Fascination	14.30 ghijk	42.2	40.6	14.1	3.1
Neptune	14.30 hijk	40.5	45.9	12.2	1.4
Poseidon	13.93 ijk	54.9	32.4	9.9	2.8
Secretariat	13.50 jkl	42.5	32.9	9.6	23.3
Cut Above	13.42 klm	56.8	36.8	5.3	1.1
ORS 12154a	13.33 lm	73.9	23.2	2.9	0.0
Wayfarer	12.23 m	65.1	29.1	5.8	0.0
p-value	<0.0001				
LSD 0.05	1.21				

**Table 6. 2016 Seedless Watermelon Variety Trial: Varieties by Average Fruit Weight and Number/Acre of Fruit in Each Size Class**

Variety	Mean Marketable I Weight (lbs)	No/A of Fruit in Each Size Class			
		60 Count 9.0-13.5 lbs	45 Count 13.6-17.5 lbs	36 Count 17.6- 21.4 lbs	30 Count 21.5 lbs plus
Maxima	18.87 a	1001	1463	2156	2002
ORS 6042b	18.85 a	847	924	1078	1463
SV 7112	17.91 ab	1309	1694	1309	308
Excursion	17.51 b	693	1617	1540	770
Talca	17.24 bc	1232	2541	2387	924
7187	16.07 cd	1771	2618	1771	385
Summer Breeze	15.93 d	1155	1771	1078	462
Crunchy Red	15.92 de	1694	2849	1540	539
Charismatic	15.64 def	1617	2156	1155	308
Tri-X 313	15.60 def	1617	2233	1078	385
Wolverine	15.54 def	2079	2079	1925	154
Sweet Dawn	15.49 defg	924	1540	924	77
Grafted Fascination LP	15.46 defg	1925	3080	1540	231
Kingman	15.25 defg	1463	2002	770	231
Sugar Fresh	15.23 defg	1925	2002	539	0
90020	15.19 defg	1463	1925	693	385
Joy Ride	15.13 defgh	1617	1386	847	308
Traveler	15.09 defgh	2233	2002	1001	231
7197	15.08 defgh	2233	2541	1001	231
Warrior	14.99 defgh	1925	2233	770	231
Premont	14.88 efghi	2618	3311	1078	385
Captivation	14.71 efghi	1463	1925	616	77
Embassy	14.71 efghi	1309	1540	539	0
Exclamation	14.70 fghij	1771	1771	924	77
Razorback	14.62 fghij	2079	2541	693	308
ORS 6151	14.60 fghij	2618	1771	1001	308
Grafted Fascination	14.55 fghijk	2310	2541	616	231
Unbridled	14.52 fghijk	2849	2695	693	0
Road Trip	14.47 ghijk	3465	2387	1001	231
Fascination	14.30 ghijk	2079	2002	693	154
Neptune	14.30 hijk	2310	2618	693	77
Poseidon	13.93 ijk	3003	1771	539	154
Secretariat	13.50 jkl	2387	1848	539	1309
Cut Above	13.42 klm	4158	2695	385	77
ORS 12154a	13.33 lm	3927	1232	154	0
Wayfarer	12.23 m	4312	1925	385	0
<i>p</i> -value	<0.0001				
<i>LSD</i> 0.05	1.21				

**Table 7. 2016 Seedless Watermelon Variety Trial: Varieties by Soluble Solid Content**

Variety	% Soluble Solids
Summer Breeze	11.49 a
Joy Ride	11.38 ab
Road Trip	11.34 abc
7197	11.29 abcd
SV7112	11.19 abcde
Poseidon	11.19 abcde
Charismatic	11.15 abcde
Crunchy Red	10.97 abcdef
ORS 6042b	10.97 abcdef
Talca	10.95 abcdefg
Sugar Fresh	10.94 abcdefgh
90020	10.89 bcdefgh
Warrior	10.89 bcdefgh
ORS 6151	10.75 cdefghi
Kingman	10.72 defghi
Tri-X 313	10.71 defghi
Premont	10.69 efghi
Cut Above	10.65 efghi
Secretariat	10.65 efghi
Traveler	10.63 efghi
Grafted Fascination	10.62 efghi
Excursion	10.61 efghi
Unbridled	10.58 fghi
Embassy	10.58 fghi
Grafted Fascination lp	10.58 efghi
Maxima	10.56 fghi
Wolverine	10.55 fghi
Razorback	10.54 fghi
Captivation	10.50 fghi
Wayfarer	10.36 hi
Fascination	10.36 ghi
Exclamation	10.28 i
7187	10.22 ij
Sweet Dawn	10.22 ij
Neptune	9.65 jk
ORS 12154a	9.61 k
<i>p-value</i>	<0.0001
<i>LSD 0.05</i>	0.59

**Table 8. 2016 Seedless Watermelon Variety Trial: Hollow Heart (HH) Severity Rating (1 = no HH, 2 = minor HH, 3 moderate HH, 4 = major HH, 5 = Severe HH)**

Variety	Hollow Heart Severity Rating (mean)	Percent Hollow Heart By Severity Rating			
		2	3	4	5
Grafted Fascination lp	2.13 a	7.7	30.8	15.4	0.0
Kingman	1.53 b	13.3	20.0	0.0	0.0
Embassy	1.47 bc	6.7	0.0	13.3	0.0
90020	1.47 bcd	16.7	5.6	5.6	0.0
Tri-X 313	1.47 bcd	6.7	20.0	0.0	0.0
Charismatic	1.45 bcd	10.0	5.0	10.0	0.0
Secretariat	1.40 bcde	13.3	13.3	0.0	0.0
Wolverine	1.33 bcdef	6.7	6.7	6.7	0.0
Grafted Fascination	1.30 bcdef	13.3	0.0	6.7	0.0
ORS 12154a	1.27 bcdef	13.3	6.7	0.0	0.0
ORS 6042b	1.27 bcdef	0.0	13.3	0.0	0.0
ORS 6151	1.27 bcdef	6.7	0.0	6.7	0.0
Poseidon	1.27 bcdef	13.3	6.7	0.0	0.0
Joy Ride	1.20 bcdef	0.0	0.0	6.7	0.0
7197	1.13 cdef	0.0	0.0	0.0	0.0
Cut Above	1.13 cdef	0.0	6.7	0.0	0.0
Unbridled	1.13 cdef	0.0	6.7	0.0	0.0
Wayfarer	1.13 cdef	10.5	0.0	0.0	0.0
Crunchy Red	1.10 cdef	0.0	6.7	0.0	0.0
Summer Breeze	1.09 def	15.4	0.0	0.0	0.0
Captivation	1.08 cdef	7.1	0.0	0.0	0.0
7187	1.07 ef	6.7	0.0	0.0	0.0
Exclamation	1.07 ef	6.7	0.0	0.0	0.0
Excursion	1.07 ef	6.7	0.0	0.0	0.0
Maxima	1.07 ef	6.7	0.0	0.0	0.0
Razorback	1.07 ef	6.7	0.0	0.0	0.0
Road Trip	1.07 ef	6.7	0.0	0.0	0.0
Warrior	1.07 ef	6.7	0.0	0.0	0.0
Neptune	1.00 f	0.0	0.0	0.0	0.0
Premont	1.00 f	0.0	0.0	0.0	0.0
SV7112	1.00 f	0.0	0.0	0.0	0.0
Sweet Dawn	1.00 f	0.0	0.0	0.0	0.0
Talca	1.00 f	0.0	0.0	0.0	0.0
Traveler	1.00 f	0.0	0.0	0.0	0.0
Fascination	1.00 f	0.0	0.0	0.0	0.0
Sugar Fresh	1.00 f	0.0	0.0	0.0	0.0
<i>p-value</i>	0.0001				
<i>LSD 0.05</i>	0.39				

**Table 9. 2016 Seedless Watermelon Variety Trial: Percent of Sampled Fruit Above Standard for Mature Seeds\***

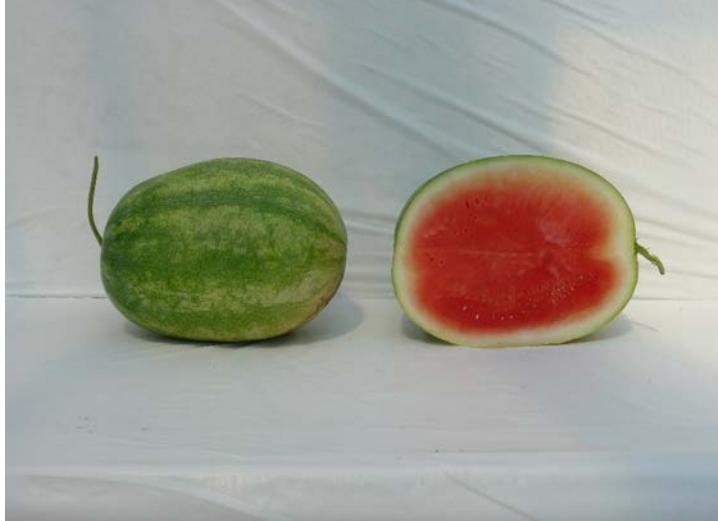
Variety	% Above Standard for Mature Seeds
ORS 6151	0
7197	0
Cut Above	0
7187	0
Warrior	0
Sugar Fresh	0
Maxima	0
Kingman	0
Summer Breeze	0
Traveler	0
Talca	0
Captivation	0
Road Trip	0
Tri-X 313	0
ORS 6042b	0
Charismatic	0
90020	0
Secretariat	0
Razorback	0
Joy Ride	0
Premont	7
Wolverine	7
Unbridled	7
Excursion	7
Crunchy Red	7
SV7112	7
Poseidon	7
Neptune	13
Sweet Dawn	13
Grafted Fascination lp	20
Fascination	20
ORS 12154a	33
Exclamation	33
Embasy	33
Wayfarer	33
Grafted Fascination	40

\* the USDA standard for seedless watermelons: “Watermelons of a size greater than ten (10) pounds may have 4 or fewer mature seeds, not to include pips/caplets, on the face of the melon which has been cut into four equal sections (one lengthwise cut and one crosswise cut)”

## **APPENDIX A:**

**Photographs of Varieties in the 2016 Seedless Watermelon Variety Trial**

## Varieties from the 2016 Seedless Watermelon Trial

	<p><b>Maxima</b></p> <p>Marketable I Yield: 124,647 lbs/A (1) Marketable II Yield: 104,565 lbs/A (4) Mean Weight: 18.9 lbs Fruits Per Acre: 6,607 Count Distribution %: 15-22-32-30 Soluble Solids: 10.6 %</p>
 <i>Origene</i>	<p><b>Origene</b></p> <p><b>Talca</b></p> <p>Marketable I Yield: 121,848 lbs/A (2) Marketable II Yield: 115,779 lbs/A (1) Mean Weight: 17.2 lbs (5) Fruits Per Acre: 7,068 Count Distribution %: 20-21-25-34 Soluble Solids: 11.0 %</p>
 <i>Origene</i>	<p><b>Premont</b></p> <p>Marketable I Yield: 110,750 lbs/A (3) Marketable II Yield: 106,786 lbs/A (2) Mean Weight: 14.7 lbs Fruits per acre: 7,375 Count Distribution % 35-45-15-5 Soluble Solids: 10.7 %</p>
	<p><b>Clifton</b></p>

## Varieties from the 2016 Seedless Watermelon Trial\*



### **7187 (Standard Check)**

Marketable I Yield: 106,175 lbs/A (4)  
Marketable II Yield: 100,015 lbs/A (6)  
Mean Weight: 16.6 lbs  
Fruits per Acre: 6,607  
Count Distribution %: 27-40-27-6  
Soluble Solids: 10.2 %

Nunhems



### **Crunchy Red (Standard Check)**

Marketable I Yield: 105,152 lbs/A (5)  
Marketable II Yield: 105,152 lbs/A (3)  
Mean Weight: 15.9 lbs (4)  
Fruits per Acre: 6,607  
Count Distribution %: 26-43-23-8  
Soluble Solids: 11.0 %

Harris Moran



### **Road Trip**

Marketable I Yield: 101,075 lbs/A (7)  
Marketable II Yield: 98,885 lbs/A (8)  
Mean Weight: 14.3 lbs  
Fruits per Acre: 7,068  
Count Disribution %: 49-34-14-3  
Soluble Solids: 11.3 %

Seminis

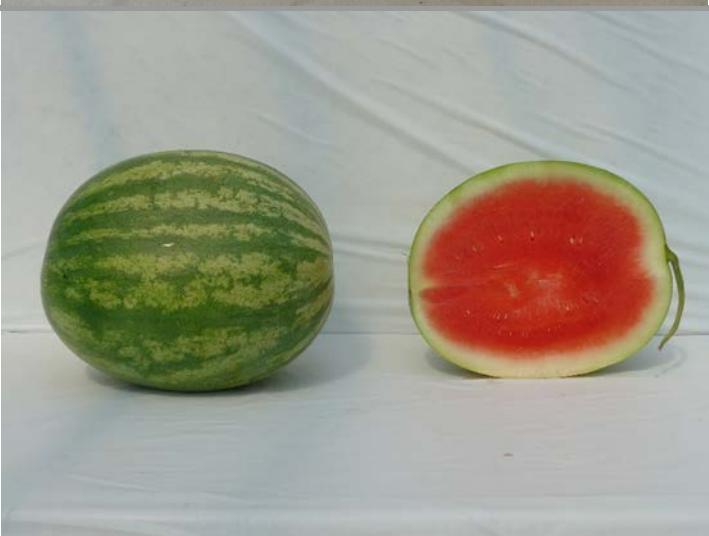
## Varieties from the 2016 Seedless Watermelon Trial\*



### SV 7112

Marketable I Yield: 100,432 lbs/A (8)  
Marketable II Yield: 83,301 lbs/A (13)  
Mean Weight: 17.9 lbs (3)  
Fruits per Acre: 5,608  
Count Distribution %: 30-39-30-7  
Soluble Solids: 11.2 %

### Seminis



### Wolverine

Marketable I Yield: 99,108 (9)  
Marketable II Yield: 99,108 (7)  
Mean Weight: 15.5 (11)  
Fruits per Acre: 6,377  
Count Distribution %: 33-33-31-3  
Soluble Solids: 10.6%

### Highmark



### Cut Above

Marketable I Yield: 98,290 (10)  
Marketable II Yield: 98,290 (9)  
Mean Weight: 13.3 lbs (34)  
Fruits per Acre: 7,375  
Size Distribution %: 57-37-5-1  
Soluble Solids: 11.2% (13)

### Clifton

## Varieties from the 2016 Seedless Watermelon Trial\*



### Unbridled

Marketable I Yield: 90,206 lbs/A (11)  
Marketable II Yield: 90,206 lbs/A (10)  
Mean Weight: 14.5 lbs (28)  
Fruits per Acre: 6,223  
Count Distribution %: 46-43-11-0  
Soluble Solids: 10.6 %



### Sakata

### 7197

Marketable I Yield: 89,819 lbs/A (12)  
Marketable II Yield: 87,821 (12)  
Mean Weight: 15.0 (19)  
Fruits per Acre: 5,992  
Count Distribution %: 37-42-17-4  
Soluble Solids: 11.3 %



### Nunhems

### Wayfarer

Marketable I Yield: 88,899 lbs/A (13)  
Marketable II Yield: 88,899 lbs/A (11)  
Mean Weight: 12.2 (35)  
Fruits per Acre: 7,298  
Count Distribution %: 65-29-6-0  
Soluble Solids: 11.3 %

### Harris Moran

## Varieties from the 2016 Seedless Watermelon Trial\*



### Traveller

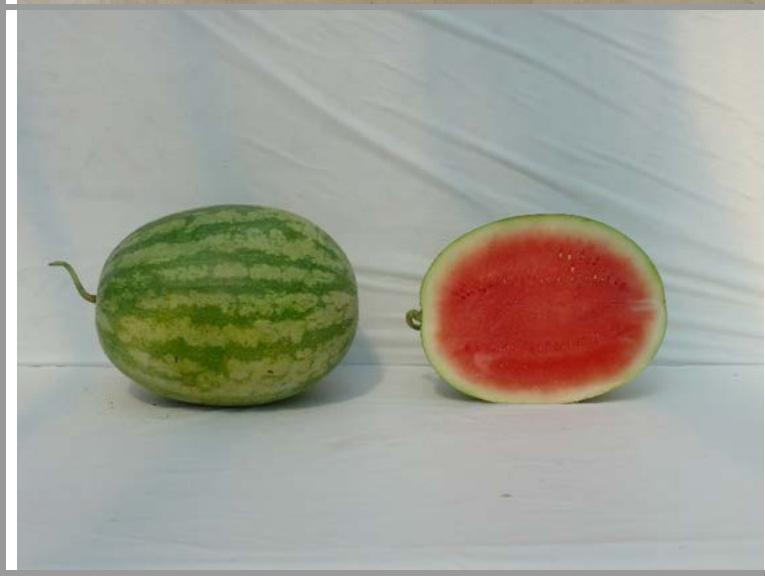
Marketable I Yield: 84,585 lbs/A (15)  
Marketable II Yield: 77,210 lbs/A (22)  
Mean Weight: 15.1 lbs (18)  
Fruits per Acre: 5,608  
Count Distribution %: 41-37-18-4  
Soluble Solids: 10.6 %



### Harris Moran

### ORS 6151

Marketable I Yield: 83,840 lbs/A (16)  
Marketable II Yield: 79,969 lbs/A (18)  
Mean Weight: 14.6 (26)  
Fruits per Acre: 5,762  
Count Distribution %: 46-31-18-5  
Soluble Solids: 10.8 %



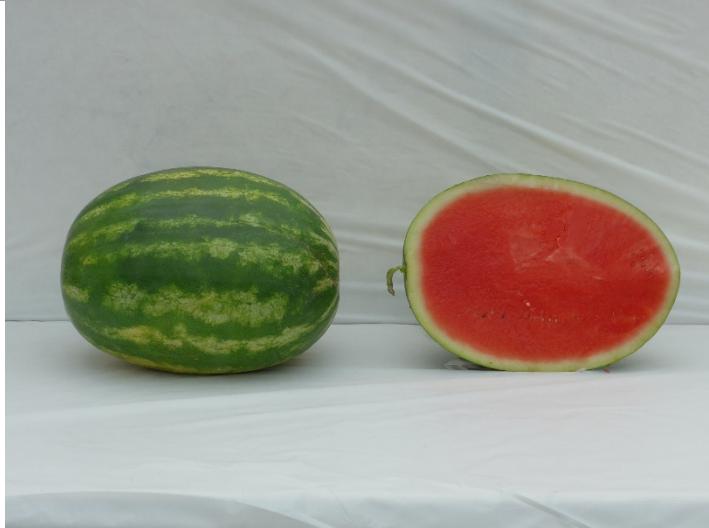
### Origene

### Tri-X 313 (Historical Standard)

Marketable I Yield: 82,712 lbs/A (17)  
Marketable II Yield: 82,712 lbs/A (14)  
Mean Weight: 15.6 lbs (10)  
Fruits per Acre: 5,301  
Count Distribution %: 30-42-20-7  
Soluble Solids: 10.9% (31)

### Syngenta

## Varieties from the 2016 Seedless Watermelon Trial\*

 Razorback	<b>Razorback</b>  Marketable I Yield: 81,986 lbs/A (18) Marketable II Yield: 81896 lbs/A (16) Mean Weight: 14.6 lbs (25) Fruits per Acre: 5,608 Count Distribution %: 37-45-12-5 Soluble Solids: 11.6% (3)
	<b>Highmark</b>  <b>Charismatic</b>  Marketable I Yield: 81,730 lbs/A (19) Marketable II Yield: 77,884 lbs/A (20) Mean Weight: 15.6 lbs (9) Fruits per Acre: 5,224 Count Distribution %: 31-41-22-6 Soluble Solids: 11.2 %
 Sakata	<b>ORS 6042b</b>  Marketable I Yield: 81,100 lbs/A (20) Marketable II Yield: 53,011 lbs/A (35) Mean Weight: 18.9 lbs (2) Fruits per acre: 4,302 Count Distribution %: 20-21-25-34 Soluble Solids: 11.0 %
 Origene	

## Varieties from the 2016 Seedless Watermelon Trial\*



### Excursion

Marketable I Yield: 80,708 lbs/A (21)  
Marketable II Yield: 74,730 lbs/A (19)  
Mean Weight: 17.5 lbs (4)  
Fruits per Acre: 4,610  
Count Distribution %: 15-35-33-17  
Soluble Solids: 10.6%

Syngenta



### Neptune

Marketable I Yield: 80,278 lbs/A (22)  
Marketable II Yield: 80,278 lbs/A (17)  
Mean Weight: 13.9 lbs (31)  
Fruits per Acre: 5,762  
Count Distribution %: 41-46-12-1  
Soluble Solids: 9.7%

Seedway



### Warrior

Marketable I Yield: 77,755 lbs/A (23)  
Marketable II Yield: 767,755 lbs/A (21)  
Mean Weight: 14.9 lbs (22)  
Fruits per Acre: 5,224  
Count Distribution %: 37-43-15-5  
Soluble Solids: 10.9%

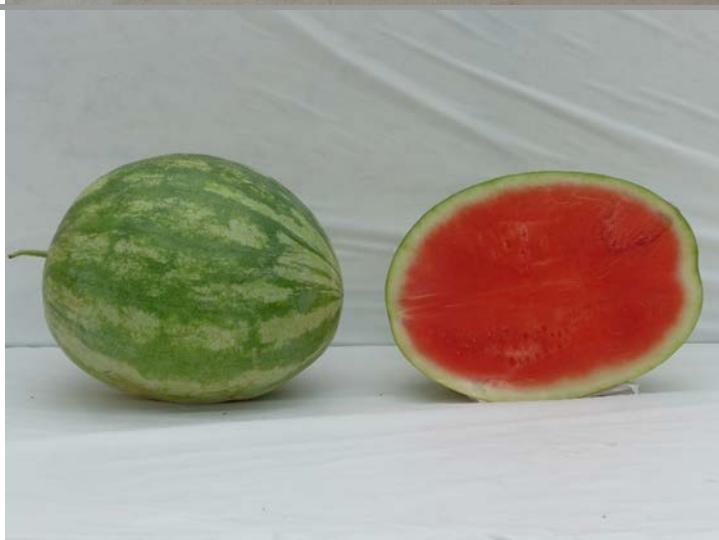
Nunhems

## Varieties from the 2016 Seedless Watermelon Trial



### Sugar Fresh

Marketable I Yield: 74,868 lbs/A (24)  
Marketable II Yield: 70,873 lbs/A (24)  
Mean Weight: 15.2 lbs (15)  
Fruits per Acre: 4,917  
Count Distribution %: 40-42-11-0  
Soluble Solids: 10.9%



### Syngenta

### Poseidon

Marketable I Yield: 73,649 lbs/A (25)  
Marketable II Yield: 73,649 lbs/A (23)  
Mean Weight: 13.5 lbs (32)  
Fruits per Acre: 5,455  
Count Distribution %: 55-32-10-3  
Soluble Solids: 11.2%



### Seedway

### Fascination

Marketable I Yield: 72,491 lbs/A (26)  
Marketable II Yield: 70,455 lbs/A (25)  
Mean Weight: 14.3 lbs (25)  
Fruits per Acre: 5,070  
Count Distribution %: 42-41-14-3  
Soluble Solids: 10.4%

### Syngenta

## Varieties from the 2016 Seedless Watermelon Trial\*



### **USA W90020**

Marketable I Yield: 72,491 lbs/A (27)  
Marketable II Yield: 70,455 lbs/A (28)  
Mean Weight: 15.2 lbs (16)  
Fruits per Acre: 4.533  
Count Distribution %: 33-43-16-9  
Soluble Solids: 10.9%

Siegers/US Agriseeds



### **Summer Breeze**

Marketable I Yield: 72,491 lbs/A (28)  
Marketable II Yield: 70,455 lbs/A (32)  
Mean Weight: 15.9 lbs (7)  
Fruits per Acre: 4.302  
Count Distribution %: 23-36-22-9  
Soluble Solids: 11.5%

Seminis



### **Kingman**

Marketable I Yield: 67,936 lbs/A (29)  
Marketable II Yield: 65,883 lbs/A (30)  
Mean Weight: 15.2 lbs (14)  
Fruits per Acre: 4.456  
Count Distribution %: 33-45-17-5  
Soluble Solids: 10.7%

Sakata

## Varieties from the 2016 Seedless Watermelon Trial\*



### Exclamation

Marketable I Yield: 67,400 lbs/A (30)  
Marketable II Yield: 67,400 lbs/A (26)  
Mean Weight: 14.6 lbs (24)  
Fruits per Acre: 4,610  
Count Distribution %: 39-39-20-2  
Soluble Solids: 10.3%



### Syngenta

### ORS 12154a

Marketable I Yield: 66.716 lbs/A (31)  
Marketable II Yield: 66.716 lbs/A (27)  
Mean Weight: 12.2 lbs (35)  
Fruits per Acre: 5,455  
Count Distribution %: 74-23-3-0  
Soluble Solids: 9.6%



### Origene



### Secretariat

Marketable I Yield: 65,990 lbs/A (32)  
Marketable II Yield: 65,990 lbs/A (29)  
Mean Weight: 13.4 lbs (33)  
Fruits per Acre: 4,917  
Count Distribution %: 43-33-10-0  
Soluble Solids: 10.7%

### Sakata

## Varieties from the 2016 Seedless Watermelon Trial\*



### Joy Ride

Marketable I Yield: 62,614 lbs/A (33)  
Marketable II Yield: 62,614 lbs/A (31)  
Mean Weight: 15.1 lbs (17)  
Fruits per Acre: 4,149  
Count Distribution %: 39-33-20-7  
Soluble Solids: 11.4%

Seminis



### Captivation

Marketable I Yield: 59,890 lbs/A (34)  
Marketable II Yield: 59,890 lbs/A (33)  
Mean Weight: 14.7 lbs (22)  
Fruits per Acre: 4,072  
Count Distribution %: 36-47-15-2  
Soluble Solids: 10.5%

Syngenta



### Sweet Dawn

Marketable I Yield: 54,724 lbs/A (35)  
Marketable II Yield: 54,724 lbs/A (34)  
Mean Weight: 15.5 lbs (12)  
Fruits per Acre: 3,534  
Count Distribution %: 27-44-27-2  
Soluble Solids: 10.5%

Syngenta

## Varieties from the 2016 Seedless Watermelon Trial\*



### Embassy

Marketable I Yield: 49,686 lbs/A (36)  
Marketable II Yield: 49,686 lbs/A (36)  
Mean Weight: 14.7 lbs (23)  
Fruits per Acre: 3,380  
Count Distribution %: 39-45-14-2  
Soluble Solids: 10.6%

### Nunhems

**APPENDIX B:**  
**Weather Summary for the 2016 Watermelon Variety Trial**  
**May – August**

Appendix B1. Weather data for the Georgetown REC site May 2016.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	51.8	54.3	48.8	1.6	95	99.3	86.4	3.2	2.7	0.49	0.03	57.4	58.5	56.6
2	61.8	77.7	50.9	14.3	90.4	100	67	17.5	4.5	0.43	0.13	61.2	67.9	56.7
3	62.3	70.1	50.2	10.1	93.8	98.5	73.2	9.5	5.2	0.3	0.08	64.7	67.6	63
4	51.5	54.2	49.6	1.9	96.2	98.9	91.5	5.2	6.1	1.1	0.04	60.8	63.8	59.3
5	49.9	52.2	48.4	0.3	91.9	98.2	84.7	5.6	6.8	0	0.04	58.2	59.3	57.4
6	50	54	47.4	0.7	93.2	98.3	79.6	7.9	5.1	0.66	0.05	57.8	59.7	55.9
7	54.2	62.3	48.9	5.6	86.5	98.4	63.4	13.3	3.5	0.01	0.09	59.3	63	56.6
8	60.3	71.7	49	10.3	64.2	94.2	26	23.2	6.5	0	0.19	61.7	66.5	57.7
9	56.9	67.2	43.1	5.1	75.2	96.3	41.2	11.4	3.3	0.01	0.1	60.1	62.7	56.6
10	57.2	64.4	51.8	8.1	72.8	95.4	52	13.3	3.2	0	0.1	61.9	65.2	59.6
11	57.5	70.2	51.4	10.8	88.2	98.7	66.9	7.7	2.8	0.37	0.07	61.9	64.4	59.8
12	62.5	70.5	56.4	13.4	90.4	99.6	73.5	12	2.5	0	0.09	64.1	67.8	61.2
13	62.9	70.1	55.4	12.8	93.9	98.4	85.2	5.7	4.2	0.15	0.05	64.3	66	62.7
14	63.7	76.6	51.7	14.1	75.2	98.4	41.2	22.3	6.1	0.16	0.18	65.6	71.5	60.5
15	53	60.3	47.2	3.7	53.1	79	28.8	22.7	9.4	0	0.18	64.2	67.5	61
16	52.1	63.1	37.4	0.3	54.2	93.6	27.4	27.7	5.8	0	0.17	63	69.4	57.4
17	55.3	63.7	48.7	6.2	82.9	97.6	59.2	7.1	3.5	0.24	0.07	62	63.6	60.5
18	57.3	64.5	51.5	8	79	98.6	51.3	19.7	3.9	0	0.13	63.2	68.4	59.2
19	60.2	71.9	52.2	12.1	63.1	90.2	35.5	21.7	3.6	0	0.16	65.3	71.7	60.6
20	62	75.9	46.2	11.1	58.5	96.8	24.1	25.9	2.6	0	0.18	66.4	73.8	59.8
21	57.7	61.7	53.7	7.7	90.8	98.3	77.2	4.9	5.4	0.92	0.05	64	67.2	62.7
22	55.9	58.5	53.5	6	96.7	98.9	90.5	5.2	5.5	0.14	0.04	62.2	63.4	61.1
23	60.5	68.4	55	11.7	79.5	98.2	49.2	16.1	4.1	0.01	0.13	64.1	68.8	60.5
24	67	80.3	56.5	18.4	69.3	96.9	32.3	22	5	0.01	0.2	67.3	73.5	62.8
25	73.2	85.8	57.4	21.6	55	92.2	25.2	25	4.2	0	0.22	70.3	76.6	64
26	76.1	89.5	58.3	23.9	56.7	92.9	24.6	26.7	5.3	0	0.26	72.4	79.2	66.2
27	76.9	88.4	68	28.2	63.9	87.2	42.8	24.8	8.3	0	0.26	74.7	80.6	69.9
28	75.9	88.1	64.6	26.3	61.7	88.9	29.6	25.4	6.8	0	0.27	75.5	81.8	70.6
29	71.8	83.4	56.9	20.1	84.9	98.7	60.2	16.7	3.7	0.01	0.14	74.1	77.7	69.6
30	71.6	75.5	67.1	21.3	95.3	97.7	91.7	4.6	4.3	1.8	0.05	73.5	74.8	72.3
31	72.6	83.6	64.9	24.3	87.4	99.4	60.4	17.7	2.5	0.23	0.15	74.8	80.3	70.4
A		Day												
B	Avg Temp			(°F)			I			Avg Solar			(MJ.m <sup>-2</sup> .day <sup>-1</sup> )	
C	Max Temp			(°F)			J			Avg Wind Speed			(mph)	
D	Min Temp			(°F)			K			Rainfall			(in)	
E	GDD			(base 50 °F)			L			Ref ET			(in day <sup>-1</sup> )	
F	Avg RH			(%)			M			Avg Soil Temp			(°F)	
G	Max RH			(%)			N			Max Soil Temp			(°F)	
H	Min RH			(%)			O			Min Soil Temp			(°F)	

Appendix B2. Weather data for the Georgetown REC site June 2016.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	73.7	82.7	64.5	23.6	78.5	98.6	48	25.6	2.8	0	0.2	76.9	82.7	71.9
2	67.4	71.9	65.5	18.7	93.9	98.6	83.3	9.2	3.3	0	0.08	75	76.7	73.5
3	68.1	74.7	64.3	19.5	92.1	99.7	77	9.2	2.6	0.01	0.08	73.9	76.2	72.1
4	71.4	82.2	62.5	22.3	81.5	98.7	60.3	19.3	2.4	0	0.15	75.1	79.6	70.9
5	75.3	85.7	66.1	25.9	82.8	97.2	64	17.4	7.6	0.04	0.17	75.9	79.4	73
6	77.9	85.3	70.9	28.1	69.1	95.6	34.6	23.8	6.9	0	0.24	78.2	83.2	74.2
7	75.5	88.1	63.9	26	71.8	93.2	22.5	21.3	5.3	0.06	0.24	78.7	84.1	75.2
8	65.5	74.1	54.3	14.2	56.6	86.9	27.4	25.7	8.1	0	0.23	74.4	77.8	71
9	66.2	79.1	50.6	14.9	51.8	85.2	26.6	27.5	6.1	0	0.24	72.5	78.3	67.2
10	67.1	79.1	55.4	17.2	49.6	86.6	20.7	27.9	5.3	0	0.24	73.4	79.1	68.4
11	76.2	89.2	59.2	24.2	66.4	94.3	41.4	24.1	7	0	0.24	75.1	80.9	69.9
12	82.5	93.3	68.6	31	45.2	73.6	13.3	25.8	9.5	0	0.37	78	82.8	74.3
13	69.4	77.8	60.6	19.2	50.4	68.8	35.3	26.8	5.9	0	0.23	76.3	82.1	71.3
14	70.7	79.2	61.9	20.5	49.4	76.4	25	28	4.8	0	0.24	77.9	83.9	73.5
15	67.8	77.8	56.5	17.1	71.5	95.6	51.1	11.3	2.5	0	0.11	74.5	77.1	71.7
16	66.7	69.9	64.2	17.1	91.8	98.3	67.6	5.9	3.3	0.54	0.07	73.3	74.7	72.2
17	67.9	78.2	62.4	20.3	77.9	97.5	36.1	22.2	4.6	0.25	0.19	74	80	70.1
18	69	81.2	56.6	18.9	60.4	98.4	24.7	28.1	3.4	0	0.22	75.1	82.7	68.5
19	74.3	87.9	57.2	22.6	53.5	89.5	22.9	27.5	3.7	0	0.24	76.6	84.1	70
20	77.7	89.1	63.7	26.4	53.5	91.5	25.1	27.3	5.1	0	0.26	78.7	85.1	73
21	75.2	87.2	67.3	27.3	76	96.1	55.2	13.6	6.7	0.87	0.16	77.5	81.8	74.6
22	75	82.4	65.7	24.1	68.4	97.3	37.6	21.8	5.7	0	0.21	75.4	78.4	72.5
23	72.9	80.3	64.4	22.4	84.8	95.8	66.2	12.5	3.4	0.14	0.12	75.1	78.7	71.9
24	73	82.1	68.1	25.1	88.8	97.8	64.8	15	3.5	1.98	0.13	76.6	80.9	73.9
25	71.6	79.9	62.6	21.2	75.3	96.5	35.8	25.9	4.7	0	0.21	77.3	82.4	73.6
26	69.6	80.9	57	19	71	98.4	29.3	27.5	2.3	0	0.2	76.9	83	71.4
27	73.1	85.5	60.3	22.9	75.8	99.1	28.7	25.1	5	0	0.23	78.1	84	73.4
28	74	78.7	71.4	25	89.8	97.2	77.3	9.9	5.1	0.16	0.1	77.9	79.8	76.2
29	75.4	85	66.1	25.6	72.3	97.7	35.8	25.8	4.5	0	0.23	78.8	83.4	75.1
30	73.8	84.6	62	23.3	68.3	95.5	40.9	23.4	3.1	0	0.19	78.4	83.7	73.5
A	Day													
B	Avg Temp	(°F)					I							
C	Max Temp	(°F)					J							
D	Min Temp	(°F)					K							
E	GDD	(base 50 °F)					L							
F	Avg RH	(%)					M							
G	Max RH	(%)					N							
H	Min RH	(%)					O							

Appendix B3. Weather data for the Georgetown REC site July 2016.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	75.5	85.1	68.6	26.8	83.3	96.9	56.4	16.2	5	0.09	0.16	78.9	82.2	76.3
2	73.5	80.4	65.5	23	65.4	95.8	32.7	27.3	5	0	0.23	78.5	82.7	74.9
3	65.3	70.2	59.5	14.9	87.3	97.4	71.7	8.1	2.1	0.32	0.07	75.4	78.1	73.3
4	69.2	74.1	62.4	18.3	91.9	98.5	73.6	8.4	3.5	0.04	0.08	74.1	75.8	72.1
5	81.1	89.8	73.3	31.6	77	96.6	51.1	23.7	6.4	0	0.23	78.3	83.5	74.4
6	81.4	90.3	72.4	31.4	80.6	97.3	57	20.4	2	0	0.18	81.6	86.3	77.3
7	83	92.2	74.2	33.2	76.4	97	47.2	23.9	3.9	0	0.22	83	87.7	78.9
8	82.2	92.7	75.2	33.9	74.7	94.7	44.5	22.6	3.3	0	0.21	83.8	88.5	80.1
9	78.9	89.3	72.4	30.9	86.3	98.3	58.2	18.2	2.7	0	0.16	83.2	86.9	80.2
10	76.5	83	69.2	26.1	67.5	95.3	46.5	22.4	5	0	0.2	81.6	84.3	78.9
11	74.4	85.1	63.6	24.4	65.9	90.8	35.6	27	4	0	0.23	80.8	85.7	76.6
12	74.3	85.3	62.6	23.9	74.4	97.9	43.6	25.4	3.2	0	0.21	80.8	85.8	76.3
13	76	85.5	69.4	27.5	88.3	96.8	67.1	10.4	3.3	0.56	0.11	80.1	82.4	78.3
14	83	91.6	75.2	33.4	79.8	98.5	51.8	25.4	5.1	0	0.23	82.7	88.7	78
15	83.2	91.1	75	33.1	71.1	92.9	47.5	25.5	4.2	0	0.23	84.1	88.7	80
16	80.6	88.6	72.7	30.7	77.7	96.8	52.7	19.5	4.1	0	0.19	83.6	86.7	80.3
17	79.4	90.1	70.6	30.4	73.4	94.6	47.2	24.8	3.7	0	0.22	83.6	88.5	79.5
18	80.4	92.1	72.2	32.2	79.3	96.6	45.8	23.3	6.1	0.44	0.24	83.6	88.1	80.4
19	78.4	87.8	71.9	29.8	76.7	97.1	43.7	22	3.4	0	0.2	83.2	88	79.5
20	75.3	83.8	66.1	25	81.1	97.4	61.1	20.6	2.8	0.45	0.17	82	85.6	78.1
21	76.4	87.3	65.6	26.4	77.7	98	41.4	25	1.9	0	0.2	82.5	87.5	77.8
22	80.1	90.2	70.4	30.3	78.6	96	52	22.4	5.5	0	0.21	82.5	86.3	79.1
23	84.2	95	74.4	34.7	72.4	94.6	40.4	24.9	4	0	0.24	83.8	88.3	80.2
24	83.8	93.3	74.4	33.9	66	95.4	34.4	24	2.7	0	0.22	84.9	88.4	81.5
25	85.6	95.9	76.3	36.1	74.7	96	45.9	23.4	5.1	0.01	0.24	85.5	89.3	82.4
26	81.5	92.6	73	32.8	79	96.7	50.9	21.9	3.4	1.34	0.2	84.3	88.4	80.9
27	83.3	93.4	75.9	34.7	77.4	96.1	37.8	21.4	2.4	0.01	0.2	85.8	89	83
28	79.1	90.5	72.9	31.7	88.1	98.1	61.4	14	2.8	2.29	0.14	84.2	86.4	81.5
29	77.2	86.1	72.2	29.2	85.8	98.3	56.7	15.6	3.4	0.13	0.15	82	84.3	80.4
30	77.9	87	70.5	28.7	82.2	98.6	54.7	19.4	3.4	0	0.17	82.3	84.5	80
31	81	89.7	73.8	31.8	81	97.4	54.7	23.2	3.3	0.04	0.2	83.3	86.6	80.6
A	Day													
B	Avg Temp			(°F)			I	Avg Solar			(MJ.m⁻².day⁻¹)			
C	Max Temp			(°F)			J	Avg Wind Speed			(mph)			
D	Min Temp			(°F)			K	Rainfall			(in)			
E	GDD			(base 50 °F)			L	Ref ET			(in day⁻¹)			
F	Avg RH			(%)			M	Avg Soil Temp			(°F)			
G	Max RH			(%)			N	Max Soil Temp			(°F)			
H	Min RH			(%)			O	Min Soil Temp			(°F)			

Appendix B4. Weather data for the Georgetown REC site August 2016.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	77.6	88.2	72.4	30.3	86.9	97.4	65	17.4	3.1	0.26	0.15	83.4	85.6	81.8
2	76.1	83.7	68.9	26.3	82.9	98.4	64.3	22	3.7	0	0.17	82.2	85.4	79.7
3	72.4	79.4	65.7	22.6	77.9	95.5	59	22.4	3.6	0	0.17	80.5	83.3	77.9
4	71.9	81.6	61.8	21.7	76.9	96.7	53.8	24	2.6	0	0.18	79.6	83.1	76.4
5	73	84.8	61.2	23	76.2	98.6	45.5	21.9	2.6	0	0.17	79.6	83.5	76
6	79.2	88.3	70.8	29.6	86.2	97.6	65.9	18.7	4.2	0.58	0.17	81.4	85.5	78.4
7	77.9	86.9	67.9	27.4	70.8	96.4	36.1	25.3	3.8	0	0.22	81.9	85.2	79.2
8	74	87.9	63.2	25.5	78.2	98.3	36.7	17.3	2.2	0	0.16	80.3	83.4	77.1
9	74.4	85.4	63.7	24.6	85.4	98.5	59.1	16.1	2.4	0	0.14	79.2	81.7	76.7
10	80.7	89.4	73	31.2	80.7	97.7	50.6	21.6	5	0	0.2	80.9	84.1	78.2
11	82.3	90	75.1	32.6	79	97.8	55.8	23.4	5.8	0	0.21	82.4	86.1	79.5
12	83.3	90.4	76.9	33.7	80.1	95.9	62.5	22.4	6.5	0	0.21	83.4	86.8	80.3
13	85.6	93.3	78.7	36	78	96.4	52.9	23.7	6.3	0	0.23	84.5	88.1	81.6
14	86.6	95.4	76.5	35.9	70.9	90.1	45	22.9	5.2	0	0.24	85.3	88.7	82.4
15	82.4	94.4	72.4	33.4	74.8	96	44.6	22.6	2.5	0	0.2	85.2	89.1	81.7
16	82.2	92	72.7	32.3	80.1	96.9	55.7	21.5	5.5	0.4	0.21	84.8	88.2	81.6
17	83.6	90.6	72	31.3	74	95.8	52	19.7	5.4	0.65	0.2	84.2	86.7	82
18	77.6	86.5	70.6	28.5	84.6	98.2	59.4	18.3	3	0.08	0.16	82.6	85.5	80.2
19	78.5	88.4	69.9	29.2	78.6	98.4	49.5	22	2.7	0	0.18	82.8	86	79.8
20	77.6	88.7	66.6	27.7	78.1	98.9	47.8	22.7	1.8	0	0.18	82.5	86.1	79
21	76.9	88.7	68.9	28.8	85.8	98.9	59.2	16.8	3.9	0.96	0.15	81.3	84.1	79.2
22	73.3	81.7	63.3	22.5	74.4	98.2	45.3	23.8	5.1	0	0.19	79.9	82.2	77.7
23	69.4	81.9	57.1	19.5	68.5	96.7	36	24.1	1.8	0	0.17	78.3	82	74.9
24	70.6	84.2	57.1	20.7	73.9	98.9	40	23.1	1.9	0	0.17	78.4	82.6	74.6
25	73.9	85.4	60	22.7	79.2	97.6	57	19.7	4.4	0	0.16	78.2	81	75.2
26	81	92.7	71.2	31.9	76.3	96.3	45.7	21.9	3.5	0	0.2	80.3	83.7	77.2
27	77.6	86.8	68.9	27.8	74.1	97.2	39.5	22.6	2.9	0	0.19	80.4	82.8	77.9
28	75.2	85.6	64.6	25.1	76.9	99.2	44.3	22.3	2.5	0	0.17	79.7	82.4	76.9
29	75.4	89.1	62	25.6	76.3	98.7	45.7	20.8	2.2	0	0.16	79.4	82.5	76.4
30	77.1	89.1	68.6	28.8	78.2	97.9	43.8	21.1	2.4	0	0.17	80.2	83	77.5
31	76.1	89.2	65.4	27.3	78.7	99.7	39.6	20.4	1.9	0	0.16	80.3	83.3	77.7
A	Day													
B	Avg Temp	(°F)					I	Avg Solar				(MJ.m <sup>-2</sup> .day <sup>-1</sup> )		
C	Max Temp	(°F)					J	Avg Wind Speed				(mph)		
D	Min Temp	(°F)					K	Rainfall				(in)		
E	GDD	(base 50 °F)					L	Ref ET				(in day <sup>-1</sup> )		
F	Avg RH	(%)					M	Avg Soil Temp				(°F)		
G	Max RH	(%)					N	Max Soil Temp				(°F)		
H	Min RH	(%)					O	Min Soil Temp				(°F)		