Personal Watermelon Variety Comparison in Western Fresno County, 2008

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Introduction

In 2008, watermelon acreage harvested totaled 2,340 acres in Fresno County and had a gross value of $22.8 million (2008 Fresno County Crop and Livestock Report, Agricultural Commissioner). The majority of commercial watermelons produced in Fresno County are seedless triploid varieties. The use of diploid plants for pollination is needed. Some growers use the seeded marketable diploid varieties as pollinators, but many use diploid varieties that do not produce marketable fruit. Personal or mini watermelons, which have fruit weighing 3 to 7 lbs, have become increasingly important to large-scale watermelon growers in western Fresno County. Prior to 2008, many personal watermelon varieties or breeding lines had not been assessed in replicated third-party trials in this production area. A trial was conducted at the University of California West Side Research and Extension Center, to evaluate yield and quality of personal watermelon varieties and breeding lines under production conditions typical in this region.

Methods

On 8 May, plants were mechanically transplanted into a Panoche clay loam soil at University of California West Side Research and Extension Center. These transplants were produced by Head Start Nursery, Gilroy, CA. Beds were 80 inches center to center and triploid plants were spaced 24' apart within a row. The pollinator, SP4 (Syngenta), was placed 12 inches after every 3rd triploid plant. Netafim drip tape (emitter output 0.18 gal/hour, with emitters spaced 14 in. apart), was buried at depth of 10 inches. Fertilizer 11-52-00, 110 lbs was applied before planting in a 12 inch band at the center of the bed and incorporated. In mid-Jun, 8 honeybee hives were placed on the edge of the field.

Thirty entries compared in the personal seedless watermelon trial at University of California West Side Research and Extension Center, 2008 were as follows

No.	Trt.	Source
1	PX 8033.5378	Seminis
2	PS 04911714	
3	Vanessa	Nunhems
4	Bobbie	
5	XW-1	Known-You
6	XW-2	
7	XW-4	
8	XW-5	
9	XW-7	
10	SSC2438 F1	Shamrock
11	WM MSL HA5158	Hazera
12	WM MSL HA5161	
13	WM MSL Fantasy	
14	WM MSL HA5157	
15	WM MSL Bravo	

No.	Trt.	Source
16	Stripe Trigon T-119	Takii
17	Petite Crisp	Zeraim
18	Petite Envy	
19	WTP9019 F1	
20	WTT-9141 F1	
21	Queenlet	Known-You Kaigo
22	Orchid Sweet	
23	Little Deuce Coup	Syngenta
24	Rosa Sweet	
25	Petite Perfection	
26	Bibo	
27	Solitaire	Harris
28	USX 7001	Ultimate Seed
29	USX 7003	
30	USX 7005	

The experimental design was a randomized complete block with 5 replications. Plots were 50 to 75 ft long and yield was determined by harvest of 35 ft from each plot on 21, 30 Jul, 7 and 19 Aug. At each harvest, fruit were counted and weighed. Weight per fruit was calculated based on the seasonal fruit count and weight. Five fruit per plot were cut across the center between the stem and blossom end, diameter and rind thickness were measured in centimeters and converted to inches. On 30 Jul and 7 Aug, fruit firmness and soluble solids were recorded. Fruit firmness was measured with a hand-held penetrometer, 10 mm tip, and each of 5 fruit was tested at 5 sites/fruit between the rind and the center of the fruit. Cores of 0.75" diameter were taken from the outside of each of five fruit, macerated as a composite sample and soluble solids were determined with a digital refractometer. Data was subjected to Analysis of Variance and Least Significant Difference at a probability of 5% (LSD P=0.05) is presented.

Results

The first harvest was on 21 Jul, 75 days after transplanting; however, the first fruit were harvested from most entries on 30 Jul. In general, both yields and soluble solids were high, but there were significant differences among entries in all characteristics compared. Shape, size, internal and external appearance also varied dramatically (Fig. 1 and 2)

Yield ranged from 8.10 to 23.12 tons per acre, as calculated from the 35 ft of bed harvested. The highest yielding entry was PS 04911714, which was similar to Petite Envy, Stripe Trigon T-119, Queenlet and Petite Crisp, P=0.05 (Table 2). The entries with the highest per acre weights, had large fruit in addition to a high or relatively high number of fruit per acre (Table 2). Of the highest yielding varieties, two had average fruit size that was greater than the 7 lb upper limit of a personal watermelon; Petite Crisp weighed 8.84 lbs and Stripe Trigon T-119 weighed 7.50 lbs (Table 3). Other entries with average fruit weight that exceeded 7.00 lbs included Solitaire (8.41 lbs), SSC2438 F1 (7.76 lbs), Orchid Sweet (7.76 lbs), Bobbie (7.30 lbs) and WM. MSL HA5161 (7.17 lbs) (Table 3). PX 8033 5378 had average fruit size of 7.0 lbs, which was not different than WM MSL Fantasy (6.99 lbs), PS 04911714 (6.84 lbs), Queenlet (6.59 lbs), Petite Envy (6.53 lbs), WTP9019 F1 (6.48 lbs), Vanessa (6.45 lbs) and XW-5 (6.41 lbs) P=0.05 (Table 3). Fruit with higher weights are usually, but not always, larger in diameter (Table 2).

Bibo, Petite Perfection WTT-9141 F1 had rind thickness of 0.18 in, which was numerically the narrowest, but did not differ significantly from Rosa Sweet (0.19 in) or Little Deuce Coup (0.20 in) P=0.05 (Table 4). Solitaire had thickest rind at 0.56 in, which was similar to SSC2438 (0.53 in), WM MSL HA5158 (0.51 in) and WTP9019 F1 (0.50 in) P=0.05 (Table 3).

Under the conditions of this study, the soluble solids were at acceptable levels for all entries. Rosa Sweet had the highest soluble solids levels of 12.33 ^{o}brix, which was similar to Petite Perfection (12.03 ^{o}brix), Bibo (11.90 ^{o}brix) and Little Deuce Coup (11.52 ^{o}brix) P=0.05 (Table 4).

Fruit firmness ranged from 1.63 to 3.09 psi. The entries that had the highest fruit firmness were Soliaire (3.09 psi), WM MSL HA5158 (3.05 psi) and USX 7001 (2.08 psi) P=0.05 (Table 5).

At the time of the first harvest on 21 Jul, few fruit were mature. However, the equivalent of 1008 fruit/acre were harvested from one entry, but no fruit or very few were harvested from

many entries (The largest early harvest was of Orchid Sweet that had 4.18 tons/acre, which was similar to Stripe Trigon T-119 P=0.05 (Table 6).

In summary, the conditions of this trial favored large fruit development, which resulted in many entries having average fruit above the level that would be considered a personal watermelon size. In addition, the days to harvest from transplant was longer than in the companion organic trial planted in a Hanford Sandy Loam soil grown under black plastic. The earliest variety was Orchid Sweet, which has yellow flesh, many other entries had no fruit or very few fruit harvested on the first date. Over all entries, the soluble solids were good, but varied dramatically.

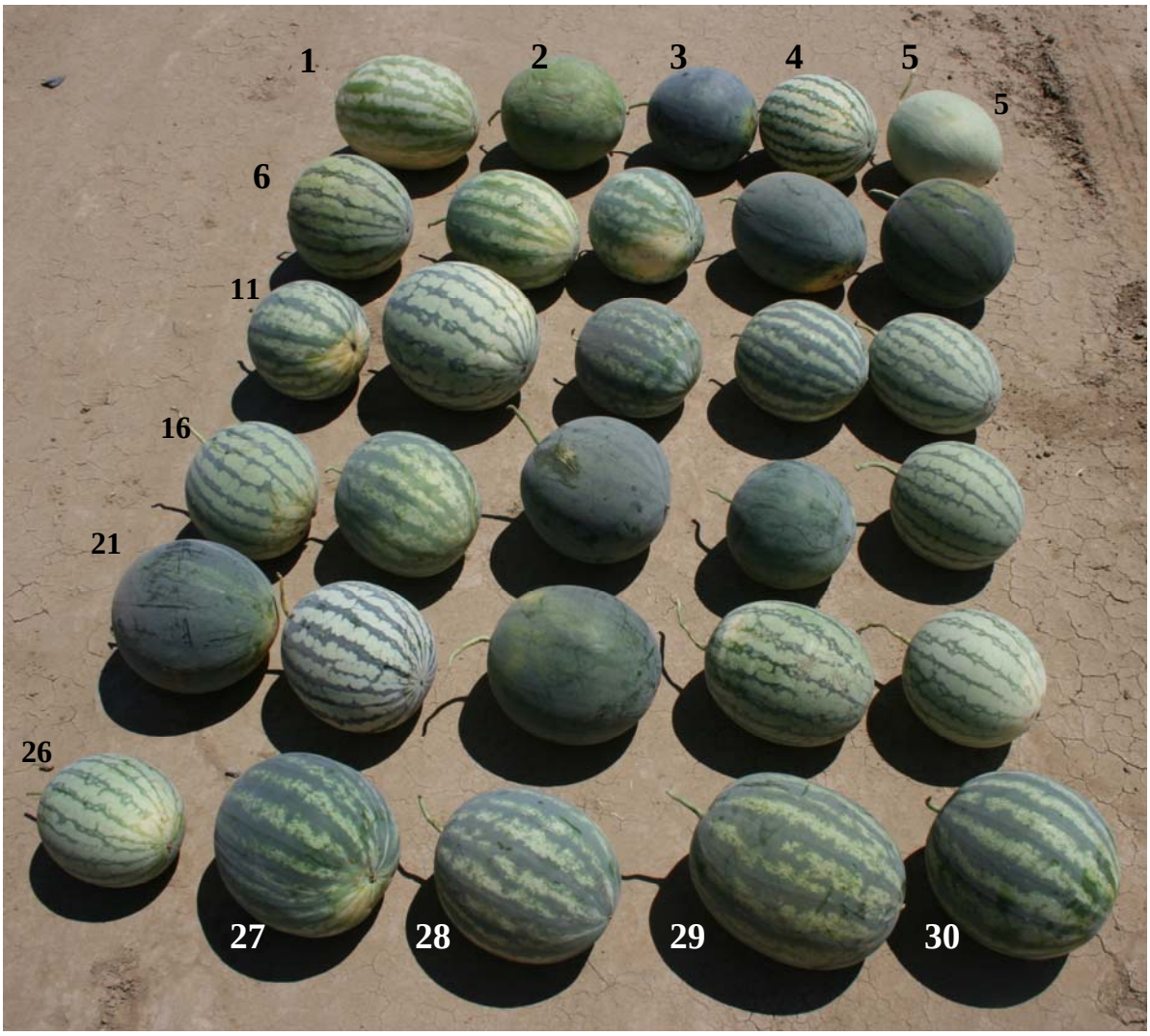

Figure 1. Entries in the trial for evaluation of yield and quality of personal watermelon varieties under conditions in western Fresno County on 25 Aug 2008. Entries appear sequentially by treatment number as listed in Table 1 from left to right, back to front.

Figure 2. Entries in the trial for evaluation of yield and quality of personal watermelon varieties under conditions in western Fresno County on 25 Aug 2008. Entries appear sequentially by treatment number as listed in Table 1 from left to right, back to front.

Table 1. Yield of entries grown at UC West Side Research and Extension Center, 2008

entry	fruit/ acre	tons/acre
PS 04911714	6758	23.12
Petite Envy	6534	21.32
Stripe Trigon T-119	5367	20.13
Queenlet	6020	19.85
Petite Crisp	4480	19.81
Vanessa	5460	17.61
XW-7	6674	17.39
XW-5	5367	17.20
WM MSL Fantasy	4900	17.14
WM MSL HA5161	4667	16.72
PX 8033.5378	4760	16.66
Orchid Sweet	4434	16.65
SSC2438 F1	4154	16.11
WM MSL Bravo	5460	15.65
USX 7001	5694	15.45
Little Deuce Coup	5694	15.09
USX 7005	4760	14.86
WTP9019 F1	4480	14.52
XW-2	5274	14.24
XW-1	5274	14.20
USX 7003	5180	14.18
XW-4	4900	13.64
Bobbie	3687	13.45
WTT-9141 F1	5087	12.76
WM MSL HA5158	4947	12.27
Rosa Sweet	5600	11.85
Bibo	5740	11.76
Petite Perfection	4434	11.16
WM MSL HA5157	3500	10.28
Solitaire	1960	8.10
LSD P=0.05	1691	5.16
CV %	23.86	23.78

Table 2. Fruit sizes of entries grown at UC West Side Research and Extension Center, 2008

entry	fruit wt (lbs)	fruit diameter (in)
Petite Crisp	8.84	8.12
Solitaire	8.41	7.36
SSC2438 F1	7.76	7.87
Orchid Sweet	7.51	7.40
Stripe Trigon T-119	7.50	7.56
Bobbie	7.30	7.51
WM MSL HA5161	7.17	7.72
PX 8033.5378	7.00	7.05
WM MSL Fantasy	6.99	7.37
PS 04911714	6.84	7.27
Queenlet	6.59	7.50
Petite Envy	6.53	7.25
WTP9019 F1	6.48	7.56
Vanessa	6.45	7.30
XW-5	6.41	7.50
USX 7005	6.24	7.16
WM MSL HA5157	5.87	7.06
USX 7001	5.83	7.12
WM MSL Bravo	5.73	6.44
USX 7003	5.68	7.10
XW-4	5.57	7.04
XW-2	5.40	6.70
XW-1	5.38	6.66
Little Deuce Coup	5.30	6.80
XW-7	5.21	7.08
Petite Perfection	5.03	6.55
WTT-9141 F1	5.02	6.58
WM MSL HA5158	4.96	6.82
Rosa Sweet	4.23	6.21
Bibo	4.10	6.11
LSD P=0.05	0.82	0.37
CV %	9.33	4.10

Table 3. Rind thickness of entries grown at UC West Side Research and Extension Center, 2008

entry	rind thickness (in)
Bibo	0.18
Petite Perfection	0.18
WTT-9141 F1	0.18
Rosa Sweet	0.19
Little Deuce Coup	0.20
XW-2	0.26
XW-1	0.29
XW-7	0.29
XW-4	0.30
XW-5	0.36
Orchid Sweet	0.37
PX 8033.5378	0.38
Stripe Trigon T-119	0.39
WM MSL HA5157	0.40
Queenlet	0.41
WM MSL Bravo	0.41
Petite Envy	0.42
USX 7005	0.43
USX 7003	0.44
PS 04911714	0.45
USX 7001	0.45
WM MSL HA5161	0.46
Bobbie	0.46
WM MSL Fantasy	0.47
Petite Crisp	0.48
Vanessa	0.48
WTP9019 F1	0.50
WM MSL HA5158	0.51
SSC2438 F1	0.53
Solitaire	0.56
LSD P=0.05	0.08
CV %	16.78

Table 4. Solids of entries grown at UC West Side Research and Extension Center, 2008

entry	soluble solids (^{o}brix)
Rosa Sweet	12.33
Petite Perfection	12.03
Bibo	11.90
Little Deuce Coup	11.52
XW-4	11.48
WTT-9141 F1	11.45
XW-2	11.35
Bobbie	11.13
PX 8033.5378	11.13
XW-1	11.05
XW-7	10.97
XW-5	10.92
Queenlet	10.88
Solitaire	10.87
PS 04911714	10.75
Vanessa	10.72
WTP9019 F1	10.68
Orchid Sweet	10.65
WM MSL Fantasy	10.63
SSC2438 F1	10.58
WM MSL Bravo	10.52
Petite Envy	10.45
WM MSL HA5158	10.43
USX 7003	10.40
USX 7001	10.35
WM MSL HA5157	10.33
Petite Crisp	10.32
WM MSL HA5161	10.28
USX 7005	10.23
Stripe Trigon T-119	10.07
LSD P=0.05	0.58
CV %	4.23

Table 5. Flesh firmness of entries grown at UC West Side Research and Extension Center, 2008.

entry	firmness (psi)
Solitaire	3.09
WM MSL HA5158	3.05
USX 7001	2.80
Petite Envy	2.70
WM MSL Fantasy	2.69
USX 7005	2.68
SSC2438 F1	2.65
WTP9019 F1	2.60
USX 7003	2.44
WM MSL HA5161	2.39
WTT-9141 F1	2.35
PS 04911714	2.33
Petite Crisp	2.32
Vanessa	2.30
WM MSL HA5157	2.27
PX 8033.5378	2.25
Petite Perfection	2.24
Stripe Trigon T-119	2.21
Bibo	2.16
Little Deuce Coup	2.12
Rosa Sweet	2.12
WM MSL Bravo	2.12
XW-4	2.11
XW-7	2.09
XW-5	2.04
Queenlet	2.01
Bobbie	1.93
XW-1	1.83
XW-2	1.70
Orchid Sweet	1.63
LSD	0.34
CV %	11.87

Table 6. Yield of entries at first harvest at UC West Side Research and Extension Center, 2008

entry	fruit/ acre	tons/acre
Orchid Sweet	1008	4.18
Stripe Trigon T-119	709	3.21
SSC2438 F1	485	2.50
Petite Envy	597	2.19
WM MSL HA5161	523	1.99
XW-1	672	1.99
XW-7	597	1.60
USX 7005	485	1.50
WM MSL Fantasy	373	1.26
PX 8033.5378	336	1.18
XW-2	448	1.15
Little Deuce Coup	373	1.13
WTP9019 F1	336	1.11
Petite Crisp	224	1.03
Vanessa	224	1.02
Queenlet	224	0.84
XW-5	149	0.74
Bobbie	187	0.70
PS 04911714	187	0.64
XW-4	149	0.44
Rosa Sweet	149	0.42
USX 7003	149	0.42
WTT-9141 F1	149	0.42
Petite Perfection	37	0.15
Bibo	37	0.09
Solitaire	0	0.00
USX 7001	0	0.00
WM MSL Bravo	0	0.00
WM MSL HA5157	0	0.00
WM MSL HA5158	0	0.00
LSD (P=0.050)	431	1.60
	117.19	120.3