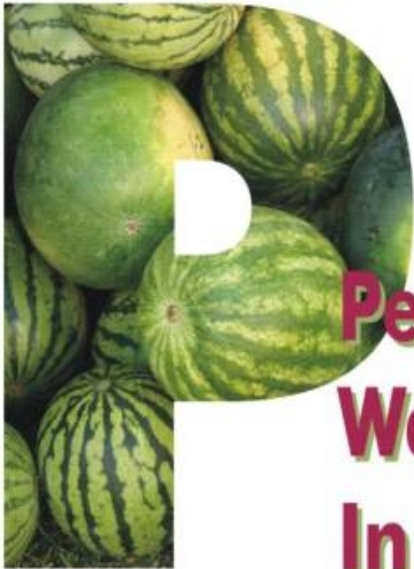


UCCE Santa Clara County



**Personal Seedless
Watermelon Evaluation
In the Central Coast**



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Mini “Personal” Seedless Watermelon Evaluation on the Central Coast of California

Aziz Baameur, UC Cooperative Extension, Santa Clara County

Terminology.

Diploid: any organism, here plants, having two sets of chromosomes. Humans are diploids.

Haploid: organism with a single set of chromosomes—or a half as many chromosomes as a diploid

Triploid: organisms having three times as many chromosomes as a haploid

Tetraploid: organism with four times chromosomes as a haploid and twice as many as diploid.

What is a seedless watermelon?

A seedless watermelon is the result of a two-step process. The first step involves the doubling of chromosomes of a diploid plant with the use of the chemical colchicines, resulting in a tetraploid plant. Secondly, when a tetraploid is crossed with a diploid, the resulting progeny is a triploid. This is the “seedless plant” in question. A triploid watermelon plant has the following characteristics: its male flower is sterile and when cross-pollinated by a diploid-seeded plant, the resulting fruit is “seedless” (having one set of chromosomes from the diploid pollinating, and two sets of chromosomes from the tetraploid receiving mother plant).

Personal Seedless Watermelon Trial

The watermelon industry has gone through several phases of development. For centuries, people grew and consumed open pollinated watermelon. This phase radically changed with the development of hybrids. Hybrid development leads to the third significant development in seedless watermelons, triploid watermelons. Now, we are entering a new phase of “personal” seedless watermelons that has been recently initiated, where fully grown and mature fruit weighing around 2-5 pounds is the market target. This is in response to consumer desire for watermelons that do not take precious refrigerator space and a public that likes smaller portion-servings.

“The new smaller versions, billed as ‘personal watermelons,’ range from two to five pounds, with a thinner rind and firm flesh that registers a higher brix, or sweetness level, than regular watermelon”. (© 2004 The Washington Post Company)

Table 1. Entry list and % greenhouse germination. 2005

Entry Code	Entry Name	Entry Source	Greenhouse % germ
1	Bambino 1714	Seminis	91.7%
2	Bambino 1712	Seminis	81.5%
3	Vanessa	Nunhems	95.0%
4	Valdoria	Nunhems	77.8%
5	Betsy	Nunhems	45.6%
6	Bobby	Nunhems	69.2%
7	Petite Perfection	Syngenta	96.4%
8	Precious Petite	Syngenta	97.2%
9	Bibo	Syngenta	87.3%
10	RWT 8149	Syngenta	87.4%
11	Palmer-Mini Yellow	De.Palmer	75%
12	Solitaire	Golden Valley	95%
	Jenny		

Pollenizer "Companion " from Seminis (97% germination)

Several varieties or hybrids are available on the market. The purpose of this field project was to evaluate their response to (1) local climate and (2) in-row spacing.

Methods

Plants were set in the field on June 24, 2005. Plots consisted of ten plants in two rows on 80''



Fig. 1. Plot view at two dates: 7/14/05 (left) and 7/29/05 (right). Pollenizer “Companion” bed is in center.

beds. In-row spacing was set either at 1- or 2-foot spacing. All plots were replicated four times, for each in-row spacing, unless seedling availability dictated otherwise. Plots consisted of two beds separated by one bed of pollinator “Companion” as illustrated in Fig. 1.

Twelve entries were included in this trial. It was established in Hollister at the Foster organic Ranch. Table 1 lists all entries in this trial.

Data collection was narrowed to one harvest, because of a sudden and severe infestation of two-spotted mites that destroyed the plots. All plots were harvested once only.

Results

Yield and yield components.

Yield is usually determined in pounds or tons per acre. Yield is determined by several subcomponents such as fruit size, and fruit numbers per plants.

Total tonnage per acre was high in the narrower spacing, 1 foot in-row spacing for each melon entry. ‘Valdoria’ was the highest producing in both spacings at 12.4 and 9.4 T/, at 1 and 2 foot spacing, respectively. The following four top ranking entries at 1 foot spacing were ‘**RWT 8149**’, ‘**Vanessa**’, and ‘**Petite Perfection**’. For comparison, **Jenny**, the pollinator, was in fourth position.

At 2 foot spacing, the same entries ranked at the top, with the exception of ‘**Bambino 1714**’ that replaced ‘Vanessa’.

Fruit size, pounds/melon, followed the reverse trend. As expected, wider spacing resulted in larger melons by an overall average increase of 28%. ‘**Bobby**’ more than doubled its fruit size

under wider spacing (109%). **‘Bambino 1712’** fruit size increased by 63% and **‘Bambino 1714’** by 41%. **‘Palmer-Mini Yellow’** was the only one to decrease fruit size as spacing widened.

The second yield component is the number of fruit produced per plant, also termed **plant productivity**. Overall productivity increased by 33% as plants had more in-row spacing. The most dramatic change happened with **‘Betsy’**, **‘Precious Petite’**, and **Jenny**. The opposite trend was noticed with **‘Bambino 1712’** with a 15% decrease. We advise caution in applying research results because we only made one harvest. Potentially, shifts in ranking could be possible under a multiple-pick scenario.

Fruit internal quality

Overall internal quality focused on three criteria: flesh color, rind thickness, and sugar content. Internal quality was not affected by spacing and therefore data were pooled into one set.

Internal color: Flesh color ranged from pink/red to red. Entries with red/pink color were ‘Bobby’ and ‘Solitaire’. Several entries (‘Petite Perfection’, ‘Precious Petite’, ‘Bibo’, ‘RWT 8149’, and Jenny) had orange to red flesh color. Definite red flesh color was recorded for two entries, ‘Vanessa’ and ‘Valdoria’. One entry, Palmer-mini, has bright yellow flesh.

Rind thickness. Entries with thickest rind (7-9 mm) were ‘Valdoria’, ‘Bobby’, and ‘Bambino 1714’, while ‘Bibo’ has the thinnest rind of all entries, less than 1 mm. Rind thickness is an important attribute because if the rind is too thick, it becomes an issue for consumers when a significant portion of the price they paid goes to rind. On the other hand, a very thin rind exposes the fruit to easy bruising and cracking during handling and shipping.

Sugar content. Sugar content as estimated by % brix is one of the most important criteria in watermelon evaluation. Brix values above 10 are considered acceptable. However, all of the entries in this trial exceed this level, with the exception of ‘Jenny (8.8), the pollinator. The highest sugar content was found in ‘RWT 8149’, with a reading of 13.5 % brix.

Physical characteristics

External color is characterized by the color intensity of the matrix or skin background and by the presence or absence of stripes. Three entries, ‘Jenny’, ‘Bambino1712’, and ‘Bibo’, have rind that is solid light color green with undistinguished green stripes. This is sometimes referred to as the “Asian type” rind.

Three other entries have a color referred to as “picnic type,” with a solid dark green matrix. These are ‘Bambino 1714’, ‘RWT 8149’, ‘Bobby’.

‘Valdoria’ and ‘Betsy’ have a medium to light green matrix with dark, distinguished stripes referred to in the trade as standard Crimson Sweet type. The remainder of entries (‘Petite Perfection’, ‘Vanessa’, ‘Precious Petite’, ‘Solitaire’, and ‘Palmer-Mini Yellow’) had the Jubilee watermelon look.

Table 2. Personal Watermelon fruit Shape--Hollister 2005

Entry Code	Entry Name	Fruit Shape
4	Valdoria	0.9
12	Solitaire	1.0
6	Bobby	1.0
7	Petite Perfection	1.0
2	Bambino 1712	1.1
11	Palmer-Mini Yellow	1.1
8	Precious Petite	1.1
1	Bambino 1714	1.1
5	Betsy	1.1
10	RWT 8149	1.1
3	Vanessa	1.1
	Jenny	1.2
9	Bibo	1.2

Melon shape. Fruit dimension is an indication of the fruit shape. Length is measured from blossom-end to stem-end. Measuring in the perpendicular direction indicates the width/diameter of the fruit.

Dimension data (table 2) shows that all entries were almost perfectly round. This was determined by the ratio of length (stem end to blossom end) and width. A score of 1.0 denotes a perfect sphere. A score of 1.2 indicates a fruit whose length is 20% larger than its width. Inversely, a score of 0.80 indicates a fruit that 20% wider than it is long (blossom end to stem end). Consult graph 1 for visual watermelon shapes based on L to W ratios. ‘Bibo’ is the only seedless entry that tended to be oblong.

Bottom Line

For comparison purposes only, I will rank the top entries based on their potential. Confidence in the results is limited because there was only one harvest; greater confidence in the results requires further research.

Based on **Yield**, the top choices would be at 1 foot spacing, ‘RWT 8149’, ‘Vanessa’, and ‘Petite Perfection’. At 2 foot spacing, the ranking is ‘Valdoria’, ‘Bambino 1714’.

Productivity or fruit per plant data showed ‘Valdoria’, and ‘RWT 8149’ high at 1 foot spacing and ‘Valdoria’, ‘Jenny’, and ‘Bambino 1714’, at top rank at 2foot spacing.

Fruit size desired is between three to six pounds. Based on fruit size ‘Palmer-Mini Yellow’, ‘Vanessa’, ‘Valdoria’ fell within this range at the 1 foot spacing. At 2 foot spacing, all entries produced fruit within this weight range, except ‘Palmer-Mini Yellow’ that was smaller than average.

Sweetness is measured by brix. With values above 12.5% brix were the following entries: ‘RWT 8149’, ‘Valdoria’, ‘Vanessa’, and ‘Bambino 1712’.

Overall rating based on all the above external and internal criteria, the following entries have performed well under the conditions of this field study. (1) ‘**Valdoria**’, (2) ‘**RWT 8149**’, (3) ‘**Vanessa**’, (4) ‘**Bambino 1712**’, ‘**Bambino 1714**’, and ‘**Petite Perfection**’. This ranking is limited to this study and by the fact that only one harvest was accomplished this year.

We look forward to repeating this field research next year in order to achieve results that can be applied with confidence when choosing varieties.

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- Our colleagues Richard Molinar and Shannon Mueller for facilitating contact with the seed producers and providing needed transplants.



Personal
watermelon



1 Bambino 1714



2 Bambino 1712



3 Vanessa



4 Valdoria



5 Betsy



6 Bobby



7 Petite Perfection



8 Precious Petite



9 Bibo



10 RWT 8149



11 Palmer Mini



12 Solitaire



Jenny



Companion



Personal
watermelon



1 Bambino 1714



2 Bambino 1712



3 Vanessa



4 Valdoria



5 Betsy



6 Bobby



7 Petite Perfection



8 Precious Petite



9 Bibo



10 RWT 8149



11 Palmer Mini



12 Solitaire



Jenny



Table 3 a. Personal Seedless Watermelon response to 1' in-row spacing--Hollister CA, 2005

Entry Code	Entry Name	Fruit/ plant	Fruit Size #/fruit	Yield T/a*	Fruit/A*
1	Bambino 1714	0.60	3.65	7.4	9,796
2	Bambino 1712	0.63	3.95	8.1	10,204
3	Vanessa	0.70	4.25	9.7	11,429
4	Valdoria	0.90	4.12	12.4	14,694
5	Betsy	0.25	3.76	3.1	4,082
6	Bobby	0.37	2.70	4.9	5,987
7	Petite Perfection	0.70	3.82	9.0	11,429
8	Precious Petite	0.40	3.56	4.8	6,531
9	Bibo	0.30	3.12	3.2	4,898
10	RWT 8149	0.83	3.60	9.8	13,470
11	Palmer mini	0.29	4.91	3.0	4,735
12	Solitaire	0.48	3.86	6.2	7,755
	Jenny-pollinator	0.69	3.76	8.6	11,021

Pollenizer "Companion "

* data from a single harvest

Table 3 b. Personal Seedless Watermelon response to 2' in-row spacing--Hollister CA, 2005

Entry Code	Entry Name	Fruit/plant	Fruit Size- #/fruit	Ton/acre*	Fruit/acre*
1	Bambino 1714	1.00	5.15	8.5	7,959
2	Bambino 1712	0.53	6.43	5.3	4,354
3	Vanessa	0.70	4.43	5.3	5,714
4	Valdoria	1.21	4.72	9.4	9,592
5	Betsy	0.60	5.56	5.4	4,898
6	Bobby	0.38	5.65	3.2	3,061
7	Petite Perfection	0.90	4.09	6.4	7,347
8	Precious Petite	0.70	4.17	4.7	5,714
9	Bibo	0.40	4.06	2.6	3,265
10	RWT 8149	0.95	4.91	7.7	7,755
11	Palmer mini	0.15	2.18	1.2	1,225
12	Solitaire	0.58	5.35	4.7	4,694
	Jenny--pollinator	1.20	4.20	8.2	9,796

Pollenizer "Companion "

* data from a single harvest

Table 4. Personal Seedless Watermelon fruit Evaluation--Hollister CA, 2005

Entry Code	Entry Name	Fruit Length	Fruit Width	Rind Thickness in.	% Brix
1	Bambino 1714	8.08	7.46	0.2	11.5
2	Bambino 1712	7.63	7.25	0.4	12.6
3	Vanessa	8.63	7.56	0.3	12.6
4	Valdoria	7.04	7.44	0.2	12.7
5	Betsy	7.54	6.84	0.2	12.2
6	Bobby	6.59	6.56	0.3	11.6
7	Petite Perfection	7.38	7.13	0.1	11.3
8	Precious Petite	6.69	6.32	0.3	12.1
9	Bibo	6.81	5.50	0.1	11.5
10	RWT 8149	8.00	7.16	0.2	13.5
11	Palmer mini	6.88	6.50	0.0	11.2
12	Solitaire	7.54	7.57	0.3	11.6
	Jenny--pollinator	8.38	7.10	0.1	8.8

Fig. 2. Watermelon shapes
Ratio of length (L) to width (W)

