Yellow Watermelon Variety Trial

Carol Miles, Carolyn Klismith, Danielle Crow, and Ed Scheenstra
WSU Mount Vernon NWREC
16650 State Route 536, Mount Vernon, WA 98273
http://vegetables.wsu.edu/

Introduction

Watermelon originated in Africa, and the first evidence of watermelon cultivation is in Egyptian hieroglyphics from 2500 BC. The fruit made its way to the Americas in the late 1500s, and today there are 200-300 varieties produced in the U.S. and Mexico. The U.S. ranks fourth globally in watermelon production, while China produces the most watermelon in the world. In the U.S., 44 states grow watermelon, and Texas, Florida, California, Georgia, Indiana, and Arizona are the top producers; Washington had 550 acres of watermelon production in 2013 (Wimer et al, 2015).

There is some variation in watermelon fruit characteristics. Rind color ranges from yellow to light green to dark green, fruit may be striped, and fruit shape ranges from oblong to round. Flesh can be varying shades of red, orange, and yellow, and fruit size is between 3 and 90 pounds. Watermelon varieties that are diploid (seeded) may be open pollinated or hybrid, while all triploid (seedless) varieties are hybrid.

Most watermelons found in grocery stores have red flesh, while varieties with yellow flesh can be found at farmers markets. This research aims to identify watermelon varieties with yellow flesh that have the potential to be produced in Washington.

Materials and Methods

Of the 28 cultivars included in this study, 26 had flesh color ranging from pale yellow to orange-yellow and 2 had pink-colored flesh (Table 1). Watermelon were seeded on May 2 in the greenhouse and were transplanted to raised beds on June 2 in a single row with 3 feet between plants, and 6 plants per plot (plots were not replicated). Raised beds were covered with black plastic mulch (1 mil thickness; Filmtech). Drip tape (T-tape; #508-08-340) was installed at the same time beds were formed. Fertilizer (19-19-9; Wilbur Ellis) was applied before bed shaping, using a 6 foot wide Gandy drop spreader, at the rate of 94 lbs of nitrogen per acre.

Watermelon were harvested on 8, 15, and 20 September and 4 October. Fruit were determined to be mature and ready to harvest when both the leaflet and tendril closest to the stem were brown and dry. Fruit were counted and weighed at each harvest (Table 2). On the day of the first harvest, 3 fruit of each variety were analyzed for total soluble solids (Brix, sweetness), and taste was rated on a scale of 1 to 10, where 1 was poor and 10 was excellent (Table 3).

A similar study was conducted in Vancouver, WA in 2004 and 2005, and included 17 of the same watermelon varieties that were a part of the 2016 study in Mount Vernon. Data that was collected in both studies was compared, which included days to maturity, Brix, and average weight per fruit (Table 4).

Results and Discussion

The first harvest was on 8 September, 99 days after transplanting, when all varieties except Desert King had mature fruit. The number of fruit per plant ranged from 1.7 to 5.0, while the average weight per fruit ranged from 2.9 to 10.9 lbs, and total weight of fruit per plant ranged from 10.7 to 30.8 lbs. Brix (sweetness) ranged from 8.2 to 12.8 (above 8 is considered good, and above 10 is considered very good), and average taste scores ranged from 4.0 to 8.4. While in general a taste rating of 7 and above is considered good, the rates in this study were negatively influenced by the color of the flesh (tasters assumed the pale or yellow color would not be sweet). To do a fair taste rating, yellow varieties should be evaluated blind (without seeing the flesh color), and a standard red variety should be included for comparison.

References

Boyhan, G., Granberry, D., & Kelley, W. 2014. Commercial Watermelon Production. *University of Georgia Extension.*

Miles, C. 2016. Icebox Watermelons. *NWREC Vegetable Research and Extension.* Retrieved October 31, 2016, from http://vegetables.wsu.edu/watermelon.html.

Orzolek, M. et al. 2010. Agricultural Alternatives: Watermelon Production. *PennState Agricultural Research and Cooperative Extension.*

Wimer, J., D. Inglis and C. Miles. 2015. Field and greenhouse evaluation of rootstocks to improve *Verticillium* resistance for grafted watermelon. HortScience 50(11):1625-1630.

An African Native of World Popularity. *Texas A&M AgriLife Extension.*

Table 1. 28 varieties of yellow watermelon included in the study in Mount Vernon in 2016, the company that provided seeds, the number of days to harvest as provided by the seed companies, and whether or not the variety is triploid (seedless).

Variety Name	Company	Days to harvest	Seedless
Amarillo	Otis S.Twilley Seeds	82	Y
Baby Doll	High Mowing Organic Seeds	75	N
Cream of Saskatchewan	Fedco Seeds	70-80	N
Desert King	Baker Creek Heirloom Seeds	85	N
Early Moonbeam	Fedco Seeds	78	N
Felicity	Osborne Seed Co.	80-85	Y
Gold Flower	Fedco Seeds	75	N
Gold in Gold	Osborne Seed Co.	80	N
Gold-N-Sweet	Colorado Seeds, Inc.	na	N
Golden Midget	High Mowing Organic Seeds	70	N
Jo Saeng No Ran Ggul	Osborne Seed Co.	75-80	N
Lemon Krush	Otis S.Twilley Seeds	85	N
New Orchid	Johnny's Select Seeds	80	N
New Queen	Territoral Seed Company	80	N
Orange Crisp	Johnny's Select Seeds	87	Y
Orange Orchid	Fedco Seeds	78	N
Orangeglo	High Mowing Organic Seeds	90	N
Orchid Sweet	Territoral Seed Company	90	Y
Peace Yellow	Fedco Seeds	75	N
Petite Yellow	Fedco Seeds	75	N
Pony Yellow	Osborne Seed Co.	70-80	N
Sorbet Swirl	Johnny's Select Seeds	77	N
Summer Sweet	Otis S.Twilley Seeds	90	Y
Sunshine	Johnny's Select Seeds	75	N
Super Gold	Osborne Seed Co.	85	N
Treasure Chest	Otis S.Twilley Seeds	80	Y
Yellow Baby	Otis S.Twilley Seeds	na	N
Yellow Doll	Otis S.Twilley Seeds	68	N

Table 2. Productivity of 28 watermelon varieties at WSU Mount Vernon NWREC in 2016. Watermelon varieties were harvested 4 times.

Cultivar	Days to Maturity	No. fruit per plant	Total fruit wt. per plant (lbs)	Avg. weight per fruit (lbs)
Amarillo	99	3.7	25.6	7.0
Baby Doll	99	2.8	30.8	10.9
Cream of Saskatchewan	99	2.3	21.0	9.0
Desert King	125	2.7	27.7	10.4
Early Moonbeam	99	3.7	24.9	6.8
Felicity	99	2.5	24.3	9.7
Gold Flower	99	3.3	15.0	4.5
Golden Midget	99	3.2	13.3	4.2
Gold In Gold	99	4.3	20.0	4.6
Gold-N-Sweet	99	4.0	20.7	5.2
Jo Saeng No Ran Ggul	99	2.2	14.7	6.8
Lemon Krush	99	1.7	13.3	8.0
New Orchid	99	2.3	11.4	4.9
New Queen	99	3.7	15.6	4.3
Orange Crisp	99	3.0	18.1	6.0
Orangeglo	99	2.2	23.6	10.9
Orange Orchid	99	4.0	18.7	4.7
Orchid Sweet	99	2.3	13.1	5.6
Peace Yellow Fleshed	99	2.8	17.1	6.1
Petite Yellow Fleshed	99	3.0	13.0	4.3
Pony Yellow	99	5.0	14.6	2.9
Sorbet Swirl	99	2.0	19.7	9.9
Sunshine	99	3.0	17.7	5.9
Summer Sweet	99	2.2	10.7	5.0
Super Gold	99	2.3	18.9	8.1
Treasure Chest	99	2.0	14.3	7.1
Yellow Baby	99	4.3	22.2	5.1
Yellow Doll	99	4.8	19.4	4.0

Table 3. Taste test results where 1 represents worst taste and 10 represents best taste. Based on 16 participants at WSU Mount Vernon NWREC.

Cultivar	Mean Rating	Standard Deviation
Amarillo	7.63	1.27
Baby Doll	5.00	1.73
Cream of Saskatchewan	5.44	1.22
Desert King	--[1]	--[1]
Early Moonbeam	5.75	1.3
Felicity	6.38	1.87
Gold Flower	5.63	2.09
Golden Midget	4.00	1.73
Gold In Gold	4.63	1.69
Gold-N-Sweet	5.81	1.29
Jo Saeng No Ran Ggul	6.81	1.24
Lemon Krush	7.44	1.27
New Orchid	5.34	1.55
New Queen	6.33	1.70
Orange Crisp	4.07	1.70
Orangeglo	--[1]	--[1]
Orange Orchid	6.07	1.34
Orchid Sweet	5.93	1.24
Peace Yellow Fleshed	7.47	1.20
Petite Yellow Fleshed	6.87	1.31
Pony Yellow	7.07	1.10
Sorbet Swirl	7.79	1.61
Sunshine	6.50	1.88
Summer Sweet	5.79	1.66
Super Gold	8.36	1.39
Treasure Chest	4.50	2.10
Yellow Baby	5.79	1.42
Yellow Doll	5.14	1.96

[1]Variety was not mature at the time of taste evaluation.

Table 4. 17 varieties grown in Mount Vernon in 2016 and Vancouver, WA in 2004 and 2005. Days to maturity, brix, and average fruit weight at both locations.

	Days to Maturity		Brix		Ave. Fruit Wt. (lbs)	
Variety	**MV**	**Van**	**MV**	**Van**	**MV**	**Van**
Amarillo	99	89	12.2	10.4	5.2	8.1
Baby Doll	99	89	10.1	8.9	5.2	14.7
Cream of Saskatchewan	99	86	9.3	8.9	9.0	9.4
Desert King	125	95	8.8	8.6	10.4	19.4
Early Moonbeam	99	88	10.5	9.9	6.8	7.0
Gold Flower	99	88	11.7	10.4	4.5	5.9
Golden Midget	99	90	8.2	7.4	4.2	4.2
New Orchid	99	90	11.3	10.7	4.9	8.9
New Queen	99	87	11.4	10.5	4.3	5.9
Orangeglo	99	94	9.9	10.7	10.9	13.2
Orchid Sweet	99	83	11.4	9.1	5.6	9.4
Petite Yellow	99	89	11.9	9.6	4.3	11.5
Sorbet Swirl	99	84	12.2	11.5	9.9	9.2
Sunshine	99	96	11.8	10.4	5.9	9.2
Summer Sweet	99	92	11.5	10.8	5.0	7.7
Treasure Chest	99	80	11.4	13.0	7.1	11.4
Yellow Doll	99	88	11.9	10.6	4.0	6.0
Mean	**101**	**89**	**10.9**	**10.1**	**6.3**	**9.5**

Table 5. Average temperatures and growing degree days (GDD, base 50^{o} F) during the growing season for watermelon in Mount Vernon and Vancouver, WA (AgWeatherNet).

Month	**Min Temp (F)**		**Ave. Temp (F)**		**Max Temp (F)**		**GDD (Base 50^{o} F)**		
Location	**MV**	**Van**	**MV**	**Van**	**MV**	**Van**		**MV**	**Van**
June	51.5	51.7	59.6	63.1	68.7	74		304	387
July	54.1	55.6	63.1	65.5	73.1	76.6		423	499
August	52.5	54	63.8	68	76.1	82.3		444	562
September	48.7	47.4	57.6	59.8	67.4	72.4		242	297
Average	**51.7**	**52.2**	**61.0**	**64.1**	**71.3**	**76.3**	***Total***	**1413**	**1745**