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Kentucky Triploid Watermelon Variety Trial — 2014

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In Kentucky, watermelon (*Citrullus lanatus* L.) production area is the second largest of all fresh market vegetables. In 2013, watermelons were grown on 1,116 acres accounting for 16% of the total fresh market vegetable acreage (USDA, 2014). Watermelons are grown in various areas across the state including Casey, Lincoln, Hart, Allen, and Daviess counties. There is also potential for increased production, particularly in central and western Kentucky, areas having proximity to the large industry in southern Indiana. Selecting an appropriate variety continues to be one of the primary decisions producers make each season to meet their needs with respect to high yield, resistance to abiotic disorders (e.g., hollow heart), good internal qualities such as soluble solids, and wholesale buyer acceptance. Buyer acceptance is important as wholesale buyers can have different requirements as compared to buyers at farmers markets. The objective of the experiment was to evaluate 11 triploid watermelon varieties grown under Midwestern United States growing conditions at the University of Kentucky Horticulture Research Farm in Lexington, Ky.

Materials and Methods

The experiment was established April 21, 2014, when seeds of 11 triploid watermelon varieties were sown in 50-cell black seedling flats (Landmark Plastic, Akron, OH). Jiffy-Mix Grower's Choice Plus (Jiffy Products of America, Lorain, Ohio) was the seedling media used. On May 27, 2014, all varieties were transplanted in the field using Accomplice (Harris Moran) as the pollenizer variety. This is a nonharvestable pollenizer with a bushy growth habit. The experiment was a randomized complete block design with three replications. Experimental plots were 40 ft. in length. Rows were spaced on 8-ft. centers with 4-ft. in-row spacing. Preplant fertilizer application consisted of 130 lbs. of urea (46-0-0) and 100 lbs. of sulfate of potash (0-0-50) per acre. Raised beds were formed and covered in black plastic mulch (4 ft x 1 mil, Filmtech Plastics of the Sigma Plastics Group, Lyndhurst, NJ). Simultaneously, drip tape (8-in emitter spacing, 30 gph/100 ft, Aqua Traxx, The Toro Company, Bloomington, MN) was installed under the plastic to allow for irrigation during the season as needed. Fertigation applications at 10 lbs. N per acre were made alternating calcium nitrate and potassium nitrate weekly from June 4 to August 14. There were 10 plants per plot in addition to five pollenizers per plot. Pollenizers were interplanted between every pair of triploid watermelon plants within the row.

Vines were turned back onto the plastic weekly from June 9 to June 30 to keep varieties separated and to also allow for cultivation of row middles for weed management. Weeds on shoulders of the beds were weeded by hand and with the use of scuffle hoe. The MELCAST disease forecasting system was utilized to determine the timing of preventative fungicide sprays (Egel, 2014). In some seasons that can result in a reduction of two or three fungicide applications (Egel and Latin, 2012). Fungicide selection and proper rotation of modes of action was done per the recommendations in ID-36 *Vegetable Production Guide for Commercial Growers* (Bessin, et al., 2014). Scouting was conducted on a weekly basis for arthropod pests. Insecticide or miticide applications were made when identified as necessary based on the scouting report. Fruit was harvested five times from July 31-August 27, weighing each fruit individually. Nine randomly

chosen fruit from each variety (three from each replication) were evaluated for internal quality including percent soluble solids, size, and firmness. Yield data were analyzed by general linear model and means were separated by Fisher's least significant difference test using SAS statistical programs (SAS Institute, Cary, NC.)

Results and Discussion

Yields in 2014 were higher compared to the previous season, ranging from 43,271-85,240 lbs/acre, as compared to 28,400-45,300 lbs/acre last season (Table 1) (Saha and Sutterer, 2013). Potential reasons for this increase could be due to site differences, as in 2014 the trial was conducted in Lexington, KY as opposed to Vincennes, IN in previous years. However, it is more likely due to the fact that only four harvests were collected in 2013 as opposed to five in 2014. Average fruit weight ranged from 15.3-20.1 pounds amongst the varieties (Table 2).

ORS12166 had higher total yield (627 lbs/plot) compared to nine of the 10 other varieties (Table 1). The exception was Exclamation (564 lbs/plot) (Table 1). However ORS12166 had lower soluble solids (10.2% Brix) relative to the majority of the other varieties (Table 3). Harvest Moon had significantly higher soluble solids (12.2 % Brix) than all other varieties and total yield was only less than one other variety in the trial (514 lbs/plot) (Tables 1 and 3). This is a unique variety that might not be suited for wholesale, but might have more potential at a farmers market or farm stand. Harvest Moon is a seedless version of an old variety known as Moon and Stars. Maxima also had reasonably good combination of yield (521 lbs/plot) and soluble solids (11% Brix) (Tables 1 and 3). Harvest Moon did have a low fruit firmness (1.9 lbs-force) compared to all but one other variety (Table 3). Varieties with higher firmness included Premont, Maxima, ORS12166, and Exclamation at 3.9, 3.7, 3.6, and 3.5 lbs-force, respectively (Table 3). Wholesale markets typically do not prefer watermelons with extremely low fruit firmness from a consumer perspective but also for fresh cut possibilities with respect to shelf life.

Harvest Moon had the greatest number of 60-count bins per acre (23) relative to all other varieties (Table 4). Harvest Moon also had the numerically greatest number of 45-count bins (35) and was statistically greater than eight of 10 other varieties (Table 4). Unbridled and SWT7829 also had relatively high number of 45-count bins per acre (Table 4). There were no significant differences amongst any of the varieties for the total number of 36-count bins harvested per acre. Exclamation and Maxima produced a greater amount of 36-count bins per acre relative to most other varieties in the trial (Table 4). Although it can vary from year to year, the current trend seems to be that 45-count and 60-count are the desirable sizes.

This season ended like the last, which consisted of significant periods of cool and wet weather, which were ideal for certain soilborne diseases. Disease incidence was low, however, both fusarium crown rot (*Fusarium solani* f.sp. *cucurbitae*) and pythium cottony leak (*Pythium* spp.) were identified. The cool temperatures also seemed to have an adverse impact on the maturity of the watermelons.

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Table 1. Yield of triploid watermelon varieties, 2014.

Variety	Seed Company	Total Fruit Weight (lb) Per Plot[1]	Total Fruit Number Per Plot	Fruit Weight (lb) Per Acre	Fruit Number Per Acre
ORS12166	Origene	626.2 a[2]	34.0 a	85,240 a	4,628.3 a
Exclamation	Syngenta	563.8 ab	28.0 bc	76,750 ab	3,811.5 bc
Premont	Clifton	523.2 bc	29.0 ab	71,223 bc	3,947.6 ab
Maxima	Origene	521.4 bc	26.0 bcd	70,971 bc	3,539.3 bcd
Harvest Moon	Seeds by Design	513.8 bc	33.7 a	69,937 bc	4,582.9 a
Captivation	Syngenta	485.4 bc	25.0 bcd	66,078 bc	3,403.1 bcd
Unbridled	Sakata	470.2 bc	26.7 bcd	64,010 bc	3,630.0 bcd
Fascination	Syngenta	428.1 cd	22.7 cde	58,279 cd	3,085.5 cde
SWT7829	Clifton	358.6 de	23.0 cde	48,811 de	3,130.9 cde
Cut Above	Clifton	339.9 de	21.7 de	46,272 de	2,949.4 de
USAWX90020	US Agriseeds	317.9 e	19.0 e	43,271 e	2,586.4 e

[1]Plot size: 320 ft^2.
[2]Means within columns separated by Fisher's least significant test ($P \leq 0.05$), means with same letter are not significantly different.

Table 3. Fruit quality of triploid watermelon varieties, 2014.

Variety	**°Brix**[1]	**Firmness** (lbs-force)	**Fruit Length** (in)	**Fruit Width** (in)	**Degree of Seedlessness**[2]	**Hollow Heart**[3]	**Color**
Harvest Moon	12.2 a[4]	2.0 e	10.07 d	9.23 bc	0.0	0.4 bc	Red
SWT7829	11.3 b	2.8 cd	10.49 bcd	8.47 g	0.1	0.7 ab	Red
Cut Above	11.3 b	2.6 d	10.93 abc	8.59 fg	0.1	1.1 a	Pink
USAWX90020	11.3 b	2.5 de	11.04 abc	8.96 cdef	0.0	0.6 abc	Pink
Unbridled	11.3 b	3.3 bc	10.41 cd	9.15 cde	0.2	0.4 bc	Red
Captivation	11.0 b	3.3 bc	11.50 a	9.04 cde	0.2	0.1 bc	Pink
Fascination	11.0 b	3.4 ab	11.37 a	8.75 defg	0.4	0.0 c	Pink
Maxima	11.0 b	3.7 ab	10.84 abcd	9.81 a	0.2	0.1 bc	Pink
Premont	10.7 bc	3.9 a	10.73 abcd	8.71 efg	0.6	0.4 bc	Red
Exclamation	10.7 bc	3.5 ab	11.21 abc	9.63 ab	0.2	0.0 c	Pink
ORS12166	10.2 c	3.6 ab	11.22 ab	9.18 cd	0.0	0.0 c	Pink

[1]°Brix: the percent of soluble solids.
[2]Degree of Seedlessness: 1=0 seeds, 2=1-5 seeds, 3=>5 seeds.
[3]Hollow Heart: 0=none, 1=minor cracking, 2=severe cracks or cavities.
[4]Means within columns separated by Fisher's least significant difference test ($P \leq 0.05$), means with same letter are not significantly different.

Table 4. Yield of triploid watermelon varieties by bin count, 2014.

Variety	Number of 60-count Bins Per Acre	Number of 45-count Bins Per Acre	Number of 36-count Bins Per Acre	Number of 30-count Bins Per Acre
Harvest Moon	22.7 a[1]	35.5 a	17.4	0.8 f
Cut Above	11.3 b	25.7 bcd	10.6	1.5 ef
SWT7829	10.6 bc	28.7 abc	12.9	0.0 f
ORS12166	7.6 bcd	23.4 bcd	28.7	17.4 bc
USAWX90020	7.6 bcd	18.2 d	12.9	4.5 ef
Premont	7.6 bcd	21.9 bcd	28.7	6.8 def
Unbridled	4.5 bcd	30.3 ab	16.6	8.3 de
Exclamation	3.8 cd	17.4 d	17.4	25.0 a
Captivation	2.3 d	17.4 d	20.4	15.9 c
Fascination	2.3 d	17.4 d	19.7	12.1 cd
Maxima	1.5 d	19.7 cd	13.6	24.2 ab

[1]Means within columns separated by Fisher's least significant difference test ($P \leq 0.05$), means with same letter are not significantly different.

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