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Wenjing Guan
Purdue University, guan40@purdue.edu

Dan Egel
Purdue University - Main Campus, egel@purdue.edu

Dennis Nowaskie
Southwest Purdue Agriculture Center, nowaskie@purdue.edu

Dean Haseman
thaseman@purdue.edu

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Wenjing Guan, Daniel S. Egel, Dennis Nowaskie, Thomas D.H. Haseman,
Southwest Purdue Agricultural Center, Vincennes, IN, 47591 guan40@purdue.edu

Introduction

Personal-size triploid watermelons are usually defined as weighing 4.4 to 8.8 lbs (Vinson et al., 2010). The ideal size is about 6-7 lbs. They often have firm flesh and high lycopene content and attract certain consumers. This variety trial included 12 personal-size triploid watermelons. Yield and fruit quality parameters were evaluated.

Materials and Methods

A personal-size triploid watermelon variety trial was conducted at the Southwest Purdue Agricultural Center in Vincennes, IN in 2021. Variety names and seed sources are provided in Table 1.

Watermelon seeds were planted in 50-cell black seeding flats filled with a peat-based potting media on Apr. 20 2021. Transplants were grown in greenhouses at the Southwest Purdue Agricultural Center (SWPAC) and transplanted in the field on May 18.

Soils of the experimental fields are sandy loam with 1.3% organic matter. Fertilizers at a rate of 300 lb/acre urea (46-0-0), 200 lb/acre potash (0-0-60), 100 lb/acre AMS (21-0-0-24), 7 lb/acre boron 14.3%, and 10 lb/acre Zinc 10% LS were pre-plant broadcast applied. Plants were grown on raised beds covered with black plastic mulch. Drip tapes with a 12-inch emitter spacing and a flow rate of 0.22 gpm/100 feet were used for irrigation. At transplant, each seedling received approximately one cup of starter fertilizer solution (Miracle-Gro® 20-20-20, 4.7 grams per gallon water).

A randomized complete block design with three replications was used for the trial. Experimental plots were comprised of three 12-ft rows spaced on 6 ft centers. Transplants were planted 2 ft apart for a total of 18 plants per experimental plot. Pollenizers were planted in one row for every three rows of personal-size triploid watermelons. Pollenizer SP-7 (Syngenta) was used for the trial.

Herbicide Dual Magnum® was applied in row middles before planting. Disease and insect pests were managed by scouting and using recommendations from the Melcast (melcast.info) and the Midwest Vegetable Production Guide for Commercial Growers (Phillips et al, 2021). Fungicide Proline® was injected through drip tapes on May 25 and June 11 for controlling Fusarium wilt. Fungicides Initiate® 720, Aprovia Top®, Ranman®, Luna Sensation®, Inspire Super®, Cabrio®, Quadris Top® Miravis® Prime, Presidio® and Zampro® were used to control foliar diseases.

Harvests were conducted on Aug. 10, 16 and 23. Fruit were weighed individually. Three fruit per variety per replication were collected for quality measurement. Fruit size and rind thickness were recorded. Soluble solids contents (SSC%) were measured with a digital refractometer. Flesh firmness was measured using a force gauge with 11 mm diameter tip. Hollow heart severity was evaluated using a 1-5 scale: 1. none; 2. carpel separation evident; 3. one large gap evident; 4. more than 2 large gaps; 5. severe. Seedlessness was evaluated by counting black hard seeds on cut surfaces of quartered melons.

Analysis of variance was performed using JMP Pro 16. Fisher's least significant difference test ($\alpha = 0.05$) was conducted for multiple comparisons of different measurements among watermelon varieties.

Results and Discussion

The 2021 personal-size seedless watermelon variety trial achieved outstanding yields. Marketable yields ranged from 106,908 to 78,606 lbs/acre, which were higher than yields of the trials in all the recent years. Top yielding variety was Sugar Rush, but it was not significantly different from Excite, Preakness, 50035, Nectaro, Sugar Bomb and Petite Perfection (Table 2). Variety Sugar Bomb had the lowest yield in the first harvest, while it had the highest yield in the last harvest (Table 3). Variety 65-1833 had the largest fruit size (average fruit weight 7.2 lb), while Sugar Bomb (4.0 lb), Petite Perfection (5.1 lb), 50035 (5.2 lb) had the smallest fruit size (Table 4). Sugar Bomb had the thickest rind, and Petite Perfection had the thinnest rind. The highest Brix value was observed in Petite Perfection, but it was not significantly different from Sirius, Preakness and Ladybelle. Cheetah and 50035 had the highest value of flesh firmness, but it was only significantly higher than Sirius and Preakness.

References

Phillips, B. et al., 2021. Midwest vegetable production guide for commercial growers 2021. < https://mdc.itap.purdue.edu/item.asp?Item_Number=ID-56>.
Vinson III. E.L. et al., 2010. Use of external indicators to predict maturity of mini-watermelon fruit. HortScience 45:1034-1037. DOI: https://doi.org/10.21273/HORTSCI.45.7.1034

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Table 1. Varieties and seed sources of personal-size triploid watermelons in 2021watermelon variety trial in Vincennes, IN.

Variety	**Seed source**
Ladybelle	BASF
Nun 31814 WMW	BASF
Preakness	Sakata
Cheetah	Hazera
Nectaro	Hazera
Excite	Hazera
50035	Hazera
Sirius	Syngenta
Petite Perfection	Syngenta
65-1833 F1	Purelineseed
Sugar Bomb	US Agriseeds
Sugar Rush	US Agriseeds

Table 2. Total and marketable yields of personal-size triploid watermelons in 2021watermelon variety trial at Southwest Purdue Agricultural Center in Vincennes, IN.

Variety	**Marketable yield**		**Total yield**	
	Lbs/acre	**No./acre**	**Lbs/acre**	**No./acre**
Sugar Rush	106,908 a	18,805 b	107,305 a	18,906 b
Excite	99,372 ab	16,184 bcde	100,130 ab	16,335 bcde
Preakness	95,737 abc	16,738 bcd	96,467 abc	16,889 bcd
50035	94,973 abc	18,150 bc	95,195 abc	18,200 bc
Nectaro	92,605 abc	15,932 bcde	92,605 abc	15,931 bcde
Sugar Bomb	92,358 abc	22,990 a	92,443 abc	23,040 a
Petite Perfection	87,395 abc	17,192 bcd	88,551 abc	17,444 bcd
Nun 31814 WMW	85,154 bc	12,957 ef	87,000 bc	13,209 ef
Sirius	85,136 bc	14,419 def	85,856 bc	14,570 cdef
Cheetah	81,379 bc	13,764 def	82,136 bc	13,915 def
65-1833 F1	79,958 bc	11,142 f	80,514 bc	11,293 f
Ladybelle	78,606 c	14,520 cdef	79,171 c	14,620 cdef

Table 3. Marketable yield of personal-size triploid watermelons on each harvest date in 2021 watermelon variety trial at Southwest Purdue Agricultural Center in Vincennes, IN. First, second and third harvests were conducted on Aug 10, 16, 23, respectively.

Variety	**1st harvest**	**2nd harvest**	**3rd harvest**
Preakness	46,656 a	32,717 ab	16,348 bcd
Excite	45,407 a	38,524 ab	15,426 cd
Sirius	41,614 a	32,787 ab	10,720 d
65-1833 F1	40,116 ab	26,656 b	13,171 cd
Nun 31814 WMW	38,988 ab	31,219 b	14,933 cd
Cheetah	38,807 ab	32,071 ab	10,487 d
Petite Perfection	37,730 abc	27,578 b	22,074 abcd
Sugar Rush	37,376 abc	46,238 a	23,281 abc
Nectaro	35,615 abc	37,744 ab	19,234 bcd
50035	28,954 bc	37,989 ab	28,019 ab
Ladybelle	28,621 bc	30,958 b	19,016 bcd
Sugar Bomb	25,749 c	34,610 ab	31,990 a

Table 4. Average fruit weight and fruit quality of personal-size triploid watermelons in the 2021 watermelon variety trial at Southwest Purdue Agricultural Center in Vincennes, IN.

Variety	**Average fruit wt. (lb)**	**Length (cm)**	**Width (cm)**	**Rind thickness (cm)**	**Soluble solids content (°Brix)**	**Firmness (lbs-force)**	**Hollow Heart**	**Black seeds**
65-1833 F1	7.2 a	21.8 a	20.3 a	1.0 c	9.6 def	3.6 abc	1.1 b	0.1
Nun 31814 WMW	6.6 b	19.6 b	19.4 ab	1.2 bc	10.1 bcd	4.1 ab	1 b	0
Excite	6.1 bc	20.3 ab	19.5 ab	1.2 bc	9.9 bcde	4.1 ab	1 b	0.3
Sirius	5.9 c	20.4 ab	19.4 ab	1.2 bc	10.4 ab	3.0 bc	1 b	0
Cheetah	5.9 c	19.4 b	18.8 bcd	1.0 c	9.4 ef	4.2 a	1 b	0.4
Nectaro	5.8 cd	19.6 b	18.4 cd	1.1 bc	9.9 bcde	4.1 ab	1 b	0.3
Preakness	5.7 cd	20.4 ab	18.2 cde	1.2 bc	10.4 ab	2.8 c	1.9 a	0
Sugar Rush	5.7 cd	20.4 ab	17.9 de	1.2 bc	9.7 cdef	4.0 ab	1 b	0.4
Ladybelle	5.4 de	19.7 b	19.0 bc	1.2 bc	10.2 abc	3.3 abc	1.2 b	0.4
50035	5.2 e	19.1 bc	17.9 de	1.3 b	9.7 cdef	4.2 a	1 b	0.2
Petite Perfection	5.1 e	17.7 cd	17.3 ef	0.6 d	10.8 a	3.4 abc	1 b	0.1
Sugar Bomb	4.0 f	16.6 d	16.7 f	1.7 a	9.2 f	3.7 abc	1.2 b	0.2

Variety			
Ladybelle			
Nun 31814 WMW			
Preakness			
Cheetah			
Nectaro			
Excite			
50035			

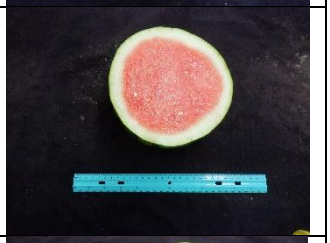
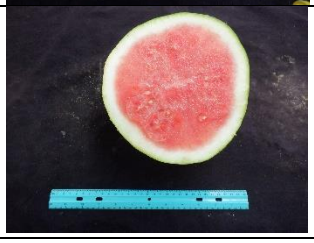
Sirius			
Petite Perfection			
65-1833 F1			
Sugar Bomb			
Sugar Rush			

Figure 1. Exterior and interior of watermelon fruit in the 2021 personal-size triploid watermelon variety trial in Vincennes, IN.