

## **Annual Report for the Pennsylvania Vegetable Research and Marketing Board**

### **Keeping PA Vegetable Growers Profitable: Statewide Cultivar Trials**

Elsa Sánchez, Professor of Horticultural Systems Management

Tim Elkner, Senior Extension Educator, Horticulture

Tom Butzler, Senior Extension Educator, Horticulture

Bob Pollock, Extension Educator, Horticulture

Carla Burkle, Extension Educator, Horticulture

Francesco Di Gioia, Assistant Professor of Vegetable Crop Science

The Pennsylvania State University Department of Plant Science and Extension

Selecting which cultivar to grow is critical to successful commercial production. When a cultivar suited to an area and having high yield and quality for market is grown, growers can make a profit. In 2018 we evaluated muskmelons. Muskmelons are an important crop for diversified vegetable operations in Pennsylvania. Between 2007 and 2012 the number of farms growing muskmelons increased by 13% from 480 to 549. Acreage devoted to muskmelon has increased 28% from 805 to 1,121. Nationally Pennsylvania ranks 5<sup>th</sup> in number of farms and 10<sup>th</sup> in acreage planted in muskmelons (2012 Census of Agriculture).

This study was conducted in central Pennsylvania at Pennsylvania State University's Russell E. Larson Research Center in Pennsylvania Furnace, in southeastern Pennsylvania at Pennsylvania State University's Southeast Research and Extension Center in Manheim and in western Pennsylvania in Indiana County on a grower's farm.

Twenty-three to 24 muskmelon cultivars on their own rootstocks and 2 grafted cultivars (see Table 1) were evaluated in a conventional plasticulture system. At all sites, 4-week-old transplants were set in rows spaced 6 feet apart with 2 feet between plants in a row. Four plots of each cultivar were planted with each plot consisting of 6 plants. Data were collected from all 6 plants.

Pests were managed following recommendations in the 2018 Commercial Vegetable Production Recommendation guide.

Melons were harvested from July 31 to August 28 at the western site, August 4 to 29 at the central site, and July 13 to August 13 at the southeastern site.

The standard used was 'Aphrodite' based on conversations with growers.

Data were analyzed by site using the mixed procedure and means were separated at the 5% level using pdiff.

**Table 1.** Cultivars and seed sources of muskmelon cultivars evaluated in 2018.

<b>Cultivar</b>	<b>Source</b>
SVMF 7641	Seminis, St. Louis, MO
Sun Blushed	Seminis, St. Louis, MO
Afterglow	Seedway LLC, Mifflinburg, PA
Aphrodite	Seedway LLC, Mifflinburg, PA
Atlantis	Seedway LLC, Mifflinburg, PA
Goddess	Seedway LLC, Mifflinburg, PA
Minerva	Seedway LLC, Mifflinburg, PA
Shockwave	Seedway LLC, Mifflinburg, PA
Sugar Cube	Seedway LLC, Mifflinburg, PA
Verona	Seedway LLC, Mifflinburg, PA
Accolade	Syngenta, Greensboro, NC
Astound	Syngenta, Greensboro, NC
Athena	Syngenta, Greensboro, NC
Aphrodite	Syngenta, Greensboro, NC
ME 4858	Syngenta, Greensboro, NC
Atlantis	Sakata, Morgan Hill, CA
Avatar	Sakata, Morgan Hill, CA
Infinite Gold	Sakata, Morgan Hill, CA
Ariel	Syngenta, Greensboro, NC
Accolade	Clifton Seed, Faison, NC
Carousel	Clifton Seed, Faison, NC
Lani	Clifton Seed, Faison, NC
Fiji	Clifton Seed, Faison, NC
Majus	Rupp, Wauseon, OH
Tirreno	Rupp, Wauseon, OH
Ambassador	Rupp, Wauseon, OH
Aphrodite/Flexifort	Grafted entry
Aphrodite/RS841	Grafted entry

## **Results**

### **Yield**

An excessively wet growing season made for a tough year for growing muskmelons. Many melons rotted before reaching maturity and some cultivars did not yield any mature fruit.

### ***Western Site***

Mean number of marketable melons produced by each cultivar ranged from 0.00 to 1.92 per plant (Table 2). 'Lani', 'SVMF 7641', and 'Shockwave' produced fewer melons (0.00 per plant for all three cultivars) compared to 'Aphrodite' (1.25). The number produced by all other cultivars

was not different than 'Aphrodite'. Grafted cultivars averaged 1.00 per plant for Aphrodite/Flexifort and 1.21 for Aphrodite/RS841.

Mean weight of marketable melons produced by each cultivar ranged from 0.00 lb to 8.90 lb per plant. Weights from 'Lani', SVMF and 'Shockwave' were lower (0.00 lb for all three cultivars) than from 'Aphrodite' (5.77 lb). All other cultivars were not different than 'Aphrodite'. Aphrodite/Flexifort averaged 7.12 lb per plant and Aphrodite/RS841 8.90 lb per plant.

Mean number of unmarketable melons produced by each cultivar ranged from 0.00 to 1.29 per plant. All cultivars were not different than 'Aphrodite' (0.67). Aphrodite/Flexifort averaged 0.42 per plant and Aphrodite/RS841 0.25.

Mean weight of unmarketable melons produced by each cultivar ranged from 0.19 lb to 5.59 lb per plant. Unmarketable weight from 'Ambassador' was higher (5.59 lb) compared to 'Aphrodite' (2.47 lb). All other cultivars were not different than 'Aphrodite'. Aphrodite/Flexifort averaged 2.85 lb and Aphrodite/RS841 1.45 lb.

### **Central Site**

Mean number marketable melons produced by each cultivar ranged from 0.00 to 3.96 per plant (Table 3). 'Lani' and 'Tirreno' produced more melons (3.96 and 3.17 per plant, respectively) compared to 'Aphrodite' (1.25). The number produced by all other cultivars was not different than 'Aphrodite'. Grafted cultivars averaged 1.38 per plant for Aphrodite/Flexifort and 1.17 for Aphrodite/RS841.

Mean weight of marketable melons produced by each cultivar ranged from 0.00 lb to 14.81 lb per plant. All cultivars were not different than 'Aphrodite' (7.44 lb). Aphrodite/Flexifort averaged 10.87 lb per plant and Aphrodite/RS841 8.18 lb per plant.

Mean number of unmarketable melons produced by each cultivar ranged from 0.00 to 1.50 per plant. 'Fiji' produced more unmarketable melons (1.50 per plant) compared to 'Aphrodite' (0.50). All other cultivars were not different than 'Aphrodite'. Aphrodite/Flexifort averaged 0.38 per plant and Aphrodite/RS841 0.25.

Mean weight of unmarketable melons produced by each cultivar ranged from 0.00 lb to 6.19 lb per plant. All were not different than 'Aphrodite' (2.91). Aphrodite/Flexifort averaged 1.2 lb and Aphrodite/RS841 1.51 lb.

### **Southwestern Site**

Mean number of marketable melons produced by each cultivar ranged from 0.00 to 2.50 per plant (Table 4). 'Sugar Cube' produced more melons (2.50 per plant) compared to 'Aphrodite' (1.25) and 'Shockwave', 'Lani', 'Fiji', 'Infinite Gold' and SVMF7641 produced fewer melons (0.21, 0.13, 0.08, 0.04, and 0.00, respectively). The number produced by all other cultivars was not different than 'Aphrodite'. Grafted cultivars averaged 1.17 per plant for Aphrodite/Flexifort and 1.42 for Aphrodite/RS841.

Mean weight of marketable melons produced by each cultivar ranged from 0.00 lb to 12.83 lb per plant. 'Shockwave', 'Lani', 'Fiji', 'Infinite Gold', and SVMF7641 produced a lower weight (1.27 lb, 4.02 lb, 0.39 lb, 0.16 lb and 0.00 lb, respectively) than 'Aphrodite' (9.40 lb). The weight produced by all other cultivars was not different than 'Aphrodite'. Grafted cultivars averaged 11.27 lb for Aphrodite/Flexifort and 12.09 lb for Aphrodite/RS841.

Mean number of unmarketable melons produced by each cultivar ranged from 0.00 to 1.58 per plant. 'Goddess' and 'Sugar Rush' produced more than 'Aphrodite' (0.38). All other cultivars were not different than 'Aphrodite'. Aphrodite/Flexifort averaged 0.71 per plant and Aphrodite/RS841 0.46.

Mean weight of unmarketable melons produced by each cultivar ranged from 0.00 lb to 8.74 lb per plant. 'Goddess' produced a higher weight (8.74 lb) than 'Aphrodite' (2.92 lb). All other cultivars were not different than 'Aphrodite'. Aphrodite/Flexifort averaged 5.97 lb and Aphrodite/RS841 4.32 lb.

Yearly environmental conditions can affect results; therefore, we are proposing to evaluate the same muskmelon cultivars again in 2019 to update current recommendations.

**Table 2.** Mean marketable and unmarketable number<sup>2</sup> and weight per plant of 25 muskmelon cultivars evaluated in Indiana, Pennsylvania (western site) in 2018.

Cultivar	Marketable yield		Unmarketable yield	
	Number	Weight (lb)	Number	Weight (lb)
Accolade	0.75 b-g	3.94 a-e	0.33 cd	1.15 bcd
Afterglow	1.29 a-d	5.87 a-d	0.54 a-d	1.85 bcd
Ambassador	0.50 c-g	2.63 b-e	1.29 a	5.59 a
Aphrodite	1.00 a-f	5.77 a-d	0.67 a-d	2.47 bcd
Aphrodite/Flexifort	1.00 a-f	7.12 abc	0.42 bcd	2.85 a-d
Aphrodite/RS48	1.21 a-d	8.90 a	0.25 cd	1.45 bcd
Ariel	1.08 a-e	5.77 a-d	0.38 cd	1.80 bcd
Astound	1.46 ab	7.22 ab	0.29 cd	1.01 cd
Athena	0.63 b-g	3.15 b-e	0.21 cd	0.77 cd
Atlantis	1.17 a-d	5.88 a-d	0.08 d	0.47 d
Avatar	0.79 b-g	6.25 abc	0.08 d	0.43 d
Carousel	1.33 abc	7.34 ab	0.38 cd	1.93 bcd
Fiji	0.08 fg	2.76 b-e	1.25 ab	2.45 bcd
Goddess	0.75 b-g	3.72 a-e	0.33 cd	1.36 bcd
Infinite Gold	0.08 efg	0.41 de	0.72 a-d	2.69 a-d
Lani	0.00 g	0.00 e	0.54 a-d	1.50 bcd
Majus	0.79 b-g	3.32 b-e	1.04 abc	3.85 abc
ME4858	1.42 abc	7.75 ab	0.42 bcd	1.68 bcd
Minerva	0.58 b-g	3.08 b-e	0.17 d	0.74 d
Shockwave	0.00 g	0.00 e	0.46 a-d	2.03 bcd
Sugar Cube	1.92 a	4.09 a-e	0.42 bcd	0.85 cd
Sun Blushed	0.38 d-g	1.90 cde	1.04 abc	4.18 ab
SVMF 7641	0.00 g	0.00 e	0.04 d	0.19 d
Tirreno	1.17 a-d	5.54 a-d	0.63 a-d	2.24 bcd
Verona	0.88 b-g	6.42 abc	0.29 cd	1.54 bcd

<sup>2</sup>Values are the mean of 4 replications; data were analyzed using the mixed procedure and means were separated using pdiff; values followed by different letters within a column are significantly different at the 5% level; 'Aphrodite' was considered the standard; values in green are statistically higher than 'Aphrodite' and red lower.

**Table 3.** Mean marketable and unmarketable number<sup>2</sup> and weight per plant of 25 muskmelon cultivars evaluated in Pennsylvania Furnace, Pennsylvania (central site) in 2018.

Cultivar	Marketable yield		Unmarketable yield	
	Number	Weight (lb)	Number	Weight (lb)
Accolade	1.90 a-f	10.49 a-d	0.22 bc	1.39 b
Afterglow	3.08 abc	14.40 a	0.13 c	0.38 b
Ambassador	0.58 ef	2.66 de	0.13 c	0.50 b
Aphrodite	1.25 c-f	7.44 a-e	0.50 bc	2.91 ab
Aphrodite/Flexifort	1.38 b-f	10.87 a-d	0.38 bc	1.20 b
Aphrodite/RS48	1.17 def	8.18 a-e	0.25 c	1.51 b
Ariel	2.29 a-e	13.38 ab	0.04 c	0.23 b
Astound	2.21 a-e	13.20 ab	0.00 c	0.00 b
Athena	2.71 a-d	9.90 a-d	0.08 c	0.33 b
Atlantis	0.59 ef	2.90 cde	1.17 ab	6.19 a
Avatar	1.63 b-f	13.02 ab	0.33 bc	2.68 b
Carousel	1.75 b-f	9.18 a-d	0.08 c	0.60 b
Fiji	1.50 b-f	12.63 ab	1.5 a	0.00 b
Goddess	2.21 a-e	11.10 a-d	0.5 bc	2.15 b
Infinite Gold	0.00 f	0.00 e	0.00 c	0.00 b
Lani	3.96 a	8.91 a-e	0.00 c	0.00 b
Majus	1.46 b-f	6.81 a-e	0.42 bc	1.76 b
ME4858	2.08 a-e	13.80 ab	0.04 c	0.26 b
Minerva	1.67 b-f	11.68 abc	0.33 bc	2.03 b
Shockwave	1.71 b-f	9.27 a-d	0.00 c	0.00 b
Sugar Cube	2.19 a-e	5.43 b-e	0.00 c	0.00 b
Sun Blushed	1.96 b-e	11.22 a-d	0.21 c	1.41 b
SVMF 7641	2.75 a-d	12.00 ab	0.00 c	0.00 b
Tirreno	3.17 ab	14.81 a	0.00 c	0.00 b
Verona	1.54 b-f	10.60 a-d	0.25 c	1.34 b

<sup>2</sup>Values are the mean of 4 replications; data were analyzed using the mixed procedure and means were separated using pdiff; values followed by different letters within a column are significantly different at the 5% level; 'Aphrodite' was considered the standard; values in green are statistically higher than 'Aphrodite' and red lower.

**Table 4.** Mean marketable and unmarketable number<sup>2</sup> and weight per plant of 25 muskmelon cultivars evaluated in Manheim, Pennsylvania (southeastern site) in 2018.

Cultivar	Marketable yield		Unmarketable yield	
	Number	Weight (lb)	Number	Weight (lb)
Accolade	1.50 bcd	10.04 a-e	0.33 d-g	2.17 b-g
Afterglow	1.46 bcd	8.89 a-f	0.38 c-g	2.15 b-g
Ambassador	0.96 cde	5.98 ef	0.92 bc	5.34 abc
Aphrodite	1.25 b-e	9.40 a-f	0.38 c-g	2.92 b-g
Aphrodite/Flexifort	1.17 b-e	11.27 abc	0.71 b-e	5.97 ab
Aphrodite/RS48	1.42 bcd	12.09 ab	0.46 c-g	4.32 b-e
Ariel	1.13 b-e	7.67 b-f	0.63 b-f	5.07 abc
Astound	1.58 bc	9.83 a-e	0.38 c-g	2.38 b-g
Athena	1.75 b	10.94 a-d	0.42 c-g	2.90 b-g
Atlantis	1.21 b-e	8.33 b-f	0.23 d-g	1.66 c-g
Avatar	1.29 b-e	12.83 a	0.42 c-g	4.06 b-f
Carousel	1.29 b-e	10.68 a-d	0.5 c-g	3.44 b-g
SVMF 7641	0.00 g	0 h	0.08 fg	0.74 d-g
Fiji	0.08 fg	0.39 h	0.13 fg	0.25 fg
Goddess	1.21 b-e	7.08 c-f	1.58 a	8.74 a
Infinite Gold	0.04 g	0.16 h	0.00 g	0.00 g
Lani	0.13 fg	4.02 h	0.17 efg	0.60 efg
Majus	1.38 bcd	7.96 b-f	0.79 bcd	4.21 b-e
ME 4858	0.71 ef	5.19 gf	0.58 b-f	4.79 bc
Minerva	0.92 de	7.92 b-f	0.46 c-g	3.97 b-f
Shockwave	0.21 fg	1.27 gh	0.29 d-g	1.89 c-g
Sugar Cube	2.50 a	6.63 def	0.71 b-e	1.87 c-g
Sugar Rush	1.50 bcd	7.46 c-f	1.08 ab	4.55 bcd
Sun Blushed	1.17 b-e	7.10 c-f	0.58 b-f	3.05 b-g
Tirreno	1.33 b-e	7.05 c-f	0.46 c-g	2.60 b-g
Verona	1.08 cde	9.22 a-f	0.58 b-f	5.34 abc

<sup>2</sup>Values are the mean of 4 replications; data were analyzed using the mixed procedure and means were separated using pdiff; values followed by different letters within a column are significantly different at the 5% level; 'Aphrodite' was considered the standard; values in green are statistically higher than 'Aphrodite' and red lower.