

**2011 Report to the Pennsylvania Vegetable Research and Marketing Board  
and Pennsylvania Vegetable Growers Association**

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

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The Pennsylvania State University Department of Horticulture and Cooperative Extension To provide growers with information for successful, region specific cultivar selection, in 2010-11, we evaluated several acorn, butternut, spaghetti squash, kabocha and other types of winter squash cultivars grown in a conventional plasticulture system across the state. In the field, evaluations were located in central PA at the Russell E. Larson Research and Education Center in Rock Springs, in eastern PA at the Southeast Research and Extension Center in Landisville and in western PA at Beinlich Farms in 2010 and Harvest Valley Farms in 2011. Additionally, butternut and acorn cultivars were evaluated in an organic plasticulture system at the Russell E. Larson Research and Education Center, Rock Springs.

The cultivars evaluated in the conventional system along with the company from which seed were acquired from are listed below. The standards ‘Vegetable Spaghetti’ in the spaghetti category, ‘Waltham Butternut’ in the butternut category and ‘Tay Belle’ in the acorn category were grown for comparisons.

<b>Cultivar</b>	<b>Seed Company</b>	<b>Type of Winter Squash</b>	<b>Year Evaluated</b>
Bush Delicata	Stokes Seeds	Other - Delicata	2010
Red October	Stokes Seeds	Other – orange/red Hubbard	2010
Golden Delicious	Rupp Seeds Inc	Other – orange/red Hubbard	2010
Butternut Supreme	Rupp Seeds Inc	Butternut	2010
Bugle	Rupp Seeds Inc	Butternut	2010-11
Betternut 401	Rupp Seeds Inc	Butternut	2010-11
Sun Spot	Rupp Seeds Inc	Other – orange/red Buttercup	2010
Harlequin	Rupp Seeds Inc	Acorn	2010-11
Table Star	Rupp Seeds Inc	Acorn	2010-11
Space Station	Rupp Seeds Inc	Kabocha	2010-11
Thunder	Rupp Seeds Inc	Kabocha	2010-11
Sweet Lightning	Rupp Seeds Inc	Other - Delicata	2010
Autumn Delight	Seedway, LLC	Acorn	2010-11
Tay Belle	Seedway, LLC	Acorn	2010-11
Celebration	Seedway, LLC	Acorn	2010-11
Sweet Mama	Seedway, LLC	Kabocha	2010-11
Atlas	Seedway, LLC	Butternut	2010
Tivoli	Seedway, LLC	Spaghetti	2010
T-133	Seedway, LLC	Kabocha	2011

Honey Bear	Johnny's Selected Seeds	Acorn	2010-11
Jet	Johnny's Selected Seeds	Acorn	2010-11
Tip Top (PMR)	Johnny's Selected Seeds	Acorn	2010-11
Red Kuri	Johnny's Selected Seeds	Kabocha	2010-11
Sunshine	Johnny's Selected Seeds	Kabocha	2010-11
Cha-cha	Johnny's Selected Seeds	Kabocha	2010
Bon Bon	Johnny's Selected Seeds	Kabocha	2010-11
JWS 6823 (PMR)	Johnny's Selected Seeds	Butternut	2010-11
Metro (PMR)	Johnny's Selected Seeds	Butternut	2010-11
Waltham Butternut	Johnny's Selected Seeds	Butternut	2010-11
Spaghetti Squash	Johnny's Selected Seeds	Spaghetti	2010
Piñata	neseed.com	Other - Delicata	2010
Speckled Pup (PMT)	neseed.com	Other – mini Kabocha	2010
Geisha	neseed.com	Kabocha	2011
Black Bellota	neseed.com	Acorn	2011
Quantum	Seigers Seed Company	Butternut	2011

The cultivars evaluated in the organic system along with the company from which seed were acquired from are listed below. The standards 'Waltham Butternut' in the butternut category and 'Table Queen' in the acorn category were grown for comparisons.

<b>Cultivar</b>	<b>Seed Company</b>	<b>Type</b>	<b>Organic or Non-treated Seed</b>	<b>Year Evaluated</b>
Waltham Butternut	Seedway, LLC	Butternut	Organic	2010-11
Celebration	Seedway, LLC	Acorn	Non-treated	2010-11
Autumn Delight	Seedway, LLC	Acorn	Non-treated	2010-11
Tay Belle	Seedway, LLC	Acorn	Non-treated	2010
Butternut 401	Rupp Seeds Inc	Butternut	Non-treated	2010-11
Metro	Johnny's Selected Seeds	Butternut	Non-treated	2010-11
JWS 6823	Johnny's Selected Seeds	Butternut	Non-treated	2010-11
Honey Bear	Johnny's Selected Seeds	Acorn	Non-treated	2010-11
Tip Top	Johnny's Selected Seeds	Acorn	Non-treated	2010-11
Jet	Johnny's Selected Seeds	Acorn	Non-treated	2010-11
Table Queen	High Mowing Seeds	Acorn	Organic	2010-11
REBA	High Mowing Seeds	Acorn	Organic	2010-11

At all locations winter squash cultivars were grown in a plasticulture system using raised beds, drip irrigation and black plastic. Three foot in row spacing and 8 foot center-to-center rows were used. At the central Pennsylvania site 4-week-old transplants were planted on June 17, 2010 and 3-week-old transplants were planted on June 14, 2011 in the conventional system. Five-week-old transplants were planted on May 28 and 29, 2010 and 3-week-old transplants were planted on June 21, 2011 in the organic system. Direct seeding was used in the western and south eastern sites.

Fruit were harvested when all plants of an individual cultivar reached maturity. Fruit was categorized as marketable or unmarketable, counted and weighed. Yield data was analyzed using analysis of variance. When P values were less than or equal to 0.05, means were separated using Duncan's LSD test.

## **Results**

### **Organic System**

All butternut and acorn squash were harvested on Sept. 9, 2010. In 2011, acorn squash were harvested on August 30 ('Celebration'), Sept 19 and 20. Butternut squash were harvested on September 1 ('Metro') and September 19.

#### ***Butternut Squash***

*Marketable and Unmarketable Yields (Tables 1 and 2)*

In 2010, 'JWS 6823' and 'Butternut 401' produced a larger number of marketable fruit than 'Waltham Butternut' and 'Metro'.

All cultivars produced similar yields in terms of weight of marketable fruit.

In 2011, marketable yields of all cultivars evaluated were not different than from 'Waltham'.

In both years, very few butternut squash were unmarketable. Differences in unmarketable yields between cultivars were not detected.

#### ***Acorn Squash***

*Marketable and Unmarketable Yields (Tables 3 and 4)*

In 2010, 'Celebration' produced a larger number of marketable fruit than 'Table Queen'. Fruit numbers from 'Autumn Delight' were smaller than 'Table Queen'. All other cultivars evaluated did not produce a different number of squash than 'Table Queen'.

In terms of weight, 'Tay Belle' marketable yields were higher than all other cultivars while 'Honey Bear' produced lower yields in terms of weight to all other cultivars.

Very few acorn squash were unmarketable. Differences in unmarketable yields between cultivars were not detected.

In 2011, 'Celebration' and 'Autumn Delight' produced a similar number and weight of marketable fruit to 'Table Queen'. All other cultivars evaluated produced fewer fruit than 'Table Queen'.

Very few acorn squash were unmarketable. 'Jet' and 'Tip Top' produced higher unmarketable yields in terms of fruit number and 'Jet' by weight than 'Table Queen'. All other cultivars evaluated produced similar unmarketable yields to 'Table Queen'.

### **Conventional System**

Squash were directly seeded about 3 weeks late in the western Pennsylvania site. The site experienced a crop failure as by July 21, 2010 each plot averaged only 2 plants.

Interaction between location and cultivar were detected and therefore statistics for each site were analyzed separately.

#### ***Spaghetti Squash – Rock Springs, PA***

Spaghetti squash were harvested on Aug. 19, 2010.

*Marketable and Unmarketable Yields (Table 5)*

The performance of ‘Vegetable Spaghetti’ and ‘Tivoli’ were not different from each other in terms of marketable or unmarketable yields.

***Spaghetti Squash – Landisville, PA***

*Marketable and Unmarketable Yields (Table 6)*

The performance of ‘Vegetable Spaghetti’ and ‘Tivoli’ were not different from each other in terms of marketable or unmarketable yields.

***Butternut Squash – Rock Springs, PA***

Butternut squash were harvested on Sept. 1 and 7, 2010 and Sept. 26, 2011.

*Marketable and Unmarketable Yields (Tables 7 and 8)*

In 2010, the largest numbers of marketable fruit were from ‘Bugle’ followed by ‘Butternut 401’. All other cultivars produced numbers of fruit not different from ‘Waltham Butternut’.

‘Atlas’ produced the largest marketable yield by weight. Fruit weight from all other cultivars was not different than from ‘Waltham Butternut’.

Very few butternut squash were unmarketable. Differences in unmarketable yields between cultivars were not detected.

In 2011, the largest numbers of marketable fruit were from ‘Quantum’ and ‘Bugle’. All other cultivars produced numbers of fruit not different from ‘Waltham Butternut’.

‘Quantum’ produced the largest marketable yield by weight. Fruit weight from all other cultivars was not different than from ‘Waltham Butternut’.

Very few butternut squash were unmarketable. ‘Bugle’ produced higher unmarketable yields in terms of number and weight than ‘Waltham Butternut’. All other cultivars produced unmarketable yields not different than ‘Waltham Butternut’.

***Butternut Squash – Landisville, PA***

*Marketable and Unmarketable Yields (Tables 9 and 10)*

In 2010, the number of marketable fruit produced by ‘JWS 6823’, ‘Butternut 401’, ‘Metro’ and ‘Bugle’ was not different than by ‘Waltham Butternut’. ‘Butternut Supreme’ and ‘Atlas’ produced fewer fruit than ‘Waltham Butternut’.

Marketable fruit from ‘Atlas’ was heavier than from ‘Waltham Butternut’. The fruit weight from all other cultivars was not different than from ‘Waltham Butternut’.

‘Atlas’ produced more culls in terms of number and weight than all other cultivars which were not different from each other.

In 2011, 'Victory' produced a larger number of marketable fruit than 'Waltham Butternut'. The number of fruit produced by all other cultivars evaluated was not different than from 'Waltham Butternut'.

'Quantum' and 'Frisco' produced higher marketable yields by weight than 'Waltham Butternut'. Yield by weight from all other cultivars was not different than 'Waltham Butternut'.

Differences in unmarketable yields between cultivars were not detected.

### ***Butternut Squash – Valencia, PA***

*Marketable and Unmarketable Yields (Table 11)*

In 2011, differences in marketable yields by number were not detected.

'Quantum' produced the highest marketable yields by weight than all other cultivars which were not different from each other.

Differences in unmarketable yields between cultivars were not detected.

### ***Acorn Squash – Rock Springs, PA***

Acorn squash were harvested on Aug. 30 and Sept. 3 and 7, 2010 and Sept. 21, 2011.

*Marketable and Unmarketable Yields (Tables 12 and 13)*

In 2010, 'Harlequin' and 'Celebration' produced higher numbers of marketable fruit than 'Tay Belle'. All other cultivars produced fruit numbers not different than 'Tay Belle'.

In terms of marketable fruit weight, 'Autumn Delight', 'Harlequin', 'Table Star' and 'Jet' were not different from 'Tay Belle'. The fruit weight of all other cultivars was lower than 'Tay Belle'.

'Table Star' produced more culls in terms of number and weight than all other cultivars which were not different from each other.

In 2011, 'Celebration', 'Harlequin' and 'Table Star' produced a larger number and 'Jet' a smaller number of marketable fruit than 'Tay Belle'. All other cultivars produced fruit numbers that were not different than 'Tay Belle'.

'Table Treat', 'Honey Bear' and 'Jet' produced lower marketable yields by weight than 'Tay Belle'. All other cultivars produced marketable yields by weight not different than 'Tay Belle'.

Unmarketable yields were very low. 'Jet' produced higher unmarketable yields in terms of number and weight than 'Tay Belle' which was not different than any other cultivar evaluated.

### ***Acorn Squash – Landisville, PA***

*Marketable and Unmarketable Yields (Tables 14 and 15)*

In 2010, 'Harlequin', 'Table Star', 'Celebration' and 'Honey Bear' produced more marketable fruit than 'Tay Belle'. The remaining cultivars produced fruit numbers not different than 'Tay Belle'.

'Jet' marketable yield by weight was higher than from 'Tay Belle'. 'Autumn Delight' fruit weight was not different than from 'Tay Belle'. Fruit weight from the remaining cultivars was less than from 'Tay Belle'.

'Tay Belle', 'Harlequin', 'Honey Bear' and 'Tip Top' produced the largest number of culls. Culls from the remaining cultivars were fewer than from 'Tay Belle'. By weight, 'Tay Belle' produced the highest amount of culls of all cultivars.

In 2011, 'Table Star' produced higher and 'Jet' lower marketable yields in terms of number than 'Tay Belle'. Only 'Jet' produced lower marketable yields in terms of numbers to 'Tay Belle'. All other cultivars produced marketable yields by number not different than 'Tay Belle'.

'Table Star' produced higher and 'Table Queen' and 'Honey Bear' lower marketable yields in terms of weight than 'Tay Belle'. All other cultivars produced marketable yields by weight not different than 'Tay Belle'.

The number of unmarketable fruit produced by 'Table Queen' was not different than 'Tay Belle' which produced a higher number of unmarketable fruit than all other cultivars. Unmarketable yield by weight produced by 'Table Queen' and 'Jet' was not different than from 'Tay Belle' which produced higher unmarketable yield by weight than all other cultivars.

### ***Acorn Squash – Valencia, PA***

#### *Marketable and Unmarketable Yields (Table 16)*

In 2011, no statistical differences were seen in marketable or unmarketable yields.

### ***Kabocha and Other Types of Winter Squash – Rock Springs, PA***

Kabocha and other types of winter squash were harvested on Sept. 1, 2, 3 and 7, 2010. In 2011, they were harvested on Sept. 18 ('Red Kuri'), Sept. 19 ('Sunshine') and Sept. 26.

#### *Marketable and Unmarketable Yields (Tables 17 and 18)*

In 2010, 'Sweet Lightening' produced more marketable fruit than all other cultivars followed by 'Sunspot' and then 'Red Kuri'. 'Sunshine', 'Sweet Mama', 'Space Station', 'Bon Bon' and 'Thunder' produced fruit numbers which were not different from each other or 'Red Kuri' or 'Cha-cha'.

By weight, 'Sweet Lightening' and 'Red Kuri' marketable yield was heavier than from 'Space Station', 'Thunder', 'Bon Bon' and 'Cha-cha'. The remaining cultivars produced an intermediate amount of fruit by weight.

'Bon Bon' produced the highest number of culls followed by 'Cha-cha', 'Thunder', 'Space Station' and 'Sweet Mama' which produced a similar number of culls. 'Red Kuri' and 'Sweet Lightening' produced no culls. The remaining cultivars produced an intermediate amount of culls. In terms of fruit weight, 'Bon Bon' produced the most culls followed by 'Cha-cha', 'Thunder', 'Space Station' and 'Sweet Mama' which were not different from each other. 'Sunshine', 'Sun Spot', 'Red Kuri' and 'Sweet Lightening' produced the fewest culls by weight.

In 2011, no statistical differences were observed for marketable yield by number.

'Geisha' had the highest yield over all other cultivars except 'Sweet Mama'. 'Space Station' had the lowest yield by weight from all others except for 'T-133', 'Bon Bon', and 'Thunder'

No statistical differences were observed for unmarketable yield.

### ***Kabocha Squash – Landisville, PA***

#### *Marketable and Unmarketable Yields (Tables 19 and 20)*

In 2010, 'Bon Bon' produced the greatest number of marketable fruit followed by all other cultivars which were not different from each other.

'Sweet Mama' produced the highest yield by weight followed by 'Sunshine' and 'Space Station' and then 'Bon Bon', 'Thunder' and 'Cha-cha'.

'Cha-cha' produced a greater amount of culls than 'Thunder', 'Sweet Mama' and 'Sunshine'. The remaining cultivars produced an intermediate number of culls. Differences in unmarketable yields in terms of fruit weight were not detected.

In 2011, 'Sunspot' produced the highest marketable yield by number and 'Space Station' and 'Thunder' the lowest.

'Bon Bon' produced a higher marketable yield by weight than 'Space Station', 'Thunder', 'Sunshine' and 'Red Kuri', but not different than 'Sunspot' and 'Sweet Mama'.

Statistical differences were not detected in unmarketable yield.

### ***Other Types of Winter Squash – Landisville, PA***

#### *Marketable and Unmarketable Yields (Table 21)*

'Sweet Lightning' produced a greater number of marketable fruit than 'Bush Delicata' and 'Sun Spot', which were not different from each other, and 'Red Kuri', which produced the fewest marketable fruit. 'Piñata' produced an intermediate number of fruit which was not different from 'Sweet Lightning', 'Bush Delicata' or 'Sun Spot'. Fruit yield by weight was highest from 'Red Kuri' followed by 'Sun Spot'. 'Piñata', 'Bush Delicata' and 'Sweet Lightning' produced the lowest yields by weight, which were not different from each other.

Differences in unmarketable yields in terms of fruit number or weight were not detected.

### ***Kabocha Squash – Valencia, PA***

#### *Marketable and Unmarketable Yields (Table 22)*

In 2011, statistical differences were not detected in marketable or unmarketable yields.

### ***Recommendations***

#### **Organic System**

**Butternut Squash** - In an organic system, 'JWS 6823', 'Betternut 401' and 'Metro' are recommended as they performed better than or as well as 'Waltham Butternut'.

**Acorn Squash** - ‘Celebration’, ‘Jet’, ‘REBA’, ‘Jet’ and ‘Tip Top’ performed better than or as well as ‘Table Queen’.

### **Conventional System**

**Spaghetti Squash** - In the spaghetti squash category, ‘Tivoli’ performed as well as ‘Vegetable Spaghetti’ at both locations and are recommended.

**Butternut Squash** – ‘Atlas’ produced very large fruit and was thought to be more suited for wholesale markets. ‘JWS 6823’, ‘Butternut 401’, ‘Bugle’, ‘Metro’, ‘Quantum’ and ‘Butternut 1744’ performed better than or as well as ‘Waltham Butternut’ over 2 evaluation years or at three locations in a single year. These cultivars are recommended. ‘Victory’, ‘Frisco’ and ‘Avalon’ also performed well. However, they were only evaluated in a single year at a single location. It is recommended that these cultivars are evaluated for an additional year to verify repeatability of these results.

**Acorn Squash** – ‘Autumn Delight’ and ‘Table Star’ performed better than or as well as ‘Tay Belle’. Additionally, ‘Celebration’ produced high numbers of fruit that was smaller than ‘Tay Belle’. However, the fruit was very ornamental with green, white and yellow coloring as well as edible. Depending on market demand, it may have a place.

**Kabocha/Other Squash** – The cultivars evaluated were beautiful and largely unique from each other. It is difficult to make recommendations in the kabocha/other squash category because ornamental value and flavor is a larger consideration in selecting these types. However, ‘Cha-cha’ produced a large amount of culls in both locations where it was evaluated.



Table 1. Number and weight of marketable and unmarketable organically grown butternut squash, Rock Springs, PA; 2010

(Note: blue color indicates standard cultivar)

Butternut squash cultivar	Mean number of marketable fruit/plant P=0.0019	Mean weight of marketable fruit/plant (lb) P=0.1535	Mean number of unmarketable fruit/plant P=0.4799	Mean weight of unmarketable fruit/plant (lb) P=0.4799
JWS 6823	4.23a	8.33	0.00	0.00
Betternut 401	4.05a	7.98	0.00	0.00
Waltham Butternut	3.08b	7.63	0.00	0.00
Metro	2.55b	4.15	0.05	0.05

Table 2. Number and weight of marketable and unmarketable organically grown butternut squash, Rock Springs, PA; 2011

(Note: blue color indicates standard cultivar)

Butternut squash cultivar	Mean number of marketable fruit/plant P=0.6310	Mean weight of marketable fruit/plant (lb) P=0.4041	Mean number of unmarketable fruit/plant P=0.0896	Mean weight of unmarketable fruit/plant (lb) P=0.2008
JWS 6823	3.5	7.88	0.21	0.43
Betternut 401	3.4	9.20	0.33	0.65
Waltham Butternut	3.2	9.27	0.25	0.78
Metro	3.4	10.1	0.00	0.00

Table 3. Number and weight of marketable and unmarketable organically grown acorn squash, Rock Springs, PA; 2010

(Note: blue color indicates standard cultivar)

Acorn squash cultivar	Mean number of marketable fruit/plant P=0.0002	Mean weight of marketable fruit/plant (lb) P<0.0001	Mean number of unmarketable fruit/plant P=0.3496	Mean weight of unmarketable fruit/plant (lb) P=0.3674
Celebration	5.53a	6.55b	0.00	0.00
Tay Belle	4.38b	7.08a	0.00	0.00
REBA	4.27b	5.67bc	0.27	0.30
Table Queen	4.20bc	5.93bc	0.00	0.00
Honey Bear	4.05bcd	4.40d	0.00	0.00
Jet	3.83bcd	6.48b	0.10	0.13
Tip Top	3.48cd	5.38c	0.00	0.00
Autumn Delight	3.40d	6.03bc	0.00	0.00

Table 4. Number and weight of marketable and unmarketable organically grown acorn squash, Rock Springs, PA; 2011

(Note: blue color indicates standard cultivar)

Acorn squash cultivar	Mean number of marketable fruit/plant P<0.0001	Mean weight of marketable fruit/plant (lb) P<0.0001	Mean number of unmarketable fruit/plant P<0.0001	Mean weight of unmarketable fruit/plant (lb) P<0.0001
Celebration	6.2 a	8.4 ab	0.00 c	0.00 b
REBA	3.5 c	5.9 cd	0.21 bc	0.30 b
Table Queen	5.8 ab	9.0 a	0.04 c	0.08 b
Honey Bear	2.4 d	4.1 d	0.31 bc	0.35 b
Jet	2.0 d	4.3 d	1.8 a	3.1 a
Tip Top	3.8 c	6.6 bc	0.63 b	0.85 b
Autumn Delight	4.7 bc	9.3 a	0.00 c	0.00 b

Table 5. Number and weight of marketable and unmarketable conventionally grown spaghetti squash, Rock Springs, PA; 2010

(Note: blue color indicates standard cultivar)

Butternut squash cultivar	Mean number of marketable fruit/plant P=0.2921	Mean weight of marketable fruit/plant (lb) P=0.4398	Mean number of unmarketable fruit/plant P=0.3910	Mean weight of unmarketable fruit/plant (lb) P=0.1801
Vegetable Spaghetti	5.65	2.78	0.08	0.08
Tivoli	3.83	2.18	0.05	0.03

Table 6. Number and weight of marketable and unmarketable conventionally grown spaghetti squash, Landisville, PA 2010

(Note: blue color indicates standard cultivar)

Butternut squash cultivar	Mean number of marketable fruit/plant P=0.0890	Mean weight of marketable fruit/plant (lb) P=0.1583	Mean number of unmarketable fruit/plant P=0.6461	Mean weight of unmarketable fruit/plant (lb) P=0.8657
Vegetable Spaghetti	6.20	3.45	1.35	4.28
Tivoli	5.30	3.70	1.00	3.60

Table 7. Number and weight of marketable and unmarketable conventionally grown butternut squash, Rock Springs, PA; 2010

(Note: blue color indicates standard cultivar)

Butternut squash cultivar	Mean number of marketable fruit/plant P<0.0001	Mean weight of marketable fruit/plant (lb) P=0.0079	Mean number of unmarketable fruit/plant P=0.0602	Mean weight of unmarketable fruit/plant (lb) P=0.1703
Bugle	6.35a	12.1bc	0.10	0.10
Betternut 401	4.90b	14.6ab	0.00	0.00
Waltham Butternut	3.78c	12.2bc	0.00	0.00
JWS 6823	3.73c	10.7c	0.00	0.00
Metro	3.58c	9.84c	0.00	0.00
Butternut Supreme	3.35c	12.7bc	0.00	0.00
Atlas	2.70c	16.7a	0.00	0.00

Table 8. Number and weight of marketable and unmarketable conventionally grown butternut squash, Rock Springs, PA; 2011

(Note: blue color indicates standard cultivar)

Butternut squash cultivar	Mean number of marketable fruit/plant P=0.0254	Mean weight of marketable fruit/plant (lb) P=0.0002	Mean number of unmarketable fruit/plant P=0.0015	Mean weight of unmarketable fruit/plant (lb) P=0.1766
Quantum	5.6 a	20.7 a	0.00 b	0.00 b
Bugle	5.3 ab	10.4 b	0.71 a	1.1 a
Metro	4.8 abc	12.3 b	0.08 b	0.20 b
Betternut 1744	4.8 abc	12.8 b	0.08 b	0.20 b
Betternut 401	4.3 bc	12.4 b	0.21 b	0.57 ab
Waltham Butternut	4.2 c	14.1 b	0.00 b	0.00 b
JWS 6823	4.1 c	10.5 b	0.08 b	0.21 b

Table 9. Number and weight of marketable and unmarketable conventionally grown butternut squash, Landisville, PA; 2010

(Note: blue color indicates standard cultivar)

Butternut squash cultivar	Mean number of marketable fruit/plant P=0.0007	Mean weight of marketable fruit/plant (lb) P<0.0001	Mean number of unmarketable fruit/plant P=0.0110	Mean weight of unmarketable fruit/plant (lb) P<0.0001
JWS 6823	6.65a	12.9b	1.23b	2.70b
Betternut 401	6.45a	15.3b	1.70b	3.68b
Metro	6.20a	15.5b	1.35b	2.63b
Waltham Butternut	5.85a	17.4b	1.63b	4.35b
Bugle	4.83ab	12.3b	1.68b	2.98b

Butternut Supreme	3.98bc	15.8b	1.08b	3.20b
Atlas	2.45c	48.0a	2.93a	19.60a

Table 10. Number and weight of marketable and unmarketable conventionally grown butternut squash, Landisville, PA; 2011

(Note: blue color indicates standard cultivar)

Butternut squash cultivar	Mean number of marketable fruit/plant P=0.0094	Mean weight of marketable fruit/plant (lb) P=0.0021	Mean number of unmarketable fruit/plant P=0.4506	Mean weight of unmarketable fruit/plant (lb) P=0.1766
Victory	7.9 a	17.9 bcd	2.4	4.0
Metro	7.2 ab	16.3 cd	1.6	3.1
JWS 6823	6.8 ab	15.8 cd	1.9	3.5
Butternut 401	6.8 ab	16.1 cd	2.0	3.9
Quantum	6.6 ab	27.1 a	2.0	7.3
Bugle	6.3 ab	11.9 d	3.1	5.3
Butternut 1744	5.8 ab	15.2 cd	2.2	5.0
Waltham Butternut	5.4 bc	15.4 cd	1.1	2.9
Avalon	5.3 bc	20.4 abc	1.5	4.7
Frisco	3.8 c	25.0 ab	2.0	8.4

Table 11. Number and weight of marketable and unmarketable conventionally grown butternut squash, Valencia, PA; 2011

Butternut squash cultivar	Mean number of marketable fruit/plant P=0.5189	Mean weight of marketable fruit/plant (lb) P=0.0280	Mean number of unmarketable fruit/plant P=0.5909	Mean weight of unmarketable fruit/plant (lb) P=0.8636
Quantum	7.3	24.4 a	0.78	2.0
Metro	6.9	16.2 b	1.6	2.0
Bugle	6.3	13.3 b	1.7	2.3
Butternut 401	5.8	15.2 b	0.69	1.5
Butternut 1744	5.6	15.4 b	1.2	3.0
JWS6823	4.9	12.1 b	1.1	3.0

Table 12. Number and weight of marketable and unmarketable conventionally grown acorn squash, Rock Springs, PA; 2010

(Note: blue color indicates standard cultivar)

Acorn squash cultivar	Mean number of marketable fruit/plant P<0.0001	Mean weight of marketable fruit/plant (lb) P<0.0001	Mean number of unmarketable fruit/plant P=0.0056	Mean weight of unmarketable fruit/plant (lb) P=0.0060
Harlequin	8.08a	10.3abc	0.00b	0.00b
Celebration	7.43ab	9.24cd	0.05b	0.03b
Table Star	6.60bc	9.54bcd	0.68a	0.95a
Autumn Delight	5.90cd	11.6a	0.05b	0.03b
Tay Belle	5.88cd	11.4ab	0.27b	0.43b
Honey Bear	5.03d	6.30e	0.13b	0.03b
Tip Top	5.00d	7.92de	0.05b	0.03b
Jet	4.85d	9.54bcd	0.05b	0.05b

Table 13. Number and weight of marketable and unmarketable conventionally grown acorn squash, Rock Springs, PA; 2011

(Note: blue color indicates standard cultivar)

Acorn squash cultivar	Mean number of marketable fruit/plant P<0.0001	Mean weight of marketable fruit/plant (lb) P<0.0001	Mean number of unmarketable fruit/plant P=0.0007	Mean weight of unmarketable fruit/plant (lb) P=0.0003
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Celebration	8.2 a	10.2 b	0.00 b	0.00 b
Harlequin	6.7 b	8.83 bc	0.00 b	0.00 b
Table Star	6.7 b	10.9 ab	0.00 b	0.00 b
Black Bellota	5.6 bc	12.5 a	0.00 b	0.00 b
Autumn Delight	5.3 cd	10.4 ab	0.00 b	0.00 b
Tay Belle	5.2 cd	10.6 ab	0.00 b	0.00 b
Tip Top	4.5 cd	8.92 bc	0.08 b	0.10 b
Table Treat	4.2 d	7.08 cd	0.00 b	0.00 b
Honey Bear	4.1 d	5.86 d	0.00 b	0.00 b
Jet	3.0 e	6.98 cd	0.54 a	0.99 a

Table 14. Number and weight of marketable and unmarketable conventionally grown acorn squash, Landisville, PA; 2010

(Note: blue color indicates standard cultivar)

Acorn squash cultivar	Mean number of marketable fruit/plant P<0.0001	Mean weight of marketable fruit/plant (lb) P<0.0001	Mean number of unmarketable fruit/plant P=0.0002	Mean weight of unmarketable fruit/plant (lb) P<0.0001
Harlequin	12.58a	8.28d	2.10ab	1.05b
Table Star	12.15a	9.60c	0.60de	0.40cd
Celebration	11.78a	7.38de	1.28bcd	0.68bcd
Honey Bear	10.43ab	7.08e	1.78abc	0.83bc
Autumn Delight	8.35bc	11.6ab	0.28e	0.20d
Tip Top	7.95bc	9.60c	1.65abc	1.18b
Tay Belle	6.60c	11.1b	2.53a	2.05a
Jet	6.30c	12.3a	1.18cd	0.95bc

Table 15. Number and weight of marketable and unmarketable conventionally grown acorn squash, Landisville, PA; 2011

(Note: blue color indicates standard cultivar)

Acorn squash cultivar	Mean number of marketable fruit/plant P=0.0007	Mean weight of marketable fruit/plant (lb) P=0.0003	Mean number of unmarketable fruit/plant P=0.0046	Mean weight of unmarketable fruit/plant (lb) P=0.0288
Table Star	15.1 a	24.1 a	1.4 c	1.9 bc
Celebration	12.6 ab	15.6 bcd	1.8 bc	1.9 bc
Table Ace	11.9 abc	19.9 ab	1.4 c	2.3 bc
Black Bellota	9.93 bcd	15.6 bcd	1.0 c	1.6 bc
Harlequin	9.73 bcd	14.3 bcd	1.1 c	1.5 bc
Autumn Delight	9.42 bcd	15.9 bcd	1.2 c	2.1 bc
Tay Belle	9.40 bcd	17.0 bc	2.9 a	4.6 a
Tip Top	8.13 bcde	13.8 bcd	1.4 c	2.6 bc
Table Treat	7.63 cde	12.5 cd	1.8 bc	2.4 bc
Jet	7.28 de	15.9 bcd	1.4 c	3.6 ab
Table Queen	6.75 de	9.63 de	2.5 ab	3.2 abc
Honey Bear	4.76 e	5.95 e	0.94 c	1.2 c

Table 16. Number and weight of marketable and unmarketable conventionally grown acorn squash, Valencia, PA; 2011

(Note: blue color indicates standard cultivar)

Acorn squash cultivar	Mean number of marketable fruit/plant P=0.9300	Mean weight of marketable fruit/plant (lb) P=0.7914	Mean number of unmarketable fruit/plant P=0.0546	Mean weight of unmarketable fruit/plant (lb) P=0.0549
Black Bellota	7.0	12.1	0.28	0.31
Table Star	6.2	11.0	0.42	0.62
Harlequin	6.0	8.77	0.46	0.54
Celebration	5.7	7.77	0.28	0.21
Table Treat	5.7	9.30	0.15	0.18
Tay Belle	5.6	13.2	0.00	0.00
Tip Top	5.3	9.52	0.17	0.17
Autumn Delight	5.1	11.7	0.06	0.08

Jet	5.1	10.2	0.06	0.06
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Table 17. Number and weight of marketable and unmarketable conventionally grown kabocha and other squash, Rock Springs, PA; 2010

Kabocha and other squash cultivar	Mean number of marketable fruit/plant P<0.0001	Mean weight of marketable fruit/plant (lb) P=0.0003	Mean number of unmarketable fruit/plant P<0.0001	Mean weight of unmarketable fruit/plant (lb) P<0.0001
Sweet Lightning	7.20a	6.66a	0.00d	0.00c
Sun Spot	3.25b	5.46abc	0.30cd	0.28c
Red Kuri	2.05c	6.54a	0.00d	0.00c
Sunshine	1.50cd	5.4abc	0.25cd	0.43c
Sweet Mama	1.40cd	5.82ab	0.53bc	1.70b
Space Station	1.23cd	3.66bcd	0.70bc	1.73b
Bon Bon	1.10cd	3.06d	1.75a	5.33a
Thunder	0.95cd	3.42cd	0.75bc	2.13b
Cha-cha	0.53d	1.79d	0.88b	2.33b

Table 18. Number and weight of marketable and unmarketable conventionally grown kabocha and other squash, Rock Springs, PA; 2011

Kabocha and other squash cultivar	Mean number of marketable fruit/plant P=1356	Mean weight of marketable fruit/plant (lb) P=0.0006	Mean number of unmarketable fruit/plant P=0.1759	Mean weight of unmarketable fruit/plant (lb) P=0.1491
Bon Bon	2.7	9.89 bcd	0.21	0.78
Sweet Mama	2.6	12.4 ab	0.04	0.05
Sunshine	2.5	10.4 bc	0.00	0.00
Thunder	2.5	8.88 bcd	0.00	0.00
Geisha	2.4	15.4 a	0.00	0.00
Space Station	2.2	6.56 d	0.04	0.10
T-133	2.0	7.66 cd	0.08	0.17
Red Kuri	2.0	10.4 bc	0.00	0.00

Table 19. Number and weight of marketable and unmarketable conventionally grown kabocha squash, Landisville, PA; 2010

Kabocha squash cultivar	Mean number of marketable fruit/plant P=0.0066	Mean weight of marketable fruit/plant (lb) P<0.0001	Mean number of unmarketable fruit/plant P=0.0110	Mean weight of unmarketable fruit/plant (lb) P=0.1646
Bon Bon	6.48a	4.05c	1.65abc	6.25
Thunder	4.30b	4.00c	1.35bc	4.73
Sunshine	4.28b	4.93b	0.88c	4.13
Space Station	3.78b	4.85b	1.95ab	6.45
Cha-cha	3.40b	3.95c	2.18a	7.25
Sweet Mama	3.35b	5.38a	1.03c	4.98

Table 20. Number and weight of marketable and unmarketable conventionally grown kabocha and other squash, Landisville, PA; 2011

Kabocha and other squash cultivar	Mean number of marketable fruit/plant P<0.0001	Mean weight of marketable fruit/plant (lb) P<0.0001	Mean number of unmarketable fruit/plant P=0.0819	Mean weight of unmarketable fruit/plant (lb) P=0.1883
Sun Spot	6.1 a	11.8 ab	2.7	4.90
Bon Bon	3.3 b	13.8 a	2.3	8.47
Sweet Mama	2.5 bc	11.8 ab	2.2	9.63
Sunshine	2.2 bc	9.50 bc	1.9	8.09
Red Kuri	2.0 cd	6.50 cd	3.0	10.4
Space Station	1.0 d	5.00 d	1.4	6.23
Thunder	0.97 d	4.50 d	2.6	9.14

Table 21. Number and weight of marketable and unmarketable conventionally grown other types of winter squash, Landisville, PA; 2010

Other type of winter	Mean number of	Mean weight of	Mean number of	Mean weight of
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squash cultivar	marketable fruit/plant P=0.0001	marketable fruit/plant (lb) P<0.0001	unmarketable fruit/plant P=0.4794	unmarketable fruit/plant (lb) P=0.0569
Sweet Lightning	13.43a	5.4c	2.63	1.93
Piñata	11.33ab	7.38c	2.38	2.80
Bush Delicata	9.35b	6.78c	2.73	3.23
Sun Spot	9.23b	11.7b	1.50	2.40
Red Kuri	5.4c	27.8a	1.78	6.20

Table 22. Number and weight of marketable and unmarketable conventionally grown kabocha and other squash, Valencia, PA; 2011

Kabocha and other squash cultivar	Mean number of marketable fruit/plant P=0.0657	Mean weight of marketable fruit/plant (lb) P=0.3784	Mean number of unmarketable fruit/plant P=0.2510	Mean weight of unmarketable fruit/plant (lb) P=0.2396
Sunspot	4.8	12.2	0.90	2.5
Sweet Mama	2.4	13.2	1.0	4.3
Thunder	2.0	10.0	0.38	1.7
Bon Bon	1.8	6.94	1.0	4.4
Space Station	1.1	4.69	1.4	5.9