

# Final Report - Disease Resistant Pumpkin Variety Evaluation

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## Introduction

Pumpkins are an important crop in Pennsylvania and the state ranks at or near the top of producers of fresh market pumpkins on a yearly basis. Disease management is a frequent concern of growers and the introduction of powdery mildew (PM) tolerant and resistant varieties by commercial seed companies has been important to the continued success of this crop. Pumpkin varieties with PM tolerance or resistance are introduced yearly but these varieties have not always been produced under our growing conditions prior to their release. A replicated variety trial of the latest PM tolerant and resistant pumpkin varieties has not been conducted in PA for several years.

The purpose of this study was to evaluate disease resistance, yield and fruit quality of commercially available small and medium pumpkin varieties in a replicated trial in southeast PA.

## Materials and Methods

Twenty nine varieties of small (<10 lbs.) and 13 varieties of medium (10-25 lbs.) pumpkins were direct seeded by hand using the no-till production system (killed-rye) on June 16, 2014. The small varieties were planted at 2ft. in row and the medium were planted 4 ft. in row; both were planted at an 8 ft. row spacing. There were five plots of 6 plants per variety. Water was applied as needed via drip irrigation. Phosphorus and potassium were applied pre-plant (broadcast) based on a soil test; 50 lbs. actual nitrogen was applied preplant (broadcast) with an additional 30 lbs. of N applied during the growing season through the drip system. Disease and insect control was based on recommendations from the PA Commercial Vegetable Production Guide.

Fruit were harvested, graded into marketable and non-marketable groups and individually weighed on October 9 and 10. Fruit quality ratings were collected at this time as well.

## Results and Discussion

Overall the 2014 growing season was cool. The weather was generally dry during harvest and fruit rot in the field was some of the lowest I have seen in my years of trialing. I cannot say for certain whether this was a result of the favorable weather or better fungicides used in the trial but I suspect it was a combination of both of these factors.

The small pumpkins were broken into four groups based on average fruit size for comparison purposes. Group 1 is up to 1 lb., group 2 is 2 – 3.5 lbs., group 3 is 3.6 – 5 lbs. and group 4 is over 5 lbs. (Table 1). The most productive varieties (by estimated yield/A) in group 1 were Half-Pint, Lil' Orange Mon and Kandy Korn Plus. These varieties also had the largest average fruit size in the group. Gooligan (white) had the greatest number of fruit per plant but many off-types in the seed lot provided for the trial lowered yield/A. Overall yields for this

group could possibly be raised by closer plant spacing. Casperita had good yields in group 1 for a white fruit.

Mischief and Jack Sprat were the most productive varieties by yield in group 2; Field Trip and Iron Man in group 3 and Blanco, Hijinks and Flatso in group 4. Blanco is a white variety but does not have the 'traditional' pumpkin shape. Snowball was another white pumpkin that did generally have the traditional appearance but yields were below average for the group.

Overall, the appearance of pumpkins in the small category varied greatly in color, texture and shape (Table 2). This should allow growers to find the varieties that will be readily acceptable in their market. In general, estimated yield/A increased with increasing average fruit size. Higher yields might be realized in some varieties by decreasing plant spacing (increasing number of plants/acre).

Rhea, Magic Lantern and HMX 1689 had the highest estimated yield/A in the medium group (Table 3). While Early Giant and Early King had greater yields, these varieties had large (>25 lb.) fruit. Goosebumps II and Moonshine small fruit weight (group 4); yields per acre could possibly be higher for these varieties with closer spacings.

Bus Stop had good yield but the color might be too yellow for our markets (Table 4). Warty Goblin was a heavily warted variety with unique green warts that appeared to keep growing through harvest. Unlike Goose Bumps II which is a hardshell, the warts on Warty Goblin were still soft at harvest. This gave the fruit their unique appearance but more disease was evident at harvest on the warts (data not reported) resulting in greater numbers of cull fruit and thus lower yields/A. A wet harvest season might increase this problem so growers might consider trialing this variety before planting on a larger scale.

Minimal powdery mildew was present in the trial at harvest and thus no ratings were taken. This may be a result of the cooler weather during the growing season but most likely it is a result of the range of effective fungicides available to control this disease.

Table 1. Yield and seed source for 29 varieties of small pumpkins grown in Lancaster County, PA in 2014.

Variety	Number Fruit/Plt	Average Fruit Wt. (lb)	Estimated Yield (T/A)	Seed Source*
<b>Group 1</b>				
Kandy Korn Plus	7.1	1.0	10.0	SW
Casperita	9.6	0.9	9.6	SW
Crunchkin	7.5	0.7	7.0	SW
Gooligan	10.6	0.6	6.7	SG
Half Pint	6.0	1.5	12.8	SG
Lil' Orange Mon	7.0	1.4	12.0	SW
Munchkin	9.9	0.5	6.0	SW
WeeeeeOne	9.7	0.7	8.5	RP
Wee-B-Little	6.0	0.8	6.2	SG
<b>Group 2</b>				
Jack Sprat	3.6	3.1	14.2	SK
Little Giant	2.7	3.0	10.9	SW
Mischief	3.7	3.3	15.6	SW
Rockafellow	4.2	2.5	12.7	SG
Snowball	3.0	3.0	11.8	ST
Touch of Autumn	3.5	2.7	12.5	SG
<b>Group 3</b>				
Cannon Ball	2.6	4.6	16.6	SW
Field Trip	2.6	4.9	17.1	SW
Iron Man	3.2	4.0	16.9	SW
Prankster	3.1	3.9	15.8	RP
Tiffany	2.8	4.0	14.7	ST
<b>Group 4</b>				
Blanco	4.1	6.6	30.7	RP
Darling	2.7	6.4	22.5	AC
Early Abundance	2.2	6.2	18.7	AC
Fall Splendor	2.0	6.0	15.9	SG
Fall Splendor Plus	2.0	5.6	14.6	SK
Flatso	3.0	6.9	28.3	SW
Hijinks	2.7	8.1	28.9	SG
Hybrid Pam	2.6	5.7	20.0	SG
Mystic Plus	2.7	5.9	20.9	ST

\*AC – Abbott & Cobb, RP – Rupp Seed, SG – Seigers, SK – Sakata Seed, ST – Stokes Seed, SW - SeedWay

Table 2. Fruit quality ratings for 29 varieties of medium pumpkins grown in Lancaster County, PA in 2014. Texture is rated on a scale of 1-5 with 1 being very smooth and 5 being heavily ribbed. Handles are rated 1-5 with 1 being poor and 5 being excellent.

Variety	Color	Shape	Texture	Handle
<b>Group 1</b>				
Kandy Korn Plus	Yellow orange	Round	2.0	3.8
Casperita	White	Flattened-round	3.9	3.6
Crunchkin	Orange/yellow stripes	Flat	4.4	4.0
Gooligan	White	Flat	4.8	4.0
Half Pint	Yellow orange	Round	2.0	3.6
Lil' Orange Mon	Yellow/orange stripes	Flat	3.3	4.4
Munchkin	Yellow orange	Flat	4.6	3.5
WeeeeeOne	Orange	Round	2.4	3.6
Wee-Be-Little	Orange	Round	1.9	3.3
<b>Group 2</b>				
Jack Sprat	Orange	Round/Upright-Round	2.4	4.4
Little Giant	Dark orange	Round/Upright-Round	1.5	4.2
Mischief	Dark orange	Upright-round	3.1	3.9
Rockafellow	Orange	Upright-round	1.5	3.9
Snowball	White	Round	2.2	3.3
Touch of Autumn	Orange	Upright-round	2.8	3.8
<b>Group 3</b>				
Cannon Ball	Dark orange	Round	1.5	4.1
Field Trip	Dark orange	Round	3.2	4.2
Iron Man	Dark orange	Round	1.5	3.7
Prankster	Orange	Round	2.5	3.4
Tiffany	Orange	Upright-round	2.6	4.2
<b>Group 4</b>				
Blanco	White	Flattened Round	3.0	3.4
Darling	Dark orange	Upright	2.0	3.0
Early Abundance	Dark orange	Round	2.6	3.7
Fall Splendor	Dark orange	Round/Upright-Round	3.2	3.9
Fall Splendor Plus	Dark orange	Round/Upright-Round	2.9	3.9
Flatso	Orange	Flat	4.3	3.3
Hijinks	Orange	Upright-round	4.0	3.7
Hybrid Pam	Dark orange	Round	3.2	3.5
Mystic Plus	Dark orange	Round	2.6	3.7

Table 3. Yield and seed source for 13 varieties of medium pumpkins grown in Lancaster County, PA in 2014.

Variety	Number Fruit/Plt	Average Fruit Wt. (lb)	Estimated Yield (T/A)	Seed Source*
Bus Stop	2.6	16.3	23.3	RP
Carrie	1.6	16.1	18.6	ST
Early Giant	1.3	38.5	34.1	AC
Early King	1.8	28.4	33.5	AC
Gladiator	1.5	18.7	18.0	SW
Goosebumps II	3.8	7.1	18.6	ST
HMX 1689	1.5	23.9	24.9	HM
Magic Lantern	2.3	19.6	28.0	SW
Moonshine	3.9	8.0	20.4	SW
Rhea	1.9	23.8	29.2	SW
Warty Goblin	1.7	20.3	23.0	SW
XPU 6016	1.5	22.9	22.3	SK
XPU 9032	2.0	17.6	21.9	SK

\*AC – Abbott & Cobb, HM – Harris Moran, RP – Rupp Seed, SG – Seigers, SK – Sakata Seed, ST – Stokes Seed, SW - SeedWay

Table 4. Fruit quality ratings for 13 varieties of large pumpkins grown in Lancaster County, PA in 2014. Texture is rated on a scale of 1-5 with 1 being very smooth and 5 being heavily ribbed. Handles are rated 1-5 with 1 being poor and 5 being excellent.

Variety	Color	Shape	Texture	Handle
Bus Stop	Yellow orange	Round	2.4	3.9
Carrie	Dark orange	Round	3.5	4.0
Early Giant	Dark orange	Upright	2.3	1.8
Early King	Dark orange	Variable	2.8	2.9
Gladiator	Dark orange	Upright	3.8	3.8
Goosebumps II	Dark orange	Round	1.2	3.7
HMX 1689	Dark orange	Upright	2.9	4.2
Magic Lantern	Dark orange	Upright-round	3.5	3.3
Moonshine	White	Round	3.1	3.9
Rhea	Dark orange	Round	3.5	4.4
Warty Goblin	Variable	Round	3.4	4.3
XPU 6016	Dark orange	Upright	3.0	3.5
XPU 9032	Orange/Dark Orange	Round	3.5	3.0