

Pumpkin Germplasm Evaluation and Screening for Disease Resistance, 2011

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Introduction

Pumpkins are the third largest fresh market vegetable in OH with nearly 7,000 acres in production. Pumpkins account for 10 to 40 % of annual gross income for some vegetable producers. It is important for our producers to use cultivars that consistently produce high yields of quality fruit. Of equal importance is to incorporate new cultivars into the program that provide good disease tolerance in order to reduce pesticide input and production costs while maintaining high quality. This project was supported in part by a research grant from the Ohio Vegetable and Small Fruit Research and Development Program.

Methods

Sixteen cultivars (11 medium and large size, 5 small and mini-pumpkins) were evaluated at the OARDC Western branch in South Charleston, OH. Prior to planting, 100 lbs/A of actual N, P₂O₅ and K₂O was applied. An additional 20-25 lb of N/A was sidedressed before vine tip. All plots were transplanted 13 Jun, 2011. Admire, for cucumber beetle and bacterial wilt control, was applied to transplants two days prior to transplanting. Plots were 30 feet long with 10 feet between rows and 3 feet between plants in the row. Strategy and Dual Magnum were applied for weed control pre-plant. The experiment was conducted as a randomized complete block design with 4 replications. Trickle irrigation was available for all plots and was used as necessary from mid to late July through August to provide 1 in of water per week. A standard disease control program included the fungicides: Bravo + Procure on 3 & 17 Aug, and 1 & 22 Sep, Quintec + Bravo on 27 Jul, 10 Aug and 24 Sep and Cueva (copper) on 27 July. A boom sprayer with cone nozzles at 40 psi was used for fungicide application. A standard insect control program included 1 application of Sevin XLR on 6 Sep. to control beetle feeding on fruit. One third of each plot was left unsprayed in order to accurately determine disease resistance. All plots were rated on 8 Sep for resistance to powdery mildew, angular leaf spot, white speck, and the presence or absence of downy mildew and virus. Fruit were harvested starting 20 Sep, 2011.

Results

Cultivars are listed in Table 1 and ranked according to average fruit size and tons produced per acre. The top variety in terms of average fruit size was HMX 0685 (29 lb/fruit). Aladdin and Gladiator averaged 20 and 19 lb/fruit respectively. HMX 0688 was slightly smaller at 18 lb/fruit. These new experimental hybrids are large, round fruit with strong, thick handles. They are similar in size, shape and handle appearance to the Phatso varieties. Varieties with medium size fruit were XPU 6025, Magic Wand and Apollo. ACX 8022, Mr. Wrinkles, Hijinks and XPU 8009 were smaller fruited cultivars, 12 lb or less.

Yield for the HMX 0685, Aladdin and HMX 0688 were 19 ton/acre. Gladiator produced 14 ton/A. Magic Wand, a smaller pumpkin, produced 19 ton/A. Varieties producing 10 ton/A or below were ACX 8022 and Mr. Wrinkles.

HMX 0685 and HMX 0688 are attractive, large, round pumpkins with good skin color and thick handles. HMX 0688 appears to be a slightly smaller version of HMX 0685. Magic Wand remains a strong producer of medium size pumpkins with a slightly flattened appearance with a deep orange skin color and a nice green handle.

HMX 5684 is a nice small pumpkin, deep orange colored skin, a strong dark green handle and slightly larger in size than Cannonball. The mini-pumpkins tested have been available for years but a new addition is Crunchlan, which is the size of Munchkin, but has the blotchy, orange, yellow skin color of Lil Orangemon. It's a nice and attractive addition into the mini-pumpkin size category.

Powdery mildew tolerance was evaluated near the end of the season on 8 Sep (table 1&2). HMX 0685, Gladiator and Hijinks had good powdery mildew tolerance and infection was 15% or lower on the top and bottom of leaves. Other varieties had 20% infection or higher. Powdery mildew infection in Apollo and XPU 6025 were greater than 50% of the leaf surface.

Bacterial leaf spot diseases were extremely high this year. Infections occurred on foliage and fruit and reduced marketable yield (data not shown). The pumpkin trial was located in an area that never had pumpkins before. Plectosporium or Microdochium (White Speck) was observed at significant levels and killed foliage in some plots (see Table 1 & 2). XPU

6025, Apollo and Cannonball had higher levels of infection compared to other varieties. The prevalence of bacterial diseases and white speck in 2011 is attributed to the warm, moist, humid summer. Downy mildew and virus symptoms were not present in the plots at the time of the disease rating.

Individual pictures of each variety plus comparison views among varieties are available below and at the VegNet website: <http://vegnet.osu.edu>

Table 1. 2011 Pumpkin Cultivar Evaluation, South Charleston, OH

ID #	Variety	Marketable Orange Fruit/A	Marketable Orange Tons/A	Average Fruit Size (lbs)	% Marketable	% PM Leaf Top ¹	% PM Leaf Bottom ¹	ALS ²	White Speck ³	Source
12	HMX 0685	1309	19.2	29	65	15	10	2.5	1.7	HM
14	Aladdin	1887	19	20	63	24	23	3.2	2	HM
15	Gladiator	1488	14	19	40	14	13	3.5	2.4	HM
7	HMX 0688	2069	19	18	83	31	31	3.5	1.8	HM
11	XPU 6025	1198	8	16	61	51	54	4.6	4.8	SK
9	Magic Wand	2577	19	15	67	43	45	3.6	2.1	HM
10	HMX 9699 (Apollo)	1452	11	15	50	66	67	4.1	6.1	HM
16	ACX 8022	1525	9.2	12	60	37	56	4.3	2.6	AC
8	Mr. Wrinkles	907	5	11	39	23	30	2.5	2	SK
13	Hijinks	2686	11	10	49	4.4	15	2.4	1.7	SK
6	XPU 8009	3488	12	7	83	21	20	2.3	2	SK
	LSD 0.05%	1162	7.9	2.6	28	43.7	43.8	3.1	2.5	

1. Powdery mildew severity is defined as the average percentage of leaf area on the upper or lower leaf surface with symptoms of powdery mildew as determined by rating 4 randomly selected leaves per plot by 2 different raters.

2. ALS = Angular leaf spot. Visual rating of lesions found on fruit and leaves based on a 1 to 10 scale: 1=none, light on leaf, 3-4=moderate on leaf, 5=lesions on leaf and fruit, 6=light lesion on fruit, 7= moderate lesions on fruit and leaves, 8= sever lesions on fruit and leaves, 9=moderate necrosis, 10 = severe necrosis.

3. White Speck, Plectosporium or Microdochium Blight: visual rating of lesions: 1 = none, 5 = moderate, 10 = severe.

Table 2. Mini and Small Pumpkin Cultivar Evaluation, 2011 South Charleston, OH

ID #	Variety	Marketable Orange Fruit/A	Marketable Orange Tons/A	Average Fruit Size (lbs)	% Marketable	% PM Top	% PM Bottom	ALS ²	White Speck ₃	Source
3	HMX 5684 (pumpkin pie)	7478	11.5	6.1	74	8	3	3.1	2.3	HM
2	Cannonball	5300	11	4	94	41.7	32	3.3	4.6	HM
1	Lil Orangemon	16444	11	1.3	100	21.5	24	2.1	1.7	HM
5	Crunchlan	13721	4	0.5	100	56	62	3.1	1.5	HM
4	Munchkin	21889	4.5	0.4	99	2	8.4	1.1	0.75	HM
	LSD 0.05%	6112	4.7	4.5	32	37	38	1.4	1.7	

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3. White Speck, Plectosporium or Microdochium Blight: visual rating of lesions: 1 = none, 5 = moderate, 10 = severe.





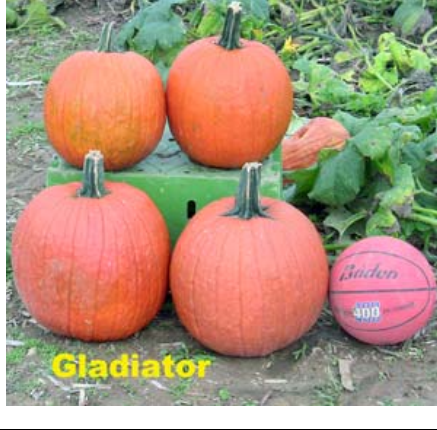
HMX 0685



HMX 0688



Aladdin



Gladiator



XPU 6025



Magic Wand



Apollo



ACX 8022

