

Evaluation of Pumpkin Cultivars with Resistance to Powdery Mildew

Vince Lawson, farm superintendent

Introduction

Powdery mildew of cucurbits (melons, squash, pumpkins, etc.) is an annual problem in Iowa and in some years has the potential to ruin the crop if not controlled. Fortunately, the growing availability of powdery mildew-resistant cultivars now offers producers a more efficient approach to managing this disease and providing high-quality pumpkins for market. This trial was established to provide an unbiased performance evaluation of cultivars with reported resistance/tolerance to powdery mildew and to generate information helpful to growers for selecting cultivars best suited to their marketing objectives.

Materials and Methods

Planting. With 1 seed/cell and 72 cells/tray, the planting was done in the greenhouse on June 7, 2005. The young plants were transplanted to the field on June 29.

Plot Design. A randomized complete block with three replications was the plot design. A plot was a single row of eight plants spaced 32 in. apart. Rows were spaced 8 ft apart.

Irrigation. Using overhead sprinklers, water was applied as needed.

Fertility. 75 lb of nitrogen and 120 lb of potassium (K20) was applied preplant on June 3; 50 lb of nitrogen was sidedressed on August 4.

Pest Control. Prefar, Sandea, Poast were the herbicides; Capture was the insecticide; Bravo and Quadris were the fungicides.

Discussion and Results

Trial plots were established by transplanting into an area of the research farm with dark-colored loamy sand soil and irrigating with a center pivot. The sunny, warm growing season was favorable for pumpkin growth, and at harvest yields and quality were found to be exceptionally good. Powdery mildew was visible in the trial planting by early August, and visual ratings for severity of infection were taken on August 22 as reported in Table 1. Following expectations, the susceptible cultivars Howden, Variety 510, and Spooktacular were the most severely affected, showing substantial vine defoliation by early September. The original plan was to let the powdery mildew develop and then take yield data from the afflicted plots; but, concerns that other diseases such as downy mildew would compromise the trial led us to apply Bravo and Pristine fungicide on August 25 and again on September 9. These fungicide applications seemed to keep vines healthy and allowed us to collect good yield data and fruit descriptions. As it turned out, all of the entries including the powdery mildew-susceptible checks produced good yields. Marketable yield and fruit characteristics are presented in Table 1, while comments and descriptions can be found in Table 2. Cultivars are ranked by average fruit weight, from large to small, in the tables. Aladdin, Variety 510, and Dependable were the highest-yielding cultivars, but the choice of which ones to plant should probably be made on desired characteristics, such as fruit size and shape, rather than just potential yield levels. Tables 1 and 2 reveal that there are several good cultivars with a variety of fruit characteristics that have an added bonus of some level of powdery mildew resistance/tolerance.

Table 1. Pumpkin cultivar marketable yield, average fruit size, and powdery mildew ratings.

Cultivar	Number of fruit per acre	Market yield (lb/acre)	Average fruit wt (lb)	Average fruit height × diameter (in.)	Powdery mildew rating on 8/22 ¹
Harvest Time	2,380	76,013	31.5	17.5 × 13	1.7
Dependable	2,833	81,124	29.1	17.5 × 12	2.5
Super Herc	2,267	52,065	22.7	13.5 × 11.5	1.5
Aladdin	4,533	97,977	21.4	12.5 × 11.5	1.3
Variety 510	4,647	95,075	20.3	12.0 × 11.0	3.0
Howden	3,060	57,199	18.7	11.5 × 11.5	2.8
Magic Lantern	4,420	70,335	15.9	10.5 × 11.5	1.3
Merlin	4,193	67,127	15.9	11.5 × 11.5	1.8
Charisma	4,420	64,011	14.6	9.0 × 11.0	2.3
Magician	4,760	64,090	13.5	11.0 × 11.0	1.3
Cannon Ball	8,840	41,491	4.8	6.0 × 6.5	1.0
Mystic Plus	6,800	28,277	4.2	6.5 × 7.0	2.2
Iron Man	10,653	42,205	4.0	6.0 × 6.5	1.5
Spooktacular	9,747	29,059	3.0	4.5 × 6.0	3.0
Touch of Autumn	13,033	31,733	2.4	4.5 × 5.5	1.5
Average	5,772	59,852	14.8		1.9
LSD 5%	1,906	22,750	2.6		

¹Powdery mildew ratings: 0=no powdery mildew; 1=slight, a little visible on inner leaves; 2=moderate, easily visible on foliage; 3=severe, on foliage and stems, leaves turning yellow or brown.

Table 2. Pumpkin cultivar comments and descriptions.

Cultivar	Comments
Harvest Time	Very tall, upright shape; medium ribbing; smooth surface with slight ribbing; bright orange color; large, thick handles
Dependable	Extra tall fruit; medium ribbing; bright orange color; large, thick handles; long vines
Super Herc	Tall, upright fruit; deeply ribbed; dark orange color; large, dark green handles; several of the fruit had rough surface (possibly due to Plectosporium blight, but only this cv. was affected)
Aladdin	Tall, round shape; medium ribbing; dark orange fruit with long, dark handles
Variety 510	Long, spreading vines; mostly tall, round shape with deep ribs; dark orange; powdery mildew susceptibility, but with still good yield because plots were sprayed with fungicide
Howden	Long, spreading vines; round to tall shape (variable); dark orange and deeply ribbed; powdery mildew susceptibility
Magic Lantern	Uniform, fat, round shape; ribbed; deep orange color with nice dark handles
Merlin	Uniform, round fruit; prominent ribbing; dark orange and long, dark handles
Charisma	Blocky, round (oblate) shape; pronounced ribbing; dark orange and long dark handles
Magician	Upright, oval shape; strong ribbing; dark orange color and nice dark handles
Cannon Ball	Hard, round fruit; dark orange with fairly smooth surface; large thick handles
Mystic Plus	Round to oval shape with long, tapered handle; nice burnt orange coloration; faint ribbing
Iron Man	Hard, round fruit with smooth surface; dark orange; strong thick handles
Spooktacular	Ribbed with flattened, round shape; bright orange; weak handles; frequent light color and pronounced susceptibility to powdery mildew
Touch of Autumn	Blocky, round shape; shallow ribbing; bright orange coloration with dark handles.