

Evaluation of Winter Squash Cultivars with Resistance to Powdery Mildew - 2006

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Introduction

Powdery mildew of cucurbits is an annual problem in Iowa and in some years has the potential to ruin the crop. Control can be difficult when weather is favorable for disease development and has traditionally relied on the application of fungicides. Fortunately, the introduction of powdery mildew resistant squash cultivars has provided a more efficient approach to managing this disease and producing a high-quality crop. This trial was initiated in 2005 and continued in 2006 to provide powdery mildew resistant (PMR) cultivar information to squash growers to guide cultivar selection.

Materials and Methods

Planting. The trial contained nine acorn, two butternut, one buttercup and a delicata type cultivar. Trial plants were started in greenhouse on June 8 by planting one seed per cell in 72 cell trays and were transplanted to the field on July 5, 2006, when plants had three true leaves.

Plot Design. The trial design was a randomized complete block design with three replications. A plot was a single row of eight plants, 28 inches apart. Rows were eight feet apart.

Culture. Soil type was dark-colored loamy sand which was irrigated as needed with a center pivot. Fertilizer was applied preplant incorporated at rate of 50 lb nitrogen and 100 lb of potash (K₂O). An additional 60 lb nitrogen was applied during the growing season through the irrigation.

Pesticides. Prefar and Sandea herbicides were used; Capture and Provado were the insecticides; Bravo Weather Stik, Kocide, Pristine and Quadris fungicides were used.

Results and Discussion

We now have two years of observations on these cultivars. In 2005 the trial had favorable growing conditions resulting in very high yields while growing conditions in 2006 produced mediocre yields. This might have been due to a late planting date, July 5, followed by irrigation problems which delayed plant development and fruit set. For whatever reason, most cultivars produced less fruit per plant in 2006 although fruit quality was still good. Data from the two seasons matched up well and were combined for presentation in Table 1. While this was a trial of resistant squash cultivars we didn't get to rate them for powdery mildew symptom development in the field because of fungicide spraying. It was decided that the planting would be sprayed because of concern that other diseases, such as downy mildew, would affect the trial and interfere with obtaining good yield data and fruit descriptions. This is a good reminder that planting powdery mildew resistant cultivars will not provide protection from all pests and does not eliminate the need for a good pest management program and timely sprays when needed.

The sole buttercup type squash and 2005 All America Selection, BonBon, had long vigorous vines and produced the largest yield. It is not reported to be resistant to powdery mildew but because of its plant vigor would probably outgrow light infections. Waltham, the standard butternut type, still shows merit producing a decent yield and large fruit. Metro, a powdery mildew resistant butternut,

was also productive bearing a high number of fruit on its relatively compact vines (for a butternut type) that were smaller and more uniformly sized than Waltham.

Yield differences between the nine acorn squash cultivars were not statistically significant and it would be difficult to recommend one over the other since they all showed good characteristics. Taybelle PM and Tip Top produced the heaviest average acorn squash weights in Table 1. The highly ornamental Harlequin and Celebration were standouts because of their multicolored fruit and good eating quality.

Bush Delicata is a powdery mildew resistant delicata type squash with six inch oblong cylindrical fruit that were cream colored with green stripes. The bright yellow-orange flesh inside the fruit was sweet and of good quality. Bush Delicata had a small, space-saving, compact plant and it is probable that per acre yield could be increased with closer plant spacing than used in this trial.

Table 1. Winter squash cultivar average yield and fruit characteristics - 2005 and 2006 data combined.

Cultivar	Seed Source	Fruit per plant	Fruit Per acre	Market Yield (cwt/acre)	Avg. Fruit (lb)	Comments
BonBon	ST	4.8	11,281	455.83	4.0	Vigorous vines, nice uniform heavy buttercup fruit, 2005 AAS
Metro PMR	JS	5.7	13,537	372.43	2.8	Butternut, uniform shape, compact vine
Waltham	JS	4.1	9,803	349.63	3.6	Butternut, standard, PM susceptible
Table Star	RU	6.9	16,416	278.52	1.7	Acorn, green with white star around stem
Taybelle PM	SM	5.6	13,226	260.71	2.0	Acorn, dark green, large
Celebration	RU	7.8	18,516	238.61	1.4	Acorn, gold and cream striped
Harlequin	RU	6.5	15,482	230.91	1.5	Acorn, green/light green striped
Autumn Delight	SM	5.3	12,526	224.22	1.8	Acorn, dark green
Table Ace	SM	5.3	12,448	216.83	1.7	Acorn, standard cultivar, PM susceptible
Royal Ace PM	HM	5.4	12,759	208.66	1.7	Acorn, dark green
TipTop PMR	JS	4.5	10,736	206.56	1.9	Acorn, dark green, large size
Table Treat	RU	4.6	10,814	189.44	1.8	Acorn, dark green
Bush Delicata	ST	5.8	13,693	172.64	1.3	Compact small plant, striped oblong fruit
<i>Average</i>		<i>5.6</i>	<i>13,172</i>	<i>261.92</i>		
<i>LSD 5%</i>			<i>4,858</i>	<i>118.6</i>		