Evaluation of Winter Squash Cultivars with Resistance to Powdery Mildew - 2005

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Powdery mildew of cucurbits is an annual problem in Iowa and in some years has the potential to ruin the crop if not controlled. The introduction of powdery mildew resistant squash cultivars offers the grower a more efficient approach to managing this disease and producing a high-quality crop for market. This trial was established to provide an unbiased performance evaluation of cultivars with reported resistance/tolerance to powdery mildew and generate information useful to growers for selecting the right cultivar for their marketing objectives.

Trial plots were established by transplanting into an area of the research farm with dark-colored loamy sand soil and irrigated with an overhead center pivot unit. The sunny and warm growing conditions during the season were favorable for squash growth and at harvest yields and quality were found to be exceptionally good. Fruit, except for a few exceptions, were well formed, hard and free of defects or rot. Powdery mildew was visible in the trial by early August and visual ratings were taken on August 22 for infection severity with results reported in Table 1. *Table Ace*, the susceptible check, was rated as having the worst symptoms. In general, powdery mildew severity on resistant or tolerant cultivars never developed beyond moderate to slight and it is doubtful the disease influenced yield to any degree. Because there was concern that other diseases, such as downy mildew, would affect the trial it was decided to apply Bravo and Pristine fungicide to the plots on August 25 and again on September 9 to keep vines healthy and allow us to collect good yield data and fruit descriptions. The presence of downy mildew in the plots does illustrate the need for a good disease management program, which might include fungicides, even when growing powdery mildew resistant cultivars.

Table 1 presents the number of marketable fruit and yield harvested from each cultivar as well as comments. Entries are grouped by squash type and ranked by yield, high to low. *Table Star* and *Taybelle PM* were the highest yielding acorn cultivars in the trial. The multicolored and highly ornamental *Harlequin* and *Celebration* also yielded well. The sole buttercup type squash and 2005 All America Selection, *BonBon*, had strong vigorous vines and produced the largest yield of all cultivars. *Waltham*, the standard butternut type, still shows merit producing a decent yield and large fruit. *Metro* and *JSW 6828* produced good yields of nice butternut squash that were slightly smaller than *Waltham*. *Bugle* would have been the top producing butternut except several fruit were graded unmarketable because of cracking. *Bush Delicata* showed a very compact bush growing habit and could have been planted much closer together than was done in this trial. A higher plant population would probably increase its yield potential. The cream colored, green striped fruit were about six inches long, cylindrical, and contained bright yellow-orange flesh.

Materials and Methods

Planting: One seed per cell, 72 cell tray, in greenhouse 6/7/05. Transplanted to field 6/29.
Plot Design: RCB, 3 reps. Plot = single row of eight plants spaced 32" apart, rows 8' apart.
Irrigation: Overhead sprinklers, water applied as needed.
Fertility: 75 lb N + 120 lb K20 applied preplant (6/3); 50 lb N sidedressed (8/4).
Pesticides: Prefar, Sandea, Poast herbicide; Capture insecticide; Bravo, Quadris fungicide.

Table 1. Winter squash cultivar average yield and fruit characteristics.

Cultivar	Seed Source	No. Frt Per Acre	Market Yield CWT/Acre	Avg Fruit Wt Lbs	Powdery Mildew Rating	Comments
Acorn						
Table Star	RU	19,040	331.7	1.7	1.5	White "star" around stem
Taybelle PM	SM	15,300	313.3	2.1	1.7	Large acorn fruit
Harlequin	RU	18,587	285.6	1.5	1.0	Green stripes & flecks
Celebration	RU	20,853	275.9	1.3	2.2	Orange & green stripes
Autumn Delight	SM	13,600	255.8	1.9	.7	Semi-bush plant
Table Ace	SM	12,920	239.9	1.9	2.8	PM susceptible check
Royal Ace PM	HM	14,167	231.7	1.6	1.5	Semi-bush plant
TipTop PMR	JS	10,767	217.0	2.0	1.8	Good fruit color
Table Treat	RU	11,220	197.7	1.8	1.0	Bush plant
Butternut & Specialty						
BonBon	ST	13,147	549.2	4.2	1.5	Buttercup type, AAS 2005
Metro PMR	JS	15,413	444.8	2.9	.7	Butternut, uniform fruit
JSW 6828	JS	12,580	385.1	3.1	.2	Butternut, cylindrical shape, a few "long" necks
Waltham	JS	9,973	367.2	3.7	1.8	Butternut, PM susceptible
Bugle	RU	14,053	365.4	2.6	.3	Some fruit splitting
Bush Delicata	ST	14,733	188.4	1.3	1.3	Small compact plant
Average		*14,124*	*309.9*	*2.2*	*1.4*	
LSD 5%		*3,260*	*72.8*	*.3*	*.7*	

Powdery 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.