

2013 Downy Mildew Muskmelon Trial Report

by Edmund Frost

This trial was funded by Southern Exposure Seed Exchange and Twin Oaks Seed Farm, with help from Organic Seed Alliance.

Introduction:

2013 was a year of very high Downy Mildew pressure in Central Virginia and at our farm. We had already observed DM on other cucurbit plantings before planting this trial, and rainy weather persisted throughout the summer. Out of 38 varieties planted (32 orange muskmelon seedstocks, 4 green netted melons and 2 honeydews), only 5 seedstocks (4 varieties) achieved good or moderate production of good-tasting fruit. 22 varieties produced very poorly or not at all. 9 varieties fell somewhere in between these categories. 2 varieties had insufficient stands.

Seed sources for the trial included Southern Exposure Seed Exchange, Johnny's, Cornell University, USDA Plant Introductions program, Fedco, Heavenly Seeds, Livingston Seeds, Cornucopia Seeds, Orange-Madison Coop, Seeds of Change and Twin Oaks Seed Farm.

We intentionally planted late to expose plants to high DM pressure. Late planting in a high pressure year represents a worst-case scenario for DM damage to melon plants, and this trial successfully evaluated performance under these conditions, identifying five seedstocks that could produce with high DM pressure. More research about performance of early planted melons and performance in moderate-pressure years would help to determine which of the melons that did less well still have worthwhile DM resistance characteristics.

Unlike cucumbers, very few melon varieties are advertised as DM resistant. Exceptions were Edisto 47, Mainstream, Planters Jumbo, and USDA Plant Introductions 292008 and 12411

Methods:

38 varieties of muskmelon were planted on June 18th and 19th, 2013. We selected varieties offered by southern seed companies, popular varieties, and DMR-listed varieties –mostly orange netted muskmelons. Three varieties were hybrids and the rest open pollinated. Seeds were planted 12 inches apart in stations – 10 stations per seedstock; 36 inches between varieties. We planted 3 seeds per station, except where seed supply was limited, in which case we planted 2 per station. Seed emergence evaluation was not one of the goals of the trial. Due to several days of heavy rain just after planting, emergence of some varieties was poor. Plants were thinned on 7/18 to 1 per station. Two plants were left in stations next to gaps. There were two rows planted 6 feet apart.

The trial took place in LB1 field at Twin Oaks Seed Farm, which is certified organic. Soil type is Alta Vista Sandy Loam. Fertility was based on a soil test from A and L Eastern Labs. Amendments used were tofu okara (for nitrogen), at a rate of one ton per acre side dressed on August 8th. An over-wintered Crimson Clover cover crop was the main source of nitrogen. Potassium was supplied with an application of

Potassium Sulfate at a rate of 400 pounds per acre. Phosphorus levels in the soil are very high, and pH is 6.4. Plants were covered with row cover until 7/5 to prevent plant mortality from cucumber beetles. Weed control was accomplished by hoeing in-row, hand weeding (once around plants), and tractor cultivation.

Downy Mildew pressure on leaves was observed and rated 5 times during the trial, using a 1-9 rating system (9 being the highest DM presence, and 1 indicating no DM presence). Harvest took place on 12 dates between 8/12 and 9/30.

Spreadsheet Notes:

#plants: The intention was to have ten plants of each variety, spaced one foot apart. Due to very wet weather just after planting, emergence was poor for some varieties. This column gives the number of surviving plants for each variety. I removed Schoon's Hardshell (2 plants) and 181A (1 plant) from the comparative analysis. They are listed at the bottom of the spreadsheet.

Tot#: Total harvested weight.

dm726-dm910: Downy Mildew ratings for plant foliage on different dates. 1 is most resistant and 9 is least resistant. An average may not be useful because some varieties that appeared to have good resistance early on eventually turned out to have very poor resistance and productivity. There is a tendency for plants to exhibit more disease susceptibility closer to, during and after harvest. Early varieties like Hannah's Choice have poor ratings in the last two DM evaluations that do not pertain well to the performance of the variety. Late varieties like Old Time Tennessee had several very favorable DM ratings, but the plants were mostly dead by the time of harvest.

DMworst: The worst DM rating received by each variety during the trial.

DMavg: The average of the DM ratings for each variety.

Tstavg: The average taste rating for each variety. 1 is best tasting, 9 is worst. Column V: Vigor on 8/13: Plant vigor mostly correlated with DM resistance, with some exceptions.

Tstbest: Best taste rating from each crop. Some poor taste ratings may relate to harvest timing.

Rating: Variety rating, based on yield and taste ratings.

A = Melons that produced well or moderately well and tasted good or moderately good.

B = Melons that 1) produced somewhat poorly and tasted moderately good, or 2) produced well and tasted bad or moderately bad. These varieties have DM resistance potential in less extreme circumstances.

C and D = Crop failure, D worse than C.

Yield/acre: Per acre yield, figuring that each variety had 78 square feet.

Variety Name	Source	Lot #	#plnts	Tot#	dm 726	dm 802	dm 813	dm 828	dm 910	dm Worst	dm Avg.	tst avg.	tst best	Rating	yield/acre
Tam Dew	Heavenly		10	11.62	3	2	4	4.5	8	8	4.3	6	5	B	6403
Eel River	Sds of Change	03ER	8	10.96	3	5	4	5	7	7	4.8	6.5	5	B	6039
Hannah's Choice	Fedco	351	6	27.8	1	3	4	6	7.5	7.5	4.3	3	1	A	15318
Sweet Passion	SESE	7827	10	21.7	5	5	6	8	9	9	6.6	9	9	B	11957
Hearts of Gold	Heavenly		10	0.9	6	5	7.5	7	7	7.5	6.5	6	6	D	496
Golden Jenny	SESE	AA750	8	10.5	4	5	8	9	9	9	7.0	9	9	C	5786
Hales Best	SESE	AA310	10	3.9	5	6	7.5	8	7	8	6.7	9	9	D	2149
Halona F1	Johnnys	40400	5	8.7	6	7	9	8	8	9	7.6	9	9	C	4794
Eden Gem	SESE	9728	8	4.86	6	7	6	7	8	8	6.8	9	9	D	2678
Top Mark	TwinOaks	2010 Stock	10	6.84	5	7	6	7	7	7	6.4	5.3	3	C	3769
Pike	SESE	AA515	10	7.6	5	5	5	7	8	8	6.0	8.5	8	C	4188
Imperial 45	Cornucopia		9	6.14	4	5	7	8	8	8	6.4	9	9	D	3383
Minnesota Midget	Seed Savers		8	6.46	3	5	8	8	8	8	6.4	9	9	D	3559
Emerald Gem	Baker Creek	861-140	10	3.4	4	4	5	6	7	7	5.2			D	1873
Pike	Twin Oaks	2012 Stock	10	4.3	4	5	5	7	8	8	5.8			D	2369
Sierra Gold	Livingston	12.10.13	10	12	4	5	6	8	8	8	6.2	6.3	5	B	6612
Kansas	Twin Oaks	2010 Stock	10	7.24	4	7	7	8	8	8	6.8	8.5	8	C	3989
Old Time TN	Twin Oaks	2011 Stock	10	10.78	3	3	3	4	7	7	4.0	9	9	C	5940
Green Honeydew	Heavenly		7	9.44	1	3	5	5	7	7	4.2	4.5	4	B	5201
Athena	Fedco	341	9	26.44	3	4	5	7	8	8	5.4	7.7	5	B	14568
Main stream	Heavenly		9	13.44	3	4	6.5	7	6	7	5.3	6.7	3	B	7405
Delicious 51	SESE	AA685	10	10.6	8	7	6.5	7	9	9	7.5	9	9	C	5841
Planters Jumbo	Heavenly		10	4.1	3	6	6.5	8	6	8	5.9	8	7	C	2259
Missouri Gold	Twin Oaks	2011 Stock	10	13.2	5	4	3.5	4	5	5	4.3	4.5	4.5	B	7273
Kansas	SESE		9	3.94	6	8	6	6	6	8	6.4	9	9	D	2171
Honey Rock	Heavenly		9	9.84	5	6.5	7	9	8	9	7.1	9	9	C	5422
Edisto Mystery	Twin Oaks	2011 Stock	10	3.1	8	9	7	8	8	9	8.0	9	9	D	1708
Pride of Wisconsin	Fedco	351	8	18.5	5	6	6	6	6	6	5.8	4.5	4	A	10194
Edisto 47	SESE	8990	5	26.84	3	4	4.5	4	2	4.5	3.5	2.3	1	A	14789
PI 292008	USDA	11.368.4	7	1.36	3	6	7	7	7	7	6.0	9	9	D	749
PI 12411	USDA	11.364.7	7	9.12	1	2	2	3	7	7	3.0	8.5	8	C	5025
NY09-180A	Cornell	Sel. 2	6	25.28	1	3	4	4	4.5	4.5	3.3	2.3	1	A	13929
Ice Cream	Twin Oaks	2009	10	0	7	8	6.5	6	6	8	6.7			D	0
Impr Rocky Ford	S. States	160-B1	10	2.5	6	6	7.5	8	8	8	7.1	9	9	D	1378
Edisto 47	Twin Oaks	2011 Stock	9	31.44	1	3	3	3	3	3	2.6	5.3	2	A	17323
Old Time TN Grn	Twin Oaks	2011	9	21.1	3	3	3	2	2	3	2.6	6.7	6	B	11626
NY09-181A	Cornell	Sel. 1	1	0	3	5	4.5	8	9	9	5.9				
Schoon's Hardshell	Baker Creek	DVB16	2	6.6	5	7	5	4	4	7	5.0	4.5	4		