MUSKMELON (*Cucumis melo*)
Anthracnose; *Colletotrichum orbiculare*
Powdery mildew; *Podosphaera xanthii*
Downy mildew; *Pseudoperonospora cubensis*

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Field evaluation of muskmelon cultivars for susceptibility to anthracnose, powdery mildew and downy mildew when grown in organic no-till and plastic-mulch production systems in Maryland, 2015.

The experiment was conducted at the University of Maryland's Lower Eastern Shore Research and Education Center, Salisbury. The certified organic field of Fort Mott and Rosedale loamy sand soil was seeded with a hairy vetch (*Vicia villosa*) and crimson clover (*Trifolium incarnatum*) cover crop mixture on 2 Oct 2014. The experiment was conducted as a split-plot design with three replicates of two cover crop systems: green manure (till section) and mowed mulch (no-till section). Main plots were split among eight muskmelon cultivars: 'Athena', 'Dulce', 'Eden's Gem', 'Escorial', 'Juane', 'Sivan', 'Snow Mass' and 'Sunbeam'. Five of the cultivars ('Athena', 'Dulce', 'Escorial', 'Sivan' and 'Sunbeam') were advertised to be resistant to powdery mildew. Plots in both production systems consisted of single row beds, 90 feet long with 36 plants on 7-ft centers and drip irrigation. In the till section, raised beds were covered with 1.25 mil black plastic mulch on 27 May. In the no-till section, in-ground beds were left uncovered. Cultivars were transplanted into the field on 10 Jun; plants were 24 in. apart in the row. Weed management relied on rototilling (till section only), mowing (no-till section only) and hand-weeding (both sections). Insects were managed with Entrust (6 oz/A) applied on 29 Jun, 29 Jul, and 24 Aug, and with Pyganic (32 oz/A) applied on 9 Jul and 6 Aug. Muskmelon foliage was evaluated three times in each cover crop system, but evaluation dates were staggered due to differences in plant growth. Foliar data represent the mean disease severity of anthracnose, powdery mildew, and downy mildew for six plants per cultivar per replicate using a 0-4 scale, where 0=no disease, 1=less than 10% disease, 2=10-25% disease, 3=25-50% disease, and 4=more than 50% disease. In the till section, disease severity was assessed on 26 Jul, 2 Aug and 13 Aug. In the no-till section, disease severity was assessed on 12, 20 and 26 Aug. Mature fruit were counted and weighed throughout the season; yield varied significantly by cultivar, cover crop system, and harvest date (data not shown). Disease severity was analyzed using JMP version 10, and means separated using Student's t-test.

Rainfall in Jun, Jul and Aug was 9.1, 4.3 and 4.0 in., respectively. Cover crop system (till versus no-till) was a significant factor for all diseases evaluated (anthracnose p=0.008; powdery mildew p=0.029; and downy mildew p=0.004). Muskmelon in the till section had less anthracnose and powdery mildew, while muskmelon in the no-till section had less downy mildew. Cultivar was also a significant factor for all diseases evaluated ($p \leq 0.001$), but performance varied by disease. Of the cultivars advertised as resistant to powdery mildew, only Athena and Dulce had consistently low foliar ratings, which were significantly lower than all other cultivars on 26 Aug in the no-till section.

Till section	Foliar disease severity[z]								
	Anthracnose			Powdery Mildew			Downy mildew		
Cultivar[y]	26 Jul	2 Aug	13 Aug[x]	26 Jul	2 Aug	13 Aug[x]	26 Jul	2 Aug	13 Aug[x]
Athena	0.5	0.9	2.1 d	0.1	0.1	0.3 e	0.5	1.7	4.0 a
Dulce	0.4	0.8	3.2 ab	0.1	0	1.1 de	0.1	0.4	3.9 a
Eden's Gem	1.4	2.1	.	1.9	4.0	.	0.7	1.7	.
Escorial	0.7	1.8	3.8 a	0	0.5	2.4 bc	0.1	0.1	0.6 c
Juane	0.4	1.2	3.8 a	1.3	3.2	3.7 a	0.2	0.9	3.1 b
Sivan	0.2	0.9	2.3 cd	0.2	0.4	2.8 ab	0	0	0.1 c
Snow Mass	0.1	0.8	3.0 b	0.1	0.8	3.0 ab	0.6	1.6	3.8 a
Sunbeam	0.9	1.9	2.9 bc	0.4	0.6	1.7 cd	0.3	1.6	3.9 a

[z]Data based on foliar ratings of six plants per cultivar per replicate using a 0-4 scale, where 0=no disease, 1=less than 10% disease, 2=10-25% disease, 3=25-50% disease and 4=more than 50% disease. Three replications.
[y]Cultivar was a significant factor for anthracnose (p=0.003), powdery mildew (p<0.001) and downy mildew (p<0.001).
[x]Mean separation by Student's t-test (p=0.05). No disease severity data for Eden's Gem, as too few living plants.

No-till section	Foliar disease severity[z]								
	Anthracnose			Powdery Mildew			Downy mildew		
Cultivar[y]	12 Aug	20 Aug	26 Aug[x]	12 Aug	20 Aug	26 Aug[x]	12 Aug	20 Aug	26 Aug[x]
Athena	0.9	3.0	3.4 a	0.1	0.6	0.6 c	0	0.7	3.2 a
Dulce	0.9	1.7	1.4 c	0	0.4	0.8 c	0	0.2	2.4 ab
Eden's Gem	1.0	3.4	1.9 bc	2.3	2.1	2.4 b	0.4	1.6	3.0 a
Escorial	0.4	2.4	2.2 bc	0.1	1.1	2.2 b	0	0	1.2 cd
Juane	0.7	1.9	2.1 bc	1.8	3.1	3.5 a	0	0.5	1.5 bc
Sivan	0.3	1.3	2.1 bc	0.2	1.4	3.1 ab	0	0.1	0.3 d
Snow Mass	1.6	3.8	2.6 ab	0.4	1.9	2.3 b	1.3	0.6	2.9 a
Sunbeam	0.7	1.9	2.5 b	0.2	2.0	3.6 a	0	1.2	3.1 a

[z]Data based on foliar ratings of six plants per cultivar per replicate using a 0-4 scale, where 0=no disease, 1=less than 10% disease, 2=10-25% disease, 3=25-50% disease and 4=more than 50% disease. Three replications.
[y]Cultivar was a significant factor for all diseases evaluated (p<0.001).
[x]Mean separation by Student's t-test (p=0.05).