Disease Susceptibility of Musk Melon Varieties

Tom Turini - UCCE Imperial County
Plant Pathology Farm Advisor

Powdery Mildew of Melons

Podospora xanthii (formerly *Sphaerotheca fuliginea)*

Damage

- Ripening may be premature or incomplete, which results in poor flavor in melon.

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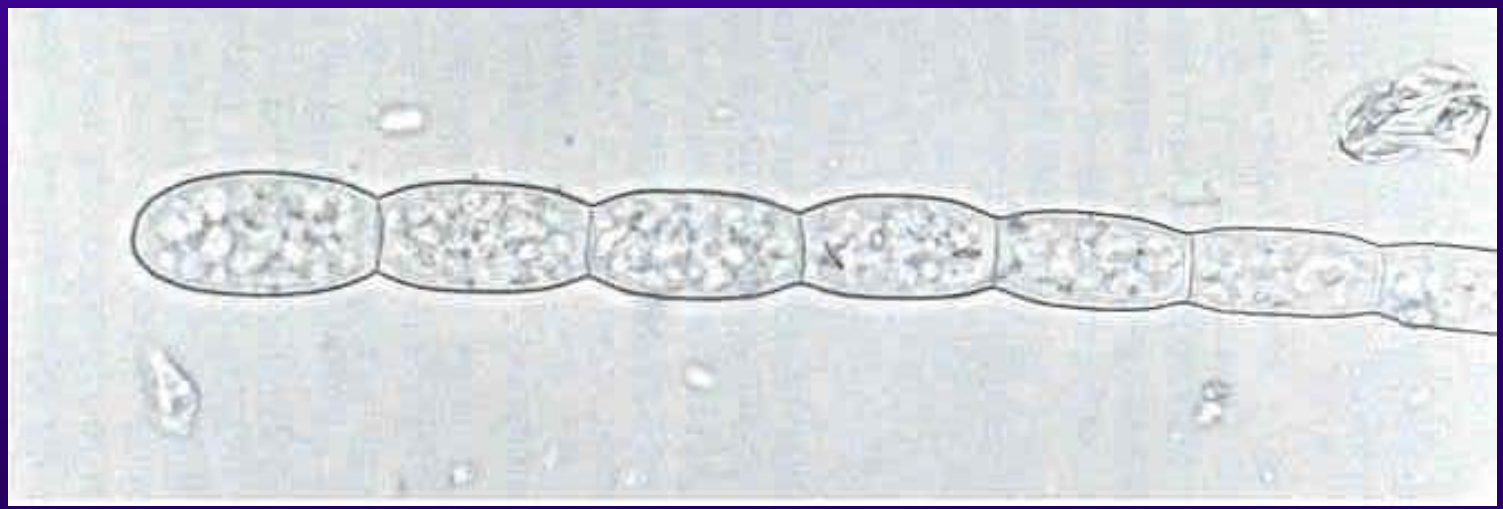
- Ripening may be premature or incomplete, which results in poor flavor in melon
- Severe mildew can kill leaves exposing the fruit, which results in sunburn.

Dissemination

- Spores can be carried long distances by wind currents.
- Thrips or other insects can spread spores locally.



Conditions Favoring Powdery Mildew Development

- Temperature - Optimum is 81 ºF.

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- Temperature - Optimum is 81 ºF.
- Humidity requirement - Infection can occur at RH of 46%, but disease is more severe under more humid conditions.

CONTROL

- Plant resistance
- Fungicides

Imperial County Research

- Determination of *P. xanthii* race present at DREC (Jim McCright in Spring and Fall 2002).
- Assess relative susceptibility of muskmelon varieties to powdery mildew (in Spring 2001 and 2002).

General Methods

- DREC
- Seeded and irrigated in late March or early April
- Irrigation: drip

RACE DETERMINATION

Determination of *P. xanthii* race, Spring 2002

- Ten varieties with different race susceptibility characteristics were grown at DREC.
- Planted and irrigated on 21 March.
- Irrigation: drip
- Disease evaluation: 19 June
- Rating scale: 1 to 10: 1 has no visible mildew and 10 is completely covered.

Determination of *S. fuliginea* race

	Disease Rating	Disease Reaction
Iran H	9.0	S
Top Mark	5.0	S
Vedrantáis	4.5	R
PMR 45	1.0	R
PMR 5	1.0	R
WMR 29	1.0	R
PI 414723	1.0	R
MR-1	1.0	R
PI 124111	1.0	R
PI 124112	1.0	R

Rating scale – 1.0 to 10.0

Differential melon lines for races of *P. xanthii*

Melon lines	0	1	2 US	2 France	3	4
Iran H	S[y]	S	nt	S	nt	S
Védrantais, Top Mark, Ananas	R	S	S	S	S	S
PMR 45	R	R	S	S	S	S
PMR 5	R	R	R	R	S	R
WMR 29	R	R	H	R	nt	S
Edisto 47	R	R	S	R	S	R
PI 414723	R	R	S	R	R	R
MR-1, PI 124112	R	R	R	R	R	R

[z] From Pitrat et al., 1998. Two new races identified in 1998 are not included (Hosoya et al., 1999).

[y] S = Susceptible, R = Resistant, H = Heterogeneous, nt = not tested.

Determination of *P. xanthii* race, Fall 2002

- Results suggested Race 3 was present

VARIETY TRIAL

Methods

- Experimental Design: Randomized Complete Block
- Replications: 4
- Plot Dimensions: 1 bed X 25 ft

Disease Severity Evaluation

- Evaluation dates: June 27, 2001 and 26 June 2002
- Sample size: Each of 10 leaves per plot were rated
- Rating scale: 0 to 5 based on percentage of leaf surface covered with powdery mildew (0=no disease, 1=20%, 2=40%, 3=60%, 4=80%, 5=100%)

Variety Trial Results, 2001

Variety	Melon type	Declared resistance (race)	Powdery mildew severity (%) 27 June
Sol Real	Cantaloupe	1 & 2	0 d
Mary Gold	Casaba	None	1 bcd
Sol Dorado	Cantaloupe	1 & 2	1 cd
Cruiser	Cantaloupe	1	2 bcd
Emerald	Honeydew	None	2 bcd
Caravelle	Cantaloupe	1 & 2	3 bcd
Impac	Cantaloupe	1 & 2	3 bcd
Laredo	Cantaloupe	1	3 bcd
Morning Ice	Honeydew	1	3 bcd
Primo	Cantaloupe	1 & 2	3 bcd
RML 7923	Cantaloupe	None	4 bcd
Valley Pac	Cantaloupe	1 & 2	4 bcd
Mission	Cantaloupe	1	5 bcd
Saturno	Honeydew	1	7 bcd
Santa Fe	Honeydew	None	7 bcd
Goldmine	Cantaloupe	1	8 bcd
Gold Rush	Cantaloupe	1	8 bcd

Variety Trial Results, 2001

Variety	Melon type	Declared resistance (race)	Powdery mildew severity (%) 27 June
Oro Rico	Cantaloupe	1	9 bc
T-542	Honeydew	None	9 bc
Gold Finger	Honeydew	None	9 b
Silver World	Honeydew	None	9 b
Hymark	Cantaloupe	1	10 b
Mega Brew	Honeydew	1	11 b
Golden Beauty	Casaba	None	38 a

Variety Trial Powdery Mildew Results, 2002

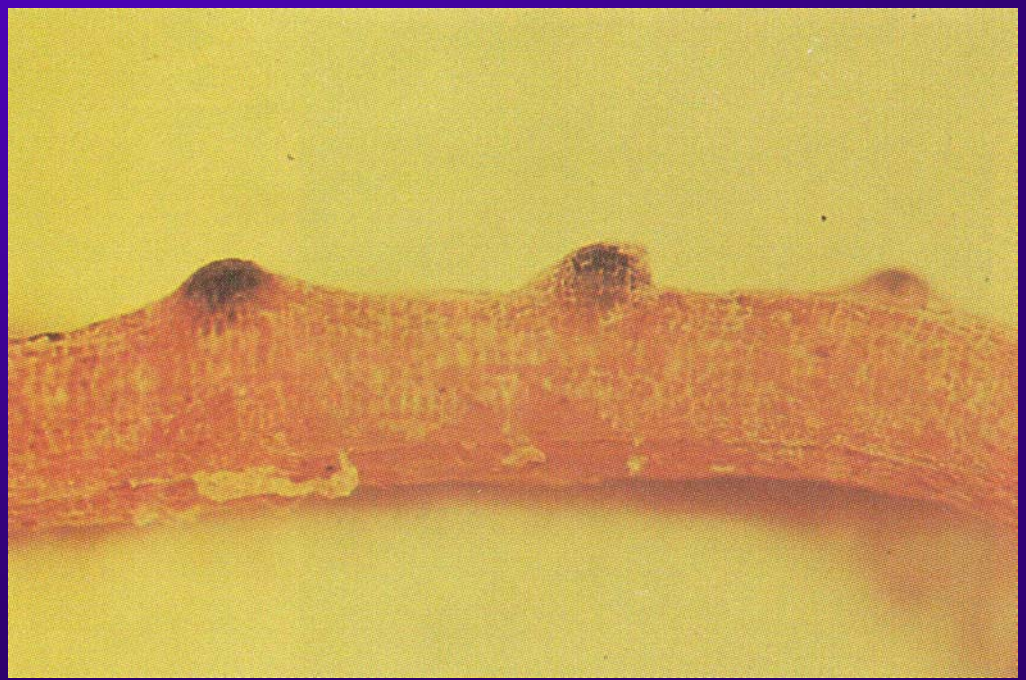
Cultivar (source)	Declared resistance	Melon type	Powdery mildew severity (26 June)
Mission (Asgrow)	1	Cantaloupe	0 C
Primo (Novartis)	1 & 2	Cantaloupe	0 C
Sol Real (Novartis)	1 & 2	Cantaloupe	0 C
Silver World (Know You)	None	Honeydew	0 C
Emerald [OP honeydew]	None	Honeydew	0 C
Caravelle (Asgrow)	1 & 2	Cantaloupe	1 C
Cruiser (Harris Moran)	1	Cantaloupe	1 C
Hymark (Peto)	1	Cantaloupe	1 C
Impac (Asgrow)	1 & 2	Cantaloupe	1 C
Goldmine (Harris Moran)	1	Cantaloupe	1 C
Esteem (Novartis) (formerly RML 7923)	None	Cantaloupe	1 C
Mega Brew	1	Honeydew	1 C
Morning Ice (Harris Moran)	1	Honeydew	1 C
Santa Fe (Peto)	None	Honeydew	1 C
Saturno	1	Honeydew	1 C
Honey Ace (Takii) (formerly T-542)	None	Honeydew	1 C
Sun Canary (Know you)	None	Canary	1 C
Don Carlos (Seminis)		Cantaloupe	2 C
Gold Rush (Harris Moran)	1	Cantaloupe	2 C
Laredo (Peto)	1	Cantaloupe	2 C
Oro Rico (Harris Moran)	1	Cantaloupe	3 C
Valley Pac (Asgrow)		Cantaloupe	3 C

Variety Trial Powdery Mildew Results, 2002

Cultivar (source)	Declared resistance	Melon type	Powdery mildew severity (26 June)
Golden crenshaw		Crenshaw	28 B
Golden Beauty	None	Casaba	53 A

Vine Decline of Melons

Monosporascus cannonballus
Perithecia



Monosporascus cannonballus
Perithecium and ascospores

Vine Decline Evaluation

- On 1 July, plots were rated on a scale of 0 to 10 for vine decline symptoms. A plot rated 0 had no collapsed vines or symptomatic leaves: a plot rated 10 would be completely collapsed.

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- On 1 July, plots were rated on a scale of 0 to 10 for vine decline symptoms. A plot rated 0 had no collapsed vines or symptomatic leaves: a plot rated 10 would be completely collapsed.
- On 11 July, 3 roots were dug per plot. Roots were rinsed in water and rated for M. cannonballus damage on a scale from 0 to 10 based on percentage of root system damaged.

Varietal Response to Vine Decline, 2002 (varieties with lower disease severity)

Variety (source)	Melon Type	Vine decline	Root symptoms
Honey Ace (Takii) (formerly T-542)	Honeydew	0.50 E	2 CD
Golden crenshaw	crenshaw	0.75 E	2 CD
Sun Canary (Know you)	Canary	0.75 E	1 D
Emerald [OP honeydew]	Honeydew	1.25 E	1 D
Esteem (Novartis) (formerly RML 7923)	Cantaloupe	1.25 E	2 CD
Morning Ice (Harris Moran)	Honeydew	1.75 E	1 D
Santa Fe (Peto)	Honeydew	2.00 E	1 D
Saturno	Honeydew	2.00 E	1 D
Silver World (Know You)	Honeydew	2.25 DE	1 D
Golden Beauty	Casaba	3.75 CDE	1 D
Mega Brew	Honeydew	4.00 BCDE	2 CD

Varietal Response to Vine Decline, 2002 (varieties with higher disease severity)

Variety (source)	Melon Type	Vine decline	Root symptoms
Sol Real (Novartis)	Cantaloupe	6.00 ABCD	6 AB
Valley Pac (Asgrow)	Cantaloupe	6.00 ABCD	4 BCD
Goldmine (Harris Moran)	Cantaloupe	6.50 ABC	5 ABC
Hymark (Peto)	Cantaloupe	6.75 ABC	4 BCD
Impac (Asgrow)	Cantaloupe	6.75 ABC	4 BCD
Primo (Novartis)	Cantaloupe	6.75 ABC	3 BCD
Cruiser (Harris Moran)	Cantaloupe	6.75 ABC	5 ABC
Mission (Asgrow)	Cantaloupe	7.00 ABC	7 AB
Oro Rico (Harris Moran)	Cantaloupe	7.00 ABC	8 A
Caravelle (Asgrow)	Cantaloupe	8.25 ABC	5 ABC
Gold Rush (Harris Moran)	Cantaloupe	8.50 AB	5 ABCD
Laredo (Peto)	Cantaloupe	8.75 A	6 AB

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- Most entries had very low powdery mildew incidence.
- Golden Beauty Casaba and golden crenshaw (2002) had high powdery mildew severity.
- Mixed melons had lower vine decline severity than cantaloupes
- Of the cantaloupe varieties, Esteem from Syngenta (formerly RML 7923) had lowest vine decline severity