Melon Disease Upddate:

Diagnosis and Control

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Melon Disease Topics

- Vine decline
  - Monosporascus root rot
  - Charcoal rot
- Foliar diseases
  - Powdery mildew
- Diseases caused by viruses
  - Potyviruses
  - Cucurbit yellow stunting disorder virus

Vine Decline

Monosporascus cannonballus
Perithecia

Monosporascus cannonballus
Perithecia


Monosporascus cannonballus
Perithecia

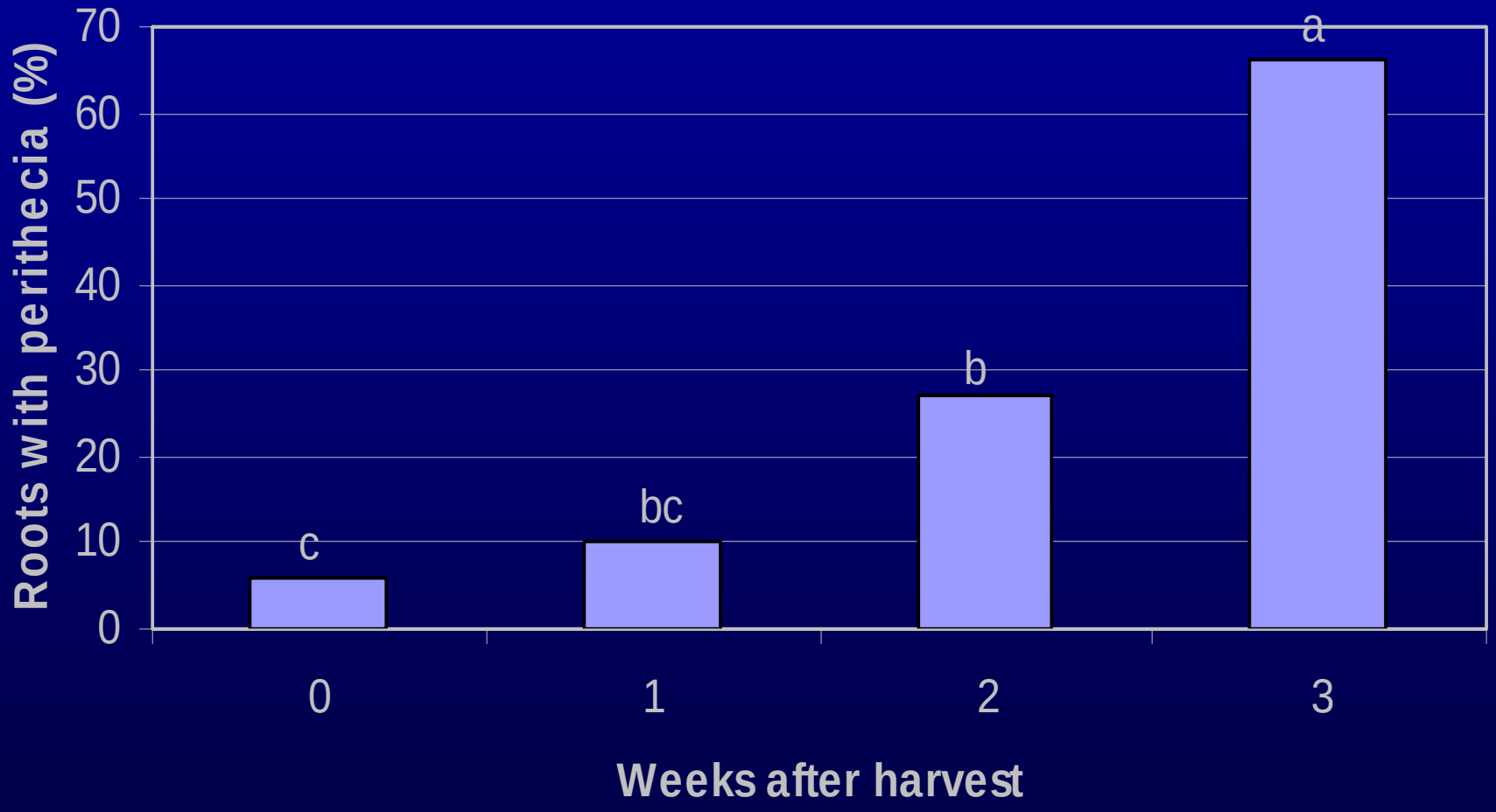

Monosporascus cannonballus Perithecium and ascospores


Monosporascus cannonballus ascospores and asci

Monosporascus cannonballus Environmental Requirements

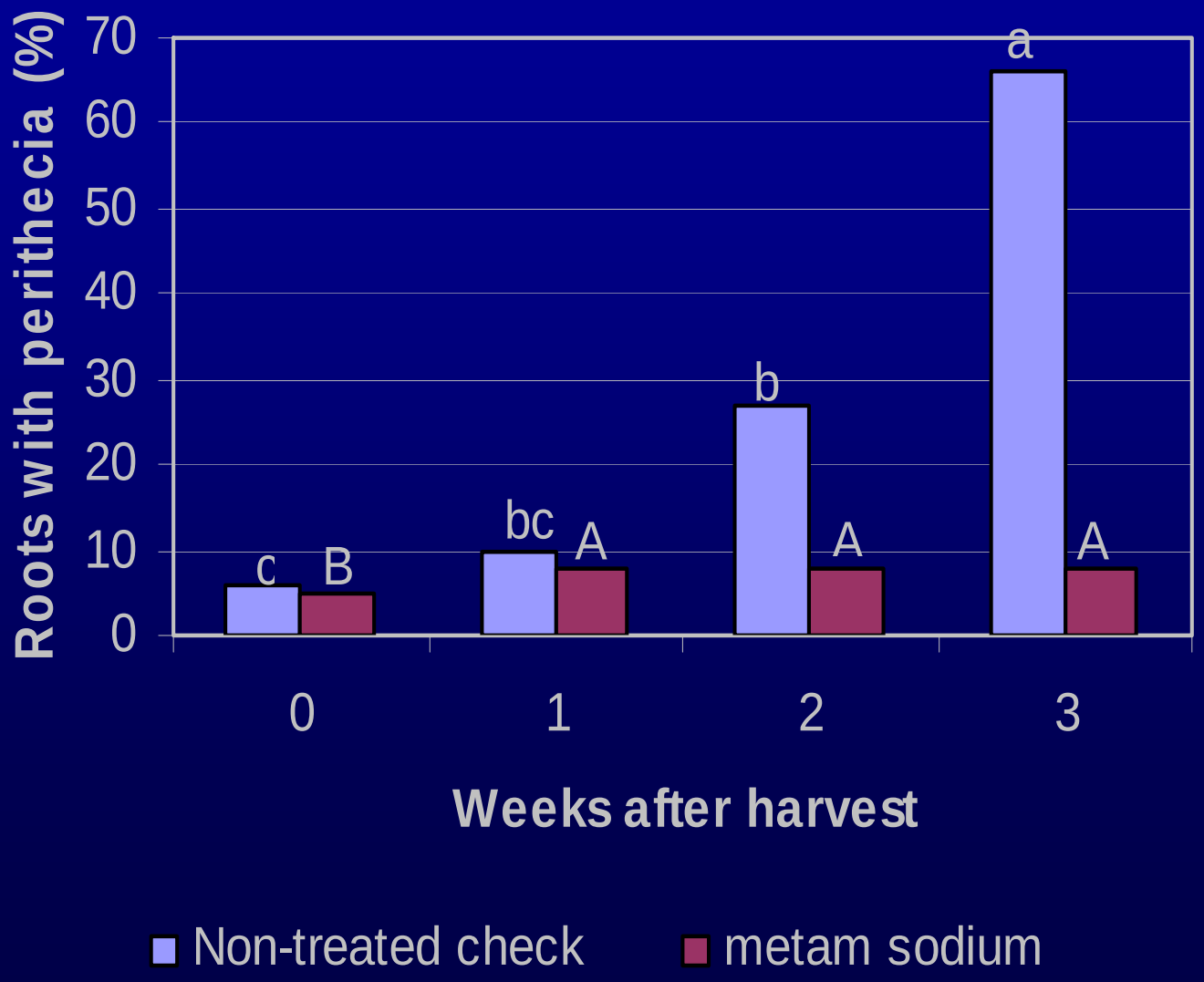
- Optimum temperatures for fungal growth: 77º to 95ºF
- Plant stress is required for vine decline

Inoculum Production After Harvest, 2000

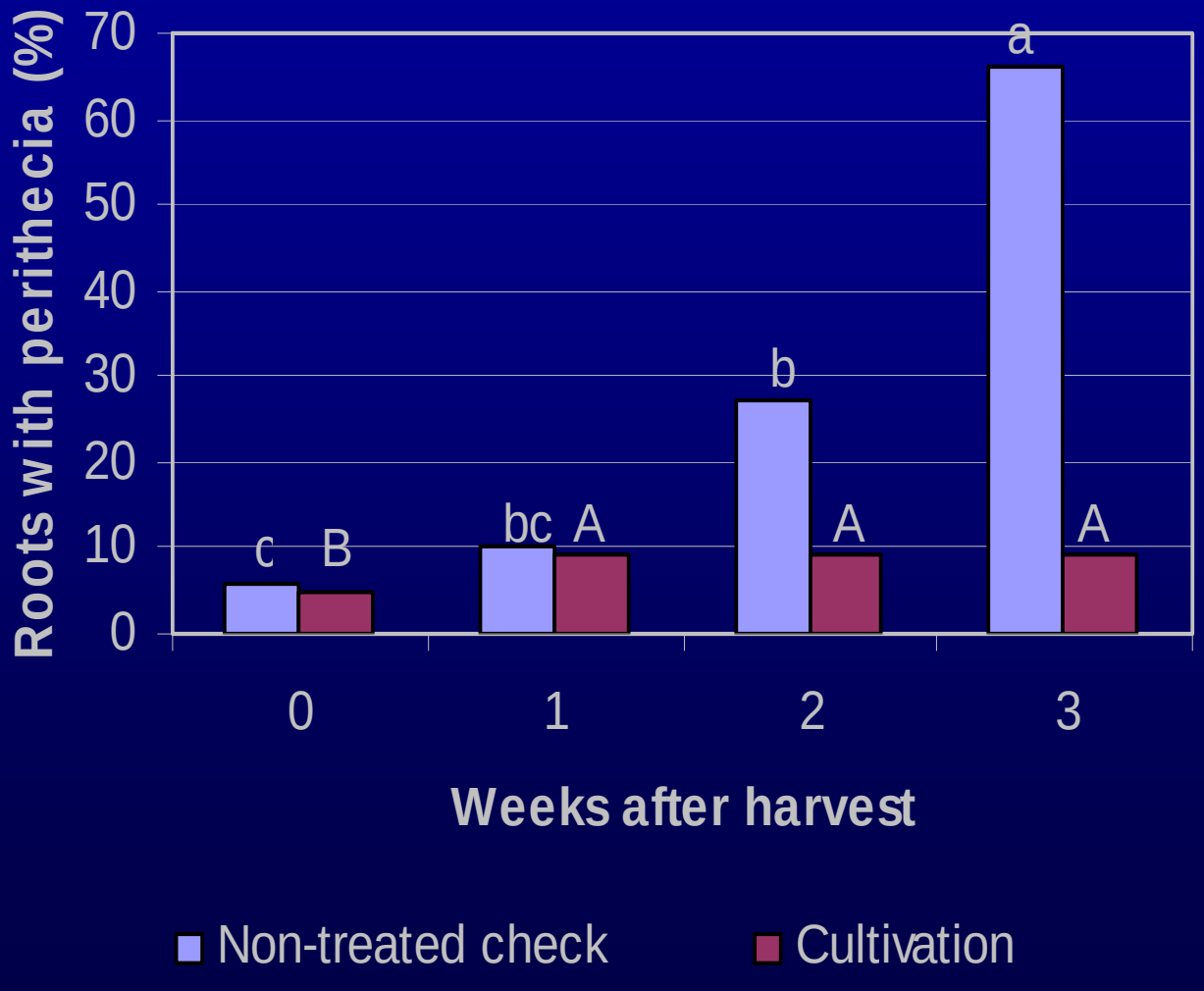


Stanghellini et. al. 2001. Plant Disease

Effect of Metam Sodium on Perithecia Production, 2000



Effect of Cultivation on Perithecia Production, 2000



Stanghellini et. al. 2001. Plant Disease

Management under SJV conditions

- During the warmer times of the year, avoid planting melons in fields known to be infested with this pathogen.
- If detected, destroy roots after harvest to prevent increase of inoculum levels in the soil.

Charcoal Rot - *Macrophomina phaseolina*

Macrophomina phaseolina Environmental Requirements

- **Disease incidence is favored by plant water stress and high temperatures.**

Macrophomina phaseolina Environmental Requirements

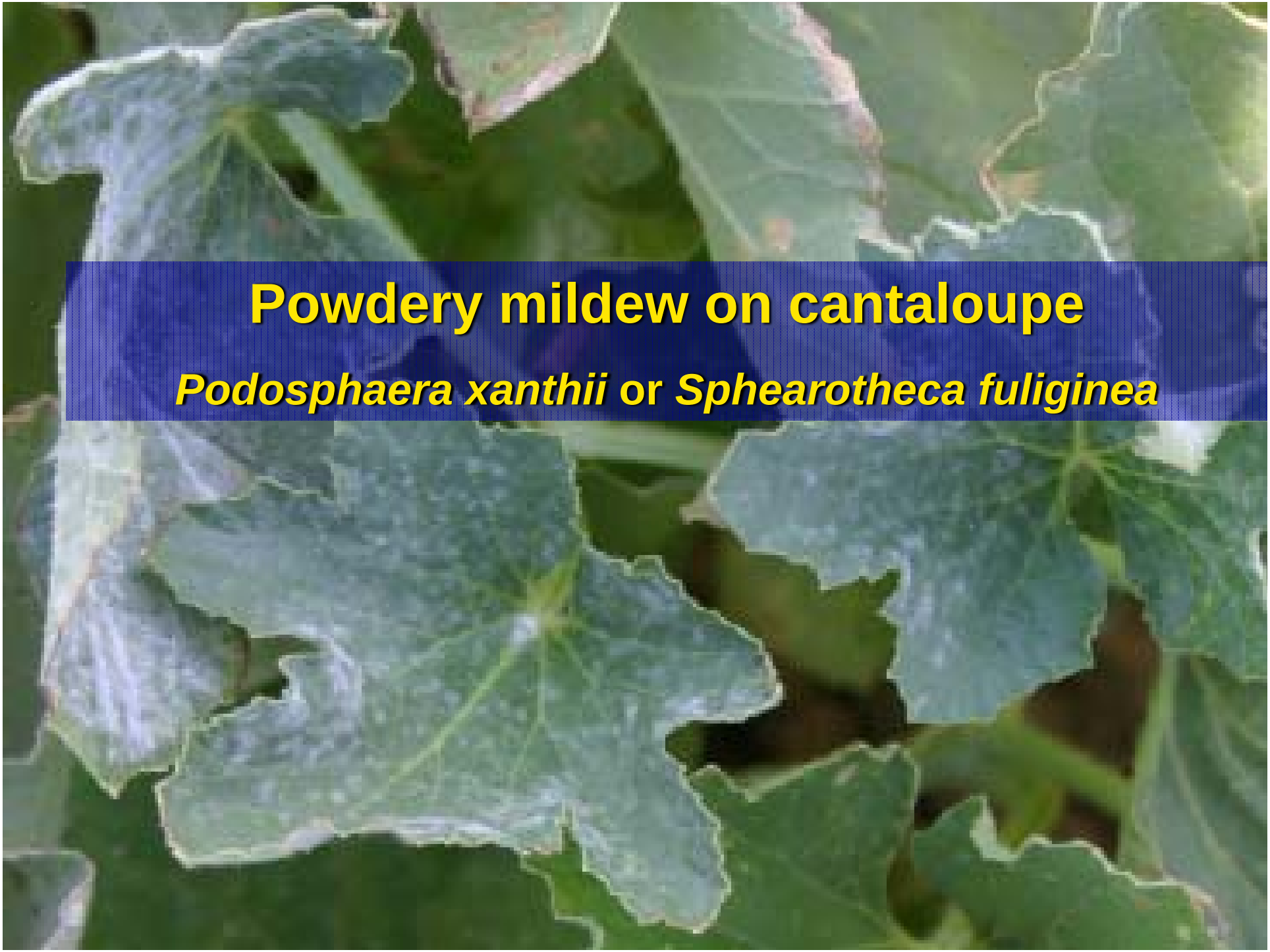
- **Disease incidence is favored by plant water stress and high temperatures.**
- **Optimum soil temperature for infection is approximately 86 ºF,**

Charcoal Rot Control

- Avoidance of stressing the plants reduces the occurrence of charcoal rot

Charcoal Rot Control

- Avoidance of stressing the plants reduces the occurrence of charcoal rot
- Soil fumigants, solarization and deep plowing are ineffective, and crop rotation is impractical due to the extremely wide host range.


Powdery mildew on cantaloupe
Podosphaera xanthii or *Sphearotheca fuliginea*


Conidia in chains
W. Gärtel

Conditions Favoring Powdery Mildew Development

- **Temperature - Optimum is 81 ºF.**
- **Humidity requirement - >46%**

Host Range of *P. xanthii*

- **Cantaloupes, casaba and honeydew *(Cucumis melo)***
- **Cumbers *(Cucumis sativus)***
- **Various squash: *Banana squash (Cucurbita maxima),* Butttenut squash *(C. moschata),* and Zucchini, yellow squash, pumpkin and ornamental gourd *(C. pepo*)**
- **Watermelon *(Citrullus lanatus)***

Control of Powdery Mildew of Melons

- Fungicides
- Resistant varieties

FRAC Code	**Group Name**	**Trade Names (common names)**	**Resistance Potential**
11	Quinone outside Inhibitors (Q_oI) or Strobilurins	*Cabrio (pyraclostrobin) , Flint (trifloxystrobin), Quadris (azoxystrobin),* ***Sovran (kresoxy methyl)***	High
1	Methyl Benzimidazole Carbamates	Topsin (thiophanate-methyl)	High
7	Carboxamides	*Endura (boscalid)*	Medium
3	DeMethylation Inhibitors (Class I of the Sterol biosynthesis inhibitors)	*Procure (triflumizole), Rally (myclobutanil)*	Medium
13	Quinolines	Quintec (quinoxyfen)	Medium
M2	Inorganic – Sulfur	*Various*	Low
M5	Chloronitriles (pthalonitriles)	*Various (chlorothanlonil)*	Low

From Fungicide Resistance Action Committee – Updated 2010
http://www.frac.info/frac/index.htm

Methods

- West Side Research and Extension Center
- Casaba cv. ‘Golden Beauty’

Experimental Design

- Randomized Complete Block
- Replications: 5
- Plot Dimensions: 1 bed X 25 ft
- Five feet between plots within a row
- One planted bed between treated rows

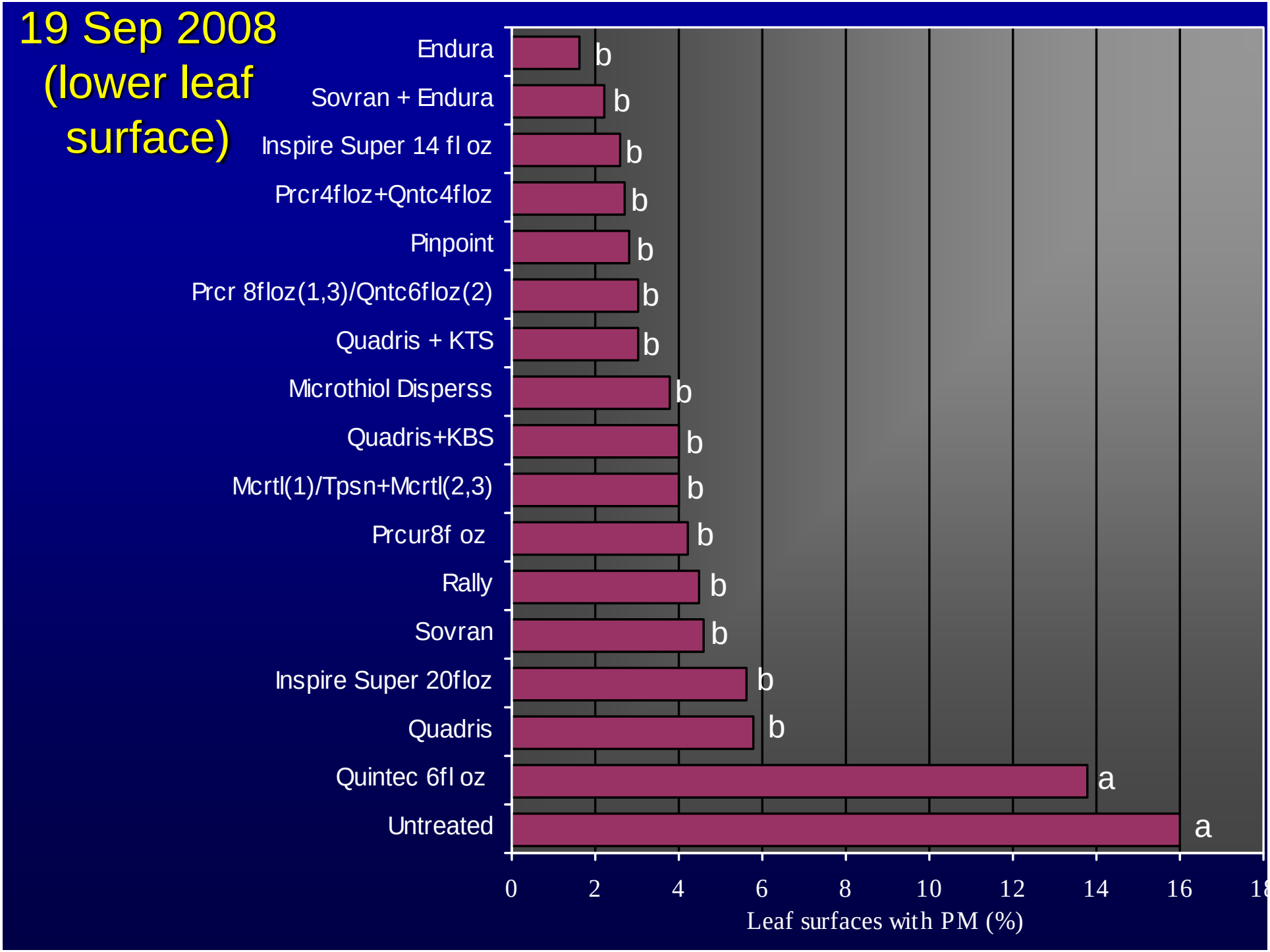
Fungicide Application Details

- Application method: CO_2 pressurized backpack sprayer
- Spraying pressure: 30 psi
- Spray volume per acre: 30 gallons
- Surfactant: Induce 0.25% by volume

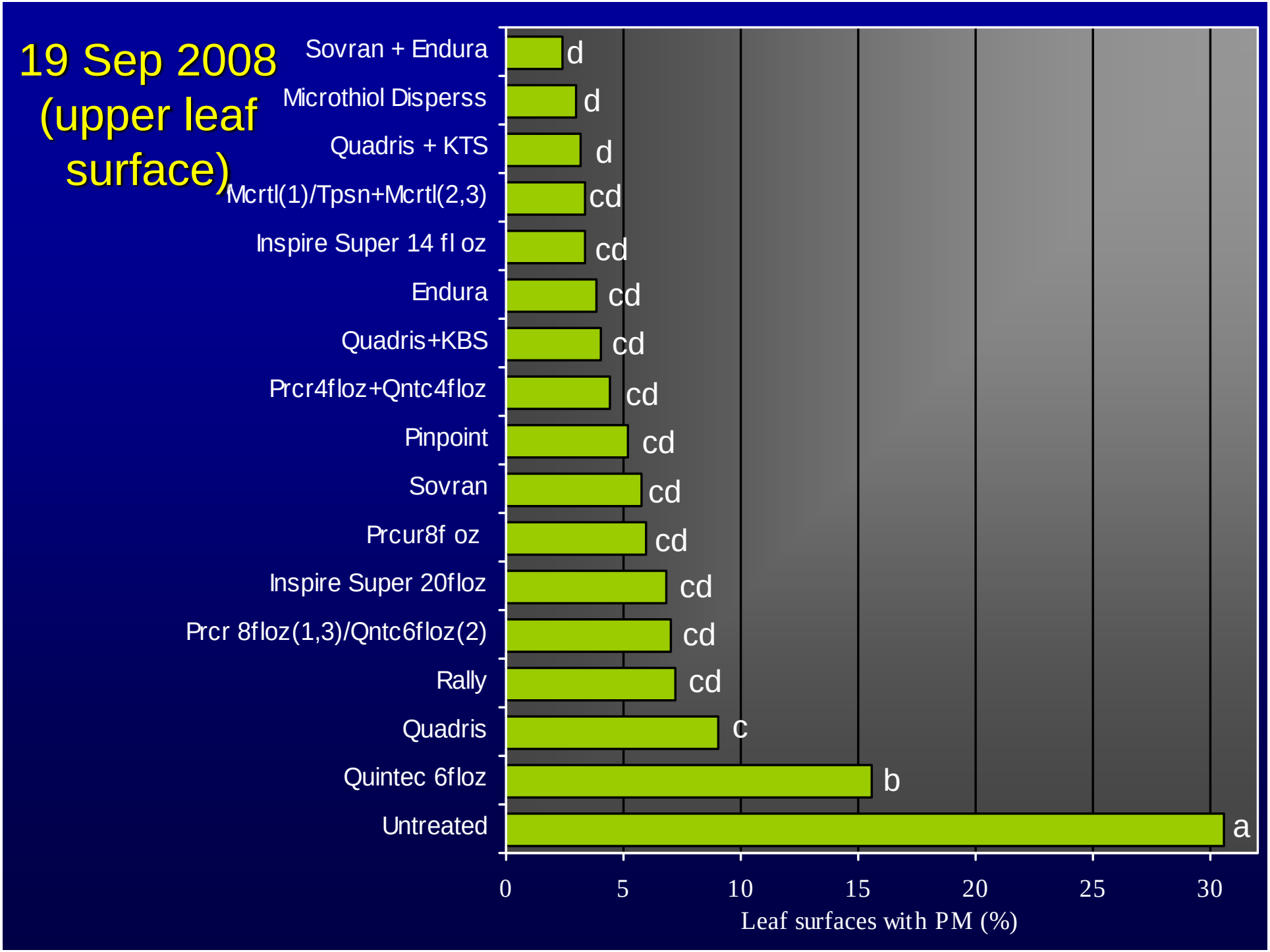
	Plant date	Application dates	Mildew present	Evaluation dates
2008	17 Jun	26 Aug, 3 Sep	25 Aug	2, 11 and 19 Sep
2009	23 Jun	6, 17, 25 Aug, 2 Sep	28 Aug	31 Aug, 8 and 17 Sep

Closely read all labels before writing a recommendation

- Not all materials tested are currently registered.
- Some materials have restrictions that could influence practicality of use in some situations.


19 Sep 2008 (lower leaf surface)
Endura
Sovran + Endura
Inspire Super 14 fl oz
Prcr4floz+Qntc4floz
Pinpoint
Prcr 8floz(1,3)/Qntc6floz(2)
Quadris + KTS
Microthiol Disperss
Quadris+KBS
Mcrtl(1)/Tpsn+Mcrtl(2,3)
Prcur8f oz
Rally
Sovran
Inspire Super 20floz
Quadris
Quintec 6fl oz
Untreated
b
b
b
b
b
b
b
b
b
b
b
b
b
b
a
a
0
2
4
6
8
10
12
14
16
Leaf surfaces with PM (%)

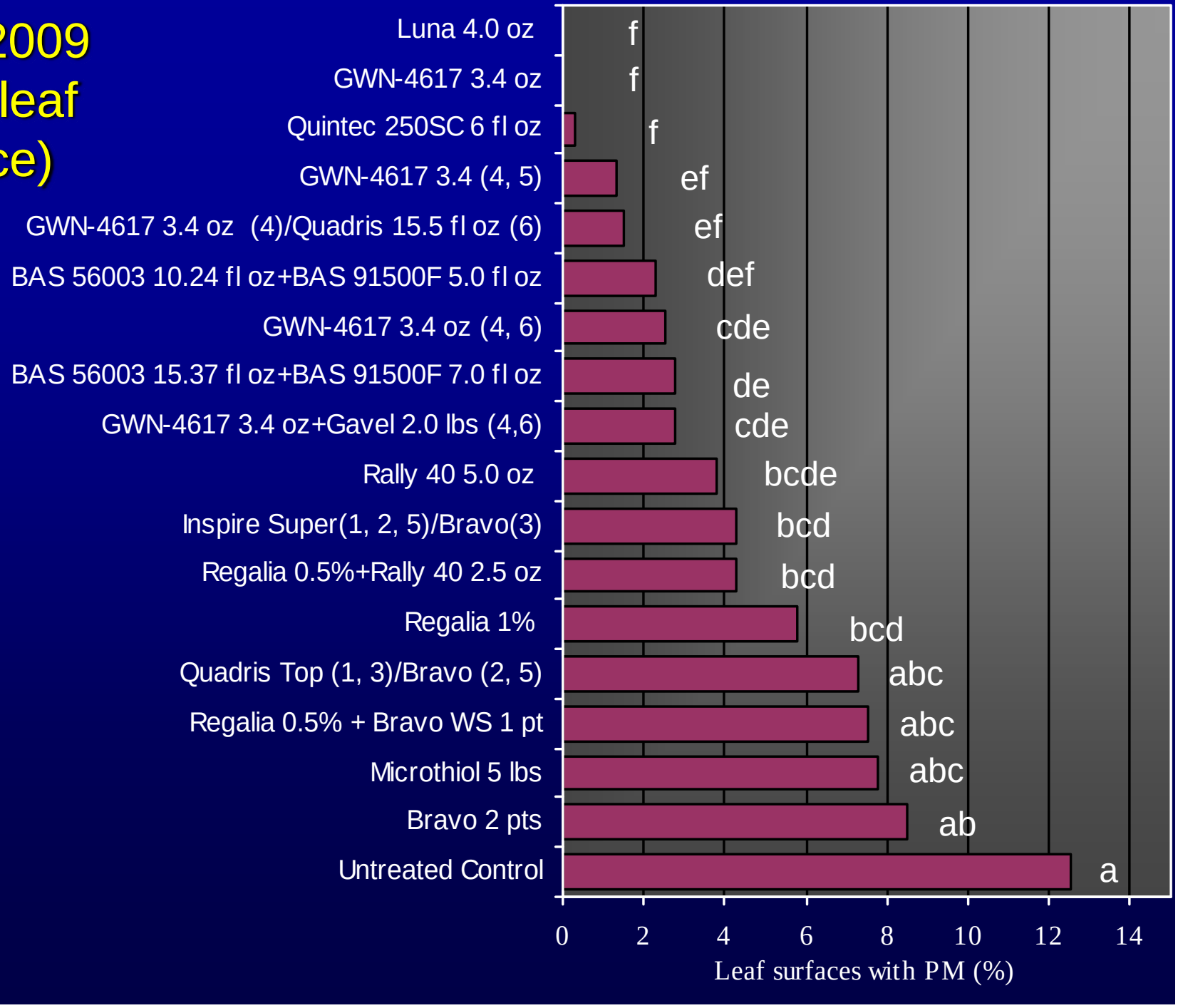
19 Sep 2008 (upper leaf surface)



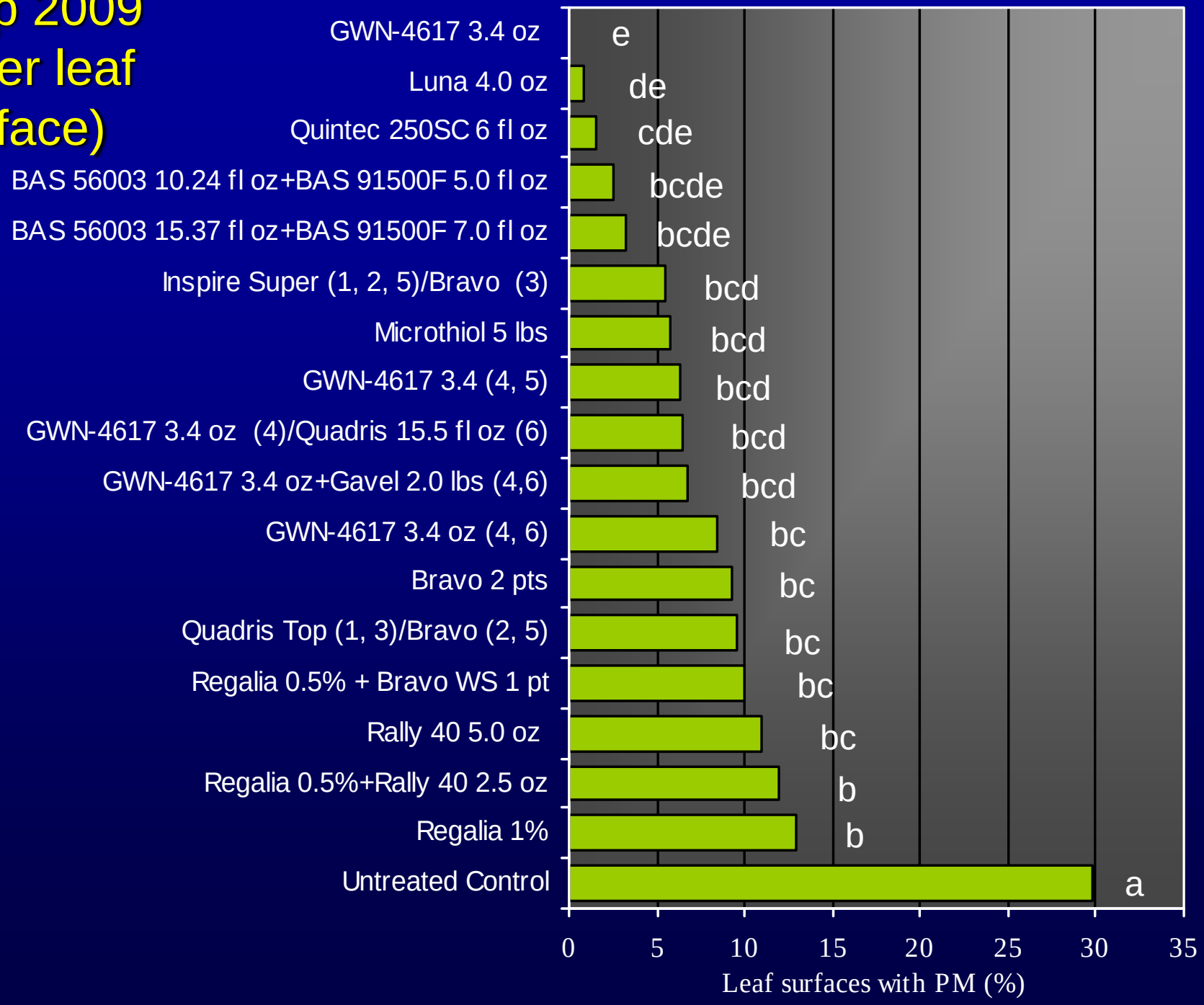
Summary

- Under the conditions of this trial, materials that provided control included
  - Procure 480SC, Rally 40SP
  - Quadris, Sovran
  - Endura
  - Pinpoint (V10118)
  - Microthiol Dispress
  - Inspire Super (difenoconazole:DMI + cyprodinil:Anilino-Pyrimines)
- Quintec performance was poor under these conditions

8 Sep 2009 (lower leaf surface)



8 Sep 2009 (upper leaf surface)



Summary, 2009

- Under the conditions of this trial, currently unregistered materials were among the best performing (GWN-4617, Luna and numbered BAS materials).
- Quintec performance was among the best when applied preventatively.

MELON DISEASES CAUSED BY VIRUSES

Potyviruses

Watermelon mosaic virus

Papaya ringspot virus

Zucchini yellow mosaic virus

- Aphid transmitted viruses
- Host range
  - all three infect cucurbits
  - WMV infects goosefoot, lambsquarters, Russian thistle, various legumes and cheeseweed

Symptoms on Watermelon Fruit

WMV and PRSV detected

General Potyvirus symptoms

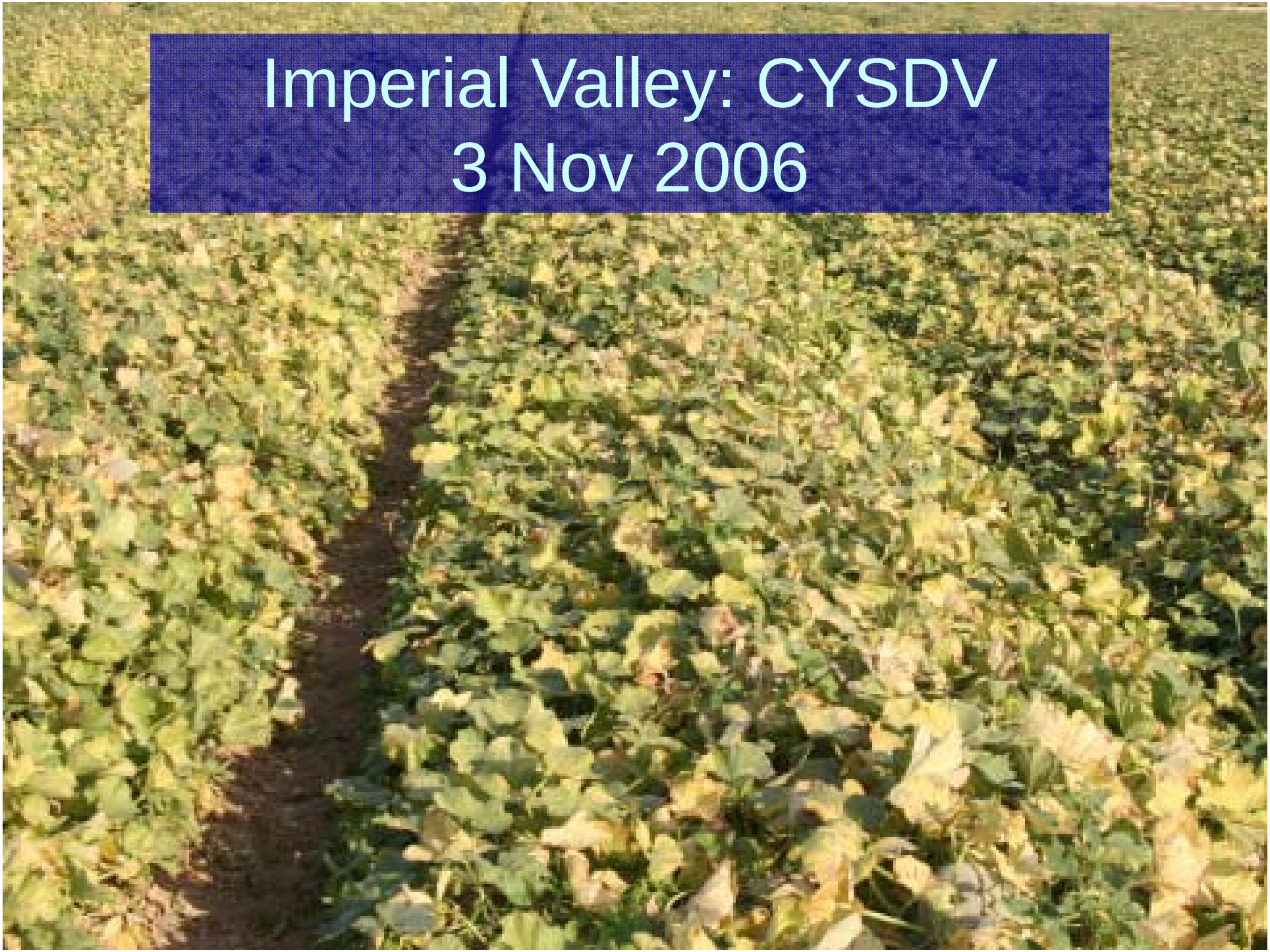
Watermelon Mosaic Virus

Zucchini Yellow Mosaic Virus

Management

- Insecticide applications are not recommended for control of potyviruses


Imperial Valley: Cucurbit yellow stunt disorder virus (CYSDV)
21 Oct 2006


Imperial Valley: CYSDV
3 Nov 2006

Transmission of CYSDV

- *Silverleaf whitefly* (*Bemisia tabaci* biotype B)
  - Semipersistent:
    - acquired in as little as two hour of feeding
    - transmitted for 7 days
- No evidence that it is seed-borne

Host Range of CYSDV

- Cucurbits (muskmelon, watermelon, cucumber, pumpkin and squash)
- Alfalfa, lettuce, bean (*Phaseolus vulgaris*), alkali mallow (*Sida hederacea*) and Wright's groundcherry (*Physalis wrightii*). *
- Transmission tests demonstrated that lettuce, snap bean, alkali mallow, Wright's groundcherry, and buffalo gourd (Cucurbita foetidissima). *

* Wintermantel, William M. Hladky, Laura L. Cortez, Arturo A. Natwick, Eric T. 2009. Plant disease. v. 93, no. 7 p. 685-690.

Aphid-borne yellows virus

Acknowledgements

- California Melon Research Board
- PCAs and growers
- Staff at UC WSREC
- Robert Gilbertson
- William Wintermantel
- Michael Stanghellini

Downy Mildew –

Pseudoperonospora cubensis

Downy Mildew –

Pseudoperonospora cubensis

Pseudoparonospora cubensis

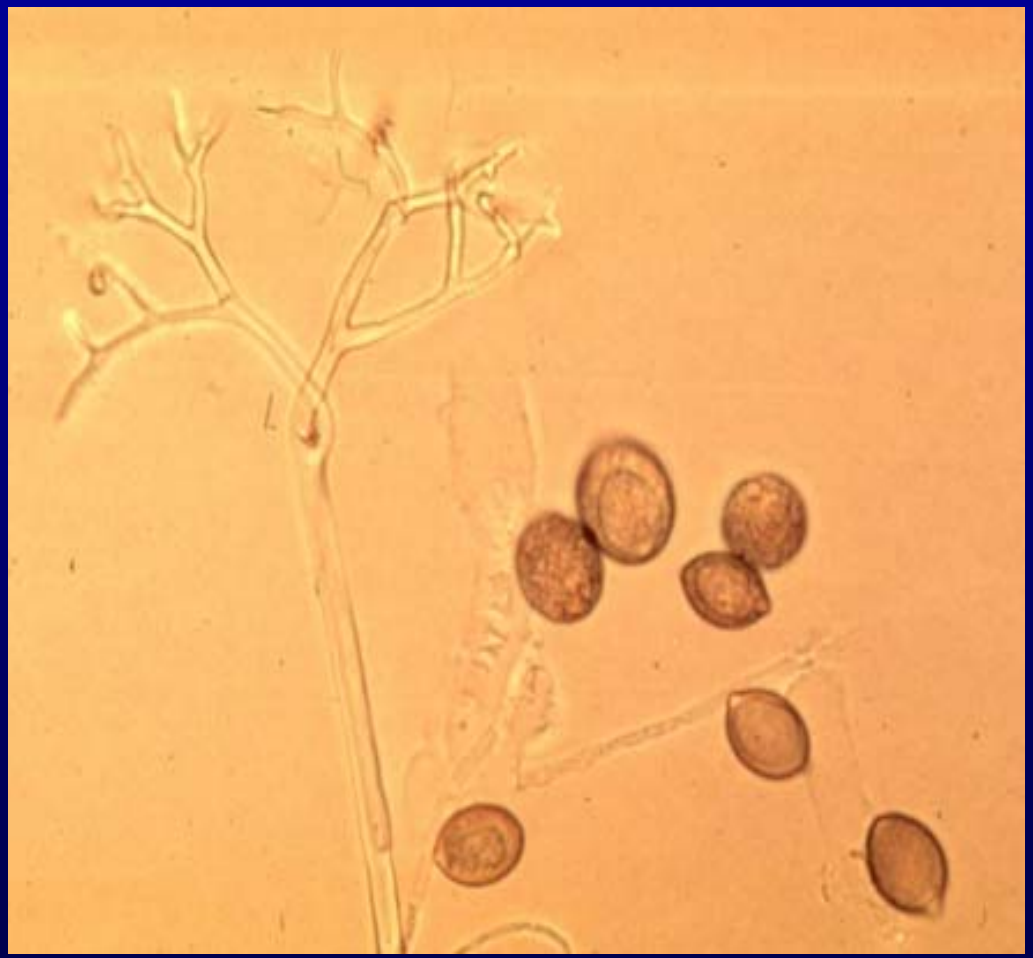


Photo by Gerald Holmes

Damage

Photo by Frank Laemlen

Fusarium Wilt - *Fusarium oxysporum f. sp. melonis*

Photo by Mike Davis

Fusarium wilt of watermelon

Fusarium oxysporum f. sp. *niveum*

Photo by Mike Davis