Effects of Preharvest Fungicides & Other Compounds on Postharvest Decay Control

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The Need

- Control of postharvest decay is always a concern.
- Many postharvest control measures.
  - Fungicides, temperature management, handling practices, etc.
- Preharvest application of Benlate has provided good postharvest decay control over a relatively long period.
  - Need a replacement for Benlate.

Compounds Tested

- Benlate (Benomyl) – 2 lb/acre.
- Ferbam – 8 lb/acre. Used in one test only.
- Enable – 8 fl oz/acre.
- Aliette – 5 lb/acre.
- Phosphorous acid (Nutriphite or Phostrol) – 4 pints/acre.

Compounds Tested

- Metallic copper (Kocide DF) – 4 lb/acre.
- Messenger (Harpin protein) – 9 fl oz/acre.
- Abound (Azoxystrobin) – 16 fl oz/acre.
- Actigard - 100 ppm + 0.025% Silwet.
- Topsin – 2 lb/acre.
- Headline – 16 fl oz/acre.

Experimental Setup

- Materials applied at 125 gal/acre.
- Fruit harvested 2 days and then 2 weeks after spray application.
- Fruit was degreened if necessary, washed and waxed (shellac).
  - No fungicides used or added.
- Stored at 50°F with 95% RH until evaluated.

Results - Fallglo

1st harvest (9/20/00). Evaluated 10/24/00.

- The fruit had poor color when harvested.
  - Degreened overnight with 5 ppm ethylene at 85°F (95% RH).
- Anthracnose developed rapidly (~50%).
- No significant differences between treatments.
  - Surprising because Benlate should have helped with the Anthracnose.

Results - Fallglo

2nd harvest (10/9/00). Evaluated 12/26/00.

- Fruit had much better color when harvested.
  - Still degreened overnight with 5 ppm ethylene at 85°F (95% RH).
- Much longer shelf life.
- Anthracnose & stem-end rots about equal.
- No significant differences in the % of healthy fruit between treatments.

Results - Sunburst

2nd harvest (11/23/99). Evaluated 1/20/00.

Treatment	% Healthy Fruit
Benlate	94 A
Nutriphite	71 AB
Kocide, Control, Ferbam, Enable, Aliette	60 to 40 B

Results - Sunburst

1st harvest (12/13/00). Evaluated 2/28/01.

Treatment	% Healthy Fruit
Benlate	97 A
Aliette, Actigard, Control, Enable, Abound, Nutriphite, Kocide	87 to 79 B

Decay due mostly to stem-end rots.

Results - Sunburst

2nd harvest (12/21/00). Evaluated 1/31/01.

Treatment	% Healthy Fruit
Benlate	99 A
Aliette	86 AB
Actigard, Control, Enable, Abound, Nutriphite, Kocide	83 to 62 B

Results - Sunburst

1st harvest (12/6/01). Evaluated 2/25/02.

- Tested Benlate, Topsin, Phostrol, and Headline.
- No significant differences.
  - Trend Benlate, Topsin, Phostrol, Headline & had 57 to 47% healthy fruit (respectively).
  - Control had only 39% healthy fruit.

Results - Sunburst

2nd harvest (12/18/01). Evaluated 3/12/02.

Treatment	% Healthy Fruit
Benlate, Topsin, Phostrol, Headline	53 to 46 A
Control	25 B

Results – Marsh GF

1st harvest (3/19/01). Evaluated 5/31/01.

Treatment	% Healthy Fruit
Benlate	88 A
Control	61 B
Kocide, Abound, Aliette, Enable, Nutriphite	52 to 42 BC
Actigard	34 C

Results – Marsh GF

2nd harvest (4/2/01). Evaluated 6/6/01.

- No Significant differences.
  - Healthy fruit p = 0.061
  - Stem-end rot p = 0.070
- % healthy fruit trend:
  - Benlate (85%) > Nutriphite > Kocide > Aliette > Abound > Control > Enable > Actigard (66%).

Results – Marsh GFT

1st harvest (2/27/02). Evaluated (6/25/02).

Treatment	% Healthy Fruit
Topsin	82 A
Benlate	75 AB
Phostrol	69 ABC
Headline	62 BC
Control	54 C

Results – Marsh GFT

2nd harvest (3/11/02). Evaluated (7/12/02).

Treatment	% Decay
Topsin	6 B
Benlate	14 AB
Phostrol	17 AB
Headline	18 AB
Control	32 A

Results – Valencia

1st harvest (4/25/02). Evaluated (8/7/02).

- No significant differences. Trend of healthy fruit:
  - Benlate (80%)
  - Topsin (75%)
  - Phostrol (63%)
  - Control (62%)
  - Headline (60%)

Results – Valencia

2nd harvest (5/6/02). Evaluated (8/7/02).

Treatment	% Healthy
Topsin	83 A
Benlate	79 A
Headline	56 B
Phostrol	51 B
Control	46 B

Results – Messenger

Jiuxu Zhang – Lead Investigator

- Tested preharvest on:
  - Ray Ruby grapefruit
  - Murcott tangerine
  - Hamlin
  - Valencia oranges

Results – Messenger

Jiuxu Zhang – Lead Investigator

- Significantly reduced stem-end rot on degreened 'Ray Ruby' grapefruit.
- No significant difference found on Murcott, Hamlin and Valencia.
- Bottom Line: Variable Results

Conclusions

- Benlate & Topsin are the most consistent product we have tested.
- Aliette, Abound, Enable, Actigard, and Kocide were never significantly better than the control.
- Phosphorous acid only significantly better than the control on one harvest.

Conclusions

- Topsin was similar to Benlate and significantly better than the control on several tests.
- Further tests with Topsin are planned for the upcoming season.

Thank You