Testing Whey as an Effective Control for Powdery Mildew

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Introduction

- Effects of powdery mildew infection in vineyards:
  - Crop loss
  - Reduced yields
  - Economic loss
  - Quality control

Variety of products available to growers
- Ex: Kaligreen, Stylet Oil, Sulfur, Rally etc.

Organic alternatives are also available for use
- Ex: compost teas, vegetable and mineral oils

Sulfur

Pros:
- Excellent control
- History of use
- Currently registered organic

Cons:
- Lbs. used in CA
- Worker safety
- Effect on natural enemies

Why whey powder as an alternative?
- Dairy industry by-product from cheese and butter processing
- Cost of disposal to dairy industry
- Sustainable product if put to use in vineyards
  - The “green” triangle: Environmental, social and economically sound.

History of using whey to control powdery mildew
- Bettiol, Brazil (1997) tests on cucumbers
- Peter Crisp, Australia (2001) tests on grapes
**Key Question**

- Can whey be an effective control against powdery mildew in high pressure climates?

**Methodology**

- **Treatments:** Four Replications
  - White = control or no treatment
  - Red = Sulfur + Kaligreen + Stylet oil
  - Blue = whey1* + Kaligreen + Stylet oil
  - Yellow = whey2* + Kaligreen + Stylet oil

  * Whey1 received more whey applications than whey2 treatment.

- **Research Sites:**
  - Laetitia Vineyard (Coastal)
  - James Berry Vineyard (Inland)

- **Variety Tested:**
  - Chardonnay, clone 4

- **Application Rates Used:**
  - Sulfur: 3lbs./acre
  - Kaligreen: 4lbs./acre
  - Stylet oil: 1% Solution (100-200 gal/acre)
  - Whey: 45g/l (500-600 liters/ha)

**Results**

- **ANOVA:** General Linear Model
  - p-value<.05

  - **Percent Leaf Infection**
    - There was statistical difference between the control treatment (white) and the other treatments.
    - No statistical difference between the sulfur (red), whey1 (blue) and whey2 (yellow) treatments.
Results

- ANOVA: General Linear Model
  p-value < .05

Percent Cluster Infection
- No noticeable difference between sulfur (red) and whey2 (yellow) treatments or between whey1 (blue) and whey2 (yellow) treatments.
- Sulfur (red) treatment showed a higher percent infection compared to the whey1 (blue) treatment.
Results

Conclusions

- Whey powder can be used as an effective treatment for powdery mildew.
- Proper spray equipment and spray protocols should be followed.
- Further research should be conducted to assess soil/water impacts, ecological interactions, and effect (if any) on wine quality.

Resources and Acknowledgements


www.naturescontrol.com/pesticidewaitperiods.html
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