Investigating Fungicide Rainfast Characteristics

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Rainfast Characteristics Fungicides and the Effect on Cherry Leaf Spot Efficacy

• **Hypothesis:** After a wetting event, fungicide residues vary based on chemistry and that rate of residue wash-off influences leaf susceptibility to CLS

• **Objectives:**
  • Determine rainfast characteristics of CLS fungicides
  • Evaluate CLS susceptibility of leaf tissue with different fungicides and rainfall amounts
Methods

• Single tree treatments were applied to 15-yr-old Montmorency in randomized complete block design:
  – Bravo®, Pristine®, Gem®, Dodine + Captan, Cuprofix® Ultra 40 Disperss®, and UTC
  – Sprays were applied to run-off (equivalent to 300 gal/A) at 300-350 psi

• Branch and spur samples were collected from each treatment after the fungicides had dried

• Samples were placed in a Generation 3 Research Track Sprayer to simulate exposure:
  – 0”, 0.1”, 0.5”, and 1” rain
Methods, cont.

- Residue samples were analyzed to determine impact of rainfall on fungicide residue
- Bioassays were conducted by exposing treatments to *B. jaapii* spores
  - Inoculated samples were placed into one-quart plastic containers with a lids
  - Treatments were evaluated every 4 days
Bioassay Results

- There were relatively low infection levels in Bravo treated samples.
- There was no significant decline in performance based on rain exposure.
Bioassay Results

- Copper completely suppressed infection when not exposed to rain.
- Copper lost efficacy as rainfall increased but overall remained one of the most effective treatments.
• Pristine (Strobilurin, boscalid mix) locally systemic and true systemic
• Pristine performed well, but lost significant efficacy after exposure to 1” rain
Bioassay Results

Gem

- Gem (trifloxystrobin) is surface systemic
- Gem efficacy broke down significantly at 0.1” rainfall
Bioassay Results

Samples receiving no fungicide treatment showed variable levels of infection from 3-17%!
Residue Results

Figure A. Residue of a.i. Based on Rainfall Exposure

- Confounding results from the residue tests
- Increasing to multiple replicates may better illustrate residue behavior
- Considering surface vs. interior residues may better describe residue
- Very dilute applications may also have contributed to these results
Conclusions

• The idea that loss of residue can be directly correlated to decreased efficacy may be flawed:
  – Differences in mode of action (locally systemic, systemic etc, surface vs. interior residue)
  – Differences in potency

• Increasing to multiple replicates for residue testing may better illustrate sample variability

• Testing a broader range of rainfall may help define when loss of significant residue and efficacy occurs

• Increasing overall sample size to a much larger scale will be necessary to minimize variation and develop a more statistically significant and robust data set
Thanks!

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