



Research Addressing Current and Future Solutions for Cranberry Fruit Rot

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Outline

Fruit Rot Management

Changing the toolbox

Timing and efficacy

Fruit Rot Resistant Varieties

Overheating Management

Timing

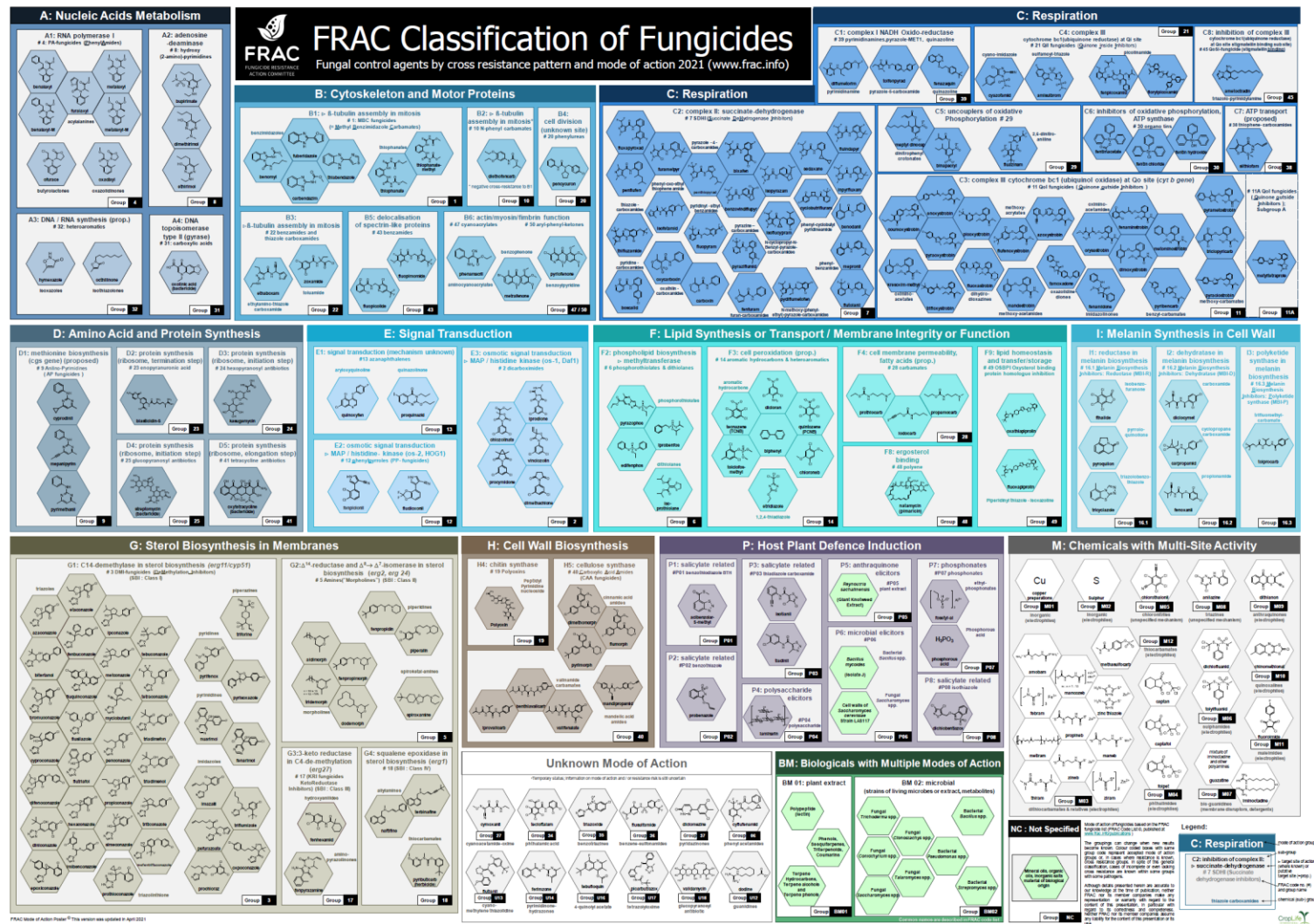
Evaporative cooling

Shade

Interaction with fruit rot

Fungicides

Finding the right one or combination



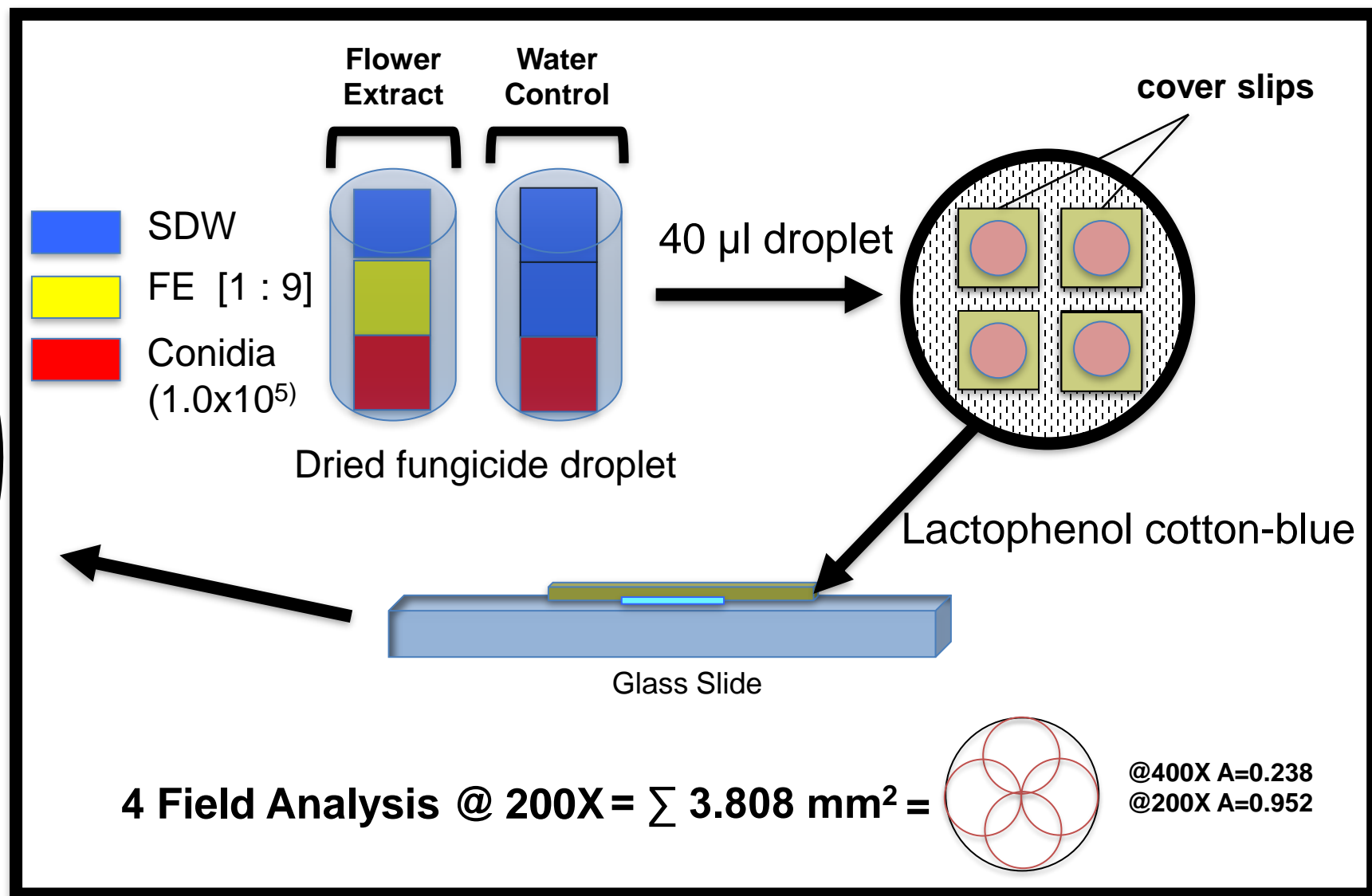
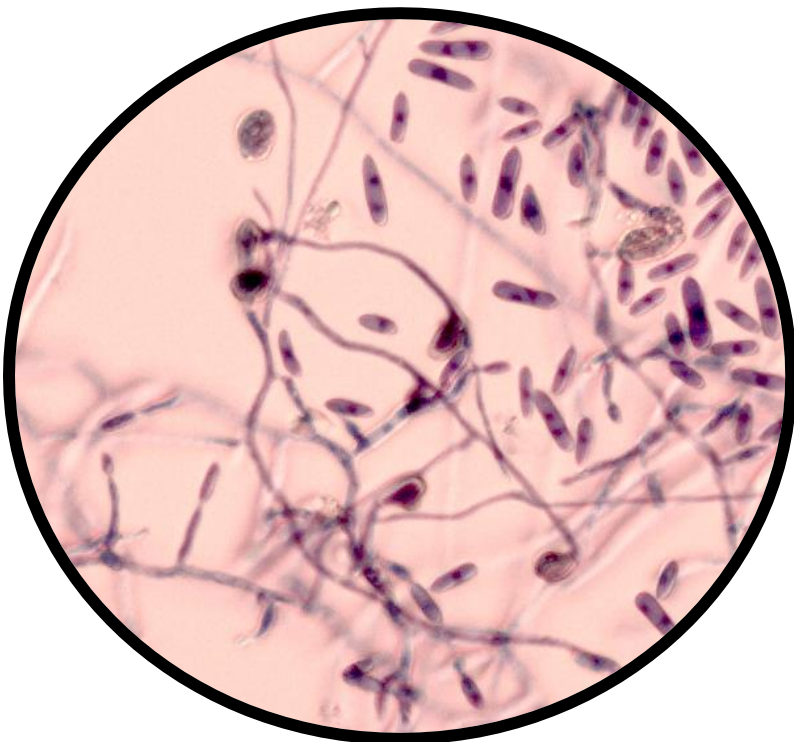


Fungicide screening

Fruit rot field trials
require space, time
and manpower

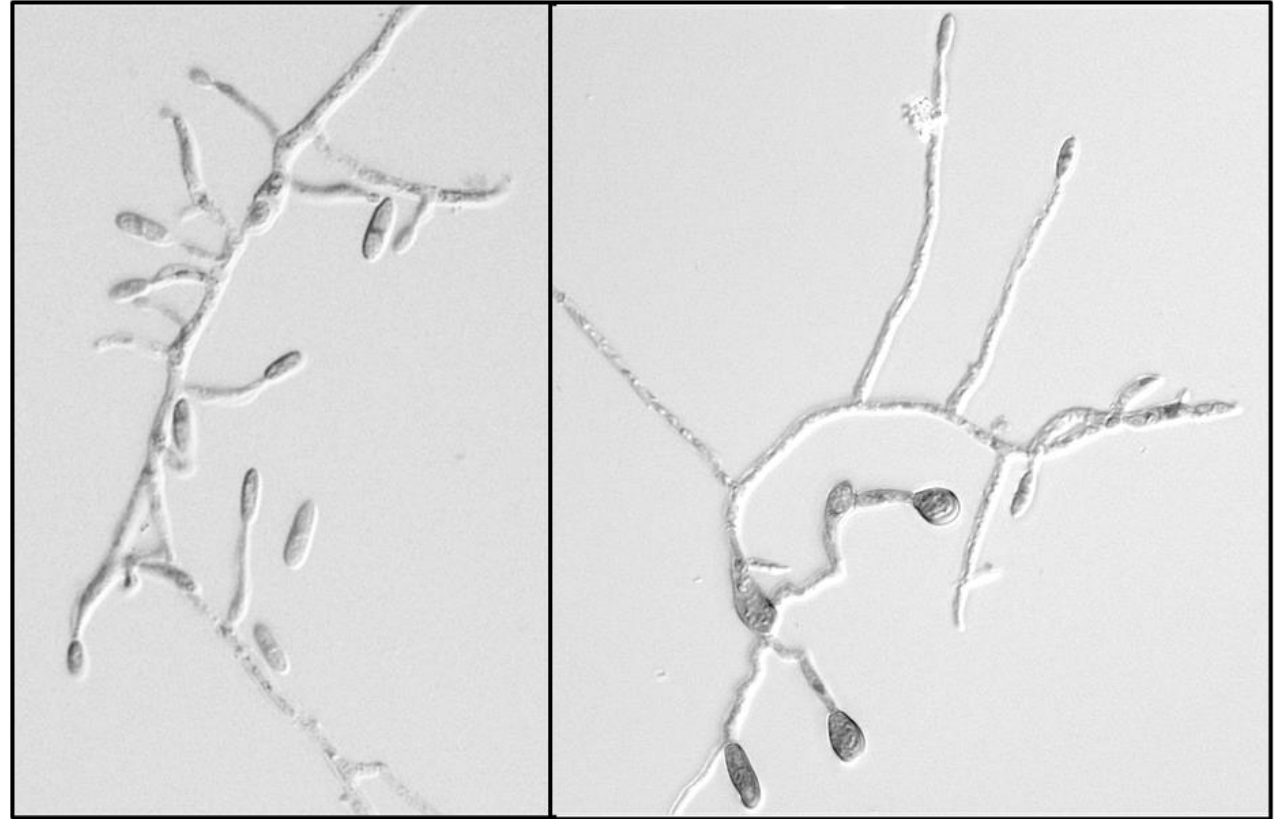
Limited Throughput

Flower Extract (FLEX) Bioassay



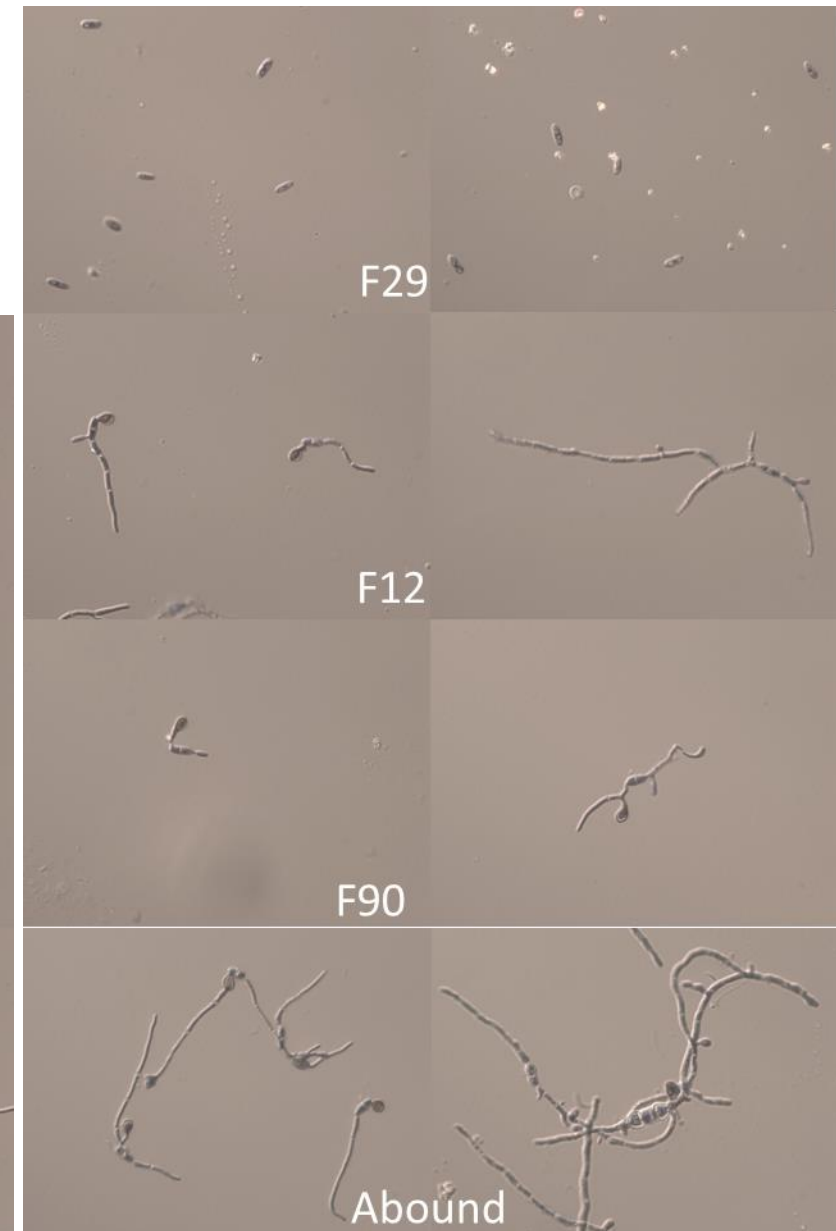
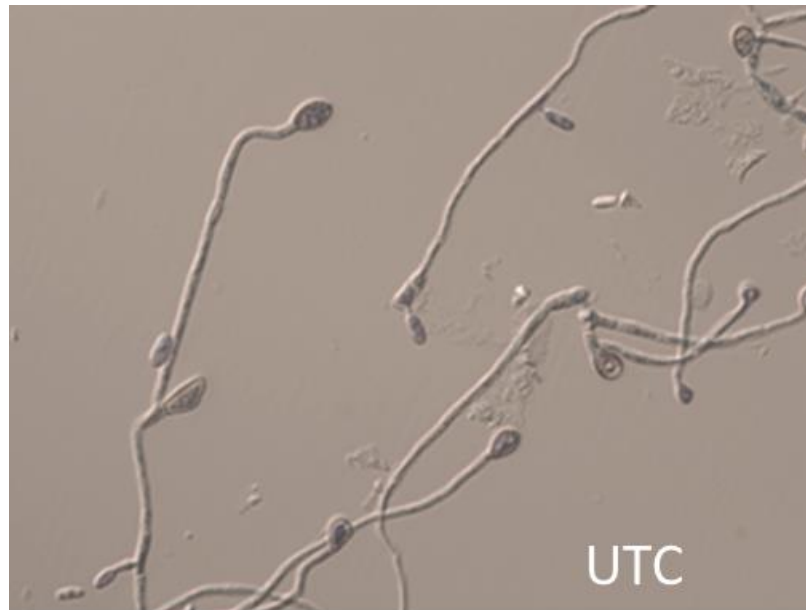
Results in 24 hours
requiring small
amount of space.

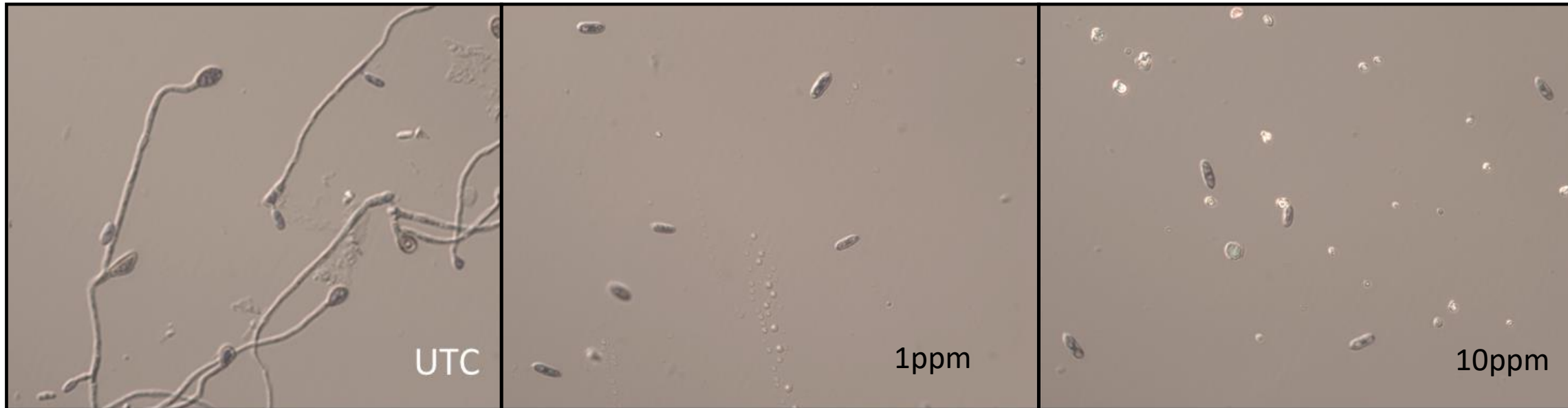
- Data is collected on key points of the infection cycle
- Germination
- Germ tub elongation
- Secondary conidiation
- Appressorium formation



FLEX Bioassay Screening Results

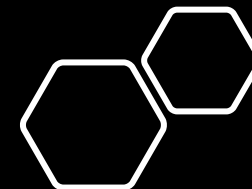
Fungicides were screened based on mode of action/groups. All fungicides were tested at 1ppm (shown below) as well as 10ppm and 100ppm.





F29 Trials

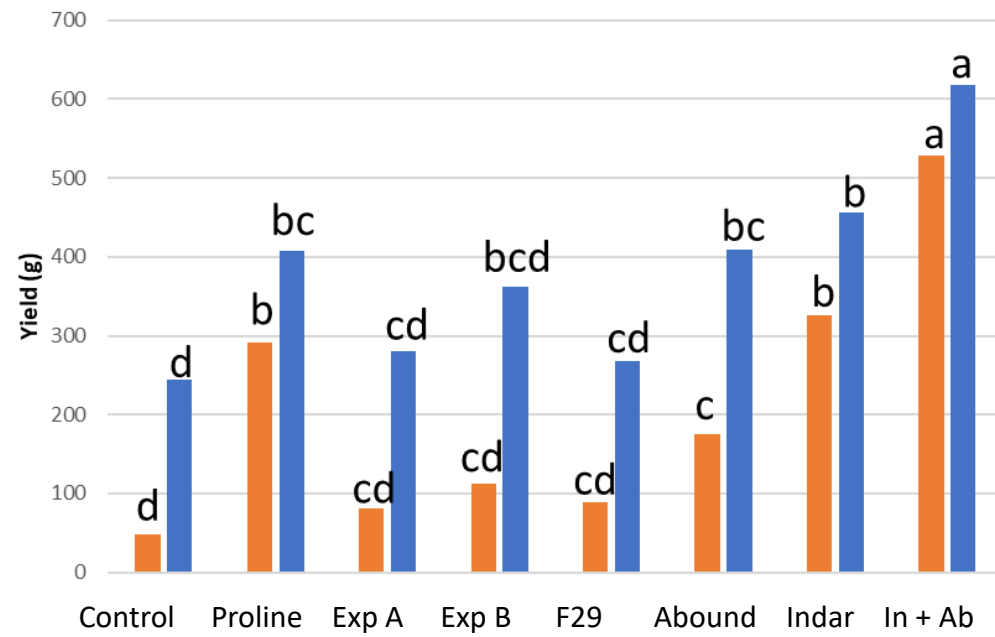
F29 is a protectant fungicide in a unique group of fungicides. It inhibits spore germination and the development of infection structures. It also interrupts cellular energy production by affecting mitochondrial function



F29: First Impressions

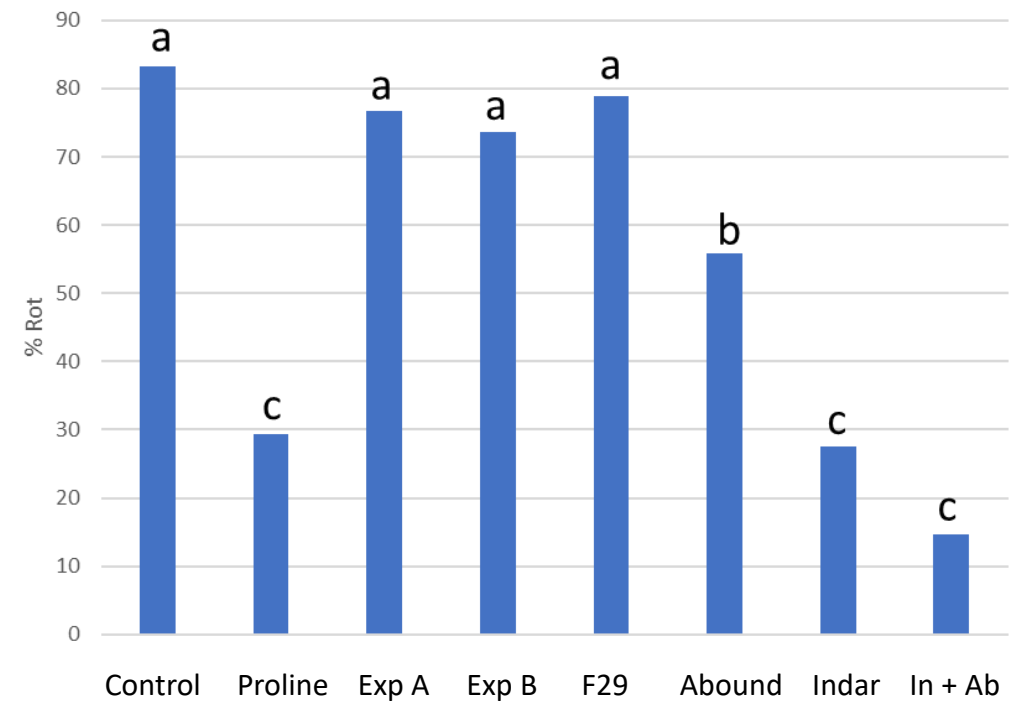
2007

Fungicide Trial 2007

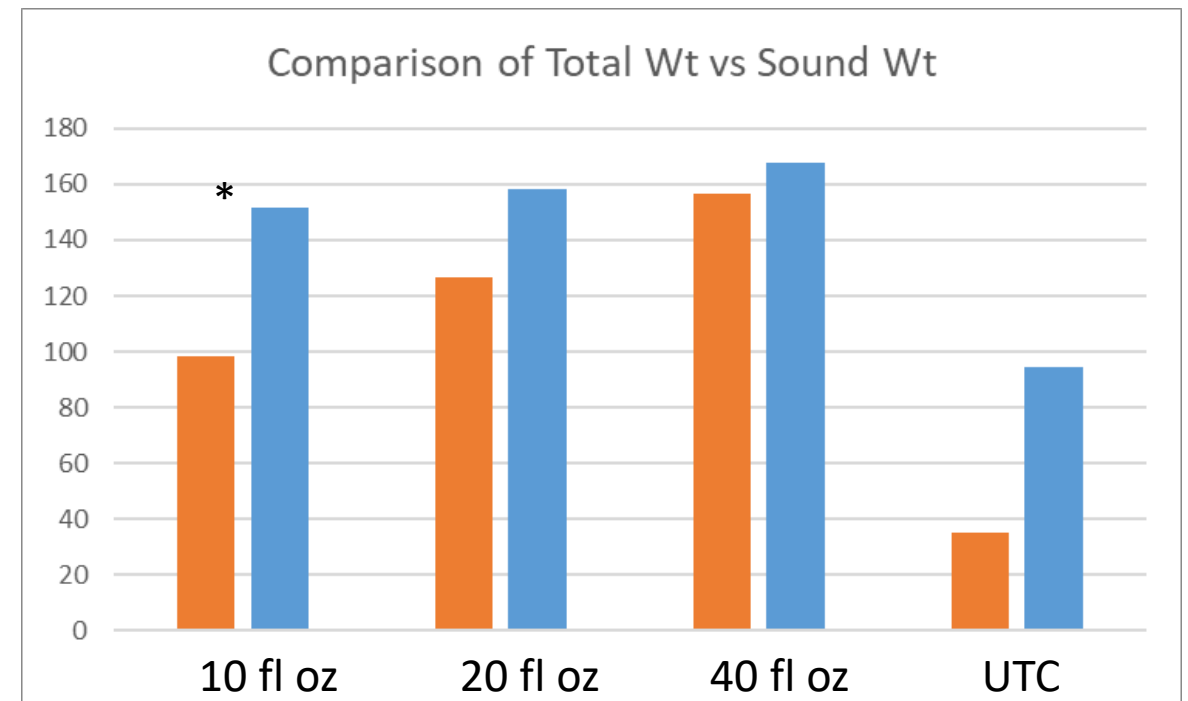
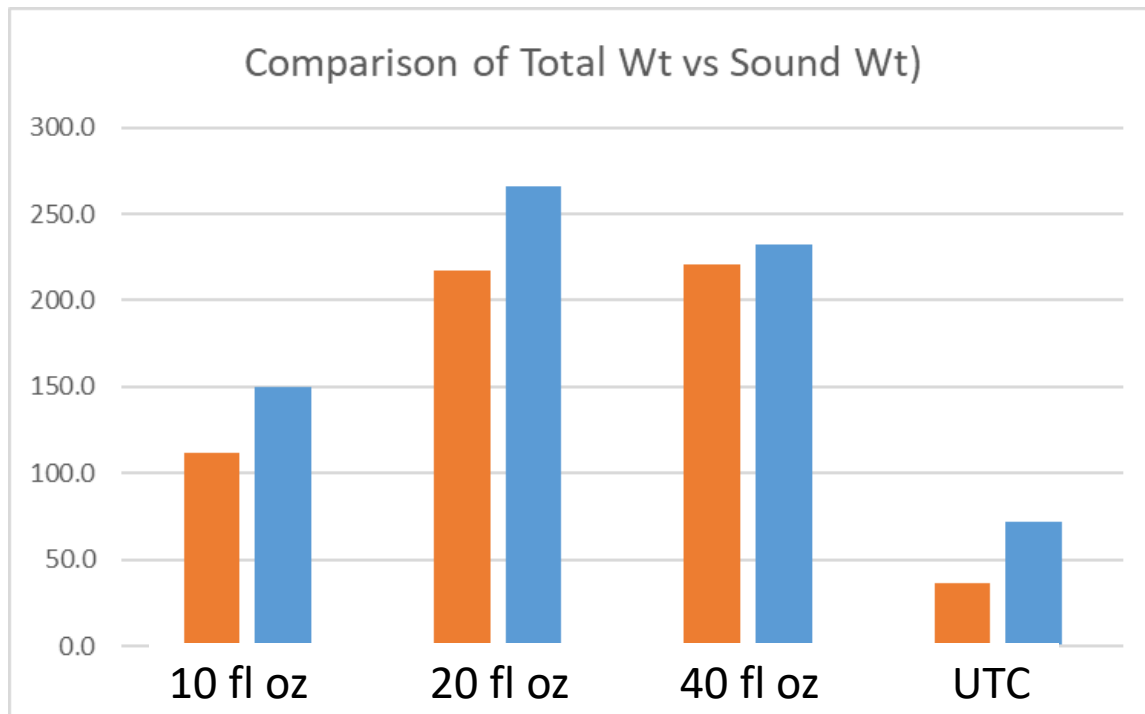
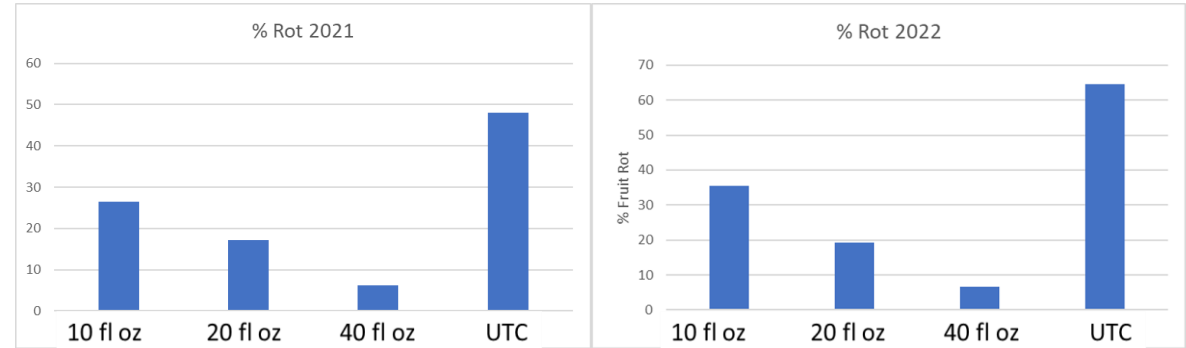


Healthy Wt Tot Wt

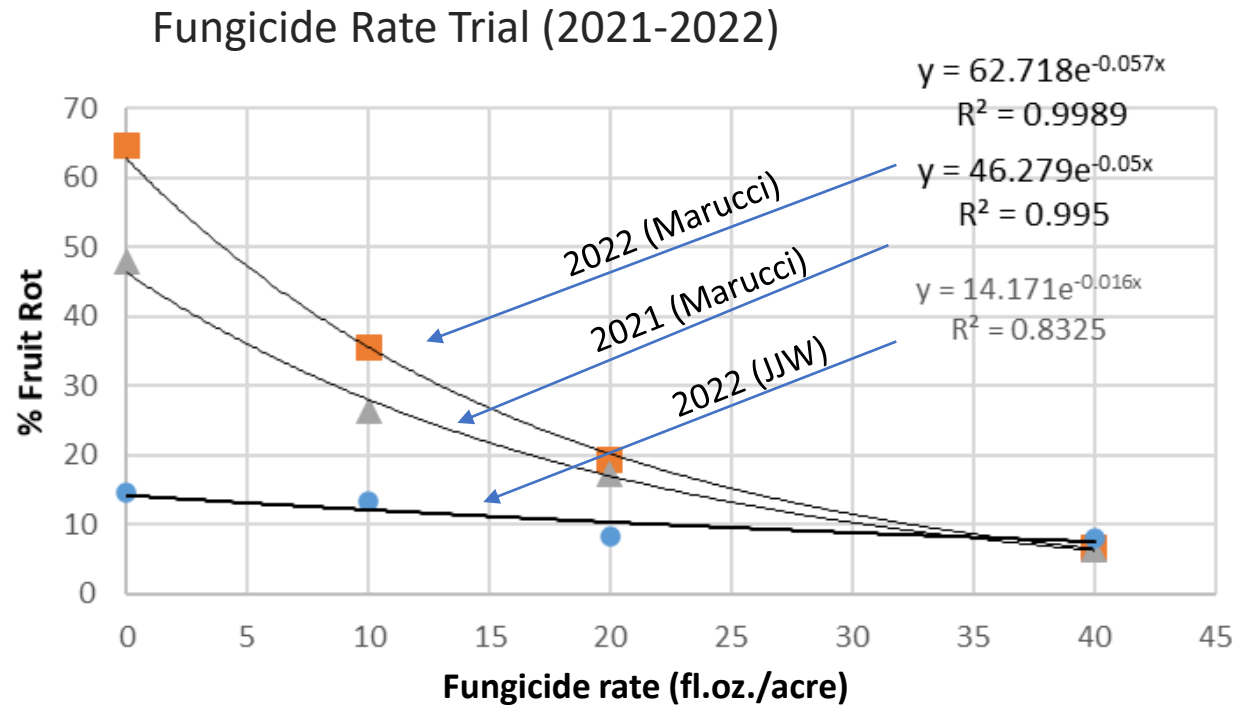
% Rot -2007



F29 Rate Trials 2021-2022



F29 Rate Test: 10, 20, 40 fl.oz/acre tested

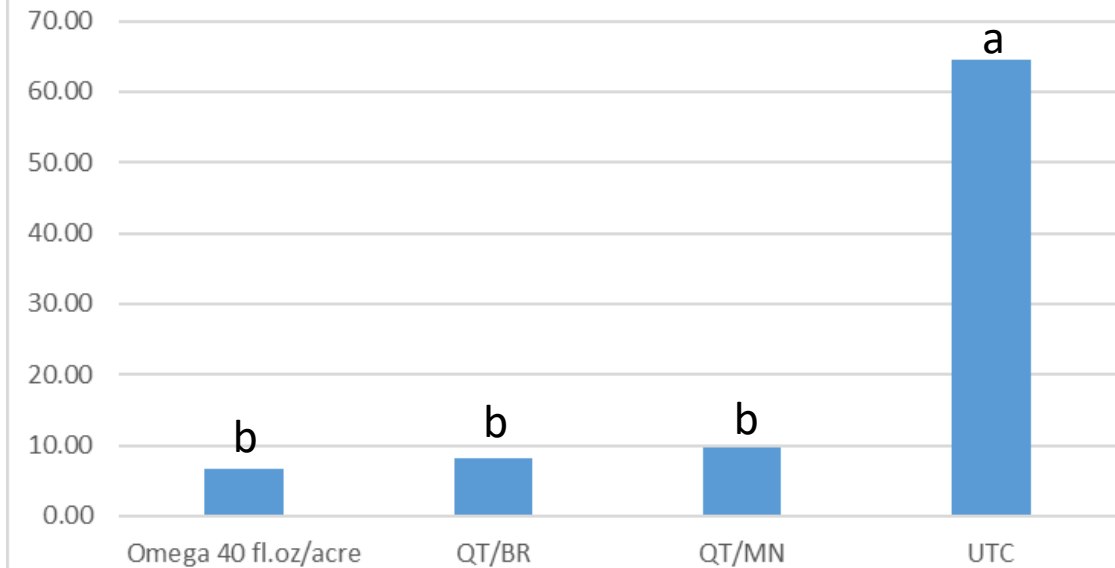


- Significant rate response

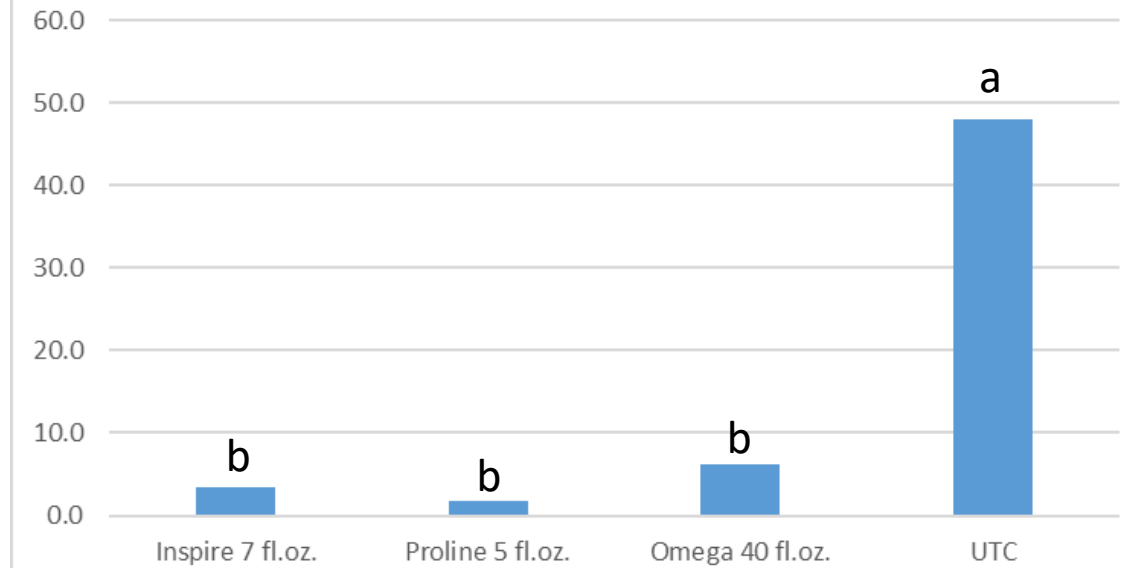
Comparison of F29 (40 fl.oz./acre) versus known controls

% Rot

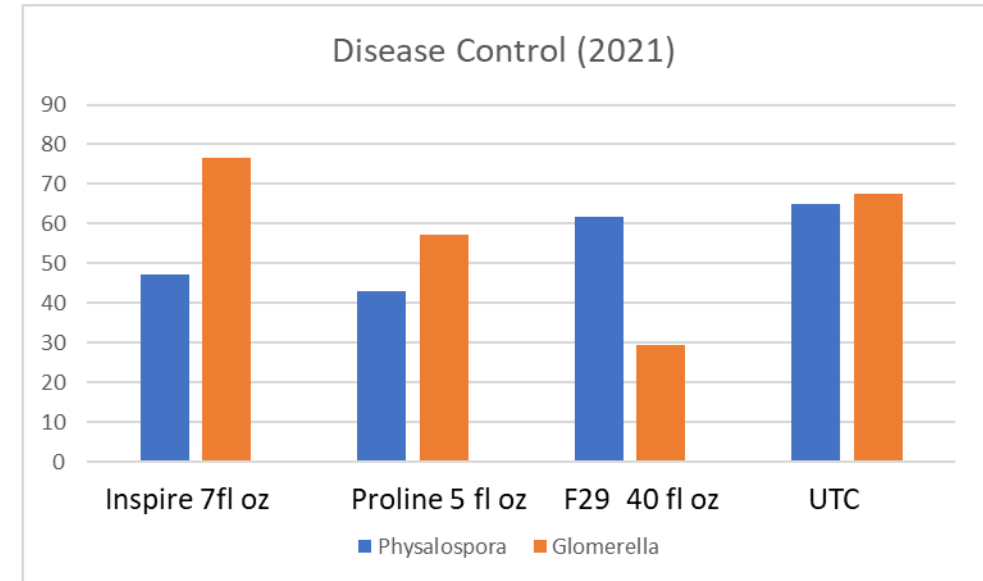
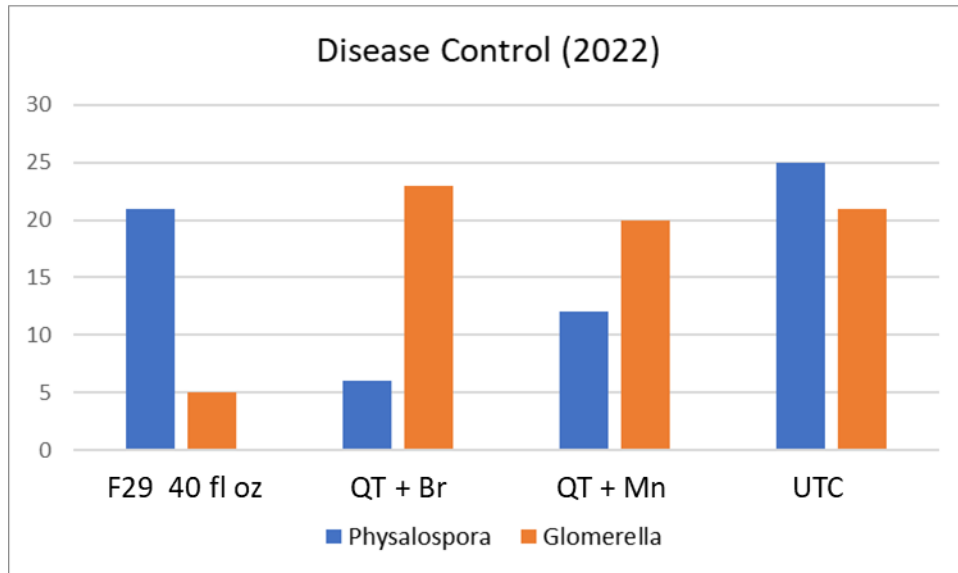
Disease Control (2022)



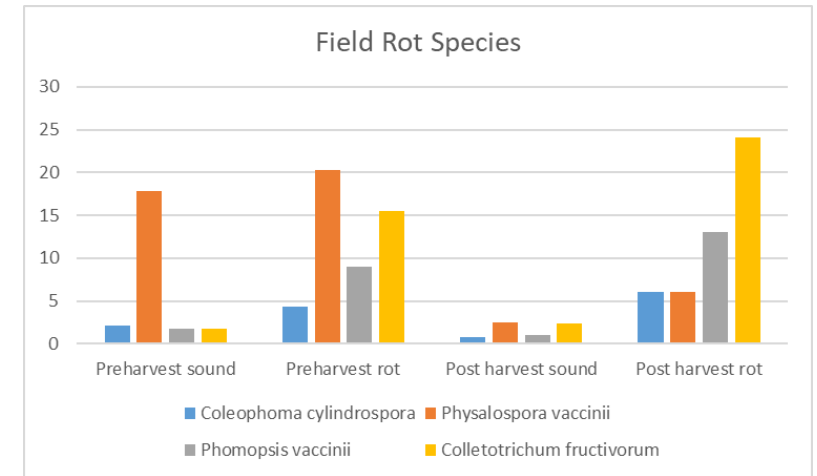
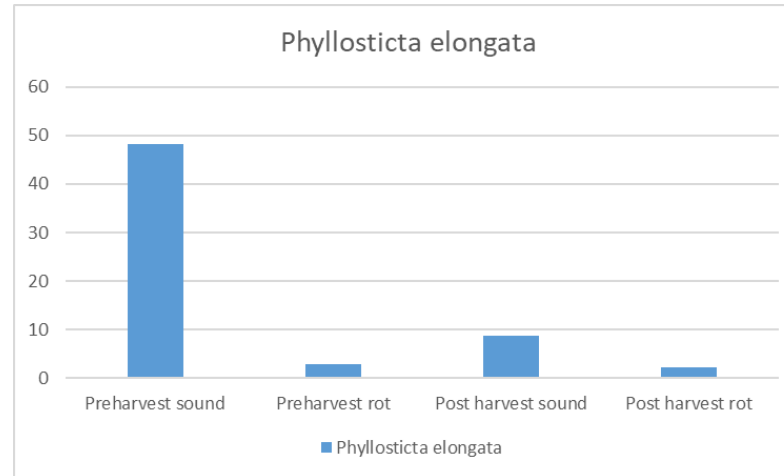
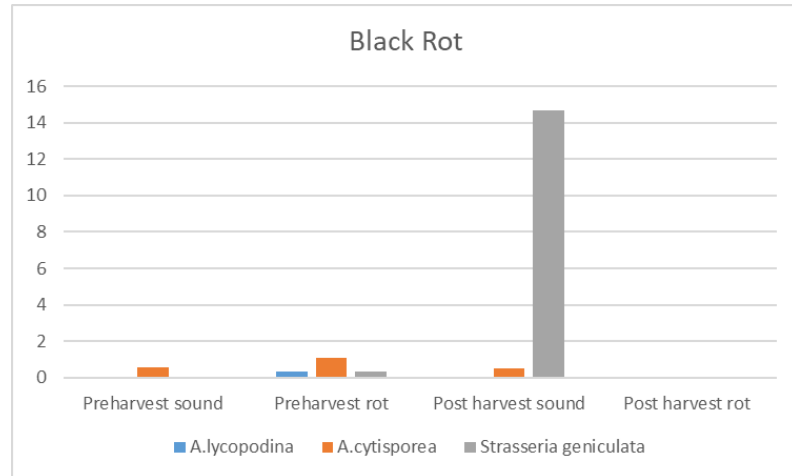
Disease Control (2021)



Fungal Profiles

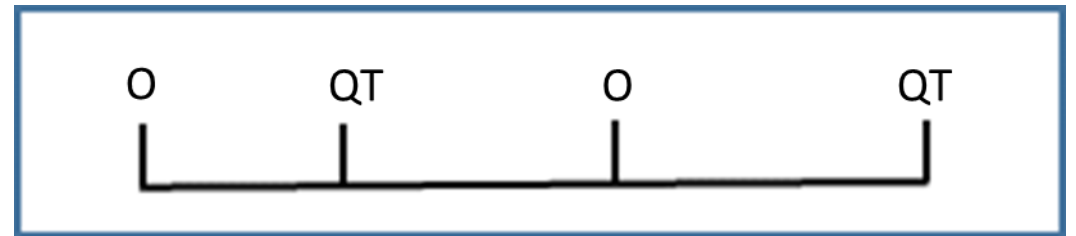


Distribution of Rot Species



Summary

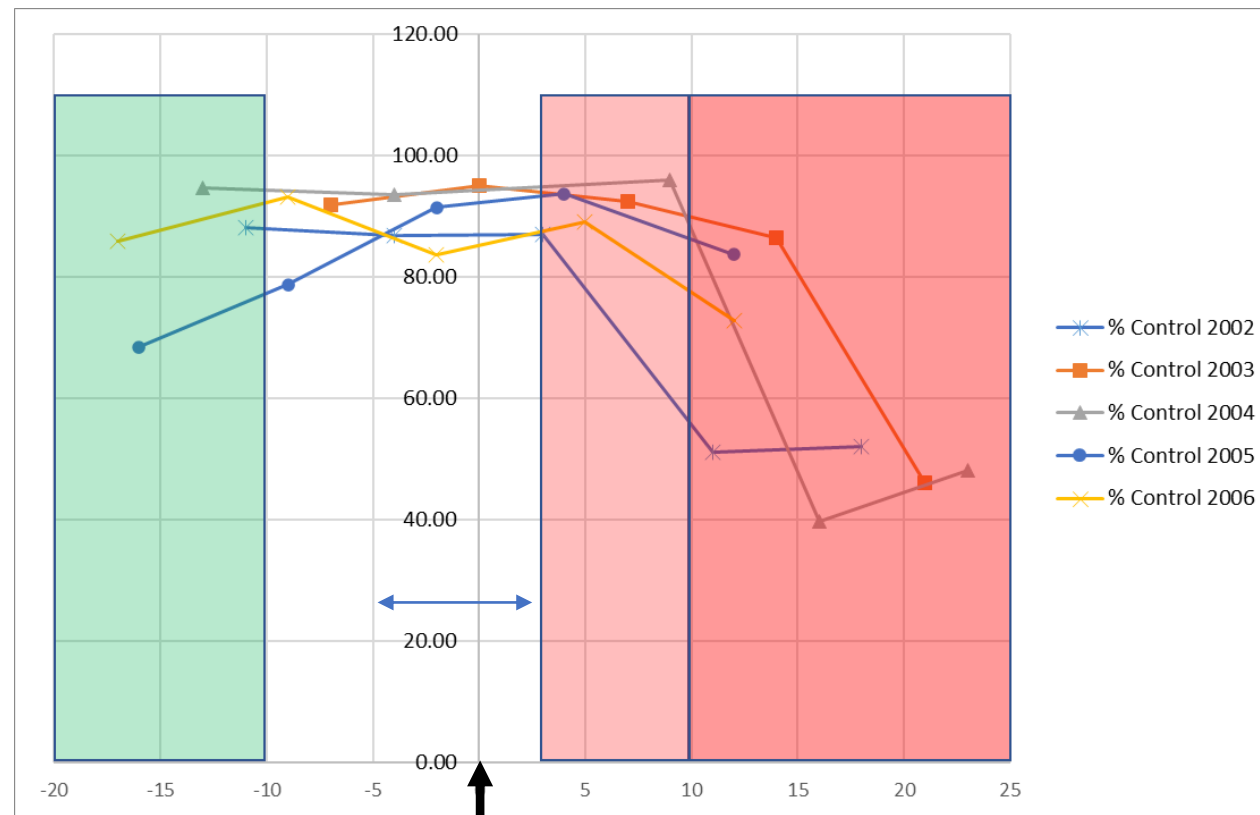
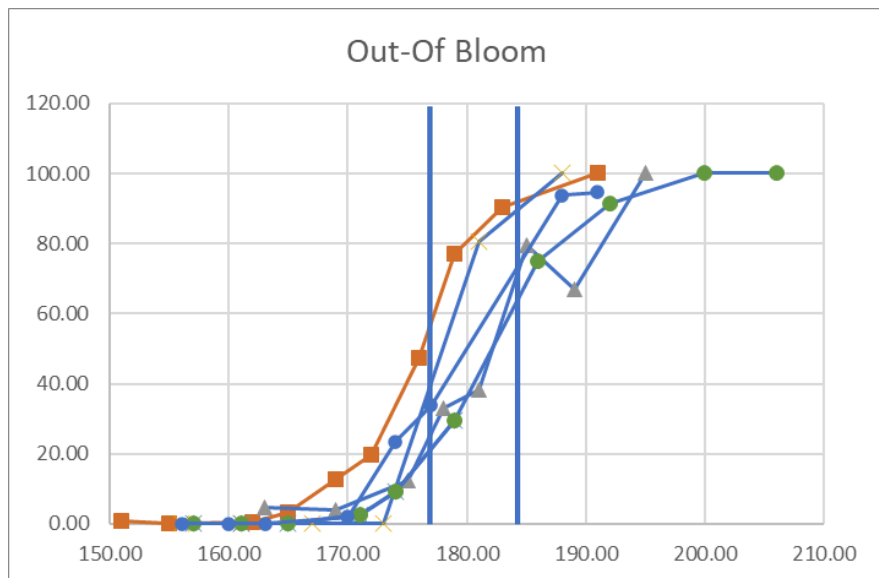
- This fungicide will be recommended for an IR4 in 2023
- Further work on use patterns are necessary to determine if alternation, combination can be used
- Since it is a mitochondrial toxin mixing partners with other mitochondrial toxins may be beneficial
- Skin irritation
- Toxic to fish and aquatic invertebrate
- Proposed us patterns 20-30 fl.oz./acre
- Alternate with QT



Fruit Rot Resistance Evaluations

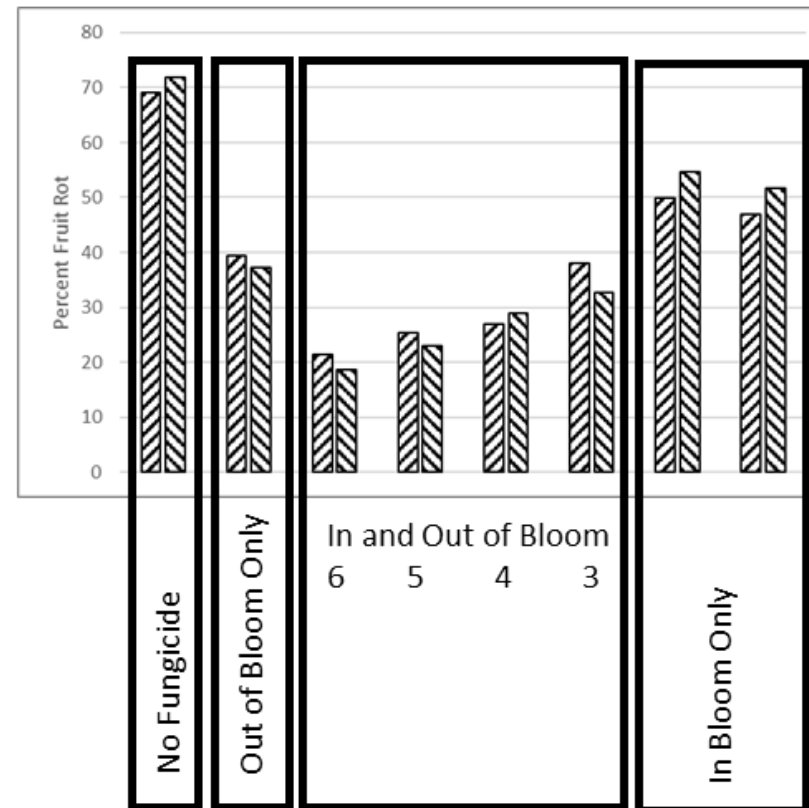
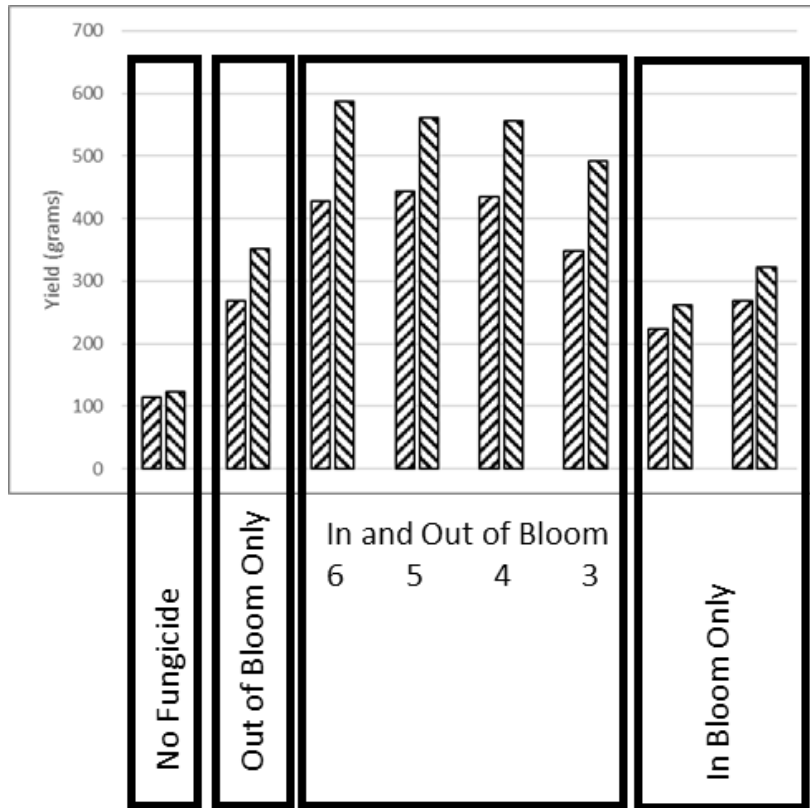


Establishing Optimal Start Date



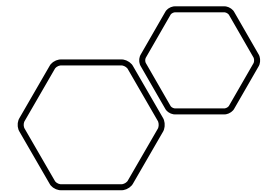
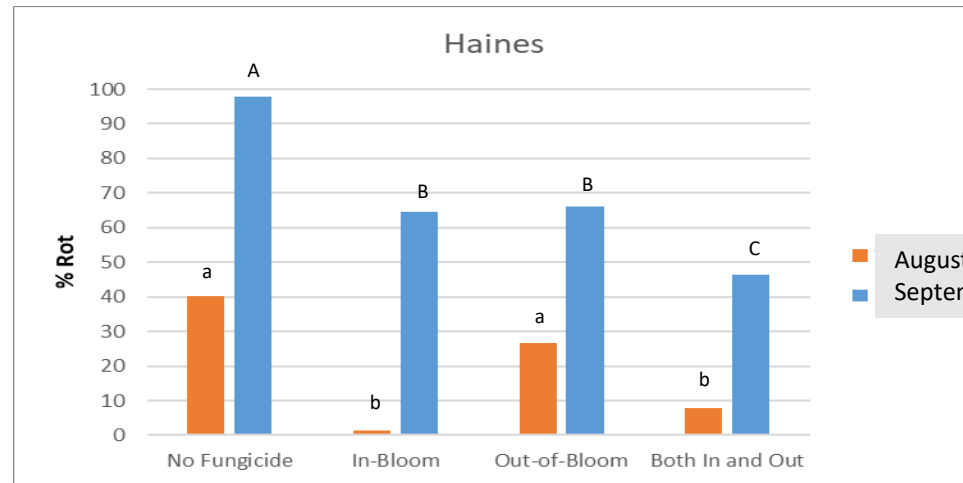
60% Out-of-bloom

Characteristics of susceptible varieties

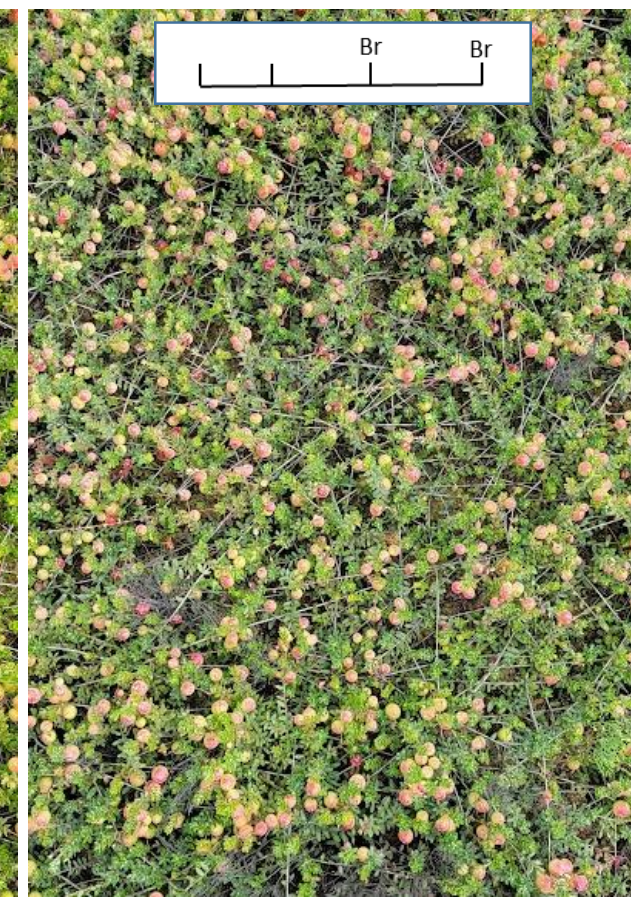




Fruit rot trials FRR Selections

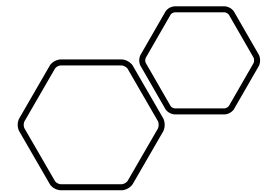
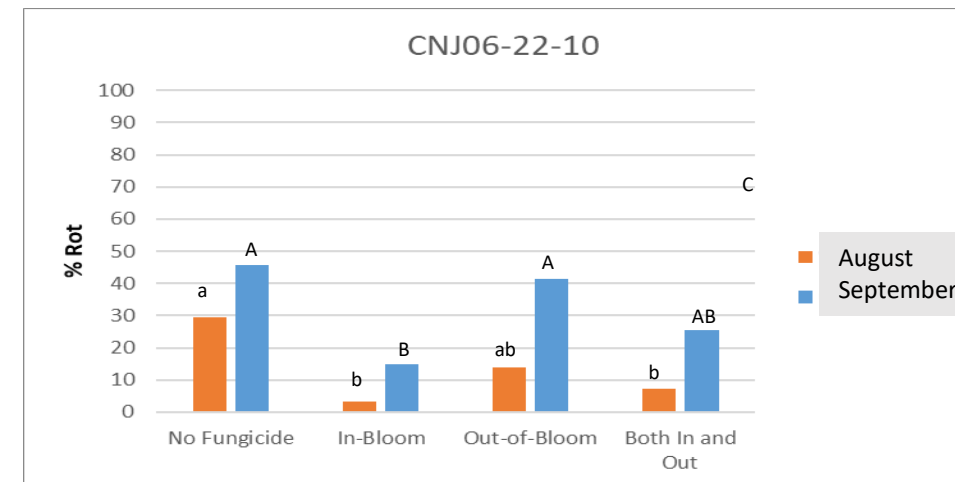


FR Susceptible



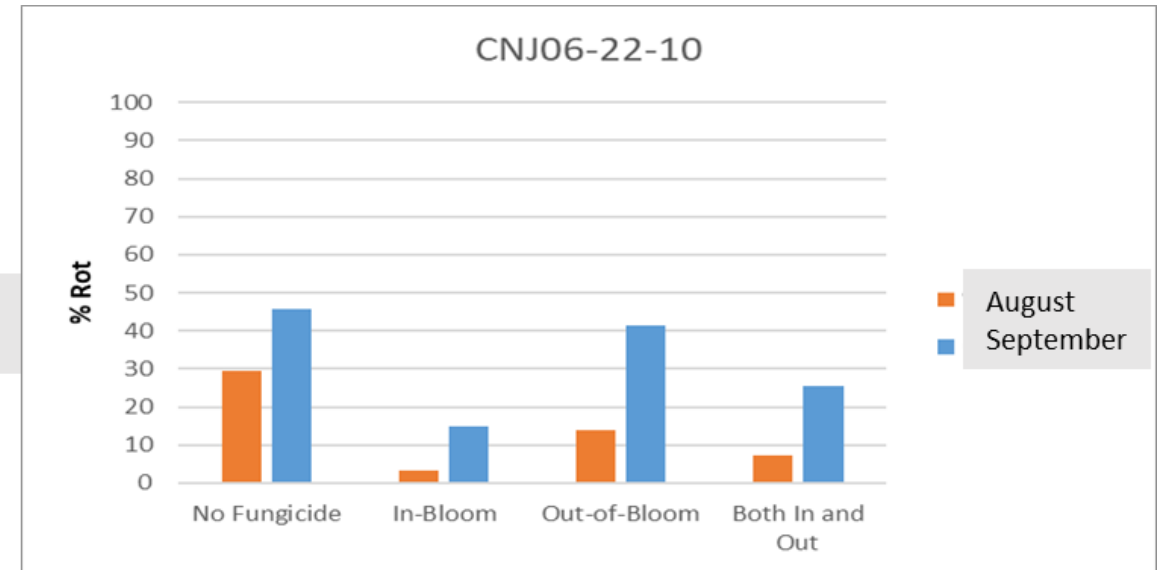
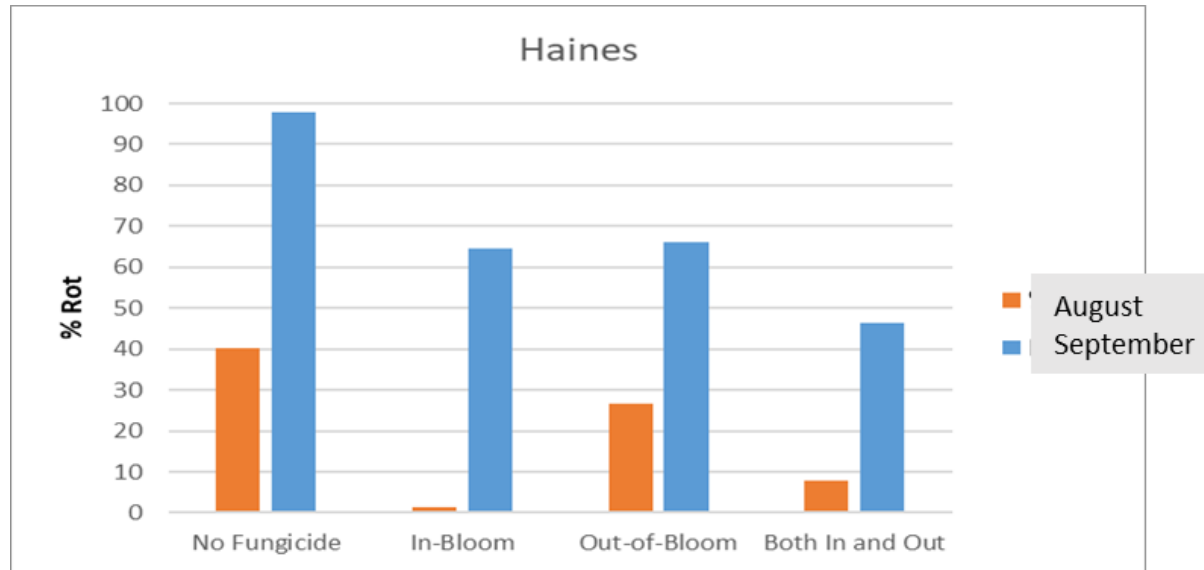
Fruit rot trials FRR Selections

FR Resistant



Comparison of Susceptible and FRR Selection

Year 2 after planting

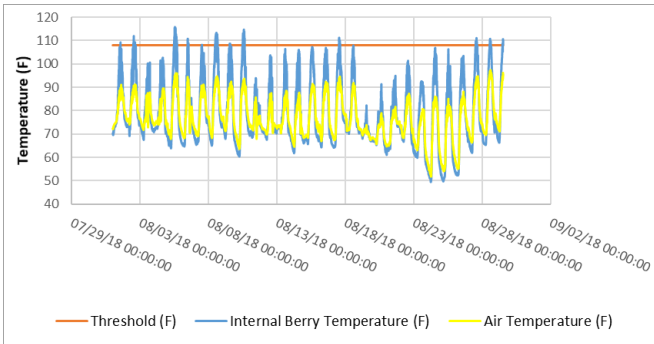


Summary

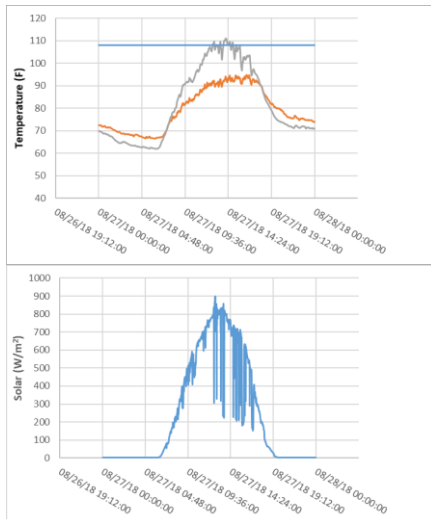
- FRR selections have significantly higher resistance than any other variety tested
- Some are very sensitive to chlorothalonil injury
- Cannot be used with zero fungicide inputs
- In-bloom applications are most beneficial



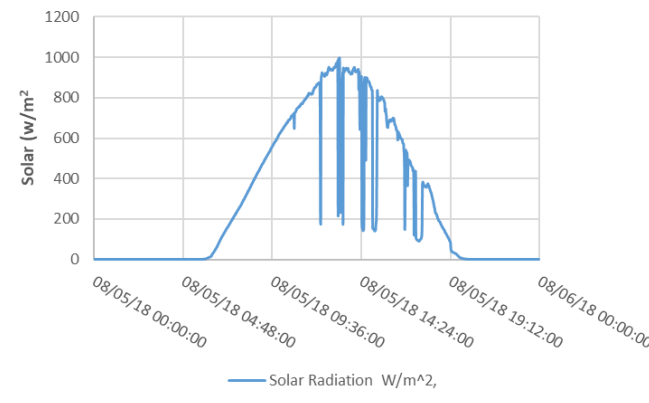
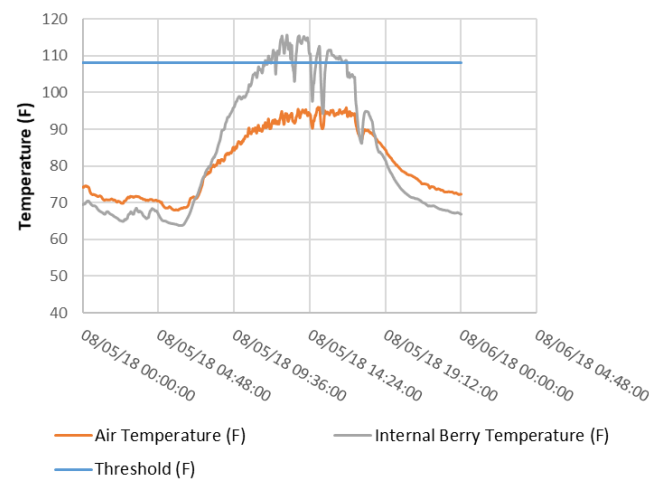
Overheating Management |



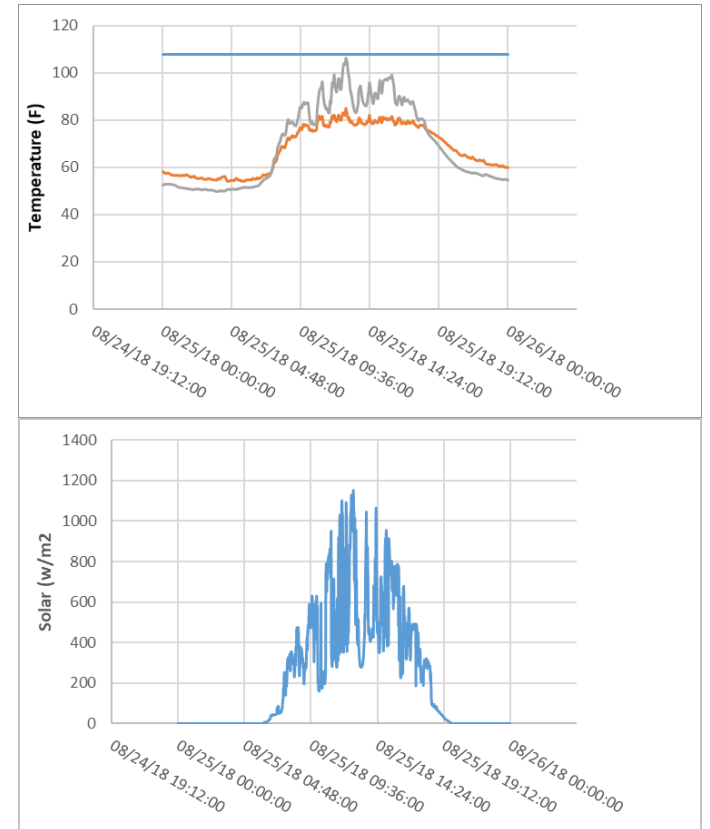
Non conductive days
Low ambient temperature
High cloud cover



Conductive days
High ambient temperature
Minimal cloud cover



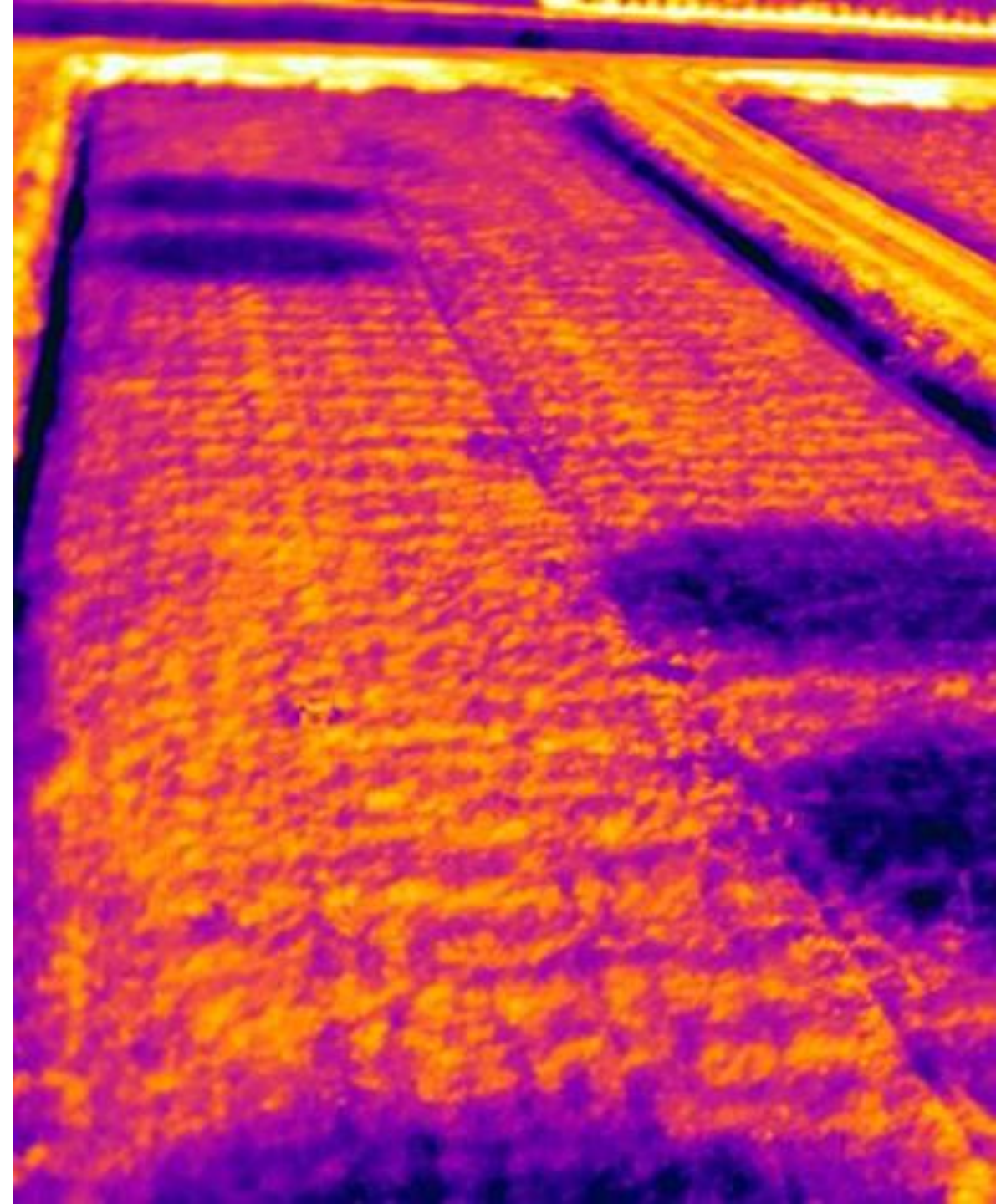
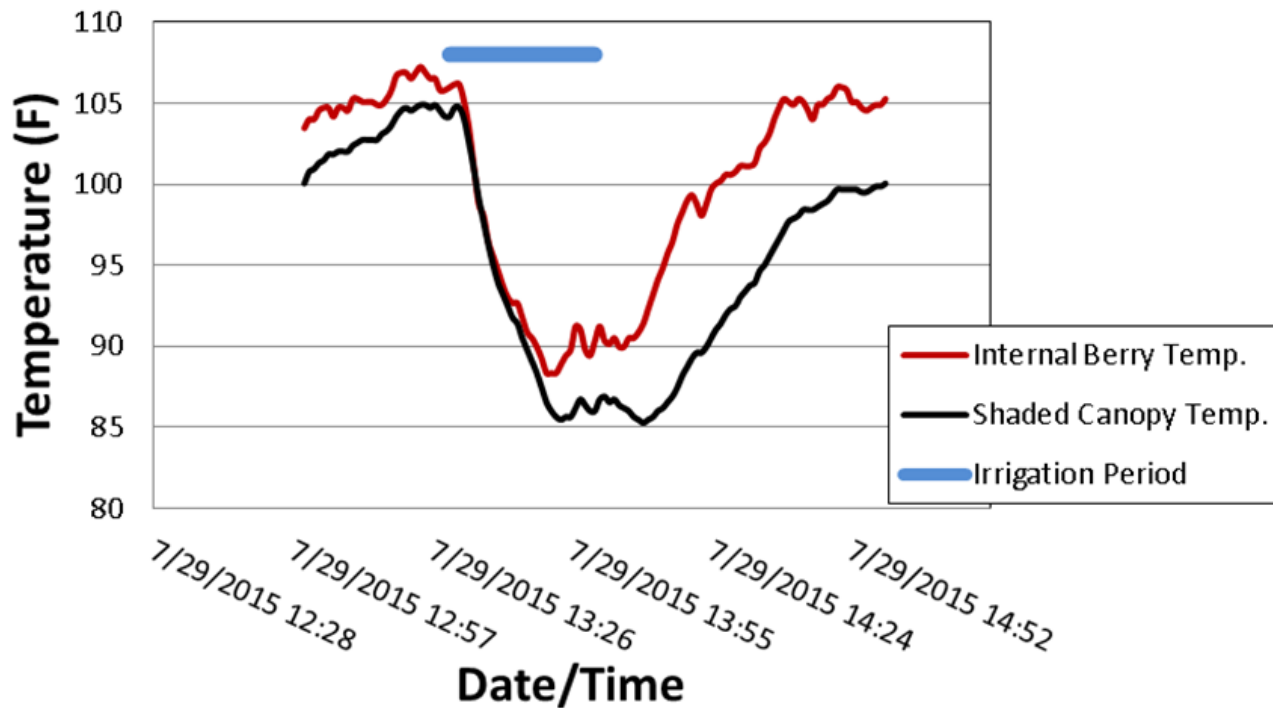
Non conductive days
Low ambient temperature
High cloud cover



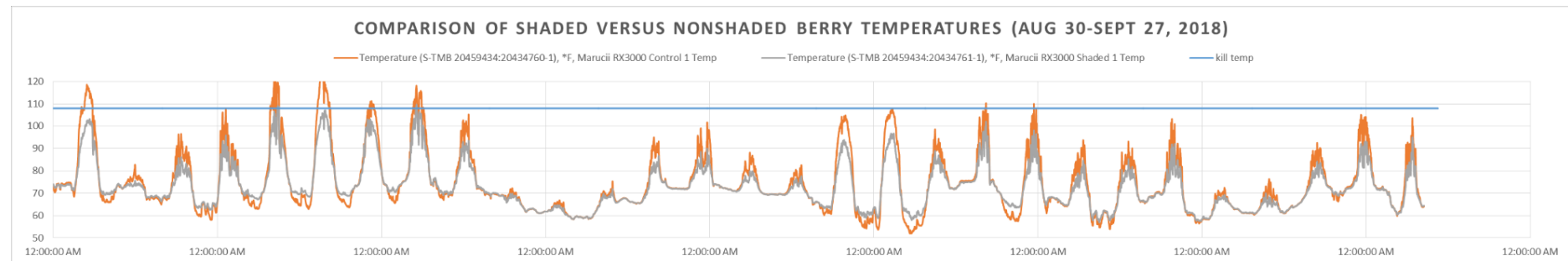
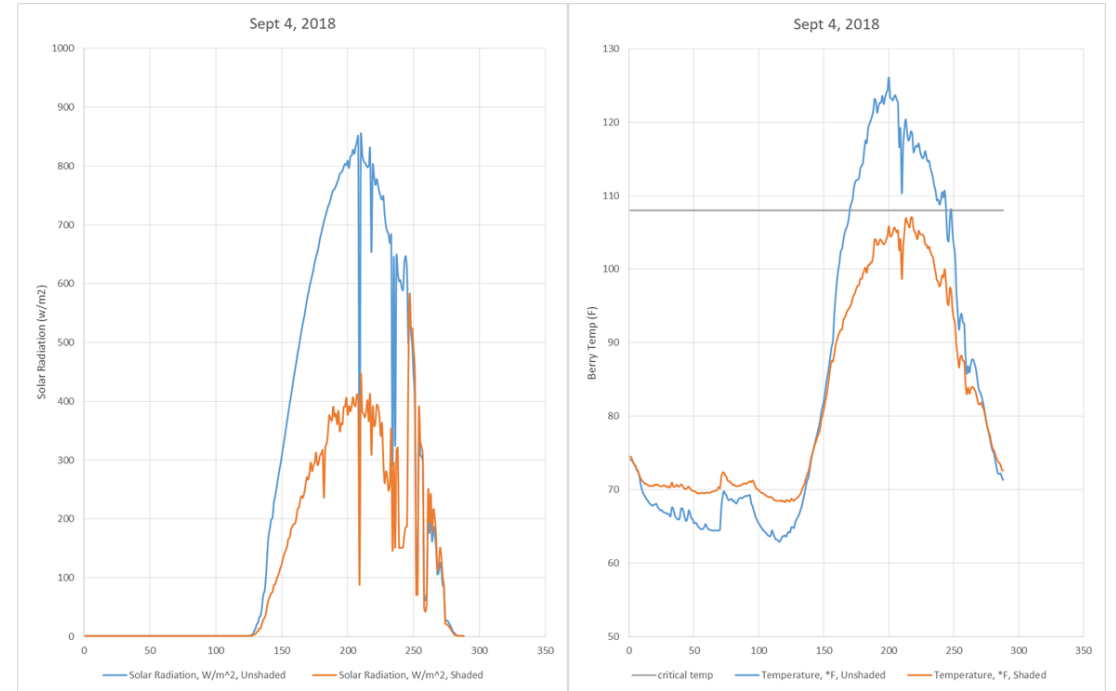
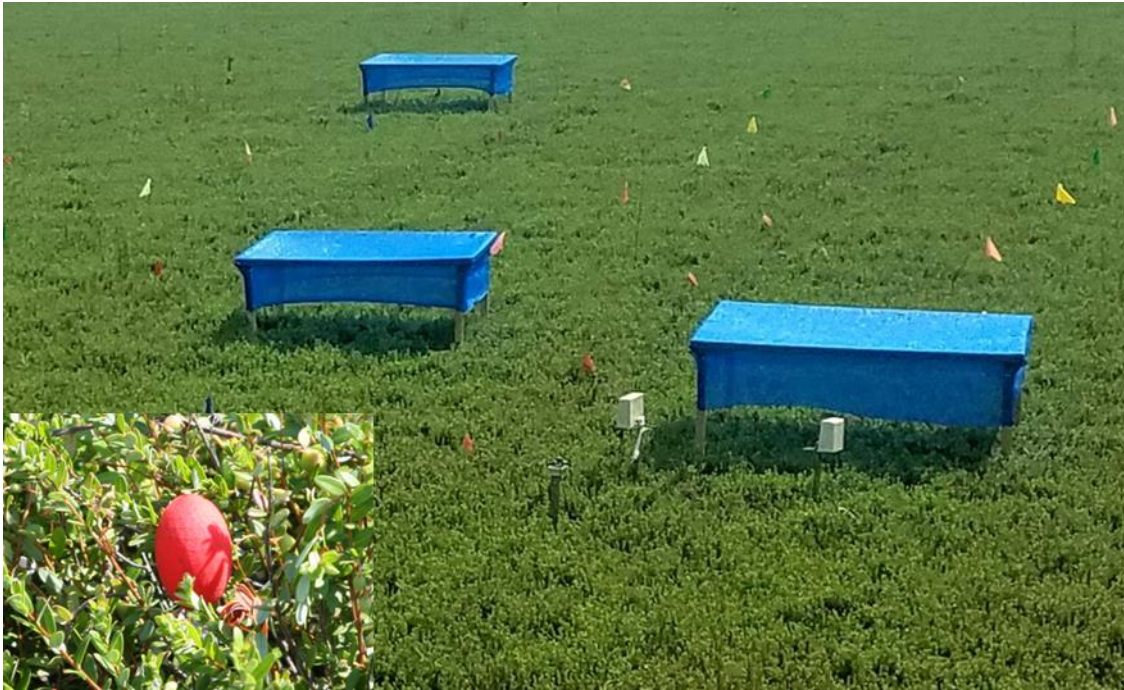
Evaporative Cooling

Impact of misting on cranberry canopy temperatures during mid-day. A. Color photo. B) Thermal image showing a ~40F degree range in temperature C) internal cranberry temperature during irrigation.

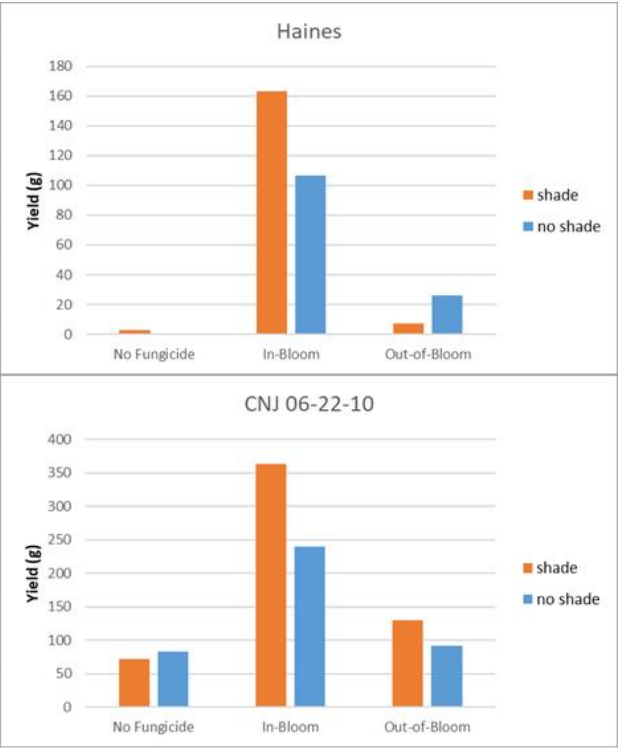
Impact of Irrigation on Canopy and Berry



Effect of shading on internal berry temperature



Preliminary results on the interaction of overheating with fruit rot



Preliminary trial investigating the effect of shade (after mid August) on cranberry yield.



Crop Risk

Canopy structure, fruit load and berry positioning dictate the volume of crop exposed to solar radiation

Optimizing Management for Berry Quality

A person in a green shirt and blue jeans is balancing on a high-pressure water spray that forms a narrow column. The background is a vibrant sunset with orange, yellow, and red hues over a body of water.

Over-irrigation

- Increased fruit rot
- Leaf drop

Over-heating

- Soft fruit
- Increased fruit rot

Fungicide Use

- Protection from fungi
- Fungicide resistance

FRR Selections

Reduced fungicide Use
Managing the population