

Cranberry Overheating

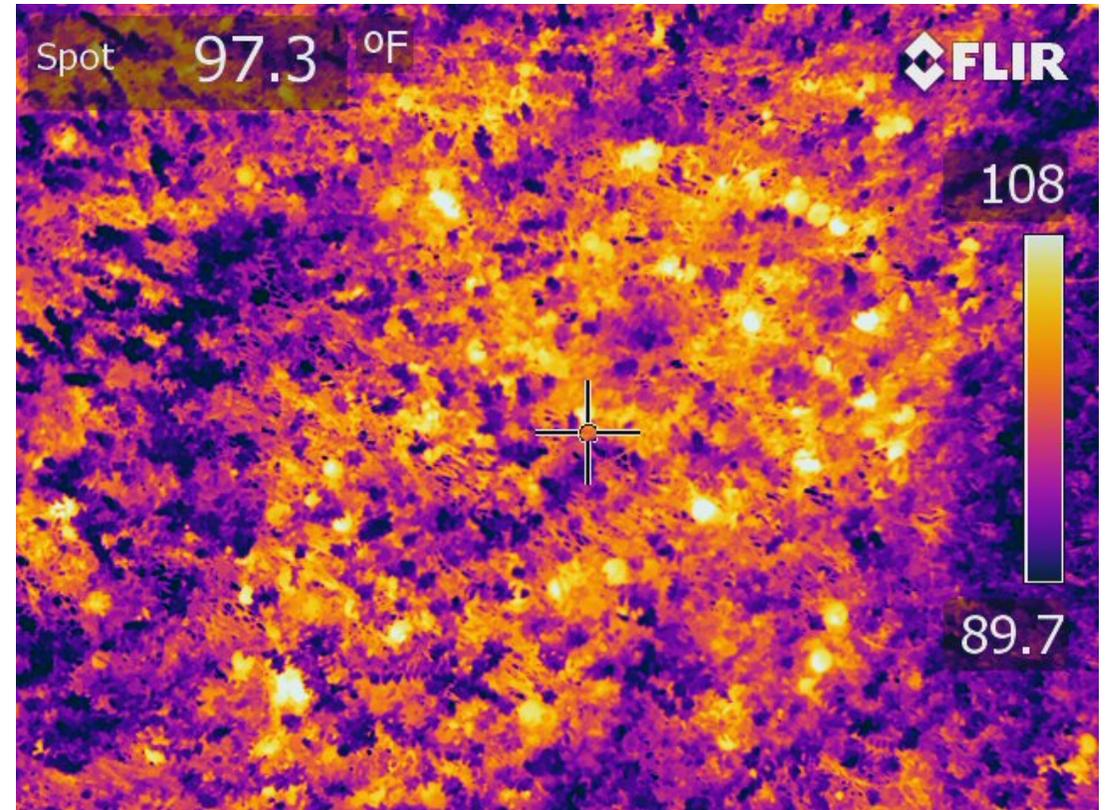
Is it a problem in your neck of
the woods

Peter Oudemans

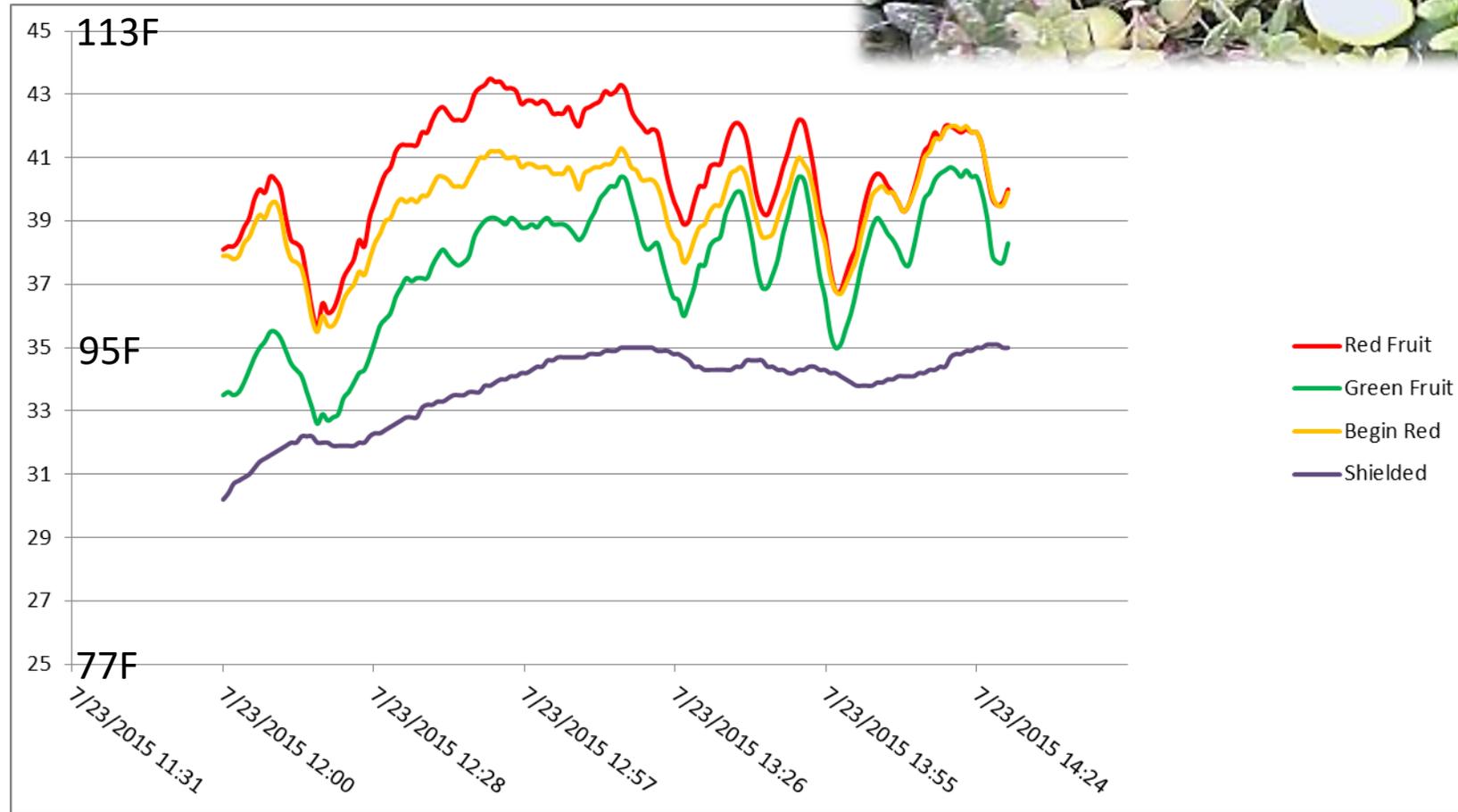
Dept. Plant Biology

Rutgers, The State University

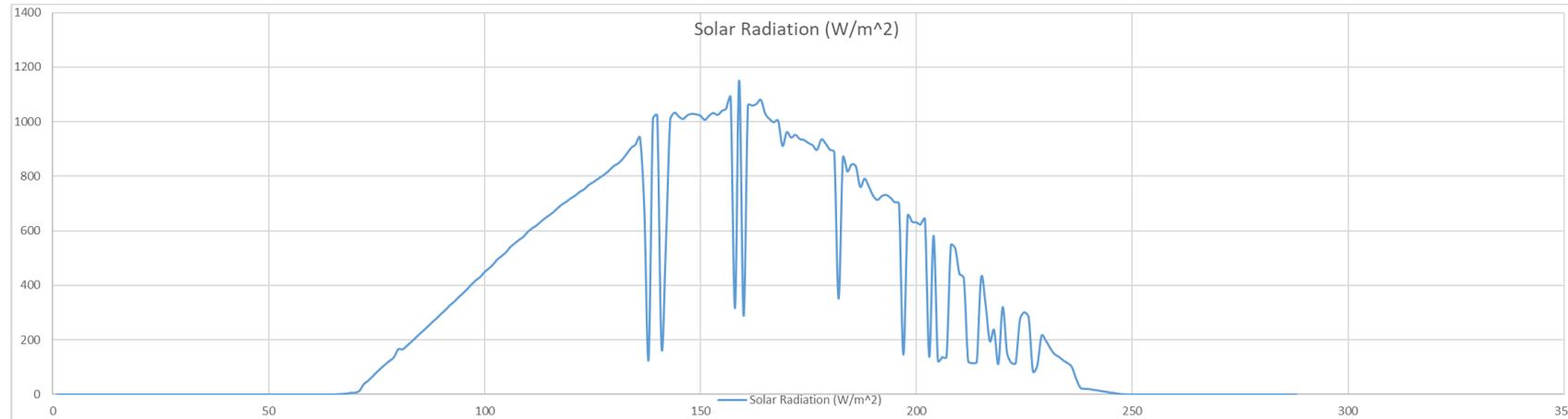
Fruit temperature is higher than canopy temperature



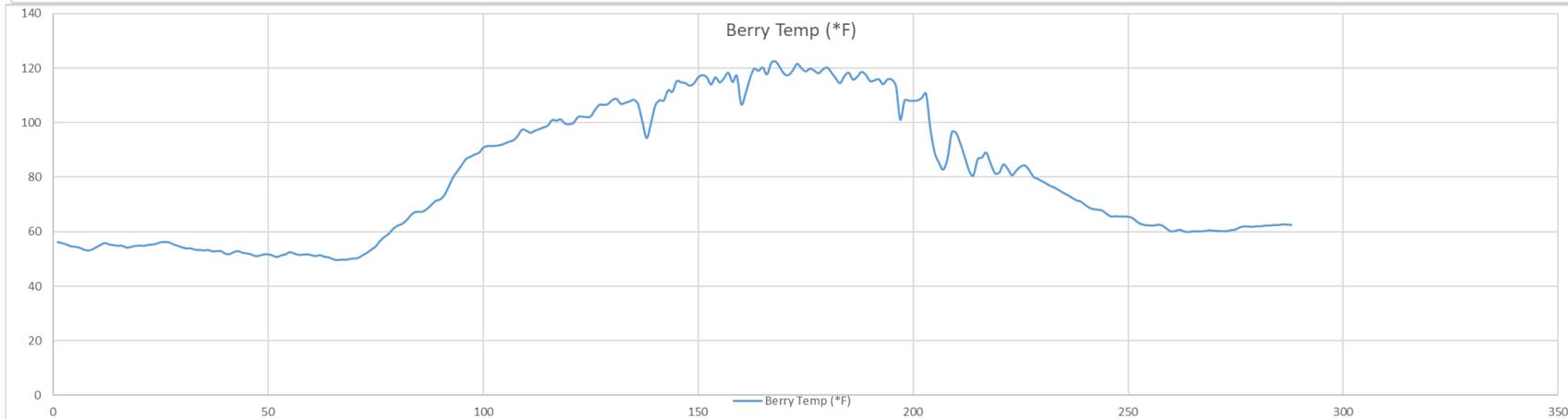
Internal Fruit Temperatures



Cause and Effect....

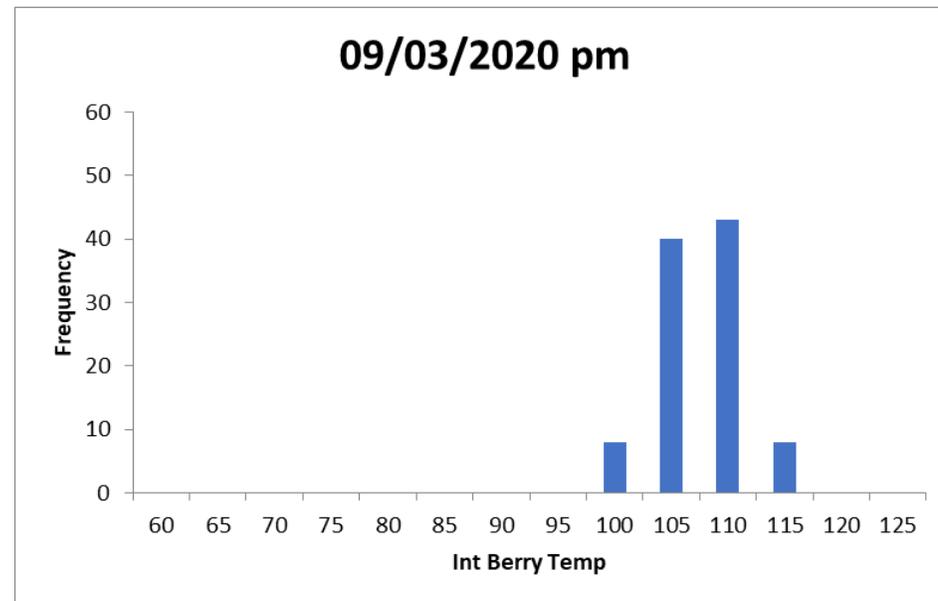
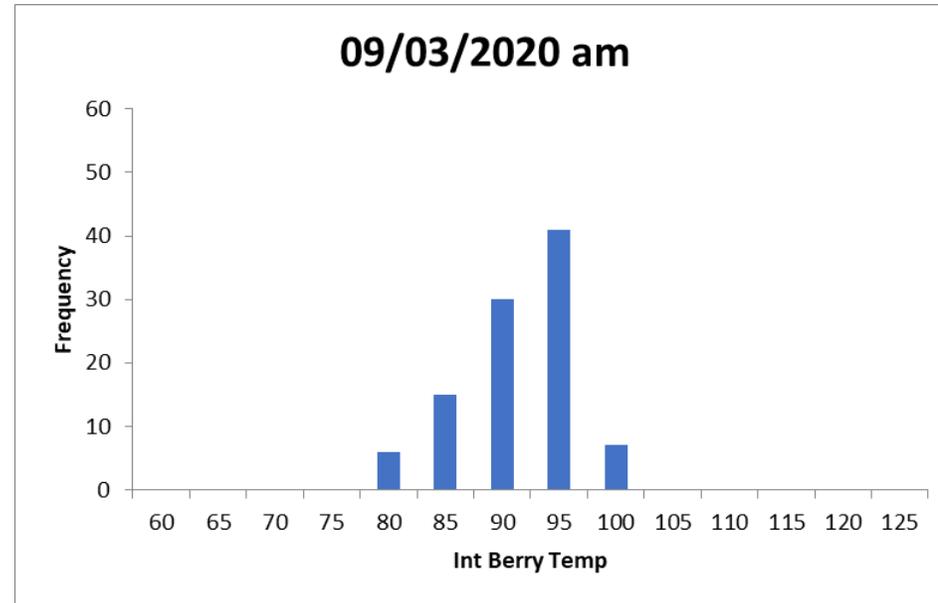
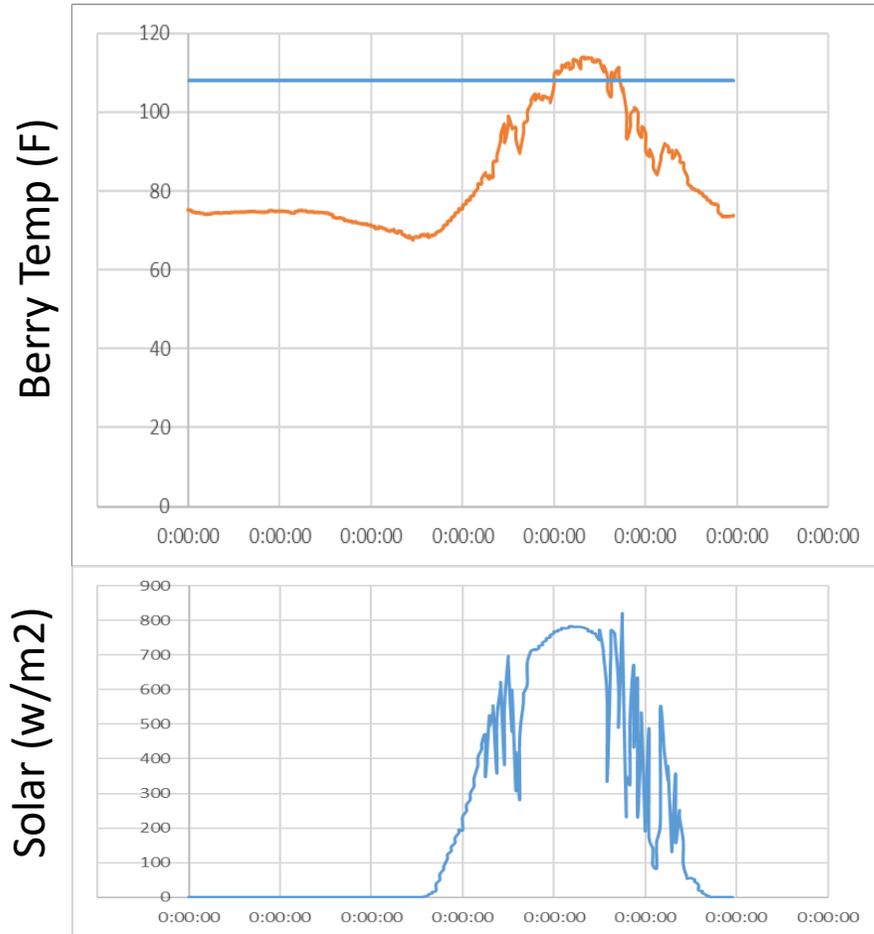


SOLAR RADIATION (w/m²)

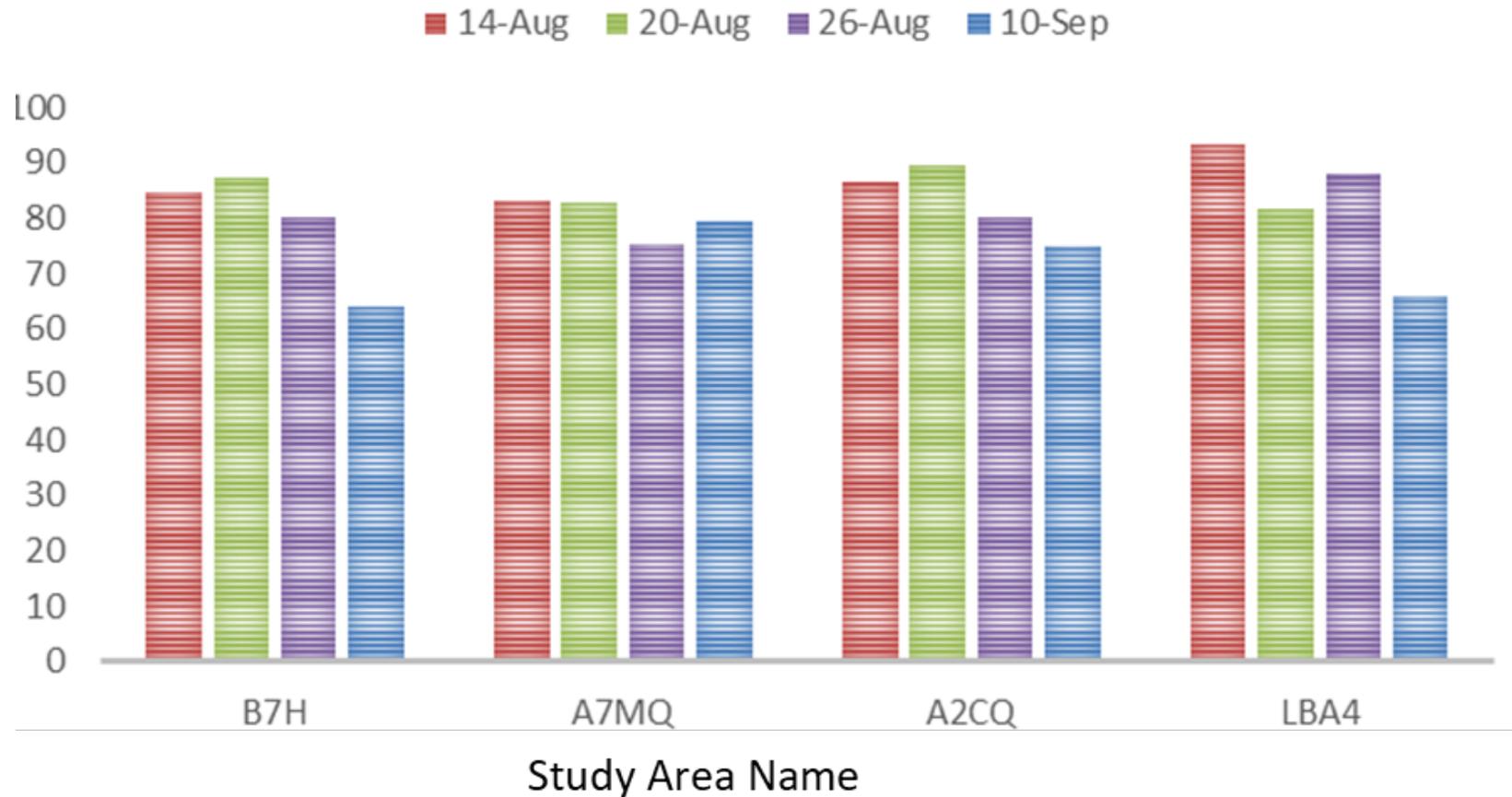


BERRY TEMPERATURE (F)

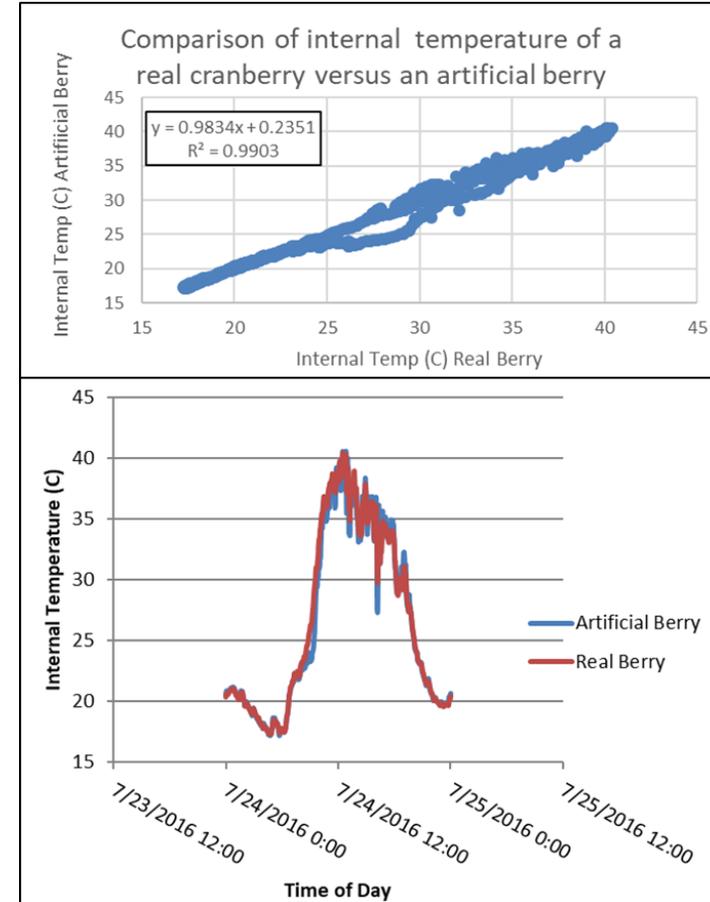
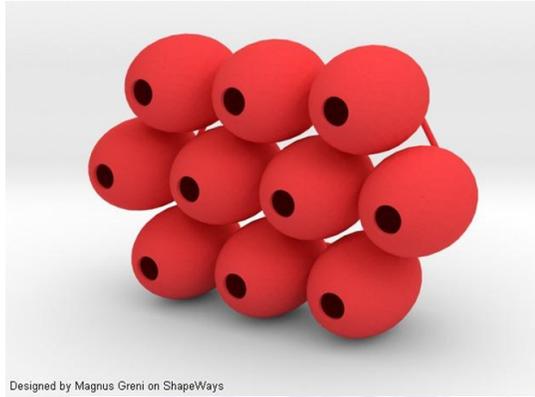
Internal Berry Temperature



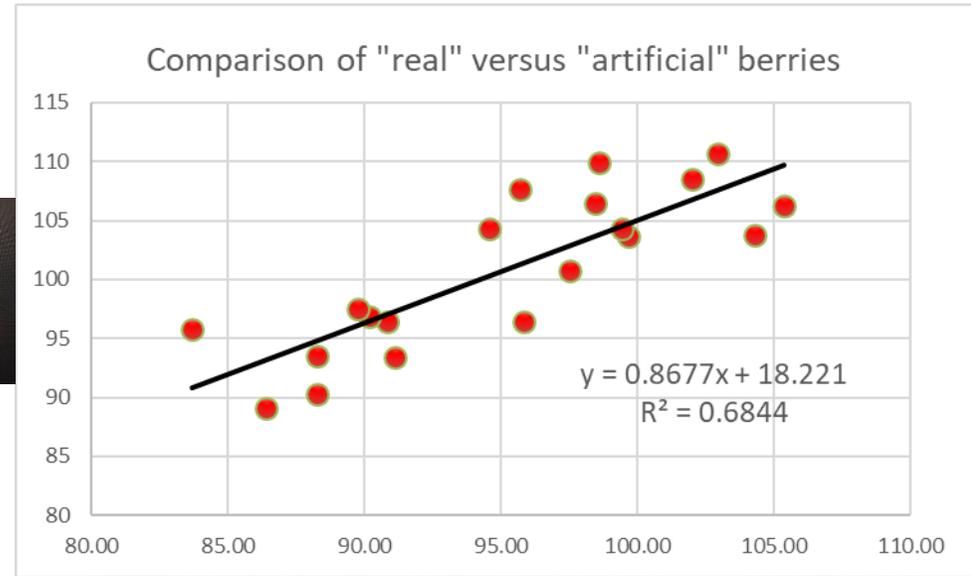
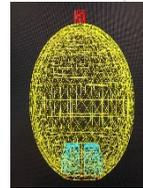
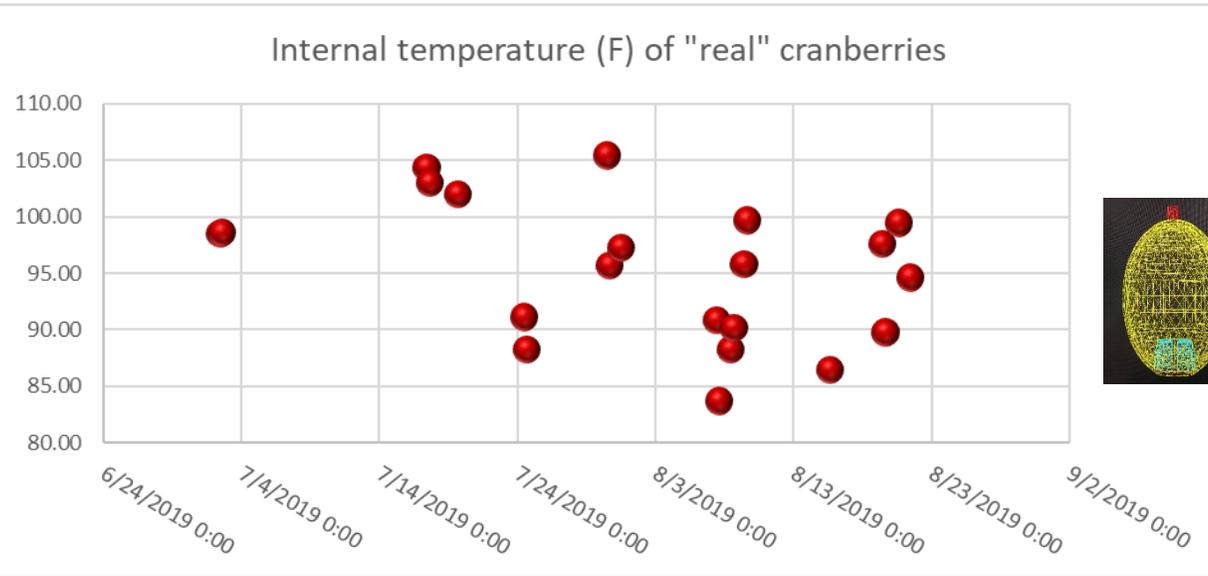
Changes in Fruit Quality



Monitoring Over heating



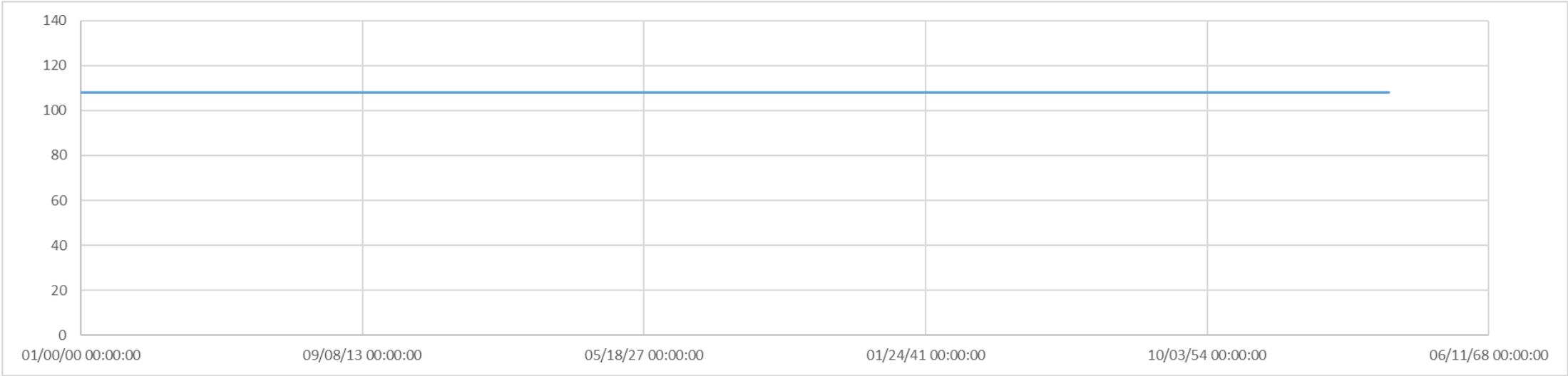
Comparison of berry temperature throughout the season



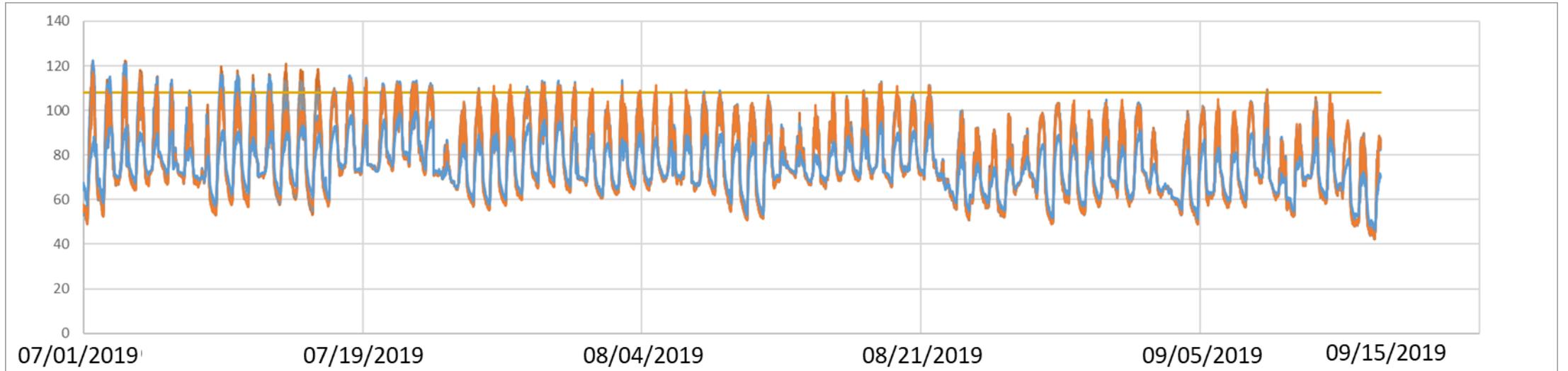
Heat Monitoring



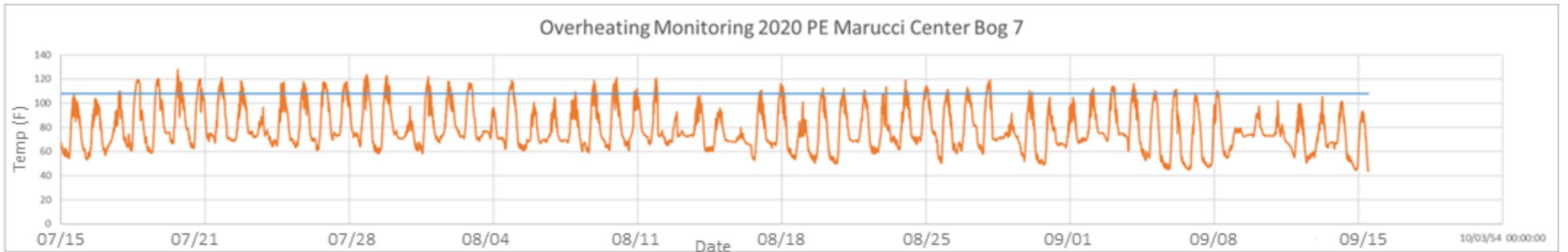
Summer 2019 – Threshold 108F



Berry Temperatures from July 1, 2019-September 15, 2019 with shaded temperature



Berry Temperatures from July 15, 2020- September 15, 2020



Treatments for Reducing Over-heating

- Shade cloth (Red) can reduce solar radiation and berry temperature.
- Raynox Plus (Green) is a wax designed to prevent sunburn in apples
- Vapor Guard (Yellow) is a material designed to reduce evaptranspir
- Parka (Pink) is a phospholipid designed to enhance the cuticle
- Surround (Orange) Kaolinite clay designed to increase albedo
- Reflections (White) Calcium carbonate to
- UTC (Blue)

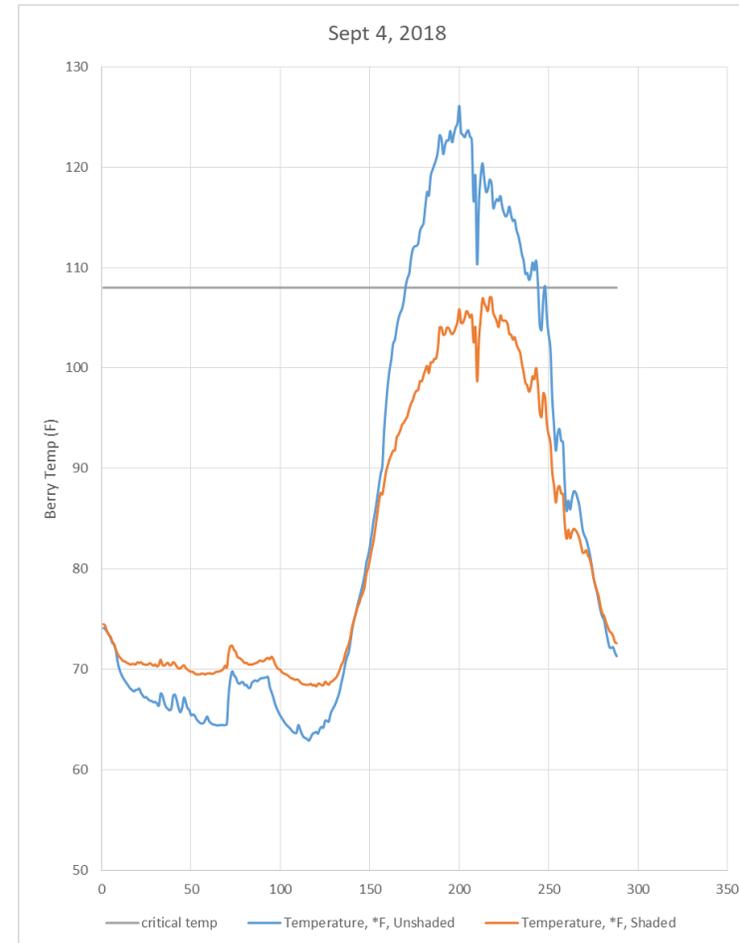
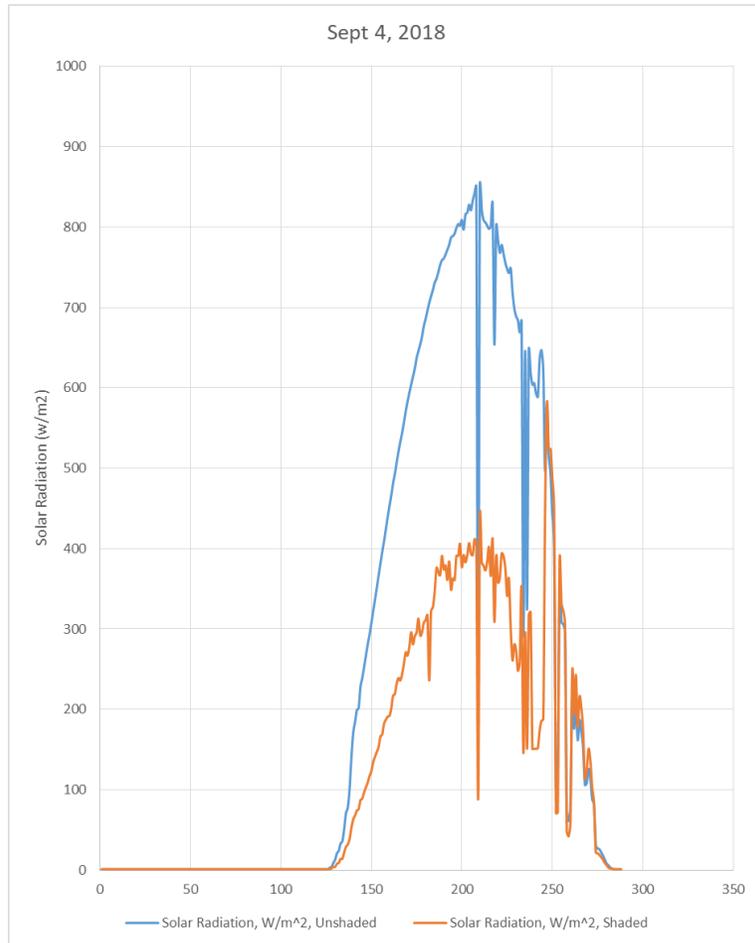
Research Plots

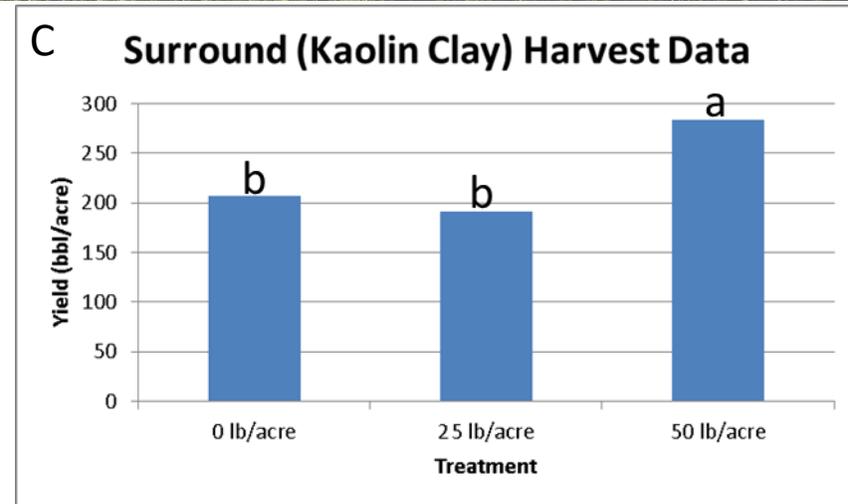
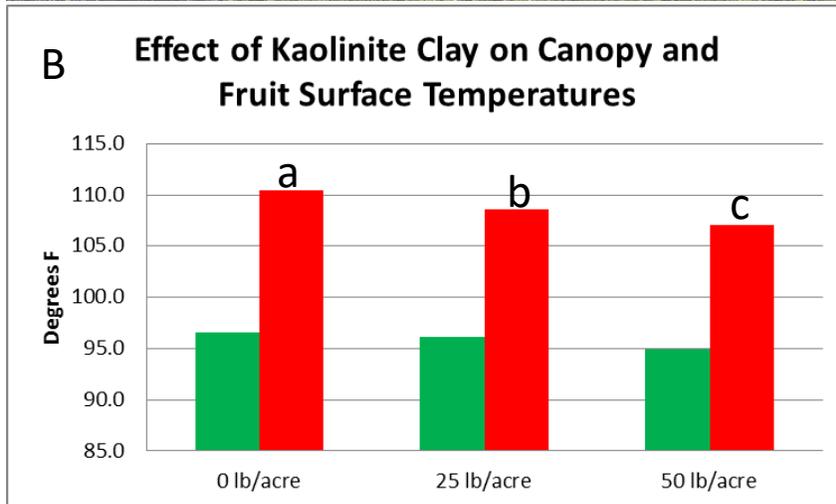
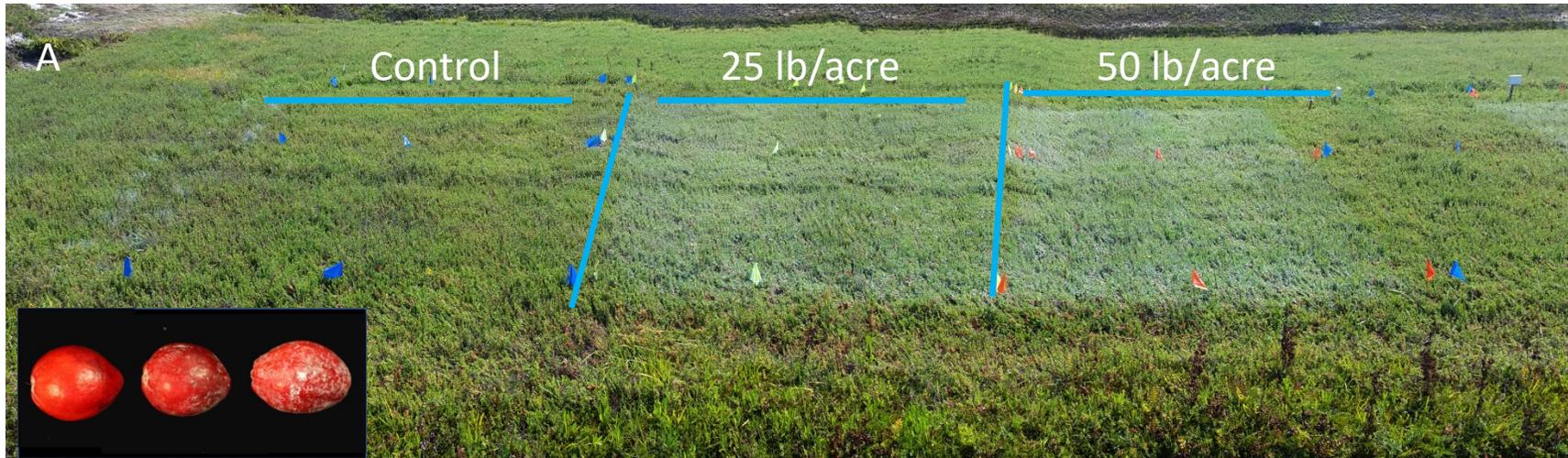


Larger Scale Studies



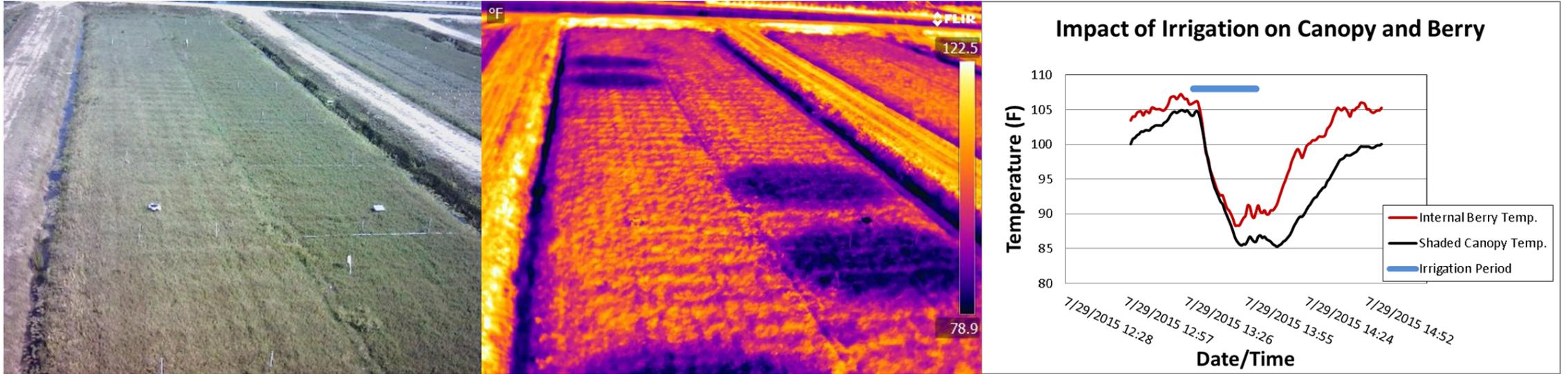
Effect of shading on internal berry temperature





Use of kaolin clay (Surround) on cranberry fruit. A) Field trial with clay applications. (inset fruit showing white residue). B) Impact on fruit and canopy temperatures during peak sunlight. C) Impact on yield of sound fruit.

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.

Measuring Risk

PHANTOM 4 RTK
P4 Multispectral





Site Specific Plans

Canopy structure can play a big role in fruit exposure therefore at-risk beds should be prioritized for control.

Evaporative cooling is the most reliable method versus sprayable materials

A person in a light green shirt and dark pants is balancing on a green irrigation pipe. The pipe is supported by a green metal structure in the foreground. The background is a vast, flat landscape under a dramatic sunset sky with orange, red, and purple hues. The sun is low on the horizon, creating a bright glow.

Over-irrigation

Increased fruit rot
Leaf drop

Over-heating

Soft fruit
Increased fruit rot