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Research Update Meeting 2009 - Frost Tolerance

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Frost Tolerance

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Cranberry Station

Frost Protection

Basics of sprinkler protection

- How sprinkling works
 - Heat of fusion as water freezes
 - Balance rate of application with rate of freezing
 - Must stay wet!! (ice should be CLEAR with water dripping)
 - What about when no ice forms? – cooling water releases heat even if it doesn't freeze

Frost Protection

Basics of sprinkler protection

- When to start
 - 1-2° above tolerance
 - If manual turn-on alarm usually is set even higher

Frost Protection

Basics of sprinkler protection

- When to stop
 - When ice begins to melt
 - if wind picks up and melting stops -- evaporation can be a problem (heat loss is more than with melting)
 - Sun on the plants
 - Both usually by 7:30 a.m.
 - Above tolerance by 3+ degrees

Notice that all of this depends on knowing the TOLERANCE

- Plants freeze below 32°F (they aren't pure water)
- How much below?
- Plant tissue can supercool – how much depends on the developmental stage and how succulent the tissue is (how much water and how 'soft')

What is the tolerance

- Temperature that the plant can cool to without ice forming in the cells
- Changes during development
- Tolerance temp increases in the spring and decreases in the fall (always 30 °F or less)

Determine using visual cues

- Spring
 - Appearance of the bud
 - $<18^{\circ}\text{F}$ to 29.5°F
- Fall
 - Color of the fruit
 - 28°F to as low as 20°F



Tolerance is site specific

- You must scout
- Spring changes are dependent on accumulation of heat units – warmer locations develop faster and lose tolerance sooner
 - Look at buds frequently to recognize changes
 - Look for most advanced stage that is present in more than 3-5% of buds

Tolerance is site specific

- Fall changes are dependent on biochemical changes during ripening – we use color as the cue
 - Look down into the canopy without moving the plants
 - Natural exposure to light plays a role

Frost message tolerance is for one site only

- When it changes – you can use this as a reminder to check your bog
- BUT – do not use it without scouting

Bogside spring tolerance workshop will be held in April

Factsheet of tolerance available



Questions?