Frost tolerances #1 - Spring 2015
April 23, 2015

On April 23, buds were examined from the following cultivars: Early Black (EB), Howes (H), Ben Lear (BL), Stevens (ST), Gregleski #1 (GH), DeMoranville (DE), Mullica Queen (MQ), and Crimson Queen (CQ). These buds were collected at State Bog in East Wareham and Rosebrook Bog in Wareham. Based on internal and external appearance, BL was the most advanced. Almost all buds had passed the spring dormant stage and were at the so-called white bud stage. Some inland bogs, where ice melted out late, may still be at the spring dormant stage.

Please note that the white bud stage was named based on the appearance of EB and H buds that have lost their dormant red color: When looking down into the plants, the buds stand out as noticeably light/white. Other cultivars retain some degree of red coloration at this stage. In those, the change is recognized by observing the buds over time - as they leave the dormant stage, the buds become a bit less red with lightening on the edges of the bud scales and in some cases noticeably green.

At the spring dormant stage, tolerance for EB and H is 18°F; tolerance for BL and ST is 20°F. At the white bud stage, tolerance for EB and H is 20°F; tolerance for BL and ST is 22°F. Based on appearance, new hybrids should be assumed to have the same tolerance as BL.

ALWAYS CHECK THE TOLERANCE ON YOUR BOGS.
H spring dormant, 18°F, State Bog 4/23

H white bud, 20°F, Rosebrook 4/23
Note: this bud is likely between the two stages but many were more advanced at the site.

BL early white bud, 22°F, State Bog 4/23. Note fading of red and white scale edge.

BL white bud, 22°F, Rosebrook 4/23

ST white bud, 22°F, State Bog 4/23

ST early white bud, 22°F, Rosebrook 4/23
GH spring dormant, 20°F, State Bog 4/23

MQ white bud, 22°F, State Bog 4/23

DE white bud, 22°F, State Bog 4/23

CQ white bud, 22°F, State Bog 4/23
Cut EB bud. 4.23 State Bog. Note internal greening.

Cut H bud. 4.23 Rosebrook. Note external structures retain more red dormant color compared to EB but interior is similar.

BL cut bud. 4.23 State Bog. Note pink flower initials developing.

BL cut bud. 4.23 Rosebrook. Note cut is not as deep as that in photo above.

If you suspect you have had conditions on your bog that would have caused frost injury, you can examine buds to look for damage - but wait for at least 24 hours after the frost event. The pictures of cut buds below and above show what an **undamaged** bud looks like when you cut a cross-section. Take an upright and carefully remove the upper leaves to expose the bud. Then lay the upright on a flat surface and use a razor blade to cut down through the bud - cut about half way between the tip and the base of the bud. Now pick up the upright, and using a hand magnifier, look down into the bud. Compare to the healthy bud photos. Damage would appear as brown or black areas. As we go through the season and find damaged buds, damage photos will be included.

In the photos below, taken in 2012, the buds were more advanced. They are included here to show the internal structures of the bud more clearly.

2012 photo. Cut bud, round structures around the center are floral initials (3 can be seen here) - they will become flowers. Solid center will become the leaves above the flowers (vegetative meristem). Outer 'ring-like' structures are the bud scales - they are protecting the center structures.
**2012 photo.** In this photo, the cut is closer to the tip and you can see the floral initials look more 'bead-like'.