Disease Concerns on Cold-Injured Blueberries in Florida

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Summary: Botrytis poses an increased risk on damaged buds, bloom, and fruit. Consider management inputs. Stem blight will likely be severe post harvest. Root rot not likely an immediate concern, despite extra water.

Growers employ all available options to protect their blueberry crops from extended sub-freezing temperatures. Damage is difficult to assess, and it takes days or weeks to see the full effect on harvestable fruit and plant survival. This tremendous and unavoidable plant stress can increase the chances of some plant diseases, adding additional insult to injury. This is a brief summary of potential disease impacts that can occur post freeze-protection, and some mitigating options to consider.

The most immediate threat to the crop that remains is botrytis blossom blight and gray mold caused by *Botrytis cinerea*. The pathogen is not active during the sub-freezing periods but has a lower-than-usual temperature optimum for infection in the 60 to 70 F range. Damaged blueberry buds and floral tissues (Figure 1 and 2) are more susceptible to infection after low temperature injury. Gray felty sporulation can often be seen growing on attached, brown petals (corollas) in days following freeze damage (Figure 3 and 4). These spores can multiply and spread to other flower clusters and eventually onto green fruit. Infections lay dormant until berries begin to ripen then cause gray mold in the field, but also in post-harvest storage.

Fungicides may help prevent widespread and severe blossom blight. Where floral buds and green fruit survived, consider fungicide applications to target blossom blight that include captan. Captan helps manage disease when used alone or as a tank mix partner for products with resistance potential. The fungicide fenhexamid (Elevate) and the pre-mix with captan (CaptEvate) are excellent choices to consider where freeze protection was required. Target applications as soon after the threat of freeze expires as possible and particularly when wet humid weather in the 60's F is predicted. These apps would precede and be in addition to most grower's normal preharvest spray routine, which should be resumed after crop loss assessments can be made. It's likely that we are also going to see increased anthracnose ripe rot pressure as well. Switch and Omega are two good products

Figure 1 and 2 Freeze damaged blueberry blooms and fruit

Figure 3 and 4 Blossom blight symptoms with visible *Botrytis* sporulation

to include in the rotation to help prevent ripe rot and other fruit rots. More info on anthracnose management: https://edis.ifas.ufl.edu/publication/PP337

Stem blight poses another disease threat post freeze injury. Increases in stem blight have been noted throughout the years following cold injury, partially due to cane breakage caused by heavy ice loads building on plants during freeze protection (Figure 5). Similar to hurricane damage, plants that have fallen over due to ice load and/or wind should be repositioned and supported upright as soon as possible (Figure 6). If roots are exposed, they should be covered with soil/bark to prevent desiccation and additional stress.

Damaged buds and canes can be colonized by the stem blight pathogens through spring and summer. Infections can move into the crowns of some plants, or access the crown directly through breakage, killing them later in the year or even in the following seasons. Pruning out damaged canes has been shown to reduce stem blight severity in research conducted in North Carolina. Consider applying a fungicide immediately following pruning events to help protect pruning wounds from becoming infected. This would apply to hedging after crop loss as well as normal post-harvest timings (see https://edis.ifas.ufl.edu/publication/PP347 for more info). When plants succumb to stem blight, remove as much of the dead plant as possible from the field prior to replanting.

Finally, some thoughts on root rot diseases: for growers that have applied Ridomil, Orondis or another mefenoxam fungicide in the last few weeks (typically recommended prior to bloom), roots should have been protected from the limited phytophthora infection threat during the periods of extended soil saturation associated with freeze protection. Neither Phytophthora nor Ralstonia are likely to infect new plants when temperatures are below 50F, but plants already suffering from root rot may be less resilient to the stresses and damage they have just sustained. I would expect plant losses to be more severe in parts of the field where these diseases were known to be active. If mefenoxam had not been used in the past few weeks, an application could still be made as a banded app to beds or through drip irrigation. Check the labels or products prior to use for PHI and other important instructions. The Ridomil Gold SL label that I have, has a 0 day pre harvest interval. Phyte drenches are probably not needed during this time for bacterial root rot (Ralstonia). As far as foliar sprays of phytes go, plants need healthy leaves and active growth to absorb these products for effective phytophthora root rot management, where phyte apps were planned, and where healthy leaves remain (evergreen production) these apps can still be made, and take the usual precautions to prevent further stress.

Figure 5 Split blueberry crown after ice accumulation during freeze protection

Figure 6 Lodged blueberry plants from heavy ice accumulation and wind.

References and additional resources:

https://content.ces.ncsu.edu/blueberry-freeze-damage-and-protection-measures

Phil Brannen, UGA blog article on response to freeze injury in blueberry from 2017 with stem blight reference. https://site.caes.uga.edu/blueberry/2017/03/blueberry-cold-damage-information-and-action-items/

Infection of Cold-Injured Blueberry Stems by Botryosphaeria dothidea. W. O. Cline, Department of Plant Pathology, North Carolina State University, Raleigh 27695-7616. Plant Dis. 78:1010. Accepted for publication 20 June 1994. Copyright 1994 The American Phytopathological Society. DOI: 10.1094/PD-78-1010A.