

Management of Mummy Berry Disease in Highbush Blueberry

Introduction

Monilinia blight, or mummy berry, is caused by the fungus *Monilinia vaccinii-corymbosi* (Reade) Honey. It is well established in the Province and can be especially damaging in seasons with extended wet periods during and shortly after bud break. Plantings on heavy soils or with poor drainage are especially susceptible and there is considerable variance in variety susceptibility. Infected foliage wilts and turns brown (top picture at right), while infected fruit shrivels and is not marketable (middle picture at right).

Infection

Mummy berry disease has both a primary and secondary phase of infection but the recommended control strategy is to prevent the primary (ascospore) infection. If there is no primary infection there will be no secondary infection and no mummy berries. The conditions necessary for primary infection include:

1. inoculum presence,
2. susceptible bud development stage, and
3. suitable weather conditions.

The 'inoculum' necessary for infection comes from small cup-like structures called apothecia (lower picture at right) that germinate during bud break from mummy berries dropped on the ground from a previous crop. When mature, these cups release primary spores (ascospores) which can cause infection of vegetative and floral buds at the susceptible stage of development. The apothecia generally remain viable for a 2-3 week period and this is the period of time when buds need to be protected.

Developing buds become 'susceptible' when about 5 mm of green tissue is exposed in vegetative buds and when bud scales are separating in flower buds (F2 stage).

The third requirement for primary infection is when 'suitable weather conditions' exist. Infection risk generally increases with wetness duration and warmer temperatures during the wet period (see graph in *Weather Based Spray Schedule* section).



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Flower buds at F2 (bud scales separating) and vegetative buds 5 mm long.

Registered Fungicides

There are now twenty products registered for application to highbush blueberries for mummy berry management – Topas, Jade, Mission 418EC, Funginex DC, Pivot, Propi Super 25EC, Tilt 250E, Quash, Proline 480SC, Indar 75WSP, Allegro 500F, Inspire Super, Quilt, Diplomat 55C, Fontelis, Serenade MAX, Serenade Opti, Actinovate SP, Oxidate 2.0 and Regalia Maxx Biofungicide.

Serenade products, and Regalia Maxx are biopesticides suitable for organic production systems and may only provide suppression of the disease. Similarly, Allegro, Quash, Fontelis and Indar are reported to provide suppression only and should be used as a protectant applied in 7-14 day intervals, as per label specifications. Quilt is listed as a preventative fungicide, but also displays systemic and curative properties. Topas, Mission, Jade, Bumper, Pivot, and Funginex can be applied after an infection event, providing up to 72 hour 'back action', in addition to being excellent protectants against future infections for 7-10 days after application. (Funginex is not registered in the US and should not be used if berries are to be exported to the US.)

Refer to Perennia's Highbush Blueberry Insect & Disease Management Schedule (found on the [highbush blueberry page](#) of Perennia's website) for more details and always read product labels fully before application.

Control Strategy

The decision to spray for Monilinia blight depends almost entirely on the past history of blight in a particular field. If growers have experienced a problem with blight in the past, they should apply controls.

Fixed Spray Schedule:

The first fungicide spray should be applied when 40-50% of the flower buds have reached the F2 stage (flower bud scales separating). A second spray may be required 7-10 days later.

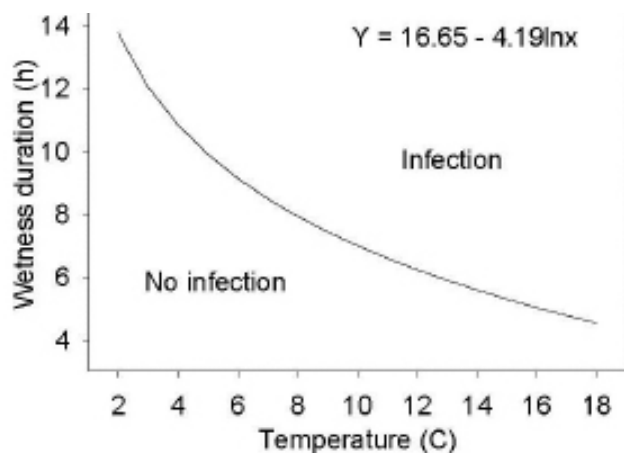
Weather Based Spray Schedule:

Dr. Paul Hildebrand developed an alternative strategy for control in lowbush blueberry while working as a plant pathologist for Agriculture and Agri-Food Canada (Kentville). He believes it would equally apply in highbush blueberries. This strategy uses temperature and leaf wetness duration to determine if an infection period has occurred and is graphically presented below. As an example, with a leaf wetness duration of 10 hours and an average temperature of 8 °C, an infection period would have occurred because the intersect occurs at or above the line on the graph. At 6 hours wetness and an average temperature of 8 °C, an infection period would not have occurred because the intersect is below the line on the graph.

If an infection period occurs and mature apothecia are present, and flower buds are at 40-50% F2, then the grower has up to 72 hours after the start of the wet period to apply Topas, Mission, Jade, Bumper, Pivot, or Funginex. A second spray may be required 7-10 days later.

During some seasons one application may provide adequate control. **Correct timing of the first spray is critically important for good control.** Bud development differs greatly from one area to another, so growers must take the time to inspect their own fields and have the fields sprayed at the proper time. Research indicates that if the Funginex, Mission or Topas sprays are applied properly, good control of blight will be achieved for the entire season.

Good spray coverage is essential for adequate control of Monilinia blight. Growers using mist blowers should spray under calm conditions. Funginex moves rapidly into the plant (within one hour). Therefore it may be applied within one hour of an expected rain. Although not tested, Topas and Mission seem to have similar activity. **Do not spray during frost events as plant injury may occur.**



Symptoms of Primary Infection

If primary spore infection does occur, disease symptoms become evident in 10 to 20 days. These symptoms appear as water soaked or dark brown areas along the midrib and veins of leaves (see image below) which soon wilt. Infected blossom clusters become dark purple-brown in color, and shrivel. A characteristic whitish-grey growth of spores (conidia) is produced on the midrib of in-



fect leaves and is very diagnostic for the secondary infection phase of the disease. If you see these 'blight' symptoms, primary infection has occurred.

Green berries do not show outward signs of infection, but cutting them open will reveal a white fungal growth (see image below).



Several weeks before harvest, infected fruit shrivel, harden, and turn salmon in colour. They will eventually fall to the ground where they renew the life cycle for future infections.

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