

Godronia (*Fusicoccum*) Canker of Blueberry

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Godronia (*Fusicoccum*) canker is caused by the pathogen *Fusicoccum putrefaciens*, the asexual stage of *Godronia cassandrae*. In recent years, godronia canker has become one of the most common diseases of highbush blueberry in the Lower Mainland of British Columbia (B.C.). Cankers caused by *F. putrefaciens* kill the affected branches, resulting in reduced yields and weakening of plants. In severe cases, affected plants may eventually die.



Figure 1. *Godronia* canker lesion developing from leaf scar (left) and *Fusicoccum*-infected (blighted) flower bud with pycnidia (right).

Figure 2. Fully developed *Godronia* canker with a grey centre and reddish-brown margin (left) and one-year stem girdled with *Godronia* canker (right).

Symptoms

Young stems are more prone to infection than mature stems. Cankers first become visible in spring as small, water-soaked, reddish-brown coloured lesions on one- and two-year-old stems, mostly on leaf scars and in the axils of leaf and floral buds (Figure 1). Young infected buds become blighted (brown to dark-brown in colour) and dark-brown to black fruiting bodies called “pycnidia” appear on them (Figure 1). These symptoms are visible in early to mid-spring. As the season progresses, cankers turn grey with reddish/dark-brown margins and expand elliptically to 1-10 cm in length, giving a target-like appearance (Figure 2). Cankers usually appear on lower stems, near soil level, (Figure 3) however, cankers may also develop on stems well above soil level. Young cankers usually girdle the stems within 8-10 weeks (Figure 2), resulting in symptoms of “flagging” and dying branches with reddish-brown leaves (Figure 4). The pathogen produces dark-brown to black, pinhead-size pycnidia on mature cankers (Figures 1 & 2) from spring to fall.



Figure 3. *Godronia* canker lesions on multiple sites on young stems of a 'Duke' plant near the soil level.



Figure 4. "Flagging" of branch of a 'Duke' plant infected with *Godronia* canker.

Disease Cycle

Fusicoccum putrefaciens, the asexual stage of the pathogen that produces conidia, is the primary pathogen responsible for the development of canker and spread of the disease. Evidence indicates that *Godronia cassandrae*, the sexual stage of the pathogen that produces ascospores, is not involved in the disease cycle.

The pathogen survives the winter on old cankers and cankers that initiated in the previous season. *F. putrefaciens* produces dark-brown to black coloured "pycnidia", containing masses of conidia (asexual spores) on mature cankers. The pathogen is most active between 8-22°C with the optimum activity around 16°C.

The production and dispersal (spread) of spores are triggered by rain events. Spores are released from mature pycnidia in wet weather throughout the season, from as early as bud-swell in the spring to leaf-drop and bud-set in the fall. Spores are spread by rain and irrigation water. Most infections occur in the spring and fall, coinciding with rain showers and cooler temperatures. Studies conducted under controlled conditions show that germination of conidia in water requires a prolonged period of 48-54 hours. However, under natural host and environment conditions, the length of time for germination of spores and the infection process of the pathogen can be shorter, enhanced (induced) by host plant surface factors and metabolites. Although the pathogen has the ability to penetrate directly into the host tissue, the appearance of cankers at sites of leaf scars and axils of leaf and flower buds indicates that the pathogen gains easy access into the host tissues via disruption of tissues during the events of leaf-fall, bud-set, bud-break and bud-swell. However, quantitative analysis of spores produced by *F. cassandrae* during the crop season indicated that majority of the spores are produced at post-harvest in the fall. Therefore, dispersal of spores by the pathogen and infection of blueberries are more likely to take place late in the season, during leaf-fall and bud-set, than early in the season. No or minimal infection occurs under hot, dry weather conditions.

Disease Management

Most blueberry varieties (e.g. Duke, Bluecrop) grown in the Fraser Valley are susceptible to the disease. However, the degree of susceptibility varies from variety to variety. Varieties like 'Duke' seem to be more susceptible to *Fusicoccum* than others. Consider blueberry varieties that are resistant or tolerant to fusicoccum canker and use them in new or replanting programs. Check with your nursery transplant supplier for information on canker resistant varieties.

Practice best management strategies, including good cultural practices, to ensure plants are free of environmental stresses. Plant stress factors often predispose plants to fungal diseases.

Prune adequately to ensure good air circulation in and around plants to minimize moisture and humidity build up since prolonged wetness and high humidity aid in the germination of spores and infection by the pathogen. A less dense plant canopy encourages faster drying of foliage.

Avoid overhead irrigation in fields with fusicoccum canker. If overhead irrigation is used, try to schedule irrigation early in the morning so plants can dry quickly.

Prune out and remove all diseased branches at the end of the season. Removal of cankered stems significantly reduces the amount of inoculum (spores) available for new infections in subsequent seasons.

It is essential to protect plants from infection by *Fusicoccum* during wet, cool weather, i.e. in spring (bud-swell and bud-break) and fall (leaf-fall and bud-set). Currently, no fungicide is registered for controlling fusicoccum canker. Fungicides that are used in the management of mummy berry, phomopsis canker, botrytis blight and anthracnose on blueberry can protect plants from early-season infection by *Fusicoccum*. However, a scheduled fungicide spray program is necessary after harvest when plants are least protected, thus more vulnerable to infection by *Fusicoccum*.

For Further Information

- Polashock, J.J, Caruso, F.L., Averill, A.L. and Schilder A.C. Eds. (Revised 2007). Compendium of blueberry, cranberry and lingonberry diseases and pests. APS press.

Prepared by:

Siva Sabaratnam

Plant Pathologist,

Abbotsford Agriculture Centre,

British Columbia Ministry of Agriculture,

Abbotsford, B.C.