

## Godronia (Fusicoccum) Canker of Blueberry

Godronia (Fusicoccum) canker is caused by the pathogen *Fusicoccum putrefaciens*, the asexual stage of *Godronia cassandrae*. In recent years, fusicoccum canker has become one of the most common and serious diseases of highbush blueberry in blueberry producing areas in the Lower Mainland of the Fraser Valley, British Columbia. 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.

### Symptoms

Young stems are more prone to infection than mature stems. Canker lesions first become visible in spring where small, water-soaked, reddish-brown colour lesions appear on one- and two-year-old stems, mostly on leaf scars and the axils of leaf and floral buds (Figure 1). Early symptoms can also be evident on young buds where 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 as early as in early to mid spring. As the season progresses, canker lesions turn grey with a reddish/dark-brown margin, 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) as early as in spring to fall.

### Disease Cycle

Evidence indicates that *Godronia cassandrae*, the sexual stage of the pathogen that produces ascospores, is not involved in the disease cycle whereas *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. The pathogen survives the winter on old cankers and cankers that initiated in the previous



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



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



Figure 3. *Fusicoccum* 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 *Fusicoccum* canker.

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 air-borne rain and irrigation and water. Most infections occur in the spring and fall that coincide with intermittent rain events and cooler temperatures. Studies conducted under controlled conditions show that germination of conidia in water requires a prolonged period of 48-54 hrs. However, under natural host and environment conditions, the length of time for germination of spores and infection process of the pathogen is expected to 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. No or minimum 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. Pay attention to 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.
- When pruning at the end of each season, prune out and remove all diseased branches. 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. Fungicide trials are underway to determine the most effective fungicides and their time of application to prevent infection and spread of the disease. 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 at the time of leaf-fall and bud-set when plants are least protected, thus more vulnerable to infection by *Fusicoccum*.

## Useful References:

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