

Fusarium Wilt in Blackberries

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The global berry industry has experienced rapid growth in the past two decades, driven by increasing consumer demand for healthy, fresh and convenient berry products. However, the expansion of berry production and international trade has also increased the industry's vulnerability to pest and pathogen incursions. The interstate movement of nursery stock or planting material and the international movement of genetic material in and out of the country have significantly increased the risk of biosecurity threats.

Fusarium wilt, particularly *Fusarium oxysporum*, is a soil-borne fungus that is responsible for significant yield losses across various fruit crops. In the berry category, it is a common disease that affects strawberries in warm to hot growing conditions. Because the pathogen can survive in the soil for many years, it is extremely difficult to eradicate and manage.

Disease identification

The earliest symptom of the disease is the wilting of leaves at the infected area. The point of infection mostly occurs from the base, and as such, early symptoms are often characterised by the wilting of the older leaves as the infection works its way up the plant.

In the case of infection occurring from cutbacks (pruning wounds), the first signs of wilting leaves will occur close to the pruning wound. Discolouration of the stem occurs soon after, with more extensive wilting and discolouration of the leaves. The discolouration of the stem is visibly distinctive, as only a cross-section of the cane's vascular system is affected at the beginning, which leads to a longitudinal discolouration on one side of the cane. In later stages of infection, spore masses are also commonly observed on necrotic parts of dead and dying plants.

Host range

Fusarium oxysporum is a fungal species complex consisting of many specialised forms known as *formae speciales* (f. sp.), each adapted to infect specific host plants. For example, *F. oxysporum* f. sp. *lycopersici* affects tomatoes, f. sp. *cubense* affects banana, and f. sp. *fragariae* affects strawberries.

Early this year, the first official report of *F. oxysporum* f. sp. *mori* was reported on the mid-north coast in a blackberry crop. Infection rates were reported at < 2%, which indicates the likelihood of varietal resistance or existing control with current fungicide use patterns.



Cane discolouration and a Fusarium wilt spore mass



Discoloured canes and wilting, discoloured leaves



A plant at a late stage of infection, after multiple cane death and removal

Management options

Proactive measures are the best means of control. Avoiding infected soil and ensuring stock plants are disease-free are key to managing disease occurrence.

Reducing inoculum in the soil pre-plant through fumigation is another way to reduce risk. However, as blackberry roots are notoriously vigorous, it might only provide temporary respite until the root system moves beyond the treated area.

Soil-borne spores can also be spread by the movement of soil and plant material on farm equipment and workers' footwear.

Ensure that harvest and pruning crews moving between farms use uninfected gear. It is of paramount importance that pruning crews entering your property sterilise and sanitise their equipment and footwear before entering the crop.

Addressing the transmission of aerial spores (which can be carried through water and air) is also key to reducing their spread. Remove and burn wilting canes at the first sign of infection before spore masses develop on affected canes.

Management of Fusarium wilt has been most effectively achieved by selecting varieties resistant to the disease, a process carried out through rigorous screening in a breeding program.

Note: There are currently no chemical crop protection treatment options available for Fusarium wilt in blackberries.

