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Fusarium wilt of Cyclamen

Not all root and crown rots are the same. Whenever I see yellowing, wilting foliage, my first thought is that the problem is most likely due to Pythium or Phytophthora root rot. However, dieback on cyclamen could be Fusarium wilt.

Fusarium wilt of cyclamen occurs worldwide and is caused by the fungus, *Fusarium oxysporum* f. sp. *cyclaminis*. This species of *Fusarium* is specific to cyclamen and will not infect other plant species within the greenhouse. Fusarium wilt can be a devastating disease as the disease may go undetected in young, vegetative plants. Symptoms of Fusarium wilt are often not seen until the infected plant begins flowering or plant experience stress, such as drought stress.



Figure 1: Yellowing leaves due to crown rot and wilt due to Fusarium infection. (Image used with permission from Raymond Joyce)

Infection and symptom development may also be delayed in cooler greenhouses (60°F) and will develop more quickly under warmer temperatures (above 70°F). Once symptoms develop, infected plants need to be removed and discarded to reduce spreading *Fusarium* spores to adjacent plants.

One of the first symptoms seen with Fusarium wilt is yellowing of leaves followed by leaf wilting and death. Initial foliage symptoms may only be seen on a few leaves but eventually the whole plant may be killed (Figure 1). As infection progresses, roots will discolor and rot, which can be confused with other root diseases (Figures 2 and 3). A

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diagnostic feature of *Fusarium* wilt is reddish-brown to black discoloration that can be seen within the corm when cutting through it (Figures 3 and 4). The internal discoloration and rot of cyclamen corms is similar to bacterial soft rot infection; however, the corms remain firm with *Fusarium* and will become soft with bacterial infection.

The source of *Fusarium* wilt can be from contaminated seed or seedling plugs. If *Fusarium* wilt symptoms develop within only one cultivar, growers should contact their distributor to see if other growers are having the same problem on that cultivar. However, *Fusarium* can also survive within a greenhouse facility where *Fusarium* wilt has occurred in the past. *Fusarium* spores and hyphae can survive on contaminated tools, benches, pots, trays, and in soil. *Fusarium* spores are mostly spread by water-splash but can also be wind-blown or spread by worker activity on contaminated tools and hands.

Fusarium wilt is very difficult to control. Symptomatic plants need to be discarded promptly to reduce spreading the pathogen. Fungicides will not cure an infected plant. Fungicides containing azoxystrobin or fludioxonil can be effective when applied preventively. However, care should be taken when using fungicides as some fungicides labeled to control *Fusarium* diseases may also be phytotoxic to cyclamen including trifloxystrobin and kresoxim-methyl. Always follow fungicide labeling for rates, use restrictions, and precautions.

Other management recommendations are to follow good sanitation and disinfestation practices to reduce *Fusarium* survival; using nitrate nitrogen fertilizers instead of ammoniacal nitrogen; and maintaining growing medium pH at 6.3 to 7 to reduce symptom development.



Figure 2: Cyclamen showing severe *Fusarium* wilt symptoms including leaf yellowing and petiole death. White clusters of *Fusarium* spores may be seen at the crown of the plant and on dead petioles (arrow). (Image by Jean Williams-Woodward)



Figure 3: Roots and petioles of *Fusarium* wilt infected cyclamen become darkly discolored and rot similar to other root and crown diseases. (Image by Jan Williams-Woodward)



Figure 4: Slicing through the corm of a cyclamen showing foliage symptoms of *Fusarium* wilt can reveal reddish-brown internal discoloration due to *Fusarium* infection. (Image by Jean Williams-Woodward)

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