

Chrysanthemums

Verticillium wilt of Chrysanthemums

Verticillium wilt is a serious fungal disease of chrysanthemums. In the past 18 months atypical symptoms of *Verticillium* wilt causing flower abnormalities have been observed leading to up to 10% loss and down-grading of crops. Due to unusual symptom expression, causes such as Tomato Spotted Wilt Virus (TSWV), Impatiens Necrotic Spot Virus (INSV), stress, etc, have been assumed and not *Verticillium*, but on each occasion no virus has been detected.



Fig 1. Typical symptoms of *Verticillium*. Note marginal yellowing of leaves associated with one side of the stem and death of leaves at base of plant



Fig 2. Atypical symptoms of *Verticillium*. Note poor flower colour and restricted pedicels with yellowing and browning of leaves near top of plant



Fig 3. Atypical symptoms of *Verticillium*. Note less severe wilt symptoms with minimal leaf discoloration

Symptoms

Typical

Unfortunately, symptoms can be quite slow to develop, preventing early recognition of the problem.

Traditionally, *Verticillium* wilt causes a one-sided effect on the stem. Leaves turn yellow and limp, although often the yellowing is initially confined to the stem base (see Figure 1 overleaf). As the disease progresses, more leaves become affected and older ones turn brown and die. These 'typical' symptoms may occur at any stage in the cropping cycle.

Atypical

More recently, problems attributed to *Verticillium* have been seen primarily towards the end of the crop, with affected plants displaying restricted pedicel extension, flower abnormalities and poor colour (see Figures 2 and 3 overleaf). Foliar symptoms have been noted but are secondary to flower/pedicel malformation. These symptoms have been referred to as 'atypical' *Verticillium* wilt.

Table comparing typical and atypical symptoms of *Verticillium* wilt

Symptom	Typical wilt	Atypical wilt
Crop appears healthy until elongation of flower pedicels	No	Yes
Petals fail to elongate uniformly and remain 'quilled' with restricted pedicels	No	Yes
Flowers do not expand properly and colour is poor	No	Yes
Leaves turn yellow, initially at the margin, become limp and eventually turn brown and die	Yes	Yes*
Foliar symptoms begin at the base of the plant and spread upwards	Yes	Yes*
Symptoms are frequently expressed only on one side of the stem	Yes	Yes

* Not always observed