March 2023

The Fast Facts: Be Wilt Aware

	FUSARIUM WILT	VERTICILLIUM WILT	SUDDEN WILT	LIGHTNING STRIKE	REOCCURRING WILT
CAUSAL AGENT	*Fusarium oxysporum* f.sp. *vasinfectum*	*Verticillium dahliae*	Potentially caused by *Fusarium spp./* physiological effect of environmental conditions	Lightning (thunderstorm)	Novel *Eutypella* species
PLANT STAGE AFFECTED	Plants may be affected throughout the season	Most common late season or after wet and/or cool weather	Plants may be affected throughout the season	Lightning can cause damage at all crop stages	Plants may be affected throughout the season
FAVOURED BY	Cool and wet conditions with temperatures below 23°C	Temperatures below 25°C and excessive nitrogen. Disease incidence is most severe during extended wet weather	Hot weather following an irrigation or rainfall. Root damage from cultivation can contribute to incidence	———	Unknown
SYMPTOMS	Plant stunting; yellowing or browning of leaves; plant wilting and death. Plants die from the top and may regrow from the base later in the season	Yellow mottling of leaves between veins and around leaf margins; dead tissue replaces mottling. Defoliation can occur depending on severity and strain	Sudden wilting followed by defoliation; plants die and occasionally regrow	Leaves can be completely desiccated or partially blackened; blackening or burnt bark (stems) in mature crops	Sudden wilting and plant death; bronzing of leaves and petioles; dead plants have blackened stems with leaves remaining on the plant
VASCULAR TISSUE & ROOTS	Solid brown/chocolate discolouration of vascular tissue	Speckled dark brown, tan to black discolouration of vascular tissue	Brown discolouration is confined to woody parts of root and lower stem	No vascular discolouration. Roots and lower stems of surviving plants relatively unaffected	When the stem or tap root is cut horizontally, infected tissue may have a wedge-shaped discolouration which is reddish-grey in colour. Discolouration of the roots and vascular tissue. Root decay i.e. if plants are pulled out of the soil, the taproot snaps due to a dry rot.
APPEARS AS	Single plants or small patches, often near the tail drain or low-lying areas in the field	Single plants or small patches	Single plants or small patches. Does not reoccur in the same place	Circular or irregular patches of dead or damaged plants	Single plants or in patches. Reoccurs in the same place
SPREAD BY	Soil inhabiting, spread with soil and plant debris – especially in irrigation water	Soil inhabiting, spread with soil and plant debris – especially in irrigation water	Soil inhabiting, spread with soil and plant debris – especially in irrigation water or floodwater	———	Suspect pathogen is spread with cotton residue. Research underway to confirm.

Figure 1. Fusarium wilt can cause some leaves to develop a yellow mottle.

Figure 2. A key feature of **Fusarium wilt** is the brown discolouration in the woody part of the stem.

Figure 3. Fusarium wilt can cause plants to die back from the top and may regrow back from the base later in the season.

Figure 4. An early symptom of **Verticillium wilt** is leaf wilting and mottling.

Figure 5. Verticillium wilt causes a speckled vascular discolouration throughout the stems.

Figure 6. Severe **Verticillium wilt** infection may cause defoliation.

Figure 7. Reoccurring wilt causes plants to wilt and suddenly die with dead leaves remaining on the plant.

Figure 8. Reoccurring wilt causes root decay i.e. if plants are pulled out of the soil, the taproot snaps due to a dry rot, and reddening of the vascular tissue.

Figure 9. When the stem or tap root is cut horizontally, infected tissue may have a wedge-shaped discolouration **(Reoccurring wilt)**.

Figure 10. Reoccurring wilt causes blackening of the stem.

Figure 11. Sudden wilt (right plant) can cause plants to suddenly wilt and die. Does not re-occur in the same place.

Figure 12. Lightning strike can cause circular or irregular patches of dead or damaged plants.

Photo acknowledgements: Duy Le (NSW DPI), Linda Smith and Linda Scheikowski (QLD DAF).