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Diseases are not usually a major problem in dryland cotton. Brief information is given in this section, but the Agfact entitled *Diseases and Weeds of Cotton* – available from NSW Agriculture and the Australian Cotton CRC's *Integrated Disease Management Guidelines* are more detailed references.

Seedling diseases

Seed rot and pre- and post-emergent damping off can be caused by several fungi, including *Pythium* and *Rhizoctonia*, which are common soil inhabitants. Thin or patchy plant stands and/or weakened root systems may result. Seedling diseases are most likely when cool, wet weather occurs soon after planting and when there is a carryover of legume residues from a previous crop.

To minimise losses:

- Prepare the seed-bed early so that plant residues have ample time to decompose.
- Avoid planting too early in the season when soil temperatures are too low.
- Do not plant seed deeper than necessary.
- Use seed treatments which control both *Pythium* and *Rhizoctonia*.

Black Root Rot

The fungus causing this disease (*Thielaviopsis basicola*) is favoured by relatively cool soil temperatures and is therefore most active early in the season. Affected seedlings are stunted and grow very slowly as a result of extensive blackening and damage to the root system. Where this disease is present it is important to avoid early planting and the use of legumes in the rotation. Many legume crops are also hosts of the fungus. Black root rot is widespread in irrigated cotton and is easily spread in infested soil adhering to machinery or vehicles.

Vascular Wilts

Verticillium dahliae and *Fusarium oxysporum f.sp. vasinfectum* cause Verticillium wilt and Fusarium wilt of cotton. These fungi infect plants via the roots and then invade the water conducting (vascular) tissue, blocking water uptake and causing yellowing, leaf mottle and sometimes wilting and death of plants. Brown discoloration of the root and stem vascular tissues becomes apparent.

KEY POINTS:

- Under most dryland conditions, diseases are usually not a problem.

Verticillium wilt is favoured by cool air and soil temperatures, excessive soil moisture and higher soil nitrogen levels. Verticillium wilt is common in most cotton growing areas and the causal organism has a wide host range that includes many common weeds. Varieties with some resistance to the disease are available and should be used if the disease is present.

Fusarium wilt has emerged as a major threat to irrigated cotton production in Australia. Evidence suggests that the disease has been dispersed with soil and crop residues attached to vehicles and machinery and in flood waters. The disease has been observed in a small number of dryland crops, especially where those fields have been inundated previously with contaminated flood water. Varieties with some resistance to this disease are available.

Leaf Spots

Leaf spots generally occur after periods of wet weather and are usually most severe on the lower leaves of the plant.

Alternaria leaf spot is characterised by brown or grey, dry spots which are most common on either very young seedlings or on plants approaching maturity.

Bacterial blight features dark green, angular, water-soaked spots that are particularly obvious on the lower surface of the leaf and may occur throughout the season.

Both of these leaf spot pathogens can also infect young developing bolls. The fungi that cause Alternaria leaf spot (*Alternaria macrospora* and *A. alternata*) survive from season to season on crop residues and on some weed hosts.

Crops that are subject to stress late in the season tend to be more susceptible. Some cultivars are more resistant than others.

Most commercial cultivars grown in Australia are completely resistant to bacterial blight. The 'Pima' cultivars are very susceptible. The bacterium which causes the disease (*Xanthomonas campestris pv. malvacearum*) survives within seed and on infested cotton crop residue.

Boll rots

Boll rots are usually only a problem in rank, irrigated crops where the humidity within the canopy remains high. An exception is **Phytophthora** boll rot caused by *Phytophthora parasitica*. This pathogen is able to infect mature bolls when soil containing the fungal spores is splashed up onto low bolls. Infected bolls quickly become dark brown to black and open prematurely. The lint does not fluff out and the locks frequently fall out of the boll and onto the ground. The disease is most severe when heavy rain occurs late in the season as the lower bolls are just about to open.

Quarantine & Clean-downs are Important!

Many cotton diseases that occur overseas are not present in Australia and it is important that they are never introduced. Similarly, there are cotton diseases that occur in some areas of Australia that are not found in other areas. Most of these diseases can be carried in crop residues and soil attached to vehicles and machinery.

It is essential that all those who move around the cotton growing areas clean down machinery and vehicles between farms.

Prevention is better than Cure!