



Fig. 1. *Leptosphaeria maculans*; a) sexual blackleg fruiting bodies on canola residue; b) necrotic lesions on canola leaf, containing asexual fruiting bodies; c) stem canker necrosis; d) sporulating lesions on canola leaf.

Disease: Blackleg of canola; **Causal agent:** *Leptosphaeria maculans*

Classification: K: Fungi, D: Ascomycota, C: Dothideomycetes, O: Pleosporales, F: Leptosphaeriaceae

Blackleg is a common disease of canola with worldwide distribution. In Australia canola cannot be grown without adequate blackleg control. Blackleg destroyed the Australian canola industry in the early 1970's, a major breeding effort over the next 20 years re-established the industry. Blackleg is able to efficiently overcome resistance genes in the host, meaning that breeders need to constantly breed to maintain adequate resistance for the Australian canola industry.

Biology and Ecology: Blackleg survives on canola residue, it will therefore survive for the entire life of the stubble, 4+ years. The pathogen undergoes sexual reproduction on the stubble and then releases airborne ascospores during the canola growing season. The spores cause a necrotic lesion on canola plants and then grow within the vascular bundle down to the crown of the plant. At the crown the pathogen again becomes necrotic causing a canker which restricts moisture and nutrient flow within the plant and in severe cases causes the plant to fall over and die. The pathogen also has an asexual reproductive stage producing rain splashed pycnidia spores within the necrotic lesions.

Blackleg fruiting bodies (pseudothecia) can be clearly seen with the naked eye on canola residue. The first symptoms on canola plants are the necrotic lesions, they are up to 1cm across, a pale off-white colour and contain small black dots which are the asexual pycnidia. If plants are pulled from the ground and the root section severed from the stem, blackleg discoloration can be seen inside the crown.

Host Range: Most species of the Brassicaceae family.

Disease Impact: Blackleg in Australia can be devastating, in some circumstances it will destroy entire crops. However on average most crops will have between 5 and 15% yield loss. Blackleg is also responsible for destroying canola cultivars, as resistance genes are overcome by the pathogen, individual cultivars have to be removed by the industry.

Disease Management: Blackleg must be managed by using a number of control strategies simultaneously.

Cultural practices: growers need to plan which paddock to sow their canola crop, they cannot sow canola into last year's canola residue and need to have a minimum 500m distance away from the previous year's canola residue. Older residue does not have as many spores compared to the previous year's residue.

Genetic resistance: Breeding companies produce cultivars with a range of blackleg resistance. Growers should choose a cultivar with adequate resistance. Because blackleg will overcome individual resistance genes growers also need to be aware of which genes are in their cultivars. If blackleg is becoming more severe over time on their farm they should choose a new canola cultivar that contains different resistance genes.

Fungicides: There are a range of fungicides available to control blackleg: seed treatments, fungicide amended fertiliser and foliar sprays. Growers can use these fungicides in isolation or in combinations.

Further Reading: The Australian Blackleg Management Guide.

<http://www.grdc.com.au/Resources/Factsheets/2015/04/Blackleg-Management-Guide-Fact-Sheet>

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