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Mature lesions that sporulate.
(Photograph: P Lombard)

WHITE LEAF SPOT

in the Western Cape

White leaf spot is caused by the fungus *Pseudocercospora capsellae*. White leaf spot or grey stem is a disease that is widespread in Western Canada and Australia (Canola Council of Canada, 2014; Department of Environment Primary Industries or DEPI, 2010; and Marcroft and Hind-Lanoiselet, 2009). The disease occurs in Canada when the crop is ripening, but it is usually too late in the season to significantly affect crops. In Australia this disease occurs during autumn and winter.

In 2013 the Directorate Plant Sciences at Elsenburg Agricultural College positively identified the disease on canola in the Malmesbury district in the Western Cape. In 2014 the same symptoms were observed over a large area in the province, including the Overberg. It was again positively identified as white leaf spot, but this time by the Department of Plant Pathology at the University of Stellenbosch.

In 2015 only a few isolated outbreaks of the disease were observed. In our winter rainfall area the disease occurs earlier in the season than in Canada and Australia, rendering canola more prone to yield losses from white leaf spot, due to the extended period for disease development in our climate.

Disease symptoms

In Canada canola is planted in spring and the disease consequently appears in summer, while in the Western Cape symptoms appear in winter and as early as mid-July. Severe lesions on leaves can lead to premature leaf loss (Canola Council of Canada, 2014; DEPI, 2010; Marcroft and Hind-Lanoiselet, 2009).

White leaf spot forms grey-white to brown leaf lesions, often with a brown edge, especially in an advanced stage. It is important to note that no pycnidia (black fruiting bodies), as is the case with blackleg, are produced in the lesions. These two diseases could, however, occur together on the same weakened plant.

Leaf spots can be up to 1cm in diameter. They often join together to

form large dead areas. The older leaves turn brown and fall off first, and the younger leaves typically follow as the disease develops. Cultivars that are susceptible to white leaf spot can suffer a complete loss of leaves. In severe epidemics, infections can defoliate susceptible varieties. According to the Department of Agriculture and Food of Western Australia (Dafwa), crop losses due to this disease vary, but it is rarely economically justifiable to apply chemical control under these conditions.

The fungus survives on canola stubble as thick-walled mycelia and produces wind-borne spores.

The observation in the Western Cape is that since the disease occurs very early in the growing season, the resulting defoliation hampers photosynthesis to such an extent that nutrients cannot be translocated to the pods.

Canola crops that suffer a nitrogen deficiency seem to be more susceptible

to white leaf spot. When the plants ripen, large purple and grey lesions form on pods and stems.

Laboratory identification of the disease can be done by the Plant Disease Clinic at the University of Stellenbosch and the Directorate Plant Sciences of the Western Cape Department of Agriculture.

Life cycle

The fungus survives on canola stubble as thick-walled mycelia and produces wind-borne spores. This is the sexual stage of the fungus, called *Mycosphaerella capsellae*. During prolonged wet weather conditions in autumn and winter, these spores infect canola plants. After infection

has taken place, the fungus, now in its asexual phase, causes the development of white to pale yellow spots on the lower (older) leaves.

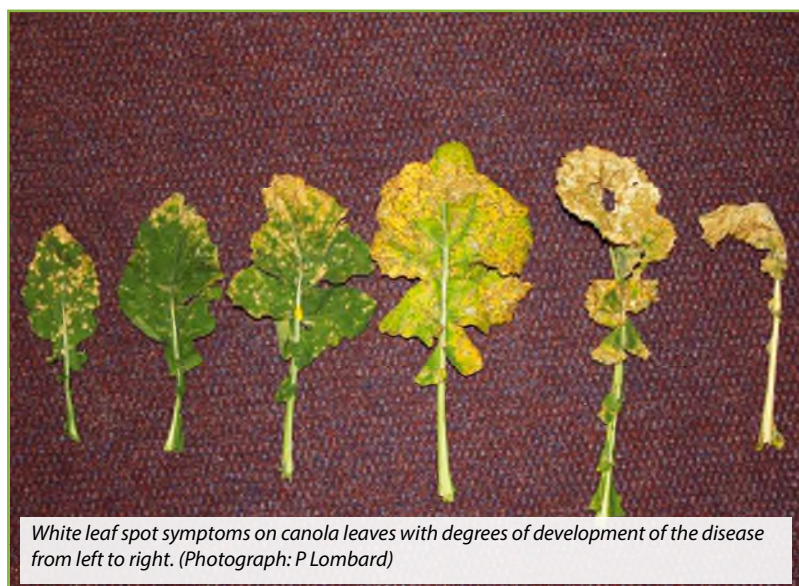
The fungus now produces wind-borne conidia that cause the disease to spread rapidly. The optimum temperature for the development of the disease is 13 to 18°C at high humidity levels. Therefore, white leaf spot usually develops after periods of heavy rain.

The disease is not usually seed-borne, but can spread infected debris with or on the seed. Farm-retained seed poses a great threat. The disease has a wide host range (mainly the

mustard- and wild radish-type weeds) in Canada, but unfortunately no such information is available for the Western Cape.

Chemical control

No fungicide is presently registered for the treatment of white leaf spot on canola.



White leaf spot symptoms on canola leaves with degrees of development of the disease from left to right. (Photograph: P Lombard)



Young white leaf spot lesions on leaves. (Photograph: P Lombard)



Lesions on stems just before and during harvest. (Photograph: P Lombard and Canola Council of Canada)

Management tips

- Follow a rotation system where canola is planted only every four years. This allows sufficient time for infected residues to break down.
- Plant clean seed. Farm-retained seed can be contaminated with infected debris.
- Plant canola as far away as possible (500m) from the previous season's planting to decrease the risk of infection by wind-borne spores.
- Keep the direction of the prevailing autumn and winter winds in mind, to prevent planting canola upwind of contaminated fields.
- It can be beneficial to destroy widely infested stubble, although the practice is detrimental to soil health. Stubble can also be heavily grazed as an alternative.
- Plants under stress are more easily infected by white leaf spot, therefore good crop practices should be followed (*Canola Production Manual*).
- The control of volunteer canola, wild radish- and mustard-type weeds aid in the prevention of the disease.

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