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Septoria avenae blotch and its management in oats

DPIRD-128

Septoria avenae blotch (*Phaeosphaeria avenaria f.sp. avenaria*) is a stubble borne fungal disease of oats and is the most common oat disease in Western Australia and occurs throughout the cereal growing areas. It is host specific, meaning it only affects oats.

This page summarises the symptoms, factors favouring disease risk and spread, yield and quality losses, and management strategies for the disease.

Symptoms

Plant

- Symptoms begin as small dark brown to purple, oval or elongated spots on leaves.
- Spots grow into larger light or dark-brown blotches, with surrounding yellow areas that can cover and kill the entire leaf.
- Infection may spread to leaf sheaths and through them to stems, where greyish-brown or shiny black lesions may cause lodging.
- Dark-brown blotches can also occur on the head and grain.



Image 1: Spots caused by septoria avenae can merge and grow into larger light or dark-brown blotches with surrounding yellow areas that can cover and kill the entire leaf

Paddock

- Plant with blotched, yellowing and dead leaves, evenly distributed across paddock.



Image 3: Septoria avenae infection may spread to leaf sheaths and through them to stems, where greyish-brown or shiny black lesions may cause lodging

Background – where did it come from?

Septoria avenae blotch in oats is host specific, meaning it only affects oats (including wild oats).

Recent paddock surveys through AgriFutures-supported NHA project and GRDC disease surveillance projects have found it to be present in more than 90% of oat crops.

Disease inoculum that is carried between seasons on infected stubble is the main source of carryover infection from one season to another.

The sexual stage of the fungus, *Phaeosphaeria avenaria*, occurs on infested stubble and, after rain or heavy dew in autumn and early winter, produces ascospores which are ejected from sexual fruiting bodies on stubble. These may be spread considerable distances by wind to infect oat crops.

Secondary generation of asexual spores (pycnidiospores) occurs in black fruiting bodies on blotched leaves, which are then locally dispersed within the crop by rain splash, infecting new leaves. These spores do not move large distances between paddocks but may also be produced by infested stubble residues and contribute to the development of new disease in multiple cropped oats.

Factors favouring disease risk and spread

Oat stubbles in paddocks rotating from oat probably contribute most of the inoculum to nearby paddocks.

In multiple cropped oats where stubble is not destroyed, ascospores land on the new crop in much larger quantities, resulting in the development of earlier and more severe outbreaks.

Septoria avenae blotch is most severe in early sown crops in the western high rainfall areas of the grainbelt, where oat has higher incidence in cropping rotations, such as around Williams and Narrogin and north of Perth up to Calingiri.

Regular rain can readily disperse pycnidiospores and induce multiple generations of infection. The latent period of the fungus (time between infection and visible symptoms) is impacted by ambient temperature. Cooler winter temperatures lengthen the disease lifecycle, and warm, damp spring conditions can result in rapid disease development. Short (dwarf) or fast-maturing varieties, where the upper canopy is more rapidly infected, are more likely to be affected than tall or slow-maturing varieties.

Most oat varieties are rated as Moderately Susceptible to Susceptible (MSS) or below to septoria, although some recently released varieties, particularly for hay, have improved resistance (up to MRMS). For up-to-date disease resistance ratings, refer to the Western Australian crop sowing guide on the website (dpird.wa.gov.au).

Yield and quality losses

Septoria avenae blotch can have a significant impact on both hay and grain production.

- Septoria avenae blotch may cause up to 50% grain yield loss and crop lodging in extreme cases, but losses of around 10% are more common in high rainfall areas.
- The disease can also affect grain quality by reducing grain weight, increasing screenings and, in some susceptible varieties, causing staining of oat grains. Septoria can also reduce hay yield, quality, and appearance and is a significant constraint to hay production.
- Losses are more likely in seasons with mild wet conditions and in earlier-sown paddocks.
- Tall or slow maturing oats are less likely to be affected by the disease than short (dwarf) or fast maturing varieties.
- Hay yield losses are less likely however, the disease can cause significant hay quality losses through discolouration and altered nutritional characteristics.
- Colour impacts result from premature senescence of infected upper canopy leaves.
- Nutritional quality impacts are most likely in heavily infected crops, particularly where infection is evident from early growth stages.

Integrated disease management strategies

The best management of Septoria avenae blotch in oats is achieved via an integrated disease management strategy, including using resistant varieties, rotating crops to avoid stubble-borne infection or destroying stubble from diseased plants, prudent nitrogen management, and efficient use of foliar fungicides.

Foliar fungicides

Management of Septoria using fungicides is typically timed to preserve the upper canopy of plants to maximise hay and grain yield and quality. Spray decisions are made using a combination of factors including plant growth stage and resistance rating, potential yield, disease level in crop and forecast rainfall.

Where disease occurs at early growth stages, application around stem extension can reduce development of disease in the lower canopy and delay development of secondary inoculum.

Application following flag leaf emergence will protect the upper canopy during head emergence in environments where spring rainfall will support rapid disease development. Protecting the upper canopy from infection will help retain green leaf area for optimum hay quality and grain yield.

Foliar fungicide sprays can control the disease but are only economic when conditions favour disease spread.

Using more resistant varieties

Not sowing 'susceptible' (S) to 'very susceptible' (VS) varieties, particularly in medium-to-high rainfall environments, reduces the risk of damaging levels of disease developing in-crop, slows epidemic development, and reduces stubble carry-over between seasons.

Use more resistant varieties in disease-prone areas, if suitable agronomic types are available. Tall or slow maturing oats are less likely to be affected by the disease than short (dwarf) or fast maturing varieties.

For more information about resistant varieties, refer to the Western Australian crop sowing guide on the website (dpird.wa.gov.au).

Rotating crops

Septoria avenae blotch is a stubble borne fungal disease. Exposure to disease inoculum can be minimised by rotating crops and not growing continuous oat crops.

Destroying stubble in continuous oat cropping

In continuous oat cropping, stubble from diseased plants should be reduced or destroyed by, for example, burning or tillage. Burning is not advised on light soils subject to wind or water erosion.

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More information

Refer to the department website at dpird.wa.gov.au for more information about the following:

- Diseases and pests of oats
- Foliar diseases of oats

Last updated September 2024

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