

# YELLOW LEAF SPOT

## FACT SHEET

**GRDC**  
Grains  
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Corporation

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## SOUTHERN REGION

### Management to reduce the risk of yellow leaf spot

A break from wheat-on-wheat, stubble management and growing resistant varieties are important risk-reducing practices for the stubble-borne disease yellow leaf spot.



PHOTO: MANISHA SHANKAR

Yellow leaf spot causes tan-coloured lesions on the leaves that are surrounded by yellow halos. Where these lesions occur near the leaf tip, the end of the leaf rapidly turns yellow (chlorosis) and dies back.

#### KEY POINTS

- A one-year break from wheat and practices that reduce surface stubble, decrease inoculum levels and provide control.
- If wheat-on-wheat must be grown, avoid sowing susceptible varieties into last year's wheat or barley stubble.
- Temperatures of 15°C to 28°C, with up to 12 hours of leaf wetness, are optimal conditions for infection.
- Typical tan-coloured lesions surrounded with yellow halos on leaves and distinctive black fruiting bodies on stubbles are good diagnostic indicators of yellow spot infection.

### What is yellow leaf spot?

Yellow leaf spot, also known as yellow spot in Western Australia and Queensland and tan spot in most other countries, is caused by a fungus, *Pyrenophora tritici-repentis*. The fungus can infect all bread wheat, durum and triticale varieties, although most triticales have good resistance.

As plants mature they become more prone to saprophytic infection. This means the stubbles of any variety of bread wheat, durum and triticale can host the fungus, irrespective of resistance rating.

Yellow leaf spot does not affect oats or green barley plants, although barley stubbles can host the pathogen and generate inoculum for the following season.

#### Risk factors

Farm practices such as minimum tillage, stubble retention, wheat-after-wheat crop sequences and growing susceptible wheat varieties (Table 1) are the main factors that increase the risk of yellow leaf spot.

Weather conditions are an important risk factor. Infection by the fungus is much greater where moist conditions extend over longer periods during the growing season. Temperatures of 15°C to 28°C together with six to 12 hours of leaf wetness or dew are optimal for infection. Incidence and severity of the disease increase as moisture periods lengthen.

**Table 1** Examples of yellow leaf spot resistance ratings in wheat varieties grown in the Southern Region.

Variety	Disease rating		
	NSW	VIC	SA
AGT Katana <sup>(d)</sup>	-	-	MS
Axe <sup>(d)</sup>	S	S	S
Barham <sup>(d)</sup>	MS-S	MS	MS-S
Beaufort <sup>(d)</sup>	MR	MR-MS	-
Bolac <sup>(d)</sup>	MS-S	MS-S	-
Bowie	S	MS-S	-
Brennan <sup>(d)</sup>	MR	MS	-
Carinya <sup>(d)</sup>	S	S	-
Catalina	MS-S	MS-S	MS-S
Chara <sup>(d)</sup>	MS-S	MS-S	-
Clearfield Jnz <sup>(d)</sup>	S	MS-S	S
Correll <sup>(d)</sup>	S-VS	S-VS	S-VS
Derrimut <sup>(d)</sup>	MS-S	S	S
EGA Gregory <sup>(d)</sup>	MS-S	S	-
EGA Wedgetail <sup>(d)</sup>	S	S	-
Espada <sup>(d)</sup>	MR-MS	S	MS
Estoc <sup>(d)</sup>	S	MS-S	-
Frame	-	S-VS	S-VS
Frelon	-	MS	-
GBA Ruby <sup>(d)</sup>	MR	MS	MR
Gladius <sup>(d)</sup>	MS	MS	MS
Guardian <sup>(d)</sup>	S	-	S
Kellalac	-	S	-
Lincoln <sup>(d)</sup>	S	MR-MS	MS
Livingston <sup>(d)</sup>	-	MS-S	-
Mace <sup>(d)</sup>	-	MR-MS	MR-MS
Mackellar <sup>(d)</sup>	-	MR-MS	-
Magenta <sup>(d)</sup>	-	-	MR-MS
Peake <sup>(d)</sup>	S	S	MS-S
Preston <sup>(d)</sup>	MR	Sp	-
Scout <sup>(d)</sup>	MS	S-VS	S-VS
Sentinel <sup>(d)</sup>	MS-S	MS	-
SQP Revenue <sup>(d)</sup>	MR	-	-
Tennant <sup>(d)</sup>	-	MS-S	-
Ventura <sup>(d)</sup>	MS-S	S	-
Waagan <sup>(d)</sup>	MS	MS-S	-
Wyalkatchem <sup>(d)</sup>	-	MR	MR
Yenda <sup>(d)</sup>	MR	-	-
Yitpi <sup>(d)</sup>	-	S-VS	S-VS
Young <sup>(d)</sup>	MS	MR-MS	MS

MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible, Sp = susceptible (provisional assessment), - = no ratings provided

## Symptoms

Yellow leaf spot causes tan-coloured lesions on the leaves that are surrounded by yellow halos. Where these lesions occur near the leaf tip, the end of the leaf rapidly turns yellow (chlorosis) and dies back.

In partially resistant varieties, dark rings often form around small tan lesions.

In the southern region, favourable conditions for infection rarely persist into spring, so infection of older plants is less common. When it does occur then, lesions are usually more defined with less chlorosis showing. In wet springs when infection occurs after flowering, this occasionally leads to the formation of pink pigments on stems and seed, which can lead to downgrading of grain deliveries.

As the plant matures, saprophytic growth of the fungus leads to infection of the stubbles and survival of the fungus to the following season.

In Western Australia, where septoria nodorum blotch (*Stagonospora nodorum*) is common, the symptoms of both pathogens can be easily confused. Correct identification usually requires microscopic observation of spores produced after leaves are placed in a humidity chamber.

## Disease cycle

The fungus *P. tritici-repentis* survives as mycelium in crop stubble and plant debris for up to two years, although relatively poorly after 18 months (Figure 1).

### Yellow leaf spot symptoms



PHOTO: HUGH WALLWORK

In summer and autumn, black fruiting bodies on stubble indicate the presence of yellow leaf spot inoculum (above).

Tan-coloured lesions surrounded by yellow halos are severe on susceptible varieties (below) but can still occur on a resistant variety (right).



PHOTO: HUGH WALLWORK



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In autumn/winter this mycelium develops sexual fruiting bodies (pseudothecia), which appear as black, pinhead-sized, raised structures with hair-like projections. These fruiting bodies are particularly common around the stem nodes.

Primary infection is mostly initiated by sexual spores (ascospores) that are shot out of the pseudothecia, infecting young plants adjacent to the infected stubble.

Secondary spread within the crop occurs under moist conditions. This is initiated by the production of conidia spores on dead leaf tissue. Conidia travel long distances on the wind and are responsible for developing later infections within the crop canopy, as well as infecting distant crops and stubbles.

### Pathogen variability

There is no clear evidence of different strains (pathotypes) of *P. tritici-repentis*, although some slight differences in variety ratings are recorded in different regions. No variety has been shown to lose resistance to new strains within a region.

## Management

### Crop rotation

Yellow leaf spot survives between crops on cereal stubbles. After a very dry season the fungus may survive more than 18 months and infect second-year crops. In most instances, a one-year rotation out of wheat is highly effective in reducing early disease occurrence.

### Stubble management

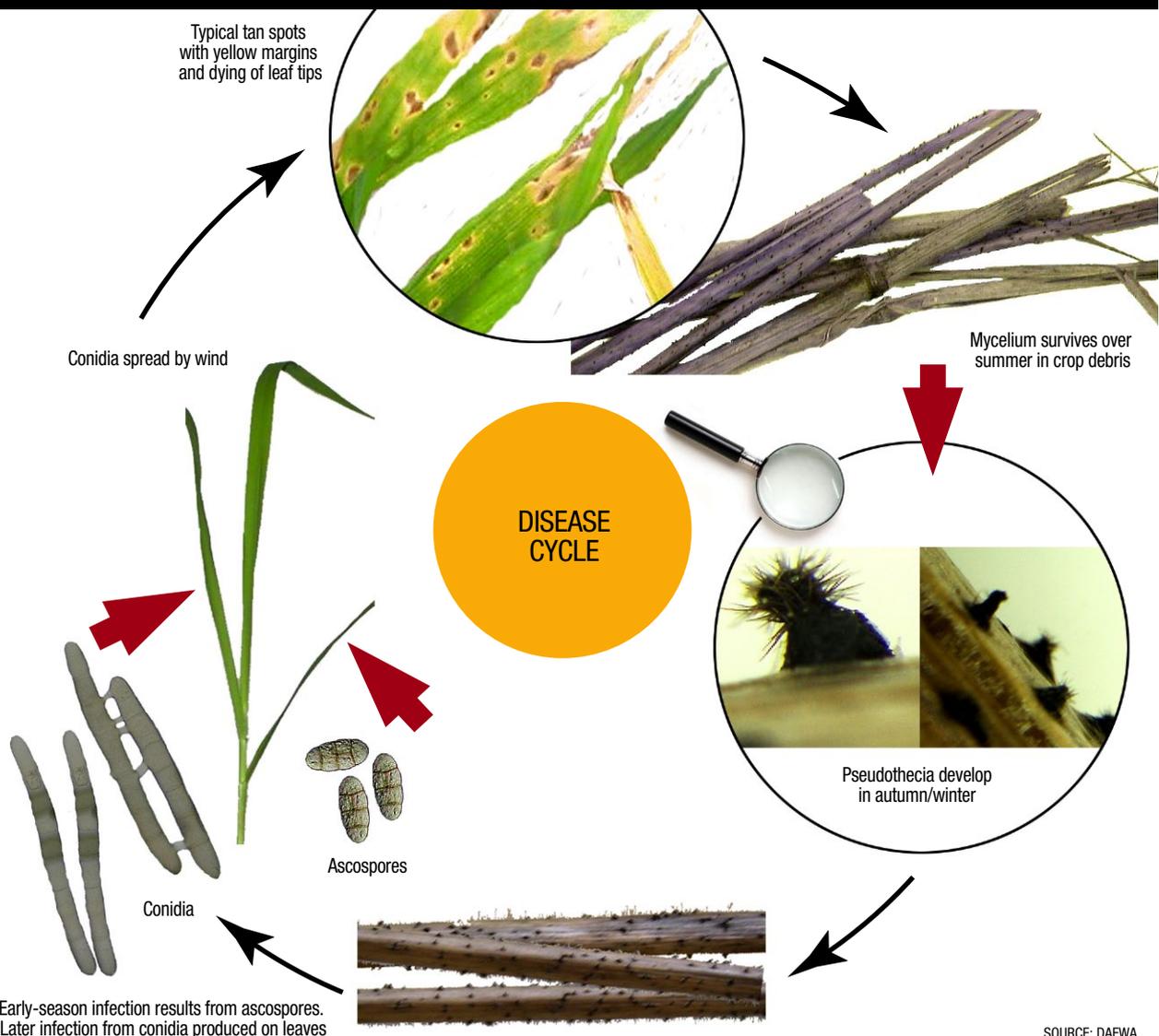
Any practice that reduces stubble density on the surface will reduce the level of inoculum. Surface stubbles may be reduced by tillage, burning or grazing. Care must be taken to balance the risk of disease carryover and stubble removal against the increased risk of soil erosion by wind or water, especially in light soils.

Stubble management will not reduce disease caused by spores blown in from other fields later in the growing season.

### Resistance in varieties

Variety choice has a major influence on yellow leaf spot development in crops. Expression of resistance ranges from moderately resistant (MR) to very susceptible (VS) (Table 1). Where wheat

**Figure 1** The disease cycle of yellow leaf spot *Pyrenophora tritici-repentis*



is to be sown into wheat stubbles-avoid varieties that are rated susceptible (S), S-VS or very susceptible (VS).

### Fungicides

Given that most yellow leaf spot in the southern region occurs in winter at early growth stages, the use of fungicides is generally not likely to be economic. However, where wet conditions are likely to persist and susceptible varieties have been sown, fungicides may provide some control.

A fungicide application can provide protection for up to three weeks.

Prosaro®, Amistar Xtra® and products incorporating propiconazole and tebuconazole are registered for the control of yellow leaf spot. These fungicides are likely to deliver yield benefits provided the symptoms have been correctly diagnosed, moist conditions persist and they are applied at appropriate times.

PHOTO: EMMA LEONARD



In the southern region yellow leaf spot is most likely to occur in early growth stages and fungicides are unlikely to be economic. Avoiding wheat-on-wheat and susceptible varieties minimise the risk of this disease.

## Frequently asked questions

### *How much yield loss is likely to be caused by yellow leaf spot?*

Providing that the spring is not exceptionally wet, it is unlikely for yield losses to exceed 15 per cent, even if a particularly susceptible variety is grown. Yield losses may be higher when exceptional weather conditions occur in areas predominantly growing wheat-on-wheat.

### *A young wheat crop has severe yellow leaf spot. Should a fungicide be applied?*

If the late winter/early spring weather forecasts suggest that prolonged leaf wetting either from dews or rainfall will occur, then a fungicide may provide useful protection for up to three weeks. If conditions are warm and dry it is likely that the crop will grow away from the problem with little benefit from a spray.

### *How is yellow leaf spot identified in a crop?*

In autumn and winter, look at the stubbles around the plants and determine whether there are any of the distinctive fruiting bodies of the fungus. They tend to be more common around the old nodes of the stems.

## Useful resources

- **Cereal Leaf and Stem Diseases**
- **Cereal Variety Disease Guide**
- **National Variety Trials**
- **GRDC Disease Links**

**Project codes: DAW00206; DAW00210; DAS00099**

[http://www.sardi.sa.gov.au/crops/wheat\\_and\\_barley/publications](http://www.sardi.sa.gov.au/crops/wheat_and_barley/publications)

[http://www.sardi.sa.gov.au/crops/wheat\\_and\\_barley/publications](http://www.sardi.sa.gov.au/crops/wheat_and_barley/publications)

[www.nvtonline.com.au](http://www.nvtonline.com.au)

[www.grdc.com.au/diseaselinks](http://www.grdc.com.au/diseaselinks)

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