

Yellowing and physiological spots in wheat and barley crops

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Introduction

Cold weather during vegetative growth stages in recent years across New South Wales and southern Queensland has resulted in cereal crops turning a bit yellow with some physiological brown spots also common in barley. These symptoms are often confused with disease but because they are purely physiological and related to environmental conditions, application of fungicides is not warranted.

The yellowing is believed to relate to transient nutrient deficiency associated with a reduction in the supply rate (uptake and mineralisation) under colder temperatures and may also be related to waterlogging in some seasons.

Herbicide application around the time of cold weather can further exacerbate the development of yellowing and physiological spotting as it slows the rate that the cereal crop can metabolise the chemical. Hence, the chemical tends to concentrate in the leaf tips where it can become phytotoxic resulting in yellowing and spotting (Figure 1 and 2).

Note (Figure 1): herbicide was applied the day before a run of frosts which exacerbated symptom development. The worst affected leaves are towards the top of the canopy with symptoms concentrated towards the leaf tips. This is not characteristic of cereal fungal leaf diseases but may be confused with barley yellow dwarf virus

Figure 1: Yellowing of barley leaf tips following cold weather and frosts at Condobolin in 2014.



Photo: Rick Graham, NSW DPI

Note (Figure 2): symptoms are mainly on the upper leaves and brown spots are concentrated towards the leaf tips. This distribution of symptoms is not characteristic of cereal leaf diseases. Net-blotch in barley and yellow spot in wheat do not caused widespread general yellowing of leaves.

Figure 2: Yellowing of barley leaf tips following cold weather and frosts at Condobolin in 2014 and production of brown physiological spots.

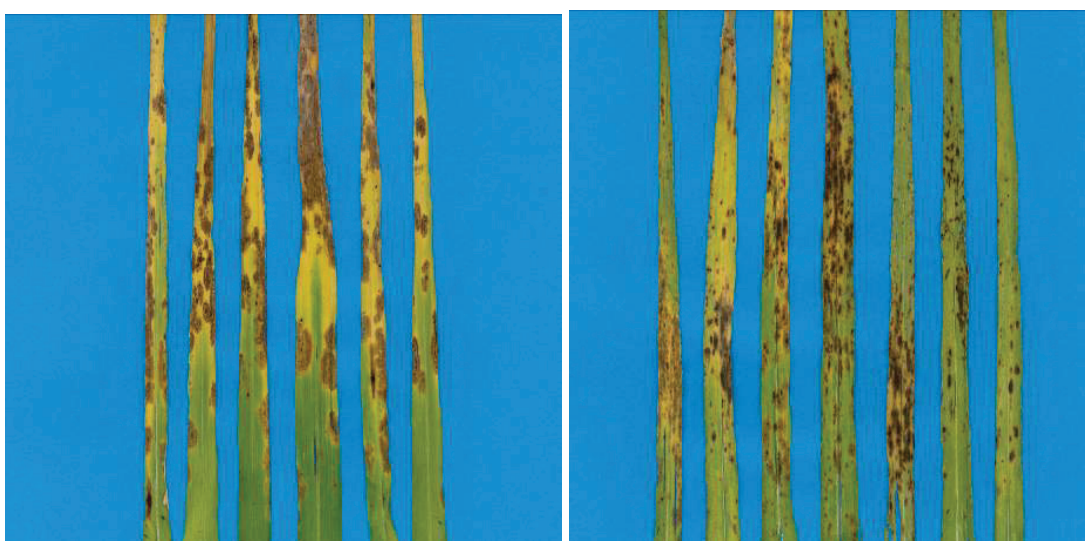


Photos: Steven Simpfendorfer, NSW DPI

Note (Figure 3): Physiological leaf spots produced in barley can be quite specific to the actual variety. The recently released variety GrangeR under stress produces characteristic light brown spots often in a circular pattern that are frequently called ‘thumb spots’ (left picture).

This is a type of physiological leaf spot largely unique to GrangeR that is not related to disease. Fungicides were applied to GrangeR crops in 2014 which made no difference to the occurrence of ‘thumb spots’. GrangeR and other barley varieties can also produce numerous random small brown physiological leaf spots on leaves when under a range of stresses (right picture).

Figure 3: Physiological leaf spots in the barley variety GrangeR in 2014



Photos: Greg Platz, Queensland Department of Agriculture and Fisheries

Note (Figure 4): lesions (tan spots) have a characteristic yellow margin related to toxin production by the yellow spot fungus.

Figure 4: Yellow spot (tan spot) in wheat

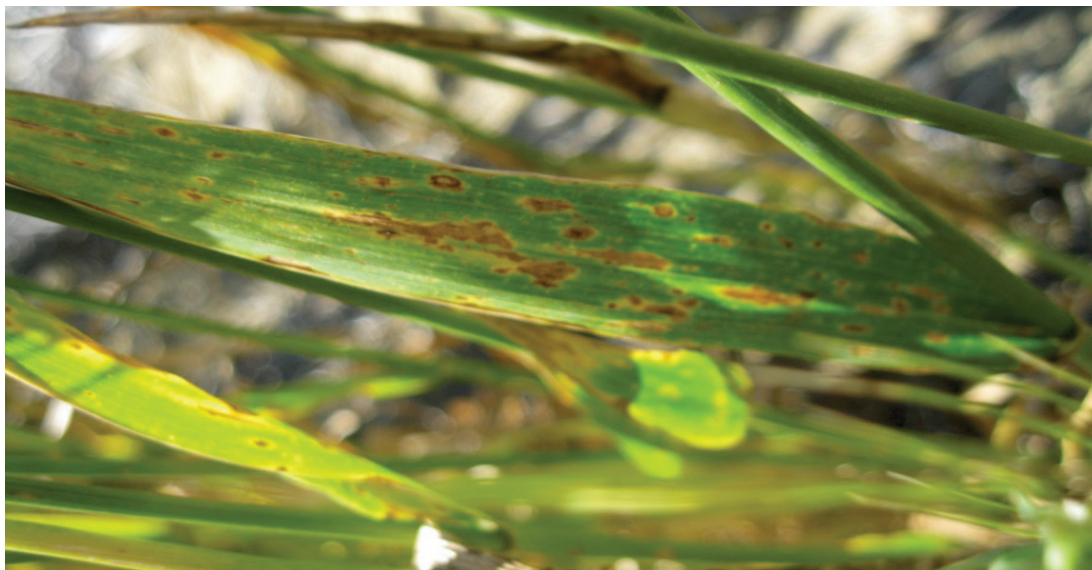


Photo: Steven Simpfendorfer, NSW DPI

Yellow spot does not cause widespread yellowing of wheat leaves. Yellow spot is a stubble-borne fungal disease so is usually worse in wheat-on-wheat rotations but can survive through a break crop. However, wheat stubble from two years ago will still be visible.

Note (Figure 5): lesions (spots) have a characteristic yellow margin related to toxin production by the spot-form of net blotch fungus.

Figure 5: Spot-form of net blotch on barley



Photo: Department of Agriculture and Food, Western Australia

Net blotch does not cause widespread yellowing of barley leaves. Net blotch is a stubble-borne fungal disease so is usually worse in barley-on-barley rotations but can survive through a break crop. However, barley stubble from two years ago will still be visible. The yellow spot fungus, although primarily a wheat pathogen, can infect barley leaves in a barley-on-wheat rotation. This produces small brown spots which look like early net blotch infections but they do not elongate over-time and hence do not appear to require fungicide intervention. Get diseases identified first through a diagnostic laboratory if you are unsure.

Distribution is important

Both yellow spot in wheat and net blotch in barley will generally have a distinct distribution in the plant and on leaves. There will be more lesions on the lowest leaf which are usually also bigger with fewer and smaller lesions as you progress up the leaves within the plant.

The lesions will also generally be spread randomly along each leaf as they appear where a spore lands and meets its moisture requirement for the spore to germinate and infect the leaf. Lesions do not concentrate towards the tips of leaves.

If unsure get it identified first

Leaf samples can be submitted through a range of diagnostic laboratories. In northern NSW leaf samples (at least 10 leaves with symptoms) can be submitted in a paper bag or envelope (not plastic) to:

Steven Simpfendorfer

NSW Department of Primary Industries

4 Marsden Park Road

Tamworth NSW 2340

More information

Contact: Steven Simpfendorfer 0439 581672

Grains Research & Development Corporation – www.grdc.com.au

Acknowledgments

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For updates go to www.dpi.nsw.gov.au/factsheets

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