PATCHES IN THE CROP - BUT IS IT RHIZOCTONIA?
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Over the course of the 2016 season there been several reports of patches in cereal crops, including in oats, which have been noted in Lake Grace, Newdegate and Dalwallinu. The first important thing to note is that patches in cereals are not unique to one particular disease, but in many cases, *Rhizoctonia solani* AG8, the cause of bare patch, or root lesion nematodes (RLN), may be the culprits. But take-all as well as non-disease issues can also cause patches. Patches need to be looked at closely and in the context that they occur. A positive confirmation is required before an effective management strategy can be put into place.

The best time to look for patches in cereals is from 4-6 weeks after planting to early/mid tillering. Look at the paddock as a whole, and observe where the patches are occurring; is there an explanation of the patching related to soil topography or previous paddock management for example, or is it unexplained? Look more closely at a few representative patches within the paddock. If a patch is well defined with a distinct edge between healthy and unthrifty plants, this is often described as a “typical” rhizoctonia patch (Figure 1A - C). These characteristic patches are formed when the primary roots are infected within a few weeks after sowing. Later infection, when the crown roots are developing, may cause patches with less distinct edges. Rhizoctonia patches can occur in all cereals, although barley is more susceptible than wheat, while oats are the least susceptible of the cereals. Root lesion nematode patches DO NOT have such defined edges. Paddocks infested with RLNs often look wavy or clumpy with more indistinct patches (Figure 1D). Looking at patches alone, therefore, is not the only characteristics to confirm the cause.

The AG8 strain of *R. solani* can cause patches in most broadacre crops and pastures including canola and lupins. There are other strains of *R. solani* that are host-specific, such as AG2-1 which causes root rots in lupins and pulses. Therefore it is important to note whether patches are appearing in the same place over a series of years in different crops or only in specific crops such as lupins as this will provide a clue as to what strain *R. solani* that is present.

The next step of the process is to look closely at the plants. Plants in patches that are affected with either Rhizoctonia or root lesion nematode will be stunted with chlorotic leaves; root pruning by these pathogens impair the roots ability to access nutrients and water.

**Figure 1.** Rhizoctonia bare patches in barley (A), wheat (B) and oats (C) caused by *Rhizoctonia solani* AG8. Patches caused by *Pratylenchus neglectus* in barley (D) (Nematode photo acknowledgement: Sarah Collins, DAFWA).
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Now it is time to look at the roots. Carefully dig up some plants ensuring most of the roots remain intact. Choose stunted plants from the middle and edge of the patch, plus some plants from outside the patch as a comparison. Gently shake off the bulk of the soil then wash the roots in a bucket of water. If the soil contains lots of clay, the plants should be soaked for an hour so the dirt can be easily washed off from the roots. For rhizoctonia, look for shortened roots ending in spear tips with brown lesions (Figure 2A and B). RLNs symptoms are varied and often less distinct; reduction in length and number of lateral roots (root hairs), brown lesions with outer layer of the roots degraded in parts, or the appearance of “noodle roots”, so called for the visual similarity to 2-minute noodles (Figure 2C).

Figure 2. Rhizoctonia solani AG8 infection of primary roots of a barley seedling (A), and primary and crown roots of a tillering barley (B). Pratylenchus neglectus infection of primary and crown roots of an oat (C) (Nematode photo acknowledgement: Sarah Collins, DAFWA).

It is important to note that this is a rough guide only and that a positive confirmation through a professional diagnostic service is recommended to achieve the best economic returns in the next cropping season. Additionally, with RLNs there are several species that can have differing host ranges and crop preferences and so require different management, so species confirmation through laboratory tests is necessary. Fresh plant samples that have not been washed and collected as shown in the DAFWA YouTube video (https://youtu.be/_hqjXWEkByg) can be sent to DDLS - plant pathology (formerly part of AGWEST Plant Laboratories) service. Ideally samples should be collected and sent at the beginning of the week so they do not sit in a post office over a weekend. Further details on the service and forms are available here: https://agric.wa.gov.au/n/1801.

Soil samples can be sent to SARDI for testing for the presence of inoculum of the main root diseases through the PreDicta B service. PreDicta B is a DNA based soil test that detects levels of a range of cereal pathogens including Rhizoctonia and RLNs. There have been over 300 PreDicta B tests done on paddocks from WA this year. Overall the results show that R. solani (AG8) and crown rot continue to be one of the biggest fungal root disease risks for cereal growers with 27% of the 363 grower pre-sow soil samples sent having medium to high level of inoculum for each disease. This result is closely followed by take-all (22%). It is important to realise that the PreDicta B test identifies the level of risk for a soilborne pathogen or RLN at the time of sowing.
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A lot can happen to the inoculum in the soil between when the soil was collected and when the crop is sown. Therefore it is recommended to take the soil sample as close as possible to the sowing date allowing of course for time to adjust management strategies. The result may have been high risk, but the paddock did not express any disease. There may be several reasons for a no-show which are related to factors such as how the seasonal conditions (e.g. rain, temperature) before and after sowing influence disease development, time of sowing and seeding system (e.g. seed placement, soil disturbance), and whether fungicides were put in place either on seed or in-furrow as a liquid or on granular fertiliser. A low risk level may show more disease than expected if volunteer crops and weeds germinate before the cereal crop for example.


For more information on fungal root disease contact Daniel Hüberli, Plant Pathologist, South Perth on 9368 3836 or daniel.huberli@agric.wa.gov.au.

For information on nematodes, contact Sarah Collins, Nematologist, South Perth on 9368 3612 or sarah.collins@agric.wa.gov.au.

PRE-HARVEST HERBICIDE APPLICATION
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The late application of herbicides in crop to prevent weed seed set (spray topping) or to desiccate crops has become more common in recent years as the occurrence of herbicide resistance in both wild radish and ryegrass continues to increase and in certain years crops mature unevenly. However, it is essential that each of these application are carried out in line with herbicide label recommendations to avoid herbicide residues in grain. Due to late germinations of grasses, especially brome grass and wild oats, crop topping offers the last chance to control these weeds before harvest and with the right conditions, help to control weed numbers going into the next season. The main influence in getting good results from crop topping is timing. It varies with both weeds and crops. Crop topping can also lead to the desiccation of the crop which has the added benefit of eliminating uneven maturity in the paddock. See table 1 for the herbicides that are registered for late application in crop. Also this year Sharpen (saflufenacil) has been registered for winter pulse desiccation which include chickpeas, field peas and lupins.

Table 1: Registration of pre-harvest applications herbicides in crop.

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<tr>
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✓ = registered for pre-harvest use
X = Not registered for pre-harvest use