

# Upper Eyre Peninsula soilborne pathogen demonstration site

BFiG crop walk, 8<sup>th</sup> September 2021

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**Farmer cooperator:** Tim Larwood

**Location:** Buckleboo, Pine paddock

**Target:** Rhizoctonia root rot (*Rhizoctonia solani* Ag8)

**Treatments:** 1 x Vetch – non-host break from cereal

2 x Barley (susceptible) - seed treated or not treated for rhizoctonia.

2 x Wheat (less susceptible) - seed treated or not treated for rhizoctonia.

**Sown:** 3<sup>rd</sup> May – Vetch. 14<sup>th</sup> May – Barley. 21<sup>st</sup> May - Wheat.

**Risk levels - cereals:** Rhizoctonia root rot – medium risk of yield loss.

Take-all – medium risk of yield loss.

Crown rot – high risk of yield loss.

Common root rot – high risk of yield loss.

Other cereal pathogens were present at low risk or were below detection.

## Comments:

The site appears to fall mainly within the slightly heavier soil type (red loam) present in the paddock. Disease risk levels varied between the heavier soil type and the slightly lighter sand found near the gate into the paddock. Disease risk levels (from PREDICTA® B soil analysis) for the heavier soil type form the basis for discussion in this report.

Risk levels relate to potential yield loss, but actual yield loss will depend on a range of factors, including crop type/variety susceptibility to the disease(s), soil nutrition, soil moisture and seasonal weather conditions.

Visual paddock symptoms of rhizoctonia root rot expression have changed over time. Sowing early into warm soil has become standard practice, allowing plants to establish quickly with less seedling stunting and death. This means that obvious bare patches where plants do not establish or are very stunted are not usually seen any more. The common symptom now is a general un-evenness in growth and plant height in small to large areas of the paddock – usually most obvious from early tillering on.

Crown rot was just starting to show up as slight browning on the leaf sheaths of a couple of the plants that were dug up for root washing at the crop walk.

## Key messages

- Higher levels of root damage from rhizoctonia root rot were seen in barley plants than in wheat plants and this was reflected in uneven crop growth in the barley plots.
- No seed treatment effects were visible in either the barley or the wheat plots in relation to evenness of crop growth.
- The target disease at this demonstration site was rhizoctonia root rot, but (as is common in commercial paddocks) other cereal root diseases were also present at medium to high risk levels (take-all, crown rot, common root rot).
- Take-all expression at this demonstration site should be quantified to ensure yield results are not confounded by expression of this root disease. In the one small take-all patch examined in the wheat plots, affected plants had blackened roots and stem bases and would be unlikely to produce grain.
- For visual identification of root diseases, it is essential to carefully and thoroughly wash out the roots after digging up plants.
- Grass control can be extremely difficult (as in the vetch treatment at this demonstration site), but is essential when managing cereal root diseases, as grasses host many of the pathogens of cereal root diseases.

## Demonstration plots

### Vetch

Barley grass was an issue in Pine paddock and took over the vetch plot. This would compromise disease management as well as resulting in an unacceptable increase in the seed bank if not controlled prior to seed-set. The decision was made to chemical fallow the vetch plot after completion of the crop walk.



## Cereal types



Uneven crop growth was easily seen in the barley plots, but not obvious in the wheat plots. This is consistent with barley being more susceptible than wheat to root damage due to rhizoctonia root rot.



Rhizoctonia root rot symptoms were similar for barley and wheat, with discoloured roots and spear tips (red arrows) as well as rotted root areas (purple arrows) where the roots will separate and leave spear tips.

Symptoms were more extreme in barley than in wheat. Before the roots were washed out, symptoms were not obvious and could have been overlooked.

While secondary root systems were quite well obvious on all plants (barley and wheat), primary root systems were not. Where seeds were visible, there was no sign primary roots had ever been present. It is unclear why this has occurred.

## Barley



Uneven crop growth was seen over both plots (first photo) but there were no obvious visual differences in that uneven growth (second photo) between the treated and untreated plots.



Roots of the plants from areas of poor growth are discoloured and show obvious spear tipping (red arrows). It is also probable that the apparently good root system on this plant will break at the rotting areas (purple arrows).

## 2 x Wheat



Crop growth was even over both plots (first photo) and so there were no obvious visual differences (second photo) between the treated and untreated plots.



There were some small patches of poor growth, perhaps resulting from barley grass competition. On closer inspection, the bases of the wheat plants in this patch appeared a bit discoloured and dark.



Spear tips from rhizoctonia root rot were visible on roots of plants from the patch, but the main symptoms were due to take-all (black core to roots, black stem bases). Under magnification in the laboratory, the black runner hyphae typical of take-all were identified on affected roots. Common root rot might also be present but would require further laboratory work to identify.