

Demonstration to control *Rhizoctonia solani*: seed treatment, liquid injection of fungicide and cultivation below the seed

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Purpose:

1. Does in-furrow application of fungicide using liquid banding improve control of *Rhizoctonia solani* compared to the untreated control or seed treatment?
2. Does in-furrow application of fungicide using liquid banding improve control of *Rhizoctonia solani* compared to coating of granular fertiliser?
3. Does an integrated approach incorporating cultivation, seed treatment and in-furrow fungicide application improve control of *Rhizoctonia solani* compared to the untreated control and all other individual treatments?

Location: WMG trial site- Warradarge

Soil treatments:

PreDicta-B pre-sowing soil test found 82 of pgDNA/g sample of *R. solani* AG8 which is considered a medium level. No other root pathogens were detectable (take-all, crown rot, RLN's and CCN).

Rotation: 2013-wheat, 2012-lupin, 2011-wheat

Growing Season Rainfall (April- October 2014): 358 mm

BACKGROUND SUMMARY

Rhizoctonia solani AG8, causing rhizoctonia root rot and bare-patch, is a significant impediment to cereal production in WA. Management of this root pathogen requires an integrated program.

Currently two new seed treatment fungicides are registered for suppression of *R. solani* which have been shown to offer 5% increase in yield of barley and wheat in *Rhizoctonia* affected paddocks (Huberli et al. 2013). Under a recent funded GRDC project we identified fungicides that significantly increase grain yield of wheat and barley when liquid banded into the furrow at the time of sowing (Huberli et al. 2014, 2015). These in-furrow fungicides have been approved by the APVMA, available for use in the 2015 season. In this trial we are using one of the two approved chemicals.

We identified in a previous trial that cultural practices such as growing canola prior to cereals and a 10 cm cultivation below the seed at sowing, can reduce the level of disease and improve grain yields. That canola can be used as a break crop confirms data from South Australia (CSIRO and SARDI). In this, demonstration trial the integrated management approach combines seed treatments, liquid banding and cultivation below the seed to improve yields in cereal paddocks affected by *R. solani*.

TRIAL DESIGN

Plot size: 20 m

Machinery use: Primary Super Seeder with Liquid Systems injector system for delivery of liquid into the furrow and behind the press-wheel on the ground

Repetitions: 4

Crop type and varieties used: barley (Baudin)

Seeding rates and dates: 75 kg/ha, sown 28 May 2014

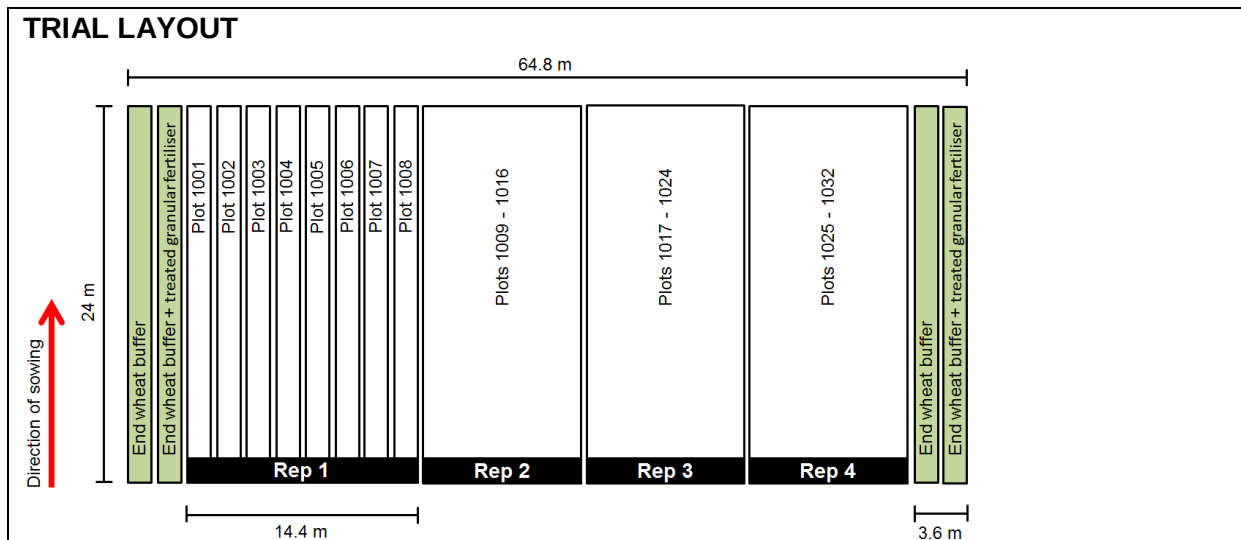
Other applications/ treatment rates and dates:

1. Untreated control
2. Seed dressing (Vibrance® 360 ml/100kg seed)
3. Liquid banding in-furrow (Uniform® 400 ml/ha)
4. Split application: liquid banding in-furrow and on the furrow (Uniform® 400 ml/ha)
5. Granular fertiliser in-furrow (Uniform® 400 ml/ha)
6. Cultivation 10 cm below seed
7. Cultivation 10 cm below seed + liquid banding in-furrow (Uniform® 400 ml/ha)
8. Cultivation 10 cm below seed + liquid banding in-furrow (Uniform® 400 ml/ha) + Seed dressing (Vibrance® 360 ml/100kg seed)

Key measurements:

- Seedling emergence counts
- Primary and crown root assessment (8 WAS): disease severity and incidence for treated and untreated plots. Total of 40 plants per plot. Trial total 960 plants.
- Grain yield and grain quality

TRIAL LAYOUT



RESULTS/STATISTICS

There were no significant treatment effects on plant emergence and no phytotoxicity symptoms were observed. When all treatments were compared in early root assessments, there were no significant differences in disease severity or incidence. In comparisons between specific treatment groups, it was found that Uniform treatments gave small but significant reduction of disease incidence, but not disease severity, when compared to Vibrance®. When method of application of Uniform® fungicide was compared (liquid vs.

granular vs. split liquid), it was found that compared to Untreated, liquid application in-furrow significantly reduced disease incidence, but not disease severity.

Foliar diseases were minimal and no differences were evident between treatments.

Grain yield for the Untreated control was 3.36 t/ha. Only the split liquid application of Uniform® (P = 0.047) and the granular fertiliser treated with Uniform® (P = 0.038) significantly increased yield compared to Untreated control. The split application treatment increased yield by 0.24 t/ha and granular fertiliser treatment by 0.25 t/ha.

Grain quality samples have yet to be processed.

OBSERVATION/ DISCUSSION/ MEASUREMENTS

While incidence of root rot was high (83-95%), the disease severity was low on the trial site ranging from 14.3 to 19.5% for treatment averages; many plants had a low level of root disease. Distinct patches were not evident in the trial.

Despite low levels of disease severity observed in the trial and only minor treatment effects on root rot, two in-furrow treatments were found to significantly improve the yield by more than 0.24 t/ha compared to the Untreated control. These were the granular fertiliser treated with Uniform® and the split application of Uniform® above and below the furrow.

In a site with a moderate rhizoctonia disease risk, as indicated by PreDicta B, the majority of plants had root rot however severity was low and patch development did not occur. Under low disease pressure, the Uniform treatments as a whole were able to provide a small reduction in disease incidence which subsequently resulted in yield increase from two treatments. Under higher disease pressure these products can be included as part of an integrated management approach for rhizoctonia.

PEER REVIEW/REVIEW

Geoff Thomas

REFERENCES

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