

# Evaluation of the seed treatment Rancona® Dimension as a standalone option for managing crown rot in wheat – 2015

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## Introduction

Crown rot (CR), caused predominantly by the fungus *Fusarium pseudograminearum* (Fp), is a significant disease of winter cereal crops in the northern NSW and southern Qld. Rancona® Dimension (ipconazole + metalaxyl) was recently registered in Australia as a fungicidal seed treatment with good activity against cereal bunts and smuts, pythium and for the suppression of rhizoctonia. Rancona® Dimension is also the first seed treatment to be registered (at 320 mL/100 kg seed) for the suppression of CR.

Suppression, by definition, indicates that the seed treatment reduces growth of the pathogen for a set period of time early in the season. This is distinct from control, which Rancona® Dimension and other seed treatments provide against bunts and smuts of wheat and barley in that they prevent infection throughout the season.

It is recommended by the manufacturer that Rancona® Dimension is used as part of an integrated disease management strategy for CR and not as a standalone option. However, growers may still be tempted to try and use Rancona® Dimension under medium to high CR risk situations where other management strategies have not sufficiently reduced inoculum levels. This is not uncommon following seasons with low in-crop rainfall that limits the effectiveness of break crops such as chickpea, faba bean, canola and sorghum in decomposing cereal stubble, which harbours the CR fungus. Under this scenario, growers are often forced into sowing another winter cereal within the rotation sequence and could be tempted to resort to a seed treatment as their main option in trying to reduce yield loss associated with CR infection. Replicated research therefore appeared warranted to determine the impact of Rancona® Dimension on yield loss from CR infection across sites in the northern region. This will hopefully ensure that growers have a realistic expectation of what this seed treatment can achieve if used in isolation from other management strategies.

## Site details

Location: **Twelve sites across northern NSW and southern Qld (Table 1)**  
Sowing date: **Varied (Table 1)**

## Treatments

- Inoculated versus uninoculated trial design to evaluate the relative seed treatment effects on the yield impact associated with CR infection at each site.
- High levels of (CR) infection induced in inoculated plots (added CR) by incorporating non-viable durum seed colonised by at least five different isolates of Fp into the seeding furrow (2.0 g/m of row) at sowing.
- One crown rot susceptible bread wheat variety EGA Gregory<sup>db</sup> was used across all sites at a target plant population of 100 plants/m<sup>2</sup> seed treatments evaluated:
  - Nil seed treatment
  - Rancona® Dimension (ipconazole 25 g/L + metalaxyl 20 g/L) at 320 mL/100 kg seed
  - Dividend M® (difeniconazole 92 g/L + metalaxyl-M 23 g/L) at 260 mL/100 kg seed
  - Jockey Stayer® (fluquinconazole 167 g/L) at 450 mL/100 kg seed.

Dividend M® and Jockey Stayer® are NOT registered for the suppression of CR, but were included to represent commonly used wheat seed treatments for bunt and smut control, or early control of stripe rust (a leaf disease), respectively. Including four treatments across each site ensured statistical rigour of yield outcomes.

## Key findings

Treating EGA Gregory<sup>db</sup> seed with Rancona® Dimension reduced establishment losses associated with the addition of crown rot inoculum to 7% compared with 26% when no seed treatment was used.

In this instance, Rancona® Dimension did not provide a significant or consistent yield benefit in the presence of high levels of crown rot infection across the 12 trial sites in 2015.

Growers should not expect Rancona® Dimension to provide a significant and consistent reduction in yield loss from crown rot infection when used as a standalone management strategy.

Growers considering the use of Rancona® Dimension should follow the manufacturer's advice and only consider it as part of an integrated management strategy against crown rot.

**Table 1.** Site location, sowing dates and background crown rot levels of the 12 trial sites in 2015

Location	Sowing date	Background crown rot*
Trangie	15 May	Nil
Garah	30 May	Nil
Mullaley	20 May	Medium
Coonamble	28 May	High
North Star	27 May	Nil
Wongarbon	27 May	High
Gilgandra	12 May	Nil
Merriwa	9 June	Medium
Nyngan	8 May	Nil
Macalister	1 June	Medium
Westmar	20 May	Nil
Mungindi	26 May	High

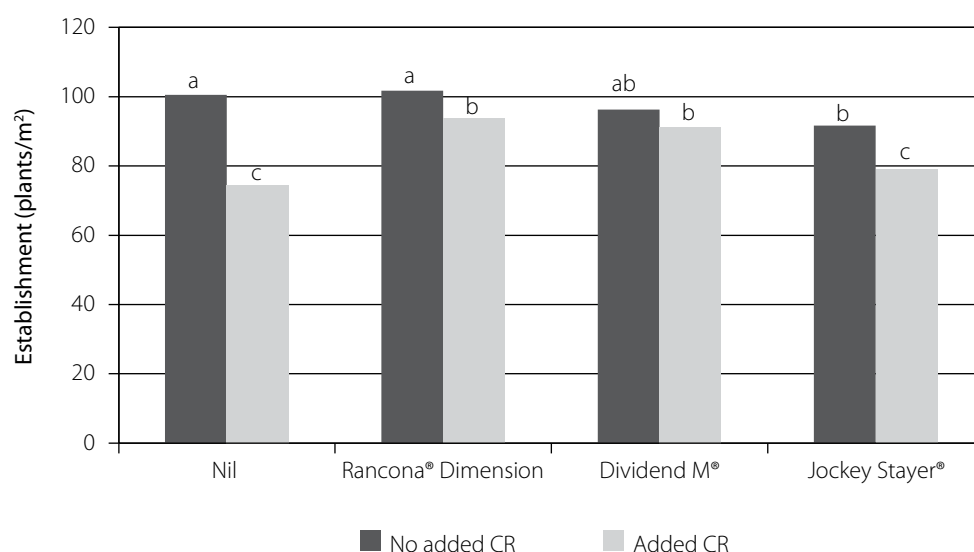
\*Background crown rot levels as determined by PreDicta B®

## Results

An across site analysis was conducted to assist in summarising the general trends in the performance of Rancona® Dimension across the 12 sites in 2015.

### Crop establishment

- In the no added CR treatments, Rancona® Dimension and Dividend M® did not significantly affect plant establishment compared with the nil fungicide treatment (Figure 1). However, establishment was slightly reduced with Jockey Stayer® compared with the Rancona® Dimension and nil treatments.



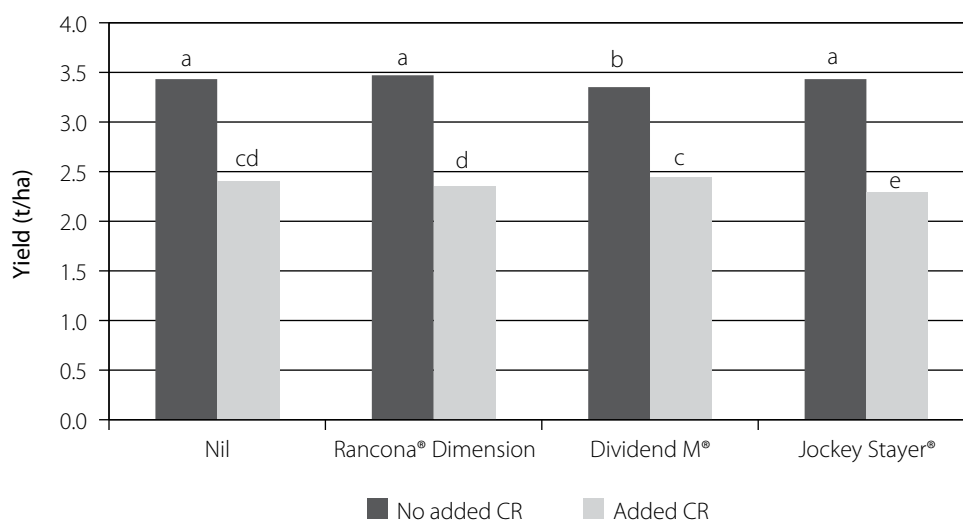
**Figure 1.** Impact of fungicide seed treatments on establishment of EGA Gregory in the absence and presence of added crown rot inoculum – average 12 sites in 2015

- Addition of CR inoculum at sowing significantly reduced the establishment of EGA Gregory by 26% averaged across sites compared to when no seed treatment was applied (Nil; Figure 1).
- Rancona® Dimension and Dividend M® significantly improved establishment in the presence of added CR with losses reduced to only 7% and 9%, respectively compared with the Nil – no added CR treatment.
- Jockey Stayer® did not significantly improve establishment in the presence of added CR.
- Severe early infection from CR, as can occur with the addition of CR inoculum in the furrow at sowing, can result in seedling blight, which reduces crop establishment. Rancona® Dimension could provide a useful level of protection against seedling blight

associated with severe early *Fusarium* infections, but further research is required to prove this.

### Grain yield

- An across-site analysis of the 12 trials conducted in 2015 found that Dividend M® had a minor yield reduction (0.08 t/ha) compared with using no seed treatment (Nil) in the no added CR treatment (Figure 2).
- Rancona® Dimension did not significantly affect yield in the absence of added CR over the Nil treatment, but was slightly (0.12 t/ha) higher yielding than Dividend M®.
- Across sites, yield loss in the added CR treatment was 27% with Dividend M®, 32% with Rancona® Dimension and 33% with Jockey Stayer®. Seed treatment did not affect the extent of yield loss, with none significantly different from what was measured in the Nil treatment (30%; Figure 2).
- Rancona® Dimension unfortunately did not provide a consistent yield benefit in the presence of high levels of CR infection across the 12 trial sites in 2015.



**Figure 2.** Impact of fungicide seed treatments on the yield of EGA Gregory in the absence and presence of added crown rot inoculum – average 12 sites in 2015

### Conclusions

Rancona® Dimension is registered in Australia for the suppression of CR infection. Rancona® Dimension reduced establishment losses associated with severe early infection created by the addition of CR inoculum to the seed furrow at sowing to 7%, compared with 26% in the absence of a seed treatment. Further research is required to determine if this improvement in establishment is associated with reduced *Fusarium* seedling blight. It should also be established whether such severe establishment losses are an artefact of the inoculation process used in the trials or occurs naturally in paddocks with high stubble-borne inoculum loads.

In a separate larger trial conducted at Tamworth in 2015 in which infected stubble at the surface was the inoculum source, Rancona® Dimension did not significantly affect EGA Gregory establishment compared with the Nil seed treatment (data not presented).

Establishment benefits apparent in the 12 trials reported here unfortunately did not translate into any improvement in grain yield. Rancona® Dimension did not provide a significant yield benefit over the nil seed treatment or the two other commonly used seed treatments examined in this study under high CR pressure in 2015.

Although Rancona® Dimension is registered for the suppression of CR, with activity against early infection and potential establishment losses evident in this study, growers should not expect this to translate into a significant and consistent reduction in yield loss from CR infection when the product is used as a standalone management strategy. Integrated management remains the best strategy to reduce losses to CR. Growers might like to consider including Rancona® Dimension (320 mL/100 kg seed) as one additional component in their integrated management of crown rot.

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