



Second year carry-over benefits of seed dressing for soilborne diseases in the Eastern Wheatbelt

Ashleigh Donnison and Kylie Chambers, DPIRD

Key messages

- In 2018 there was a reduction in crown rot severity when Product X was applied, however this did not improve yield
- 2019 pre-season PreDictaB results showed a reduction in crown rot risk for Evergol, Product X and Vibrance
- The second year had no carry over benefit of seed dressings or previous year's variety. These seed dressings are only effective in the year applied and effectiveness can be influenced by initial inoculum level and how conducive the season is for the disease

Aims

To determine the carryover benefit of seed dressings for soilborne diseases in the eastern wheatbelt.

Background

Crown rot (*Fusarium pseudograminearum*) is a soilborne disease frequently detected in the eastern wheatbelt (Chambers et al. 2018). Several seed dressings are registered to suppress crown rot in wheat and barley. In 2018, a trial was established in Elabbin, Western Australia, to determine the return on investment of four seed dressings, and the influence they have on disease levels and yield (Chambers 2018). These seed dressings are only intended for disease suppression in one season. Continuation of this trial in 2019 investigates if there was a reduction in inoculum which then translated to a reduction in crown rot in the second year.

Methods

Site

In 2017 a PreDictaB test, established that the trial site had medium crown rot disease risk. There was also a medium level of *Pratylenchus neglectus* (RLN). Other diseases such as white grain and charcoal rot were also detected. The trial was established in 2018 with four seed dressings (Rancona, Evergol, Vibrance and Product X) and a nil dressing. It was sown to two varieties, Emu Rock (moderately susceptible) and Scepter (susceptible). The trial was replicated four times. In 2019, the entire trial was sown to Scepter, receiving 151mm of April to October rainfall, the season had a late break (June) and had a very dry September (5.3mm). There was no additional crown rot inoculum added to the site in either 2018 or 2019.

Results and Discussion

2019 PreDicta B testing

Pre-sowing 2019 PreDictaB tests indicated that there was an overall low level of crown rot risk. There was a significant reduction in crown rot risk for the Evergol, Product X and Vibrance compared to the nil ($p < 0.05$).

There were no significant differences among the seed treatments in the post-harvest PreDictaB results ($p > 0.05$). There was also no difference between the wheat variety stubble ($p > 0.05$).

Overall the crown rot risk was slightly higher at the end of the season, however this was still within the low risk category. In this trial, the seed dressings seemed to have little effect in changing in crown rot disease risk, however disease risk is also influenced by the seasonal effects on the disease along with the initial disease risk level.

In season whitehead counts 2019

There were no significant differences in whitehead counts between seed dressings or varieties ($p > 0.05$). There was also no significant interaction between seed dressings and variety ($p > 0.05$). Similar results were found in 2018, with no significant whitehead count differences between treatments.

Disease incidence and severity

Crown rot severity was determined using the using the 0–3 crown rot rating scale which was used to calculate the crown rot index score (Forknall *et al.* 2018). This was calculated from 25 plants pulled per plot after harvest cuts were taken.

$$\text{Crown rot Index} = \left(\frac{\text{tillers with basal browning}}{\text{total number of tillers}} \times \frac{\text{crown rot severity}}{3} \right) \times 100\%$$

In 2018, Product X significantly reduced the crown rot severity, however there was no reduction from other seed dressings compared to nil ($p < 0.05$). There was also no difference between the two varieties ($p < 0.05$).

In 2019, there were no significant differences among seed treatments or 2018 variety ($p > 0.05$). Overall there was a reduction in severity for all treatments compared to 2018. This was likely due to the seasonal conditions.

Yield and grain quality parameters

In 2018, Scepter was significantly higher yielding by 0.14t/ha compared to Emu Rock ($p < 0.05$). However, there were no differences among seed dressings ($p > 0.05$) or any interaction between seed dressings and variety.

In 2019 none of the previous year's seed dressing products increase yield compared to untreated seed. All treatments yielded 1.0-1.2t/ha.

Conclusion

In 2018, none of the registered seed dressings significantly reduced crown rot severity. There was some benefit to using the Product X in the first year (2018) as it significantly reduced crown rot severity; however, in this trial it did not translate to a significant difference in yield.

The residual disease risk determined by PreDictaB testing at the beginning of the 2019 season was significantly reduced for Evergol, Vibrance and Product X compared to the nil, indicating some potential second year benefits of these products. Though there was a reduction in risk there were no significant differences in crown rot expression or severity in the 2019 season. There were also no yield differences among seed treatments or 2018 variety compared to the nil. It is important to note that these seed dressings are only intended to suppress crown rot in the season of application.

Managing crown rot as part of an integrated disease management plan as well as part of an overall farming system is essential when considering use of seed dressings. Seed dressings can be effective in the year of application, potentially suppressing the disease; however, the yield benefits are dependent on current disease levels and how conducive the season is for the disease. Assumedly, the higher the disease pressure the more beneficial the seed dressings will be for yield. The benefits of seed dressings did not carry over into the second year of this trial.

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