

# FUNGICIDE SEED TREATMENTS IN WHEAT

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## AIM

To evaluate the yield response, efficacy and crop safety of various seed treatments in the control of root pathogens affecting wheat.

## BACKGROUND

One input that is frequently overlooked is the need for fungicide seed treatment in cereals. Traditionally used for the control of common smuts and bunts only, it is easy to see why growers may opt to only treat every couple of seasons based on the frequency of infection from these fungal diseases. What may be often overlooked however are the yield-limiting effects of common root diseases including *rhizoctonia*, take-all, *fusarium* and *pythium*.

In particular the root disease *rhizoctonia* often infects crops on sandier soils and may increase in severity in no-till seeding systems that provide little disturbance of fungal hyphae. The management of *rhizoctonia* is not an easy one and requires an integrated approach to control that incorporates a range of control measures.

## TRIAL DETAILS

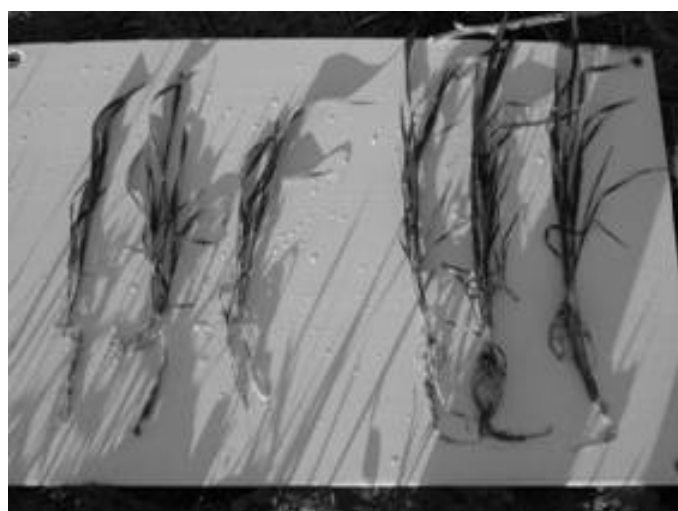
Property	Clint, Ian & Helen Hunt, Marchagee
Plot size & replication	1.32m x 10m x 3 replicates
Soil type	Sandy loam
Sowing date	12/5/08
Seeding rate	100 kg/ha Guardian Wheat
Fertiliser	12/5/08: 100 kg/ha Urea broadcast pre-seeding + 100 kg/ha MAPSZC Plus banded at seeding
Paddock rotation	2006 = Wheat; 2007 = Canola
Herbicides	12/5/08: 2 L/ha Glyphosate, 35 g/ha Logran, 1.6 L/ha trifluralin
Growing Season Rainfall	324mm

## RESULTS

**Table 1:** Mean crop establishment counts (plants/m<sup>2</sup>) and vigour ratings 2/7/08, Marchagee 2008.

Treatment	Crop Establishment (plants/m <sup>2</sup> )	Crop Vigour 1 (poor) – 10 (excellent)
Untreated	164.1	8.0
Dividend 1.3 L/t	<b>173.4</b>	9.2
Dividend 2.6 L/t	163.2	8.0
Dividend 1.3 L/t + Emerge 1.2 L/t	160.2	8.5
Hombre 4.0 L/t	<b>154.9</b>	8.2
LSD (P=0.05)	11.35	n.s.
CV (%)	3.86	11.99

Figures in **bold** are statistically different from one another.



**Figure 1:** Untreated wheat cv. Guardian (left) versus wheat treated with Dividend 2.6 L/tonne seed (right), Marchagee 2008.**Table 2:** Grain yield for various fungicide seed treatments, Marchagee 2008.

Treatment	Yield (t/ha)
Untreated	2.94
Dividend 1.3 L/tonne	3.30
Dividend 2.6 L/tonne	3.08
Dividend 1.3 L/tonne + Emerge 1.2 L/tonne	3.18
Hombre 4.0 L/tonne	2.87
LSD (P=0.05)	n.s.
CV (%)	10.82

## COMMENTS

- The plant count and vigour data presented in table 1 demonstrates the crop safety of Dividend relative to other fungicide seed treatments, with no negative effect on crop establishment recorded relative to the untreated. Trial results have proven Dividend has no effect on coleoptile length, unlike many other fungicide seed treatments, thus minimizing the potential for negative interactions with pre-emergent herbicides such as trifluralin. Observations of crop vigour and biomass production during the season tended to show improvements in crop establishment for all plots treated with Dividend (figure 1), despite no statistical difference in crop vigour being recorded.
- Grain yield at harvest also showed a tendency for improved yield with Dividend of between 140 to 360 kg/ha, although some variation in yield between replicates was recorded (third replicate exhibited an unusually low yield for Dividend 2.6 L/tonne and is an outlier in data set). An increase in yield of 140 kg/ha achieved using Dividend at 2.6 L/tonne seed, represents a return on investment of \$25.80/ha even after the treatment cost of around \$12-13/ha is considered (\$9/ha at 70 kg/ha sowing rate). An identical trial conducted at Arrino resulted in a 220 kg/ha increase in yield, returning an additional \$49/ha. Based on a wheat price of \$280/tonne, this equates to an additional return of \$1990 per 100 acre paddock.
- Visual assessments of root damage during the growing season showed symptoms of low level *rhizoctonia* infection and this may explain the tendency for Dividend treated plots to yield higher than the untreated. The variability in distribution of the fungus across the site was also evident, commonly making small plot field trials with this disease difficult. Dividend is the only product currently registered for the suppression of *rhizoctonia* in wheat and barley, in addition to controlling common smuts and bunts in wheat and also having activity on smuts and seed-borne net-form net blotch in barley.
- Whilst Dividend is highly effective in suppressing *rhizoctonia*, an integrated approach to root disease management is critical to minimise yield losses from this disease. Planting time, choice of pre-emergent herbicide, crop nutrition, crop tolerance, residual soil nitrogen and choice of fungicide seed treatment are all likely to impact on the severity and ultimate yield loss from this disease. As *rhizoctonia* predominates in the top 5cm of soil, agronomic practices which encourage rapid root development beyond the infection zone will improve the plants ability to tolerate disease infection. Adequate crop nutrition, particularly phosphorous, zinc and nitrogen are important to maximise establishment and minimise the effects of disease infection. The use of herbicides associated with root pruning, particularly Group B herbicides such as Logran<sup>®</sup>, can reduce plant tolerance to *rhizoctonia* infection. Where possible sow into warm soils to maximise early root growth and avoid green bridges which allow high levels of inoculum to build up prior to planting.

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