Evaluate newly registered seed treatments for loose smut and rhizoctonia in Hindmarsh barley

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Purpose:	Comparison of EverGol® Prime, Vibrance® and Tripower® to Baytan® T for loose smut control. Comparison of EverGol Prime compared to triazole seed treatments for rhizoctonia suppression. WMG 2013 rotational site, Regans Ford
Soil Test Results:	Predicta B testing picked up low levels of Rhizoctonia from the trial site.
Rotation:	Pasture, Wheat

BACKGROUND SUMMARY

- Hindmarsh barley has in recent seasons observed high levels of loose smut infection.
- Barley crops infected with loose smut will have the characteristic dark spore filled heads within the crop but this is actually the appearance of infection from the previous season which has been within the seed. At maturity, the spores will rupture and be spread by wind infecting neighbouring crops at flowering. Moist conditions at flowering combined with mild temperatures like in the 2013 spring will favour infection. Grain infected this season will appear completely normal. When the seed is sown and germination occurs the following season, the fungus will begin to grow within the plant with a mass of spores replacing the head and continuing the disease cycle.
- Group 3 triazole (Baytan) seed treatments can cause reductions in coleoptile length, previous trial experience has shown EverGol Prime from Group 7 carboxamide chemistry does not reduce coleoptile length or delay emergence.

Key Points

- Loose smut in barley is internally seed borne so if you are seeing infected heads then it means your grain source was contaminated. It is the hardest of the smut diseases to control because it is an internally seed borne infection and most current seed treatments are not as effective on internally seed borne diseases.
- EverGol Prime has excellent local systemicity meaning it is able to move across the seed wall and into the seed meaning it is an excellent option for control of loose smut.
- The application for Sakura into barley was not successful with the APVMA. Therefore we will not review the results of this component of the trial in regard to the interactions with pre-emergent herbicides.

TRIAL DESIGN

Plot size & replication: 2.5 x 20 m, 3 replicates

Variety: Hindmarsh

Seeding date: 3/6/13

Seeding rate: 70 kg/ha

Fertiliser: 60 kg of Gusto® Gold or similar banded, 60 kg of Urea top dressed

Herbicides: Glyphosate 2 L/ha 30/4/13, SpraySeed® 2.5 L/ha + Ally® 3 g/ha 12/7/13, Glyphosate 2 L/ha + Sakura® 118 g/ha + Lorsban® 1 L/ha 3/6/13

Velocity® 670 mL/ha + Hasten® 14/7/13

Fungicide: Prosaro® 150 mL/ha + Uptake® 0.5% v/v 16/8/13

SITE CONDITIONS

Disease: The source of Hindmarsh barley used in this trial had high levels of loose smut infection during the 2012 season. Plant counts of the untreated in 2013 recorded 4% infection in the untreated.

Under the seasonal conditions strong rhizoctonia symptoms were evident across the trial site with ~2-3 patches visible in each plot. However there was some variability in replicate one with 2 plots containing no obvious patches (see notes in yield discussion).

Time of sowing: Sowing was made into more marginal top soil moisture although there was excellent sub surface moisture. The benefits of an effective series of knockdowns reduced grass weed competition across the trial.

RESULTS

Loose Smut

Table 1. Loose smut infection in Hindmarsh barley. Untreated recorded ~4% plants infected.

Assessment date	**06/09/13**		
Days after seeding	**98DAS**		
Seed Treatment	**% Control**	**plants/plot**	
Untreated	0	182	a
EverGol Prime 80 mL/100 kg	100	0	d
EverGol Prime 40 mL/100 kg	100	0	d
Vibrance 360 mL/100 kg	100	0	d
Vibrance 180 mL/100 kg	97	5	d
Baytan T 100 mL/100 kg	75	46	c
Tri-Power 400 mL/100 kg	51	89	b
LSD (P=.05)		14.60	
CV		17.83	

Means followed by same letter do not significantly differ (Duncan's 0.05)

EverGol Prime at both rates recorded control of loose smut along with Vibrance at the 360 mL/ 100 kg rate. Vibrance at the 180 mL/100 kg rate recorded excellent (97%) control of loose smut in this trial.

The Group 3 fungicides Baytan and Tri-Power recorded significantly lower and unacceptable control of loose smut in this trial.

FINANCIAL ANALYSIS OF RESULTS

Table 2. Yield (t/ha), grain quality and return on investment ($/ha).

Date	**12/11/13**									
Days after sowing	**164DAS**									
Seed Treatment	**Yield t/ha**		**% Untreated**	**Protein (%)**	**Hectolitre Weight (kg/hL)**	**Screenings (%)**	**Colour**	**Cost $/ha**	**Gross return $/ha**	**$ return over untreated**
Untreated	3.41	a-d	100	10.71	62.64	5.76	55.19	-	$757.02	-
EverGol Prime 80 mL/100 kg	3.70	ab	109	11.02	65.36	5.79	55.46	$8.02	$821.40	$56.36
EverGol Prime 40 mL/100 kg	3.70	ab	108	10.33	63.96	5.84	55.03	$4.01	$821.40	$60.37
Vibrance 360 mL/100 kg	3.64	abc	107	10.36	65.62	4.86	56.08	$7.48	$808.08	$43.58
*Vibrance 180 mL/100 kg	3.93	a	115	10.8	66.02	5.03	54.71	$3.74	$872.46	$111.70
Baytan 100 mL/100 kg	3.48	a-d	102	9.53	63.99	4.94	56.05	$1.46	$772.56	$14.08
*TriPower 400 mL/100 kg	3.72	ab	109	11.64	64.55	6.12	54.21	$6.72	$825.84	$62.10
LSD (P=.05)	0.819									
CV	12.61									
Kwinana Delivered $/tonne	$222									

Means followed by same letter do not significantly differ (Duncan's 0.05)

OBSERVATION

All treatments met Hindmarsh food grade parameters although loose smut was not tested for, which may have excluded the untreated from delivery due to its levels of infection.

There was no significant difference in yield between treatments.

*Plot 112 TriPower (4.78 t/ha) and Plot 115 Vibrance 40 mL/100 kg (4.59 t/ha) recorded no obvious patches due to disease variability. This increased the average yields for these two treatments. Other treatments in the trial were more consistent for yield across the 3 replicates.

DISCUSSION

It is recommended that grower's retaining seed apply an effective seed treatment. For those retaining Hindmarsh or any other variety that contained loose smut in 2013 it is recommended that you use an effective seed treatment and ensure excellent coverage of all seeds. It is also recommended that when bulking up new varieties like Bass or Litmus growers use an effective seed treatment to prevent build-up of loose smut.

PEER REVIEW

Craig White – Technical advisor southern WA, Bayer CropScience.

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