

Effect of Hombre[®] seed treatment on reducing BYDV in wheat

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Key Outcomes

- Yield responses were achieved when Hombre seed treatment was used at Frances and Conmurra sites in 2012
- Crop rotation effects had a much greater impact on grain protein than whether a seed treatment was used or not
- Reducing aphid activity reduces the risk of developing BYDV
- Most occurrences of BYDV occur from aphid activity early in the season, so early protection is best

Trial Objectives: To investigate the effect of the seed treatment Hombre[®] on reducing barley yellow dwarf virus in different wheat varieties

Trial Duration: 2012

Locations: Conmurra & Frances

Farmer Cooperators: Lachie Seears (Conmurra), Chris & Tim Fry (Frances)

Soil Types: Black clay over limestone (Conmurra), Sandy loam over clay (Frances)

Monthly Rainfall:

Rain	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	April-Oct	Total
Conmurra (NRM)	9	7	34	39	51	151	71	121	42	39	29	11	514	604
Frances (NRM)	20	1.6	40	17	37	88	53	77	45	26	15	15.2	343	435

2011 Paddock History: faba beans (Conmurra), barley (Frances)

Yield Limiting factors: delayed sowing date at Frances

Plot Size: 1.6m x 10m (8 rows x 15cm spacings) Replicates: 3

Trial	Application	Date applied
Sowing date	10 May Conmurra 7 June Frances	
Harvest date	2 January Conmurra 27 December Frances	
Seeding rate	75 kg/ha	
Sowing fertiliser rate	18:13:0:10 @ 140 kg/ha	15 August (40 units N) Conmurra 14 August (40 units N) Frances

Both sites received the residual insecticide Ambush on BYDV treatments during spring.

Trial Results

Seed treatment x Variety

While the seed treatment by variety interaction was not significant at either Frances or Conmurra, there was a difference between whether seed treatment was used or not for both sites. At Frances, Pugsley and Derrimut recorded a 20% and 19% yield increase (respectively) by using a seed treatment, while Bolac and Mace recorded a 16% and 11% increase (respectively).

At Conmurra, the effect was similar to Frances for most varieties except Preston and Espada where responses were only 2% and 4% (respectively) with seed treatment. Estoc and Pugsley however yielded 26% and 25% higher with seed treatment and likewise Mackellar, IGW3119 and SQP-Revenue yielded in excess of 20% higher when treated.

Variety

Mackellar, Rudd, Brennan and Pugsley yielded considerably lower at the Frances site regardless of whether seed treatment was used. IGW3119 was highest yielding at Frances, both with and without seed treatment, and was a stand-out variety. SQP-Revenue and Scout were also high performers (despite treatment), along with Derrimut (when treated).

At Conmurra, the overall site yield was higher than Frances, however a different pattern between variety performance was observed. SQP-Revenue, Mackellar, IGW3119 and Estoc were high yielding when treated, however when left untreated, most varieties yielded similarly, except for Pugsley and Mace.

Grain Quality

Protein levels differed slightly between varieties although dramatically between sites (table 2). The site average for protein at Frances was 9.4% while at Conmurra the site average was 12%. The higher site average for Conmurra is strongly related to nitrogen availability at this site (2011 bean stubble) compared to Frances (2011 barley stubble).

At Frances, SQP-Revenue recorded low protein as it was highest yielding, reflecting the partitioning of a limited nitrogen resource to the crop. This occurred both with and without seed treatment. At Conmurra, Espada and Estoc recorded high grain protein with seed treatment, with Espada showing no difference when seed treatment was not used. Rudd and Scout recorded the lowest protein of all varieties with seed treatment while IGW3119 was low when seed treatment was not used.

Grain test weights at both sites were comparable, with Frances recording a site average of 81.5% and Conmurra 80.9%. Mackellar, Rudd and SQP-Revenue were notably lower at both sites.

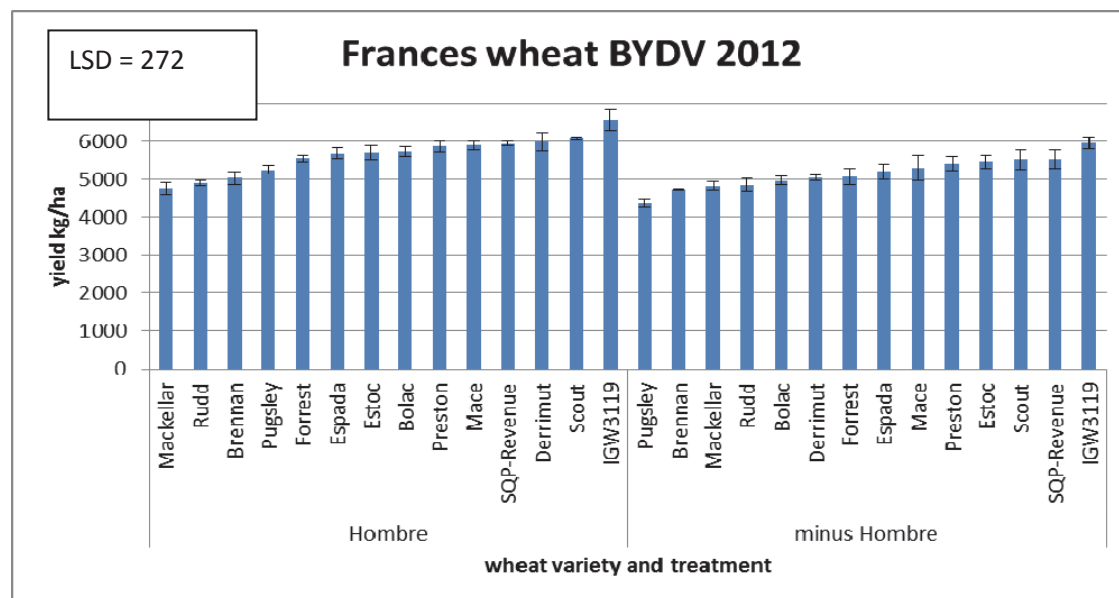


Figure 1: Grain yield of wheat varieties with Hombre seed treatment and without at Frances, 2012. IGW3119 was highest yielding, particularly when seed treatment was used.

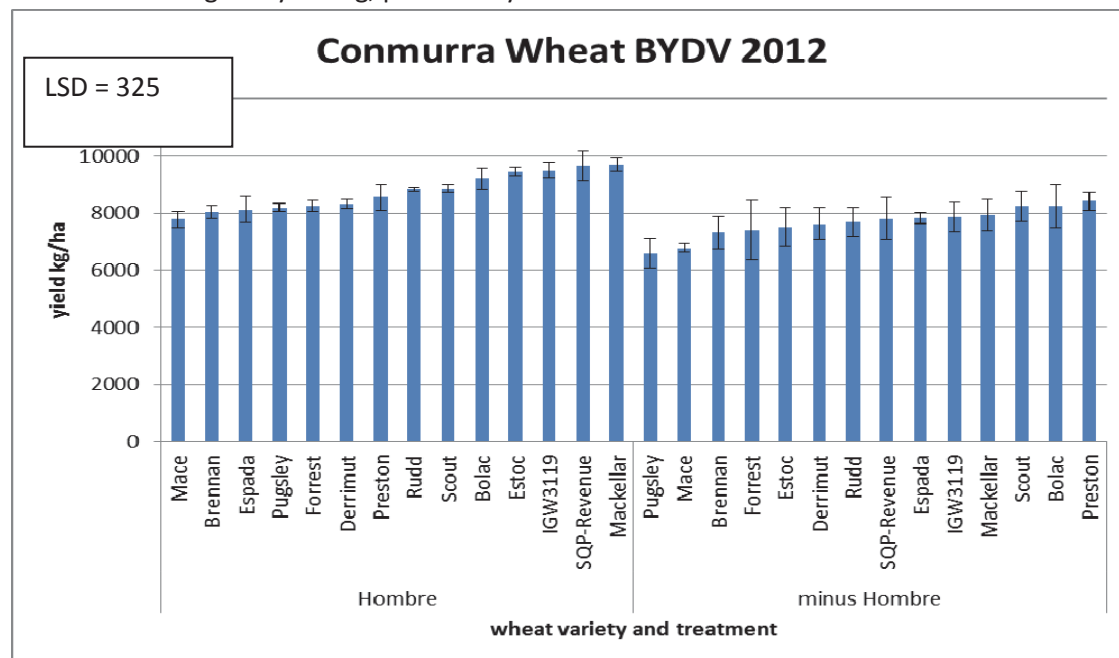


Figure 2: Grain yield of wheat varieties with Hombre seed treatment and without at Conmurra, 2012. Mackellar, IGW3119, SQP-Revenue and Rudd all yielded higher when seed treatment was used.

Table 2: Grain quality results for BYDV in wheat trial at Frances and Conmurra 2012, showing differences between wheat varieties +/- Hombre seed treatment

Treatment	Variety	Frances		Conmurra	
		Test Wt kg/hL	Protein %	Test Wt kg/hL	Protein %
Hombre	Bolac	83	9.7	83.6	11.8
	Brennan	82.4	9.7	83.9	12
	Derrimut	84.4	9.7	83.3	11.7
	Espada	81.9	10	80.6	12.7
	Estoc	85.3	10	84.3	12.7
	Forrest	82.7	8.9	-	12.3
	IGW3119	84.3	9	84	11.7
	Mace	83.1	9.4	81.8	12.2
	Mackellar	76.9	9.4	80.4	11.4
	Preston	79.7	9.1	80.2	11.8
	Pugsley	83.3	9.7	82.9	11.9
	Rudd	75.1	9.5	78.5	11.5
	Scout	85.3	8.9	84.3	11.5
	SQP-Revenue	76.8	8.4	76.9	12.1
minus Hombre	Bolac	82.6	9.6	83.4	12.2
	Brennan	81.9	9.5	83.9	12.3
	Derrimut	84.1	9.6	83.5	11.6
	Espada	81.3	9.8	80.4	12.7
	Estoc	85	9.6	84.5	12.4
	Forrest	82.7	9	81	12.6
	IGW3119	83.3	9.5	84.3	11.5
	Mace	80	9.7	82.2	12.1
	Mackellar	77.1	8.8	79.9	11.8
	Preston	78.8	9.5	80.7	12.1
	Pugsley	83	9.8	82.1	12
	Rudd	75.3	9.2	77.2	11.8
	Scout	85.9	9.6	84.4	11.6
	SQP-Revenue	75.7	8.8	76.6	12.4

Comments

Grain yield increased when Hombre seed treatment was applied at both sites as the wheat plants were protected from aphid activity for longer. As aphids are carriers of barley yellow dwarf virus (BYDV), crop protection from the outset is very important to maximise yield potential.

The yield difference between treatments is probably a reflection of their individual tolerances to BYDV. Some varieties are much more susceptible to BYDV such as Pugsley, Derrimut and Bolac, seen

at Frances (figure 1) while others naturally have a higher level of tolerance to BYDV such as Preston and Espada (Conmurra) and Mackellar and Rudd (Frances).

An unexpected outcome of this trial was the impact of legume break crops in rotations to reduce reliance on artificial fertilisers which can be readily leached from the profile. In 2011 the Frances site was a barley crop, while at Conmurra a bean crop was grown. The difference between the grain protein recorded at these sites highlights the importance of growing nitrogen by means of break crops. Legumes fix nitrogen throughout the profile, whereas artificial fertilisers rely on nitrogen surface moisture to wash into the profile. Nitrogen fixed by legumes becomes a slower release form of nitrogen (compared to urea which is a 'quick hit') and enables crops to partition this into grain yield and protein accordingly. An additional benefit of legumes in a rotation is to break up disease in the system, meaning healthier crops will be grown, more often.

Conclusion and into the paddock

Hombre seed treatment is a powerful tool to provide cereal crops with protection from BYDV. As Hombre is effective for the first six weeks after sowing, the developing cereal plants are given the best start to the season. This trial highlights the importance of using seed treatments in the Frances and Conmurra districts, particularly when BYDV is prevalent. Farmers need to be vigilant and focus on protecting crops to maximise yield potential.

Acknowledgements

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