

2.1.9 DPI (Vic) Wheat variety trials with and without fungicides - Inverleigh, Hamilton & Mininera, Vic**Location:**

Hamilton (Skenes Woolshed Rd,
Strathkellar)
Mininera - Streatham (Tatyoan Rd)
Inverleigh (Peels Rd)

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for stripe rust, a long and arduous
task. Trial design and biometric
analysis was conducted by biometric
consultant, Gavin Kearney.

Background/Aim:

These trials were established to allow
grain growers to assess the grain
yields of released and upcoming
wheat varieties under "with
fungicide" and "without fungicide"
management regimes. Hopefully,
these results will alert growers to
the need to consider their preferred
disease management strategy during
variety selection.

Take home messages:

Growers' choice of wheat variety in South-west Victoria must take into account the possible need for fungicide sprays to protect some varieties from leaf diseases, in particular stripe and leaf rusts. Wheat growers who are not fully prepared to adopt an adequate regime of correctly timed fungicide sprays should choose only varieties that have high levels of resistance to Stripe Rust and Leaf Rust. As new strains of both rusts appear very regularly, varieties may rapidly lose their resistance. It is very important to check the disease ratings of your chosen varieties every year.

Rainfall:

Average annual rainfall: Moutajup - 642mm
Westmere - 545mm
Bannockburn - 513mm
Avg. G.S.R.: (April - November)
Moutajup - 499mm
Westmere - 431mm
Bannockburn - 369mm

2009 Total: Hamilton - 562mm
Mininera - 603mm
Inverleigh - 471mm
2009 G.S.R.: (April - November)
Hamilton - 489mm
Mininera - 523mm
Inverleigh - 392mm

Trial Inputs:

Sowing dates, fertiliser and herbicides were the same as used on the adjacent NVT trials.

Fungicides (applied to fungicide treated plots only):

Growth stage range 30 – 32 : 200 mL/ha Nufarm Opus 125 (epoxiconazole)
Growth stage range 37 – 45 : 250 mL/ha Nufarm Opus 125
Growth stage range 57 – 65 : 145 mL/ha Nufarm Hornet (tebuconazole)
Approximate total cost per hectare of all three fungicide treatments was \$30/ha, chemical cost only.

The fungicide regime was devised in conjunction with Nick Poole, Foundation for Arable Research, New Zealand. The three spray regime was designed to adequately cover the range of maturities in the variety set, without being too far in excess of local practice. The alternative strategy, of putting on many more sprays to achieve 100% protection was rejected as being too far removed from local practice to be relevant.

Harvest dates:

Mininera - 29/12/2009
Inverleigh - 21/12/2009
Hamilton - 30/12/2009

Trial Design:

All trials were arranged in a Latinised design with three replicates and two fungicide treatments (+/-). Inverleigh had 34 varieties, while Hamilton had 33 and Mininera 30, due to seed unavailability of some lines. Fungicides were applied as an experimental treatment at three times, as above.

Trials at Hamilton and Inverleigh were sown on 1.7m raised beds with 20cm row spacings and 6 rows per plot. Trials at Mininera were sown on flat land with the same row spacing. All trials were direct drilled into stubble with a cone seeder fitted with knife points and presswheels.

Results and Discussion:

On the 5th & 6th November the plots at the three sites were scored for stripe rust by a plant pathologist, with scores being given as % Leaf Area Affected (% LAA). No stripe rust was recorded at the Inverleigh site, while it was detected on eight varieties at Mininera, and 21 at the Hamilton site. The appearance of the plots throughout much of spring indicated that other leaf diseases might have been present on some varieties, particularly leaf rust, but the only disease scored was stripe rust.

At all sites, a number of varieties showed statistical differences in grain yield between treated and untreated plots. At Inverleigh only two varieties showed such a difference, at Mininera the treated plots of three varieties yielded significantly higher than untreated, while one yielded significantly lower when treated. At Hamilton, fungicide treated plots had significantly higher yields in five varieties. Three of those varieties at Hamilton were quite commonly grown ones, Mackellar, Chara and Derrimut, demonstrating that choice of variety needs to

go hand in hand with a planned fungicide strategy if the variety chosen is known to be susceptible to leaf diseases, particularly stripe and leaf rusts. The Mackellar yield difference was despite the pathologist recording no stripe rust in any of its plots. This result may therefore have been due to the treatments achieving good control of leaf rust in that variety, as Mackellar is rated "S" for susceptibility to leaf rust. In only a very few cases was a stripe rust score allocated to a sprayed plot, and such scores were only ever 1% or 2% LAA.

There seems little doubt that, as would be expected, the yields and grain size at all sites were affected by the unseasonable hot weather spell in November which is known to have had severe effects on cereal crops across the South-west region of Victoria. However at both the Mininera and Hamilton sites, a significant proportion of the varieties still managed to yield over 5 t/ha.

Table 1. Stripe rust scoring at all sites, 5th & 6th November 2009. Affected varieties only.

Variety	% LAA for each of the three unsprayed plots.		
	Mininera. 5/11/09	Hamilton. 6/11/09	Inverleigh. 5/11/09
Beaufort	0, 0, 0	3, 2, 0	No stripe rust
Bolac	0, 0, 0	2, 1, 0	present
Chara	10, 20, 5	10, 10, 5	in any varieties
Derimut	5, 0, 0	5, 5, 0	at Inverleigh
Diamondbird	5, 2, 2	5, 5, 1	
EGA Gregory	0, 0, 0	5, 1, 0	
EGA Wedgetail	0, 0, 0	1, 3, 2	
Endure	5, 15, 0	10, 15, 0	
Espada	0, 0, 0	1, 3, 3	
Gascoigne	0, 0, 0	2, 2, 1	
HRZ 03.0065	0, 0, 0	2, 5, 0	
HRZ 03.0086	0, 0, 0	2, 2, 0	
Kellalac	5, 0, 0	5, 5, 5	
Lincoln	0, 0, 0	2, 3, 2	
LR 03-0112	0, 0, 0	5, 2, 0	
Preston	2, 0, 0	0, 0, 0	
RAC 1412	0, 0, 0	5, 0, 0	
Sunzell	0, 0, 0	1, 3, 0	
VV0129	0, 0, 0	3, 0, 0	
VV02089	0, 0, 0	2, 0, 0	
VV2852	0, 0, 0	3, 3, 3	
WW12885	1, 0, 0	2, 2, 2	
Yenda	1, 0, 0	0, 0, 0	

Mininera DPI Wheat x Fungicide Trial:

The yield table for Mininera site shows that three varieties, Barham, Bolac and Chara, had significantly higher yields when treated with the fungicides. EGA Wedgetail, on the other hand, had a significantly lower yield, a result that cannot be explained.

Even at low grain prices, the three significantly higher yields, which are all close to 1 t/ha, would be likely to be worth considerably more than the cost of the fungicide treatments.

MININERA - Table of predicted means for Variety. Fungicide.			
Fungicide	No	Yes	
Variety	Yield, t/ha	Yield, t/ha	Difference
Barham	3.83	4.72	0.88
Beaufort	5.84	5.89	0.05
Bolac	4.63	5.53	0.90
Chara	4.72	5.54	0.82
CS 150.1	4.63	4.51	-0.12
Derrimut	4.82	5.16	0.34
Diamondbird	5.20	4.90	-0.31
EGA Gregory	5.03	5.45	0.43
EGA Wedgetail	4.90	4.02	-0.89
Endure	4.66	5.26	0.60
Espada	5.62	5.96	0.33
Frelon	5.27	4.75	-0.52
Gascoigne	5.19	5.20	0.00
Hyperno	4.08	3.65	-0.43
Kellalac	5.11	5.19	0.08
Lincoln	5.35	5.70	0.35
LPB 04-0965	5.89	5.44	-0.45
LR 03-0112	5.30	5.32	0.02
Mackellar	4.21	4.79	0.57
Naparoo	4.66	4.67	0.01
Preston	5.98	5.64	-0.34
RAC 1412	4.94	5.03	0.09
Sentinel	5.59	5.24	-0.36
SQP Revenue	4.98	4.29	-0.69
Sunzell	4.97	5.36	0.40
VV0129	4.45	5.06	0.61
VV2089	5.02	5.24	0.22
VV2582	5.27	5.72	0.45
WW12885	5.03	5.44	0.42
Yenda	4.36	4.68	0.32
Mean Yield	4.98	5.11	0.13
I.s.d. (P=0.05)	0.78	0.78	

Green = Significantly lower yield

Red = Significantly higher yield

Hamilton DPI Wheat x Fungicide Trial:

The Hamilton site yield table shows that four of the 34 varieties yielded significantly higher with fungicide treatment than without fungicides. The significant yield increases ranged from 0.72t/ha to 1.39 t/ha. As at Mininera, the yield increases would be likely to more than cover the cost of treatment in those varieties.

Chara, in particular, which showed significant fungicide responses at both Mininera and Hamilton, has been shown to be a variety that should no longer be chosen by any grower in SW Victoria who has not planned and budgeted to protect it from leaf diseases. At this site, Derrimut was also in that category, as it yielded 1.15 t/ha more with applied fungicides, and in the latest disease ratings it is listed as MS (moderately susceptible) to one particular stripe rust pathotype. In higher rainfall areas, where stripe rust inducing conditions are common, it might be unwise to choose Derrimut without having a disease control plan in place. Close observation should then be used to determine whether, or when, to execute that disease control plan.

HAMILTON - Table of predicted means for Variety. Fungicide.			
Fungicide	No	Yes	
Variety	Yield, t/ha	Yield, t/ha	Difference
Barham	3.81	3.60	-0.20
Beaufort	5.78	5.81	0.03
Bolac	5.52	5.43	-0.09
Chara	4.83	6.22	1.39
CS150.1	5.22	5.14	-0.08
Derrimut	5.17	6.32	1.15
Diamondbird	4.94	5.20	0.27
EGA Gregory	5.41	5.29	-0.12
EGA Wedgetail	5.06	5.01	-0.04
Endure	5.18	5.66	0.49
Espada	6.35	6.96	0.62
Frelon	5.61	6.18	0.57
Gascoigne	5.67	6.10	0.43
HRZ 03.0065	4.97	5.40	0.43
HRZ 03.0069	5.00	5.40	0.39
HRZ 03.0086	3.65	4.18	0.54
Hyperno	4.17	3.57	-0.60
Kellalac	4.25	4.84	0.58
Lincoln	5.48	5.94	0.46
LPB 04-0965	5.72	6.02	0.30
LR 03-0112	5.66	5.70	0.03
Mackellar	5.31	6.02	0.72
Naparoo	3.45	3.41	-0.03
Preston	6.48	7.17	0.70
RAC 1412	5.92	6.13	0.21
Sentinel	5.95	5.59	-0.36
SQP Revenue	5.67	5.61	-0.06
Sunzell	4.32	4.28	-0.04
VV0129	5.57	6.11	0.54
VV02089	5.78	5.93	0.15
VV2852	5.58	6.39	0.81
WW12885	5.88	5.41	-0.47
Yenda	3.82	4.58	0.76
Mean Yield	5.03	5.31	
I.s.d. (P=0.05)	0.70	0.70	

Red = Significantly higher yield

Inverleigh DPI Wheat x Fungicide Trial:

At the Inverleigh site, no Stripe Rust was detected, and no other diseases were formally scored. It is not therefore possible to explain the two varieties that showed a significantly higher yield in the treated plots. It is possible that it was due to control of another leaf disease, but this is uncertain.

INVERLEIGH Table of predicted means for Variety.Fungicide			
Fungicide	No	Yes	
Variety	Yield t/ha	Yield t/ha	Difference
Barham	4.39	4.27	-0.12
Beaufort	5.32	5.01	-0.32
Bolac	4.61	4.59	-0.02
Chara	4.94	4.79	-0.15
CS 150.1	3.33	3.81	0.48
Derrimut	4.95	5.00	0.05
Diamondbird	4.21	4.17	-0.04
EGA Gregory	4.51	4.14	-0.37
EGA Wedgetail	4.56	4.62	0.06
Endure	4.00	4.03	0.02
Espada	4.84	5.22	0.38
Frelon	4.06	3.95	-0.11
Gascoigne	4.36	4.47	0.11
HRZ 03.0065	4.35	4.36	0.00
HRZ 03.0069	4.02	4.10	0.08
HRZ 03.0086	2.50	2.64	0.14
Hyperno	4.25	4.41	0.16
Kellalac	3.85	4.12	0.26
Lincoln	4.06	3.96	-0.10
LPB 04-0965	4.48	4.33	-0.15
LR 03-0112	4.04	3.81	-0.23
Mackellar	3.71	3.78	0.08
Naparoo	3.79	3.92	0.13
Preston	4.66	4.66	0.00
RAC 1412	4.96	4.63	-0.32
Sentinel	4.04	3.92	-0.11
SQP Revenue	3.69	3.60	-0.09
Sunzell	3.63	3.79	0.16
VV0129	4.47	5.19	0.71
VV02089	4.72	4.57	-0.15
VV2852	5.00	4.82	-0.18
WW12885	3.99	4.36	0.37
Yenda	3.99	3.93	-0.06
Mean Yield	4.13	4.15	
I.s.d. (P=0.05)	0.406	0.406	

Red = Significantly higher yield