



Cereal Rust Report

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Expected Responses of Australian Wheat and Triticale Varieties to the Cereal Rust Diseases in 2012

COLIN WELLINGS, HARBANS BARIANA, URMIL BANSAL AND ROBERT PARK

The University of Sydney, Plant Breeding Institute, Cobbitty

Email: colin.wellings@sydney.edu.au, Phone: 02-9351 8826 (on secondment from NSW Department Primary Industries)
harbans.bariana@sydney.edu.au, Phone: 02-9351 8809

A national consultative process for determining rust responses for Australia wheat and triticale varieties was developed in 2004 for stripe rust. This has become an annual event with the intention to keep industry growers and technical advisors alert to expected rust responses across the range of Australian commercial varieties. In 2011 the annual review was expanded to include leaf and stem rust responses. The variety responses presented in this report are based on consultation using the most recent field trial reports and historical data sets, and developed in the context of prevailing rust pathotypes recorded in 2011.

The disease response categories are summarised in Table 1. The colour coding in this table has been used in the following tables to assist in highlighting strengths and potential weaknesses in varieties with respect to rust reaction.

The rust responses of current Australian bread wheat varieties, durum wheats and triticales are presented in Tables 3, 4 and 5 respectively. The presence of adult plant resistances *Sr2*, *Sr57*, *Lr34*, *Lr46*, *Yr18* and *Yr29* have been predicted on the basis of molecular markers, pedigree and associated agronomic features such as false black chaff and leaf tip necrosis.

Stripe rust response is represented in two columns: the 'WA' pathotype predominates in Western Australia, but has been displaced in the east by a range of pathotypes in recent years. The most virulent in the east is currently the 'Yr17-27' pathotype, although it remains at low frequency. However, the response to this pathotype among varieties carrying *Yr17*, *Yr27* or the combination of these genes will indicate the

expected response to pathotypes which predominately carry virulence for *Yr17*.

Leaf rust pathotypes virulent for *Lr13*, *Lr24* and *Lr37* have been used to develop leaf rust responses. However, the leaf rust response of Wyalkatchem and its derivatives will be expected to change following the detection of a new leaf rust pathotype combining virulence for *Lr13*, *Lr17a* and *Lr20* (76-1,3,5,7,9,10,12+Lr37) in 2011. Field data for this pathotype is currently not available and will be generated during the 2012 field testing cycle.

Stem rust resistance based on *Sr2* confers low to moderate levels of adult plant resistance under low disease pressure. The combination of *Sr36* with *Sr38* (Sunbri, Sunvale, Young) or with *Sr24* (Lang, Sunco) confer resistance to all known stem rust pathotypes. A majority of varieties carrying *Sr30* will be expected to show more rusting in the northern region in the presence of pathotypes virulent for *Sr30*.

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Table 1 Response descriptors for the rust diseases of wheat

Description	
R	highly resistant: occasional symptoms of infection including necrotic flecks; no sporulation
RMR	resistant: symptoms evident and usually with necrosis and chlorosis, limited sporulation, and affected leaf area up to 15%
MR	moderately resistant: evidence of sporulating areas on the leaf surface with some chlorosis and necrosis, and affected leaf area up to 30%
MRMS	intermediate: restricted sporulating areas with some chlorosis, and affected leaf area up to 50%
MS	moderately susceptible: freely sporulating lesions and affected leaf area up to 70%
MSS	moderately susceptible to susceptible: freely sporulating lesions with leaf area affected up to 90%
S	susceptible: abundant sporulation across the whole leaf surface; leaf area affected up to 100%; some chlorosis and necrosis evident
SVS	Susceptible to very susceptible: abundant sporulation across the leaf surface ; leaf area affected up to 100%; limited chlorosis
VS	highly susceptible: abundant sporulation across the whole leaf area with no evidence of chlorosis or necrosis; 100% leaf area affected

Table 2 Disease response and disease resistance genotypes of Australian bread wheat varieties to leaf, stem and stripe rust diseases

	Rust Response					Rust Resistance Genotype		
	Leaf Rust ^A		Stem Rust	Stripe Rust		Leaf Rust	Stem Rust	Stripe Rust
	Eastern States	WA		WA pt	Yr17-27 pt			
AGT Katana	MS	MR	MSS	MRMS	MRMS	Lr1, Lr13	Sr8a, Sr30	
Amarok	R	R	S	R	MRMS	Lr14a, Lr37	Sr38	Yr17
Annuello	RMR	RMR	RMR	MSS	MSS	Lr24, Lr34, Lr46	Sr24, Sr57	Yr18, Yr29
Arrino	MS	MS	SVS	S	S		Sr30 ^C	
Axe	MR	MR	MRMS	RMR	RMR		Sr8b	
Babbler	MS	R	RMR	MSS	MSS	Lr24, Lr34	Sr24, Sr57	Yr18
Barham	MRMS	MRMS	MRMS	RMR	MSS	Lr1, Lr20, Lr34, Lr37	Sr9b, Sr15, Sr38	Yr17, Yr18
Baxter	MR	R	R, MS ^C	MSS	MSS	Lr17a, Lr34	Sr2, Sr30, Sr36 ^C , Sr57	Yr18
Beaufort	R	R	SVS	R	RMR	Lr13, Lr37	Sr38	Yr17
Binnu	MRMS	MRMS	S	R	MS	Lr37	Sr38	Yr17
Bolac	MS	MR	MR	RMR	RMR	Lr34	Sr30, Sr57	Yr4, Yr18
Bowerbird	R	R	MS	S	S	Lr1, Lr13	Sr2, Sr30	
Bowie	MS	MS	S	RMR	S	Lr37	Sr15, Sr38	Yr17
Braewood	R	R	MR	R	MRMS	Lr13, Lr34, Lr37	Sr2, Sr30, Sr38, Sr57	Yr17, Yr18
Bullaring	MS	R	RMR	MRMS	MRMS ^{C, D}	Lr24	Sr24	
Bumper	R	R	MSS	MS	MS	Lr1, Lr13, Lr34	Sr30, Sr57	Yr18
Calingiri	MS	MS	S	S	S		Sr30	
Carinya	MRMS	R	RMR	R	MRMS	Lr24, Lr34, Lr37	Sr24, Sr38, Sr57	Yr17, Yr18
Carnamah	MS	MSS	MRMS	S	S	Lr27+Lr31	Sr2, Sr30	
Catalina	R	R	RMR	MS	MS	Lr24, Lr34	Sr24, Sr57	Yr18
Chara	MS	R	MRMS	MSS	MSS	Lr13, Lr34	Sr30, Sr57	Yr18
Clearfield JNZ	MRMS	R	MR	MSS	MSS	Lr24, Lr34	Sr24, Sr57	Yr18

	Rust Response					Rust Resistance Genotype		
	Leaf Rust ^A		Stem Rust	Stripe Rust		Leaf Rust	Stem Rust	Stripe Rust
	Eastern States	WA		WA pt	Yr17-27 pt			
Clearfield STL	SVS	SVS	MRMS	S	S		Sr13	
Cobra	MR	MR	RMR	S	S	Lr3a, Lr27+Lr31	Sr2, Sr8a, Sr30	
Corack	MSS	RMR	MR	MS	MS	Lr3a, Lr13	Sr2, Sr30	
Correll	MSS	MSS	MR	MRMS	MRMS		Sr30	
Crusader	R	R	RMR	R	MS	Lr1, Lr13, Lr34, Lr37	Sr2, Sr30, Sr38, Sr57	Yr17, Yr18
Cunningham	MRMS	R	RMR	MS	MS	Lr24, Lr34	Sr24, Sr57	Yr18
Currawong	RMR	RMR	RMR	MRMS	MRMS	Lr34	Sr26, Sr57	Yr18
Dakota	MRMS	MRMS	MR	MRMS ^D	MRMS ^D	Lr34	Sr57	Yr18
Derrimut	R	R	MR	R	MSS	Lr13, Lr34, Lr37	Sr2, Sr30, Sr38, Sr57	Yr17, Yr18
Diamondbird	R	R	MRMS	MS	MS	Lr1, Lr13, Lr46	Sr2	Yr29
Drysdale	MS	MS	MR	MS	MS	Lr46	Sr2, Sr30	Yr29
EGA Bonnie Rock	RMR	MR	MS	VS	VS	Lr13	Sr30	
EGA Bounty	R	R	MR	MR	MR	Lr1, Lr13	Sr2, Sr30	
EGA Burke	R	R	MR	MS	MS	Lr1, Lr13, Lr34	Sr2, Sr30, Sr57	Yr18
EGA Eaglehawk	R	R	RMR	R	MRMS	Lr1, Lr13, Lr37	Sr2, Sr30, Sr38	Yr17
EGA Gregory	RMR	RMR	MR	MR ^{C, D}	MR ^{C, D}	Lr13, Lr23, Lr34	Sr20, Sr57	Yr18, Yr33
EGA Hume	R	R	MR	MRMS	MRMS	Lr13, Lr23, Lr34	Sr30, Sr57	Yr18
EGA Kidman	R	R	MR	MRMS ^D	MRMS ^D	Lr13, Lr23, Lr34	Sr2, Sr30, Sr57	Yr18
EGA Stampede	R	R	RMR	MR	MR	Lr13, Lr34	Sr2, Sr30, Sr57	Yr18
EGA Wedgetail	MS	MS	MRMS	MRMS ^D	MRMS ^D	Lr34	Sr30, Sr57	Yr18
EGA Wentworth	MR	MR	RMR	MS	MS	Lr24, Lr34	Sr2, Sr24, Sr57	Yr18
EGA Wills	R	R	RMR	MRMS ^D	MRMS ^D	Lr13, Lr24, Lr34	Sr2, Sr24, Sr57	Yr18
EGA Wylie	R	R	R	MS	MS	Lr17a, Lr34	Sr2, Sr30, Sr36, Sr57	Yr18
EGA2248	MRMS	MRMS	MRMS	MSS	MSS			
Ellison	R	R	MR	R	MS	Lr3a, Lr13, Lr37	Sr2, Sr30, Sr38	Yr17
Elmore CL Plus	RMR	RMR	RMR	MRMS	MRMS	Lr24, Lr34	Sr24, Sr57	Yr18
Emu Rock	S	R	MRMS	MRMS	MRMS	Lr13	Sr2, Sr8a, Sr30	
Endure	MRMS	RMR	MR	RMR	SVS	Lr1, Lr3a, Lr37	Sr12 or Sr17, Sr38	Yr17
Envoy	R	R	MRMS	R	SVS	Lr37	Sr38	Yr17
Espada	R	R	R	R	MRMS	Lr24, Lr37	Sr24, Sr38	Yr17
Estoc	MRMS	MRMS	RMR	MRMS	MRMS			
Fang	R	MR	R-MS ^E	R	MSS	Lr34, Lr37	Sr38, Sr57	Yr17, Yr18
Forrest	MRMS	MR	R	RMR	RMR	Lr1, Lr13, Lr34	Sr8a, Sr12, Sr30, Sr57	Yr18
Fortune	MRMS	MR	MS	MS	MS	Lr17a	Sr30	
Frame	MS	MSS	MS	MS	MS		Sr30	
Frelon	R	R	SVS	R	R	Lr37	Sr38	Yr17+
Gauntlet	MR	MR	RMR	RMR	MRMS	Lr3a, Lr37	Sr8a, Sr38	Yr17
GBA Hunter	MS ^C	MS ^C	RMR	RMR	MRMS ^D	Lr26, Lr34	Sr31, Sr57	Yr9, Yr18, Yr27
GBA Ruby	MRMS	MR	MS	RMR	MSS		Sr30	Yr27
GBA Sapphire	MRMS	R	RMR	MS	MS	Lr24, Lr34	Sr24, Sr57	Yr18
Giles	R	R	RMR	MS	MS	Lr13, Lr24, Lr34	Sr24	Yr18
Gladius	MS	MS	MR	R	MRMS ^D	Lr37	Sr38	Yr17
Guardian	MRMS	R	RMR	MS	MS	Lr24	Sr24	
H45	R	R	MS	VS	VS	Lr13	Sr30, Sr57	
H46	R	R	MRMS	RMR	VS	Lr13, Lr37	Sr30, Sr38, Sr57	Yr17
Hartog	MR	R	MR	MS	MS	Lr1, Lr13	Sr2, Sr30	
Hornet	R	R	MSS	R	MS	Lr13, Lr34, Lr37	Sr38, Sr57	Yr17, Yr18
Impala	S	S	RMR	MR	MR	Lr37, Lr34	Sr12, Sr38, Sr57	Yr17, Yr18
Impose CL Plus	RMR	RMR	RMR	RMR	VS	Lr3a, Lr13, Lr20	Sr8a, Sr15, Sr38	Yr17
Janz	MRMS	RMR	RMR	MS	MS	Lr24, Lr34	Sr24, Sr57	Yr18
Justica CL Plus	MSS	MSS	MR	RMR	MRMS	Lr1, Lr37	Sr8a, Sr38	Yr17
Kellalac	S	S	MSS	MRMS	MRMS		Sr30	
Kennedy	MRMS	MRMS	MR	MS	MS	Lr46	Sr2, Sr30	Yr29
King Rock	MRMS	R	MS	RMR	VS	Lr13, Lr37	Sr30, Sr38	Yr17
Kord CL Plus	MS	MRMS	MR	RMR	MRMS	Lr1, Lr37	Sr8a or Sr9b, Sr38	Yr17
Kunjini	MSS	MSS	MRMS	MS	MS			
Lang	MRMS	R	R	MS	MS	Lr24, Lr34	Sr24, Sr36, Sr57	Yr18
Leichhardt	R	R	MR	MS	MS	Lr1, Lr13	Sr2, Sr30	
Lincoln	R	R	MR	RMR	RMR	Lr34	Sr30, Sr57	Yr4, Yr18

	Rust Response					Rust Resistance Genotype		
	Leaf Rust ^A		Stem Rust	Stripe Rust		Leaf Rust	Stem Rust	Stripe Rust
	Eastern States	WA		WA pt	Yr17-27 pt			
Livingston	R	R	MRMS	R	MRMS	Lr1, Lr13, Lr34, Lr37	Sr2, Sr38, Sr57	Yr17, Yr18, Yr27
Mace	MR	R	MR	R	SVS	Lr13, Lr23, Lr37	Sr2, Sr38	Yr17
Mackellar	S ^C	R	MRMS	RMR	RMR	Lr13, Lr17b	Sr2, Sr30	
Magenta	MS	R	RMR	MS	MS	Lr24	Sr24	
Mansfield	MS	RMR	SVS	RMR	RMR			
Merinda	R	R	RMR	RMR	MRMS	Lr13, Lr24, Lr34	Sr2, Sr24, Sr57	Yr18, Yr27
Naparoo	R	R	RMR	R	R	Lr13, Lr24	Sr24	
Orion	R	R	MR	RMR	MSS	Lr20, Lr37	Sr15, Sr38	Yr17
Peake	MR	R	MR	MRMS ^D	MRMS ^D	Lr13, Lr34, Lr37	Sr2, Sr30, Sr38, Sr57	Yr17, Yr18
Petrie	MR	MR	RMR	MS	MS	Lr13, Lr24, Lr34	Sr24, Sr57	Yr18
Preston	R	MR	SVS	RMR	RMR			
Pugsley	MSS	SVS	S	R	S	Lr37	Sr38	Yr17
QAL 3362	MS	-	MRMS	MS	MS			
QAL Bis	R	R	RMR	RMR	SVS	Lr24, Lr37	Sr24, Sr38	Yr17
QAL2000	R	R	RMR	R	VS	Lr24, Lr37	Sr24, Sr38	Yr17
Rosella	MRMS	MR	MRMS	MRMS	MRMS	Lr34	Sr30, Sr57	Yr18
Rudd	R	R	S	R	R	Lr37	Sr38	Yr17
Sabel CL Plus	MSS	MRMS	MR	RMR	MSS	Lr37	Sr38	Yr17
Scout	R	R	MR	RMR	MS	Lr37	Sr38	Yr17
Sentinel	R	R	RMR	RMR	RMR	Lr26, Lr34	Sr2, Sr31, Sr57	Yr18
Snipe	MS	MS	MR	MS	MS	Lr34	Sr57	Yr18
Spitfire	MS	MS	MR	MR	MR	Lr1, Lr46	Sr2, Sr30	Yr29
SQP Revenue	R	R	R	R	R	Lr13, Lr37+	Sr38+	Yr17
Strzelecki	R	R	MRMS	MR	MR	Lr13, Lr23, Lr34	Sr30, Sr57	Yr18, Yr33
Sunbri	MRMS	MR	R	R	MR	Lr34, Lr37	Sr36, Sr38	Yr17, Yr18
Sunco	MR	MR	R	MRMS	MRMS	Lr24, Lr34	Sr24, Sr36, Sr57	Yr18
Sunguard	RMR	RMR	R	MR	MR	Lr24+, Lr34	Sr24+, Sr57	Yr18
Sunlin	MRMS	MR	MRMS	MR	MRMS	Lr1, Lr13, Lr37, Lr46	Sr26, Sr38	Yr17, Yr29
Sunstate	R	R	MR	R	MSS	Lr1, Lr13, Lr37, Lr46	Sr2, Sr30, Sr38	Yr17, Yr29
Sunvale	MRMS	RMR	R	R	MR ^D	Lr34, Lr37	Sr36, Sr38, Sr57	Yr17, Yr18
Sunvex	R	R	R	R	MR	Lr24, Lr34, Lr37	Sr24, Sr38, Sr57	Yr17, Yr18
Sunzell	R	R	MR	RMR	MS ^D	Lr1, Lr13, Lr37, Lr46	Sr2, Sr30, Sr38	Yr17, Yr29
Tammarin Rock	MR	MR	MSS	MSS	MSS	Lr34	Sr30, Sr57	
Tennant	MSS	RMR	RMR	RMR	RMR	Lr26	Sr31	Yr9, Yr18
Ventura	R	R	RMR	R	MSS	Lr13, Lr37	Sr2, S38	Yr17
Waagan	MS	MR	MS	RMR	S	Lr34	Sr30, Sr57	Yr18, Yr27
Wallup	MS	RMR	RMR	MRMS	MRMS	Lr13, Lr20, Lr27+Lr31?	Sr2, Sr8a, Sr15, Sr30	
Westonia	MS	S	SVS	VS	VS	Lr1	Sr9g	
Whistler	MRMS	MRMS	MR	MSS	MSS	Lr34	Sr17, Sr57+	Yr18
Wyalkatchem	MS	MR	MS ^B	S ^B	S	Lr13, Lr23	Sr2, Sr8a ^C , Sr15	Yr29 ^C
Wylah	MS	MS	MR	MS	MS	Lr34	Sr26, Sr57	Yr18
Yandanooka	RMR	R	MS	S	S	Lr13+	Sr30	
Yenda	R	R	R	R	S	Lr37	Sr38	Yr17
Yitpi	MSS	MS	S	MRMS	MRMS		Sr30	
Young	R	R	MRMS, R ^C	RMR	MS	Lr37	Sr30, Sr36 ^C , Sr38	Yr17
Zippy	MRMS	MS	MRMS	MSS ^D	MSS ^D	Lr3a, Lr13, Lr27+Lr31	Sr2, Sr8a, Sr30?	

^A leaf rust responses are against pathotypes virulent for Lr13, Lr24 and Lr37 in eastern states. WA responses reflect pathotypes avirulent for Lr24 and/or Lr13

^B Wyalkatchem in WA: MR-MS to stem rust pathotypes avirulent for Sr15; MS to stripe rust

^C indicates a mixed (heterogeneous) response to the disease or for the presence of a resistance gene

^D these varieties may show high levels of stripe rust if disease onset is early and may benefit from fungicide protection

^E indicates a range in response

- response unknown

Table 3 Disease response of Australian durum varieties to the three rust diseases

	Rust Response		
	Leaf Rust	Stem Rust	Stripe Rust
Caparoi	MRMS	R	MR
EGA Bellaroi	MRMS	R	MR
Hyperno	RMR	R	MR
Jandaroi	MR	R	MR ^D
Kalka	R	RMR	MRMS
Saintly	MRMS	RMR	MRMS
Tamaroi	MRMS	RMR	MR
Tjilkuri	RMR	RMR	MR
Wallaroi	RMR	RMR	MR
Yallaroi	RMR	RMR	MR

Table 4 Disease response of Australian triticale varieties to the three rust diseases

	Rust Response		
	Leaf Rust	Stem Rust	Stripe Rust Tobruk pt
Breakwell	R	R	S
Berkshire	RMR	R	MS
Bogong	RMR	MR	MS
Canobolas	MR	RMR	MSS
Chopper	R	MR	MSS
Crackerjack	-	R	MS
Endeavour	R	R	RMR
Goanna	MR	R	MRMS
Hawkeye	R	RMR	MR, MSS
Jaywick	R	MRMS	MR, MRMS
Kosciuszko	R	R	SVS
Rufus	R	R	MS
Speedee	R	RMR	SVS
Tahara	R	R	MS
Ticket	RMR	RMR	MS
Treat	R	MR	MSS
Tobruk	R	R	MSS
Tuckerbox	R	MR	MRMS
Yowie	R	R	MRMS, MS
Yukuri	R	R	RMR

GENERAL ENQUIRIES

Plant Breeding Institute
Private Bag 4011
Narellan NSW 2567

107 Cobbitty Road
Cobbitty NSW 2570
T 02-9351 8800 (Reception)
F 02-9351 8875

RUSTED PLANT SAMPLES

can be mailed in paper envelopes;
do not use plastic wrapping or plastic
lined packages.

Direct samples to:

Australian Cereal Rust Survey
Plant Breeding Institute
Private Bag 4011, Narellan NSW 2567

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