Cereal variety disease guide 2012

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Summary of 2011 season and implications for 2012

Rain at intervals throughout summer and autumn played a large role in allowing inoculum of powdery mildew and the leaf and stem rusts to build up early in wheat, barley and oat crops leading to widespread occurrences of these pathogens. It was only the timely application of foliar sprays by most growers that prevented serious yield losses. Summer rain also allowed the wheat curl mite *(Aceria tosichella)* to survive on self sown cereals and this led to an outbreak of Wheat streak mosaic virus on the upper EP in October.

The cold winter and dry September conditions greatly reduced the incidence of net and spot forms of net blotch and scald in barley although some early sown crops on Eyre Peninsula still saw some severe infection with NFNB.

Rains from early October onwards are most likely responsible for white grain, caused by the fungus *Botryosphaeria*, returning as a problem in wheat for the second year running. As in 2010 the most serious damage occurred on north eastern Eyre Peninsula, but in 2011 the disease was recorded more widely and in most areas of the state other than the western and southern Eyre Peninsula and southern Yorke Peninsula. Many loads were downgraded or rejected at silos whilst others were not delivered. There seems to have been no clear reason why some paddocks were infected and other similar paddocks alongside were not. Stubble borne inoculum will ensure that the disease remains a threat for 2012 but the severity will likely depend on spring weather conditions. At this stage it appears that all varieties can be affected and there is evidence that some varieties such as Wyalkatchem are worse than others. However the data obtained from two variety trials is not consistent enough to provide reliable ratings at this stage. From a spray trial at Kimba there is evidence that fungicides are not effective in controlling grain infection.

Stripe rust

Fortunately, stripe rust did not appear to survive on summer volunteers in SA and was first observed in crops, mostly Mace between Bute and Wandeerah in the Mid North, in the first week of August. Most of the rust has been the strain 134E16A+17+ which is virulent on the Yr17 gene present in Mace, Gladius and Espada. With a much larger area expected to be sown to Mace in 2012, expect stripe rust to develop much faster and spread much farther than in previous years. Use of in-furrow fungicides should be considered in all prone areas and growers should be prepared to spray at short notice in winter and spring.

Stem and leaf rust in wheat

A new strain of leaf rust emerged in 2011 rendering Wyalkatchem moderately susceptible to leaf rust rather than resistant as before. At the end of the season a number of other varieties (Correll, Gladius, Kord CL Plus, Justica CL Plus and Yitpi) also appeared to be susceptible to leaf rust rather than moderately susceptible as previously rated. It is not known at this stage whether a new strain is involved or whether particularly conducive environmental conditions are responsible for these more severe observations.

With widespread rains in December, volunteer wheat will allow both stem and leaf rusts to survive the early part of the year. If mid-late summer rains occur then a repeat of the threats posed by these diseases in 2011 will recur in 2012. Whilst the area sown to wheat varieties susceptible to stem rust may reduce in 2012, the increased virulence on Wyalkatchem will ensure that a large area will be sown to susceptible wheat and this will increase the risk of this disease in 2012.

Barley leaf rust

Leaf rust was by far the most damaging disease of barley in 2011. Summer rains allowed the rust to survive and spread early far and wide and many crops were seriously affected. Most of the common varieties are now all susceptible or very susceptible with virulence on Buloke and Scope now common everywhere in the state. Virulence on the gene Rph3 has been detected in SA so Yarra is now also susceptible. Oxford and Henley which carry two leaf rust resistance genes, Rph3 and Rph20, have lost some of their resistance and are now rated MR/MS where this strain occurs. Any further summer rains will again create the potential for significant problems with this disease in 2012.

Powdery mildew

The area on the lower Eyre Peninsula that saw severe powdery mildew in wheat in 2010 was mostly treated with in-furrow fungicides in 2011. This proved very effective in controlling the disease until the effect wore off after about 12 weeks. Much of the wheat area surrounding the badly affected southern Eyre Peninsula was infected early in 2011 due to large inoculum loads surviving through summer.

Extensive spraying against powdery mildew took place across the Peninsula. With the area sown to Wyalkatchem being reduced the threat of this disease should recede in coming years, although a significant threat will be present in 2012 and in-furrow fungicides should be considered for all susceptible wheat crops in the affected areas. Serious powdery mildew was also observed in some crops in the Mid North particularly in Gladius, and so this variety should also be considered for in-furrow fungicide treatments in 2012, especially if summer rains allow mildew to survive on volunteers.

Net blotch

Both net blotches in barley were at relatively low levels in 2011. This can be explained partly by the cold winter and dry spring conditions reducing infection efficiency but also by growers monitoring early sown susceptible crops and spraying early to suppress infection where required.

Oats

Stem and leaf rust were the most prevalent oat diseases in 2011. Summer rainfall provided good conditions for both pathogens to survive and increase early on wild oats and volunteer oat crops. Oat crops were infected early in the growing season and by October very susceptible varieties were severely infected with leaf rust and later by stem rust. Monitoring oat crops for leaf and stem rust is essential for effective control by fungicides in years such as 2011.

Explanation for Resistance Classification

R The disease will not multiply or cause any damage on this variety. This rating is only used where the variety also has seedling resistance.

MR The disease may be visible and multiply but no significant economic losses will occur. This rating signifies strong adult plant resistance.

MS The disease may cause damage but this is unlikely to be more than around 15% except in very severe situations.

S The disease can be severe on this variety and losses of up to 50% can occur.

VS Where a disease is a problem this variety should not be grown. Losses greater than 50% are possible and the variety may create significant problems for other growers.

This classification based on yield loss is only a general guide and is less applicable for the minor diseases such as common root rot, or for the leaf diseases in lower rainfall areas, where losses are rarely severe.

Other information

This fact sheet supplements other information available including the SARDI Sowing Guide 2011 and Crop Watch email newsletters. Cereal Leaf and Stem Diseases and Cereal Root and Crown Diseases books (2000 editions) are also available from Ground Cover Direct or from Hugh Wallwork in SARDI.

Disease identification

A diagnostic service is available to farmers and industry for diseased plant specimens. Samples of all leaf and aerial plant parts should be kept free of moisture and wrapped in paper not a plastic bag. Roots should be dug up carefully, preserving as much of the root system as possible and preferably kept damp. Samples should be sent to the following address:

SARDI Diagnostic Centre
Plant Research Centre
Hartley Grove
Urrbrae SA 5064

Further information contact:
hugh.wallwork@sa.gov.au

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Wheat	Rust			CCN	Yellow leaf spot	Powdery mildew	*Septoria tritici* blotch	Root lesion nematodes		Crown rot	Common root rot	Flag smut	Black point ‡	Quality in SA
	Stem	Stripe #	Leaf	Resistance				*P. neglectus*	*P. thornei*					
AGT Katana	MS/S	MR/MS	MS	MS	MR/MS	MR/MS	MS	S	S	MS	MS	S	S	AH
Axe	MR/MS	R/MR	MR	S	S	MR/MS	S/VS	MS	MS/S	S	MS/S	S	S	AH
Barham	MR	#MS/S	MR/MS	MS	MS/S	S	MS/S	MR	MS/S	S	MS/S	MR/MS	MS	Soft
Bolac	MR	R/MR	MS	S	MS/S	-	MS	S	MS	S	-	R/MR	MS/S	AH
Brennan	MS	R/MR	R/MR	-	-	-	-	-	-	S	-	-	MS	Feed
Catalina	R/MR	MS	R	R	MS/S	MS/S	MS	S	MR/MS	S	MR/MS	R/MR	S	AH
Chara	MR/MS	MS/S	MR/MS	R	MS/S	-	MS	S	MR/MS	S	S	MR	MS/S	AH
Cobra	R/MR	MS/S	MS	MR/MS	MR/MS	MS/S	MS	S	MR/MS	S	-	S/VS	MS/S	APW α
Corack	MR	MS	MS/S	R/MR	MR/MS	VS	MS/S	MR/MS	MR/MS	S	-	S	MS/S	ASW β
Correll	MR	MR/MS	MS/S	MR	S/VS	MR/MS	MR/MS	S	S	S	MS	R	MS	AH
Derrimut	MR	#MS/S^	R	R	S	MS	MS/S	S	S	S	S	R	MS/S	AH
Elmore CL Plus	R/MR	MR/MS	R	S	S	MR	MR/MS	-	-	S	-	S/VS	-	APW α
Emu Rock	MR/MS	MR/MS	MS/S	S	MS	MS/S	S	MR/MS	MR/MS	MS/S	-	MS	MS	AH
Espada	R/MR	#MR/MS	R	MS	MS	MS/S	S	MS	MS/S	S	MS/S	MR/MS	MS/S	APW
Estoc	MR	MR/MS	MR/MS	MR	S	MS	S	S/VS	MS	S	MR/MS	MR/MS	MR/MS	APW
Forrest	R/MR	R/MR	MR	S	MR/MS	MS	MR/MS	S	S	S/VS	MS	R/MR	MR	APW
Gladius	MR^	#MR/MS	MS ξ	MS	MS	S	MS/S	S	MS/S	S	MS	R/MR	MS	AH
Impala	AH	MR	S	S	MS/S	R	S	-	-	S	MS/S	S/VS	MR/MS	Soft
Justice CL Plus	MR	MR/MS	MS/S ξ	MS	S	S	S	S	-	S	-	-	MS	APW
Kord CL Plus	MR	MR/MS	MS ξ	MR	MS/S	MS/S	MS/S	S	-	S	-	-	MR	APW
Lincoln	MR	R	MR	S	MS	-	S	S	S	S	MS	R/MR	MR	AH
Mace	MR/MS^	#S/VS	MR	MR/MS	MR/MS	MS/S	MR/MS	MR/MS	-	S	MS/S	S	MS	AH
Peake	MR/MS^	MR/MS^	R^	R	S	MS	S	S	MS	S	S	MR/MS	MS/S	AH
Preston	S/VS	R	R	S	MS/S	-	MR	S	MR/MS	S	MS	S/VS	MR/MS	Feed
Pugsley	S	#S^	MS	MS	S	MS/S	MS	S	-	S	MS	MR	MS	APW
SQP Revenue	R	R	R	S	MS	R	MR	MS	MS	S	S/VS	S	MS	Feed
Scout	MR/MS	MS	R	R	S/VS	MR/MS	MS	S	MS/S	S	S	R/MR	S	APW
Sentinel	R/MR	R/MR	R	S	MR/MS	R	MS/S	S	MS	MS/S	S	MS/S	-	ASW
Wallup	R/MR	MR/MS	MS	MR	MS	S	MS/S	MR/MS	MR/MS	S	-	S/VS	MR/MS	AH
Wyalkatchem	MR/MS	S	MS	S	MR/MS	S/VS	MR	MR/MS	S	S	S	S/VS	MS/S	APW
Yitpi	S	MR/MS	MS ξ	MR	S/VS	MR/MS	MR/MS	MS	MS/S	S	MS	MR	MS	AH

- These ratings are for the WA Yr17 strain. Varieties with a # have the Yr17 resistance and so will be resistant to the other strains α - quality grade under review and may change

^ - Some susceptible plants in mix. α - quality grade under review and may change to AH. β – quality grade under review and may change to APW

ξ – These varieties showed increased susceptibility to leaf rust at the end of 2011.

Durum	Rust			CCN Resistance	Yellow leaf spot	Powdery mildew	*Septoria tritici* blotch	Root lesion nematodes		Crown rot	Common root rot	Flag smut	Black point ‡	Quality in SA
	Stem	Strips #	Leaf					*P. neglectus*	*P. thornei*					
Caparoi	R/MR	MR	R	-	MR	-	R/MR	-	MR	VS	MS	R	MS/S	Durum
Hyperno	R	MR	R	MS	MS	-	R/MR	MR	MR/MS	VS	MS	R	MS	Durum
Kalka	R/MR	MR	R/MR	MS	MR	-	MR/MS	MR	MR	VS	MS	R/MR	S	Durum
Saintly	R/MR	MR	MR/MS	MS	MR	-	MR/MS	MR	-	VS	MS	R	MS	Durum
Tamaroi	R/MR	MR	R/MR	MS	MR	-	S	MR	MR	VS	MS	R	MS	Durum
Tjilkuri	MR/MS	MR	MR	-	MR	-	MR/MS	-	-	S/VS	MS	R	MS/S	Durum

Triticale														
Bogong	R	MS	R	-	MR	-	R	-	-	MS/S	-	-	-	Triticale
Chopper	R	MS/S	R	R	MR	-	R	-	-	MS/S	-	-	-	Triticale
Hawkeye	R/MR	MR ^	R	R	MR/MS	-	R	-	-	MS	-	-	-	Triticale
Jaywick	R/MR	MR ^	R	R	MR	-	R	-	-	MS	-	-	-	Triticale
Rufus	R/MR	MS	R	R	MR	-	R	R/MR	R/MR	MS	-	-	-	Triticale
Tahara	R/MR	MS	R	R	MR	-	R	R/MR	R	MS	MS	R	-	Triticale
Treat	R	MS/S	MR	MS	MR	-	R	MR/MS	-	-	MS	R	-	Triticale

The stripe rust ratings for the tritcales are for the WA Tobruk strain present in Eastern Australia in 2011

R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible
T = tolerant, MT = moderately tolerant, MI = moderately intolerant, I = intolerant, VI = very intolerant, - = uncertain

Tolerance levels are lower for durum receivals.
‡ Black point is not a disease but a response to certain humid conditions.

Barley	Leaf rust*	Net form net blotch	Spot form net blotch	Scald	CCN Resistance	Powdery mildew	Barley grass stripe rust	Covered smut	Common root rot	Root lesion nematodes		Black point
										P. neglectus	*P. thornei*	
Barque	MR/MS-S	MS/S	R/MR	S/VS	R	MR	MR	MS/S	S	MS	MR	S
Bass	R-MS	MS/S	MS/S	MR-S	S	MS	-	VS	MS	-	-	-
Buloke	MS-S/VS	MR	MS	MS	S	MR	R	MS	MS	MS/S	-	MS
Commander	MS-S	MS	MS	S	R	MR	R	R	MS/S	MS	-	S
Fathom	MR-S/VS	MS/S	MR	MR	R	MR	-	R/MR	MS/S	-	-	S
Flagship	MR/MS-S	MR	MR/MS	MS	R	MR/MS	MR	MR/MS	S	MS	MR/MS	MS/S
Fleet	MR/MS-S	MR	R/MR	MR/MS	R	MR/MS	MR	MR	MS/S	MS	-	MS
Gairdner	MS-S	MR/MS	S	R-S	S	MR	R	MS/S	MS/S	MS	MR/MS	MR
Grange	MR	MR	MS/S	MS/S	-	-	-	-	S/VS	-	-	MS
Henley	MR-MR/MS	MR	MS/S	R-S/VS	-	-	-	MR	MS	-	-	MS
Hindmarsh	MR/MS-S	MR	S	R-S	R	MS	R	MS	S	MS	-	MS/S
Keel	VS	MS	R/MR	MS	R	MR/MS	MS	R	S	MR	MR	S/VS
Maritime	MS-S	VS	MR/MS	MS/S	R	S	S	MS	S	MR	-	MS/S
Navigator	VS	MR	MR	R	R	R	MR	MS/S	MS	-	-	MS/S
Oxford	R-MR/MS	MR	MS/S	MS-S	S	R	-	MR/MS	MS/S	-	-	MR
Schooner	S/VS	MR	MS	MS/S	VS	S	R	MR	S	S	R	MS
Skipper	MS/S-S/VS	MR	MR	S	R	MR	-	S	MS/S	-	-	MS
Scope	MS-S/VS	MR	MS	MS/S	S	MR	R	MR/MS	MS	-	-	MS/S
Sloop SA	S/VS	MR	S/VS	S	R	S	R	R	S	S	R	S
Westminster	R/MR	MR	S	MR	-	MR	-	R	-	-	-	MR/MS
Wimmera	R-MR/MS	MR	MS	MS/S	S	MR	-	MR/MS	MS	-	-	MR

* Due to multiple strains of leaf rust and scald, the table provides a range of reactions that may be observed. Different ratings are separated by a -

R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible
T = tolerant, - = uncertain

Oats	Rust		CCN		Stem nematode		Bacterial blight	Red leather leaf	BYDV	*Septoria avenae*	*P. neglectus* Resistance
	Stem	Leaf φ	Resistance	Tolerance	Resistance	Tolerance					
Brusher	MS/S	MR/S	R	MI	MS	I	MR/MS	MS	MS	MS	MR/MS
Echidna	S	S	S	I	MS	MT	S	MS	MS	S	MR
Euro	VS	S	R	I	S	I	MS	MS	S	MS	MR
Glider	MR/MS	MS/S	MS	I	R	T	R	R	S/MR*	MR	-
Kangaroo	MS	S	R	MI	S	MI	MR/MS	MR/MS	S/MR*	MR/MS	-
Marloo	S	S	R	MT	MS	MI	S	VS	MR/MS	S	-
Mitika	MS/S	MS/S	VS	I	S	I	MR	S	MS/S	S	-
Mulgara	MS	MS/S	R	MT	R	MT	MR	MS	MS	MS	-
Numbat	MS	S	S	I	S	I	S	MS	S	MR	MR
Potoroo	S	S	R	T	S	MI	S	VS	MS	S	MR
Possum	MS/S	S	VS	I	S	I	S	S	S	MS	MR
Quoll	MS/S	MR/MS	S	I	R	MT	MS	MS	MS	MR	MR/MS
Swan	VS	S	MR	I	S	I	S	S	MS	MS	MR/MS
Tammar	MR	MR/MS	MR	MT	R	T	MR	R	MS	MR	-
Tungoo	MS	MS/S	R	MT	R	T	MR	R	MR/MS	MR	-
Wallaroo	S	S	R	MT	MS	MI	S	MS	MS	S	MR
Wombat	MS/S	MS/S	R	T		MT	MR/MS	MS	MR	MS	
Wintaroo	S	S	R	MT	R	MT	MR/MS	MR/MS	MR/MS	MR/MS	MR/MS
Yallara	S	MS/S	R	I	S	I	MR/MS	MS	MS	MS	-

Key to symbols used
φ – Depending on which strains are present all current oat varieties can be susceptable to leaf rust

R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible
T = tolerant, I - intolerant, MI - moderately intolerant, - = uncertain