Cereal Variety Disease Guide 2011

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SARDI, Waite

Summary of 2010 season

The cool wet and humid conditions experienced across most of SA during the growing season favoured higher than normal levels of yellow leaf spot and powdery mildew in wheat and scald in barley. The net form of net blotch was much less damaging than expected and this is thought to be due to later sowing in some areas, cooler conditions and effective management of early sown crops with fungicides. Stem and leaf rust in wheat and oats became widespread after several quiet years and this poses a threat for crops in 2011 should volunteers allow carryover of infection to autumn. At the end of the season white grains were observed and caused downgrading of some wheat, particularly on the Eastern Eyre Peninsula and Upper North regions. The white grain was caused by a fungus, *Botryosphaeria zeae,* previously not recorded in south-eastern Australia. This new pathogen which is favoured by wet conditions can also infect barley and survives on wheat and barley stubbles.

Stripe rust

Stripe rust developed later than normal and was mostly well controlled with early application of fungicides. The most common strain identified was the WA "Jackie" strain (134E16A+J+) although the WA Yr17 strain (134E16A+17+) was also widespread and common. Another new strain the "Tobruk" strain was also identified from samples collected from Mambray Creek, Crystal Brook, Paskeville and Wolseley. This strain is more virulent on Tobruk triticale but is otherwise not thought to be different from the Jackie strain.

Stem rust

Stem rust was observed on volunteers at Jabuk in the Mallee and at Kapinnie on the Eyre Peninsula in autumn but wide dispersal of stem rust in spring is thought to have originated from a very early sown crop of Kite wheat at Baroota in the Mid North. Kite was released with the stem rust resistance gene Sr26 which is effective against all strains of stem rust. After 44 years of growing Kite at Baroota it appears that the Sr26 gene, which has a yield reducing effect, has been selected out of the seed rendering these particular crops of "Kite" susceptible to stem rust. Similar selection along with seed mixing has led to nearby crops of Blade, also released with Sr26, similarly susceptible to stem rust. The stem rust spread widely through the Mid North and Mallee and also to the eastern part of the Eyre Peninsula during late September and October. Cool weather would have slowed development of the epidemic especially in varieties with at least partial resistance. Many crops, mainly Yitpi, were sprayed and little crop damage was reported.

Leaf rust

Leaf rust was observed on the Eyre and Yorke Peninsulas from August onwards. Although somewhat cool, the conditions were more favourable for leaf rust than stem rust and had susceptible varieties been grown then a significant epidemic is likely to have occurred. Because almost all crops grown in SA are now at least only moderately susceptible (MS) the development of leaf rust was effectively suppressed. Growers are therefore encouraged to maintain this level of resistance and avoid adopting varieties more susceptible than Gladius and Yitpi.

Yellow leaf spot

The higher than usual levels of stubbles from 2009 and late rain in that year led to increased inoculum of yellow leaf spot in wheat stubbles and increased infection in 2010. The wet winter and spring will have also helped to increase the levels of infection and it is to be expected that even higher levels of yellow leaf spot infection will be observed in 2011. Pink blotches can be seen on many mature wheat stems where they have been exposed to high moisture levels. This is one sign of the yellow leaf spot fungus colonising stubbles. Growers should therefore take particular care to select more resistant varieties if they plan to sow wheat into wheat stubbles in 2011.

Powdery mildew

Powdery mildew developed more severely on Wyalkatchem crops on the Eyre Peninsula than previously observed. Some Gladius crops were also affected but not as severely. The late damp conditions caused severe head infection and led to widespread use of fungicides on the Lower Eyre Peninsula in particular. Given the ideal conditions for powdery mildew, the fact that barley mostly escaped infection despite large areas sown to susceptible varieties demonstrates the effectiveness of seed treatments when almost all crops are treated. Where a few crops are not treated these provide a breeding ground for the fungus and can lead to severe epidemics when the effects of seed treatments have worn off. Continuing widespread use of seed treatments will also greatly reduce the risk of fungicide resistance emerging as has happened in Europe and Western Australia.

Net form net blotch

Seedlings of early sown crops on the western and south-eastern coasts of the Eyre Peninsula were infected early with NFNB and fungicide spraying began at the tillering stage and repeated up to 3 times to keep crops protected, particularly Maritime. Less infection occurred where crops were sown later and the cool winter and spring conditions appear to have effectively suppressed the disease. Virulence on Keel and Maritime were widespread whilst virulence on Fleet, observed in one paddock in 2009, was not evident in 2010.

Leaf yellowing and death in wheat and oats

"Frame yellows" which is not a disease but is often confused for one was particularly noticeable in many crops of Yitpi, Correll and Axe during August. The yellows symptoms are more prevalent in wet winters and the cause remains elusive. In October a similar but different yellows condition became apparent in Gladius crops. Again no cause is known.

Another different but widespread yellowing and death of wheat leaves occurred in the Keith-Bordertown region and into Victoria during October. The symptoms were observed in all wheat varieties and were similar to barley yellow dwarf virus (BYDV) but this is not thought to be the cause owing to a lack of aphids and negative antibody tests.

Oats

Stem and leaf rust of oats became common and widespread after a few years of low recordings. A strain of oat stem rust not previously observed in South Australia and virulent on a resistance gene *Pga* caused severe infection and significant damage in many Mitika oat crops in the South-East and in western Victoria. Mitika and Yallara are now rated as S to stem rust but will be more resistant in other areas of SA until this strain reaches these areas. Glider and Tungoo are also thought to carry *Pga* and so may also be more susceptible where this strain occurs although no data on the resistance of these varieties to the new strain is available.

Red leather leaf, a fungal disease caused by *Spermospora avenae*, has become more common in recent years, particularly in the South-East, and was favoured by the wet spring in 2010. General leaf death was observed in many crops in the South-East and although red leather leaf and BYDV may have had a role, other unknown causes are also likely to have been involved.

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 15-50% 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 to 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 article supplements other information available including the SARDI Sowing Guide 2011 and Crop Watch 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

Disease

SARDI

R&D

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Wheat	Rust			CCN		*Septoria tritici* blotch	Yellow leaf spot	Powdery mildew	Root lesion nematodes		Crown rot	Common root rot	Flag smut	Black point	Quality in SA
	Stem	Stripe #	Leaf	Resistance	Tolerance				*P. neglectus* Resistance	*P. thornei* Resistance					
AGT Katana	MS	MR-MS	MS	MS	-	MS	MS	MR-MS	S	S	S	MS	S	MS-S	Speciality
Axe	MS	R-MR	MR	S	-	S-VS	S	MR	MS	MS	S	MS-S	S	MS-S	AH
Barham	MR	#MS-S	MR-MS	MS	-	MS-S	MS-S	S	MR	MS	S	MS-S	MR-MS	MS	Soft
Bolac	MR	R-MR	MS	S	-	MS	MS-S	-	-	-	S	-	R-MR	MR-MS	AH
Bowie	S	#S	MS	MR-MS	MT	MS	S	S-VS	MR	MS	S	S	-	MR-MS	Soft
Brennan	MS	R-MR	R-MR	-	-	-	-	-	-	-	-	-	-	MS-S	Feed
Catalina	R-MR	MS	R-MR	R	-	MS	MS-S	MS-S	MS	MS	S	MR-MS	R-MR	S	AH
Chara	MR-MS	MS-S	MR-MS	R	MI	MS	MS-S	-	MS-S	MR-MS	S	S	MR	MS	AH
Correll	MR-MS	MR-MS	MS-S	MR	-	MR-MS	S-VS	MR-MS	S	MS	S	MS	R	MR-MS	AH
Derrimut	MR	#MS-S^	R	R	-	MS-S	S	MS	S	MS-S	S	S	R	S	AH
Espada	R-MR	#MR-MS	R	MS	-	S	MS	MS-S	MS	MS-S	S	MS-S	MR-MS	MS-S	APW
Estoc	MR	MR-MS	MR-MS	MR	-	S	S	MS	S-VS	MS	S	MS	MR-MS	MR-MS	APW
Frame	MS	MS	MS-S	MR	MT	MR-MS	S-VS	MS	MS-S	S	S	S	MR	MS	APW
Gladius	MR^	#MR-MS	MS	MS	-	MS-S	MS	S	MS-S	MS-S	S	MS	R-MR	MR	AH
Guardian	R-MR	MS	MS	R	-	MS-S	S	MR-MS	MS-S	MS	S	MS	S	S	APW
CLF Janz	R-MR	MS-S	MR-MS	S	I	MR-MS	MS-S	MS	MS-S	S	S	MS-S	R	S	AH
Kukri	MR-MS	MR-MS^	MS x	S	I	MR-MS	MS	-	S	MS	MS	S	MS	MS	AH
Lincoln	MR	R	MR	S	-	S	MS	-	S	S	S	MS	R-MR	-	AH
Mace	MR-MS^	#S-VS	R	MR-MS	-	MR-MS	MR-MS	MS-S	MR-MS	-	S	MS-S	S	MS-S	AH
Mackellar	MR	R-MR	S	-	-	-	-	-	-	-	-	-	-	MS-S	Red Feed
Magenta	R-MR	MS	MR-MS	MS-S	-	MR-MS	MR-MS	MR-MS	MS	S	S	S-VS	S-VS	S	ASW
Peake	MR-MS^	MR-MS^	R^	R	-	S	S	MS	S	MS	S	S	MR-MS	MS-S	AH
Preston	S-VS	R	R	S	-	MR	MS-S	-	S	MR-MS	S	MS	S-VS	MR-MS	APW (prelim)
Pugsley	S	#S^	MS	MS	MI	MS	S	MS-S	S	-	S	MS	MR	MS	APW
SQP Revenue	R	R	R	-	-	MR	MS	R	MS	MS	-	S-VS	S	MS	Feed
Scout	MR	MS	R	R	-	MS	S-VS	MS-S	MS	MS-S	S	-	R-MR	S	APW
Sentinel	R-MR	R-MR	R	S	-	MS-S	MR-MS	R	S	MS	MS-S	S	MS-S	MR-MS	ASW
Wyalkatchem	MS	Sε	R	MR	MI	MR	MR-MS	S-VS	MR-MS	-	S	S	S-VS	MS	APW
Yitpi	S	MR-MS	MS	MR	MT	MR-MS	S-VS	MR-MS	MS-S	-	S	MS	MR	MS	AH
RAC1669R	R-MS	MR-MS	-	MR	-	MS-S	MS-S	MS-S	-	-	S	-	-	-	-
RAC1671R	R-MR	MS	-	MS	-	MS-S	MS-S	S	-	-	S	-	-	-	-
RAC1683	R-MR	MR-MS	MS-S	MS	-	S	S	S	-	-	S	-	-	-	-

- The wheat stripe rust ratings are for the WA Yr17. Varieties with a # have the Yr17 (VPM) seedling resistance and so will be resistant to the WA Jackie strain

^ - Some susceptible plants in mix   ε - Wyalkatchem shows stronger stripe rust resistance at higher temperatures

x - kukri and treat have a resistance gene (Lr13) which is not effective to a leaf rust (Mackellar) strain found in NSW

Durum

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

Triticale

Triticale	Rust			CCN		Septoria tritici blotch	Yellow leaf spot	Powdery mildew	Root lesion nematodes P. neglectus Resistance	P. thornei Resistance	Crown rot	Common root rot	Flag smut	Black point ‡	Quality in SA
	Stem	Strips #	Leaf	Resistance	Tolerance										
Bogong	R	MS	R	-	-	R	-	-	-	-	-	-	-	-	Triticale
Chopper	R	MR	R	R	MR	R	-	-	-	-	-	-	-	-	Triticale
Hawkeye	R-MR	MR^	R	R	-	R	-	-	-	-	-	-	-	-	Triticale
Jaywick	R-MR	MR^	R	R	-	R	-	-	-	-	-	-	-	-	Triticale
Rufus	R-MR	MR-MS	R	R	T	R	-	-	R-MR	R-MR	-	-	-	-	Triticale
Tahara	R-MR	MS	R	R	T	R	R	-	R-MR	R	S	MS	R	-	Triticale
Treat	R	MR	MRx	MS	T	R	R	-	MR-MS	-	S	MS	R	-	Triticale

The stripe rust ratings for the tritcales is for the WA 'Jackie' strain common in SA in 2009 and 2010

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 P. neglectus	P. thornei	Black point
Barque	MS-S-VS	MS-S	R-MR	S-VS	R	MR	MR	MS-S	S	R-MR	MR	S
Buloke	MS-S-VS	MR	MS	MS	S	MR	R	MR	MS	-	-	MS-S
Commander	MR-MS-S	MS	MS	S	R	MR	R	R	S	-	-	S-VS
Finniss	MR-MR-MS	MS	MS-S	R#	R	VS	-	S-VS	S-VS	-	-	S
Flagship	MR-MS-S-VS	MR	MR-MS	MS	R	MR-MS	MR	MR-MS	S	MS	MR-MS	S
Fleet	MR-MS-S	MR	R-MR	MR-MS	R	MR-MS	MR	MR	MS-S	-	-	MS-S
Gairdner	MS-S	MR-MS	S	R#	S	MR	R	-	MS-S	MR	MR-MS	MR-MS
Henley	R	MR	S	S-VS	-	-	-	MR	MS	-	-	MS-S
Hindmarsh	MS-S	MR	S	R#	R	MS	R	MR-MS	S	MR	-	-
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	-	S
Oxford	R	MR	MS-S	MS#	S	R	-	MR-MS	-	-	-	MR
Schooner	S-VS	MR	MS	MS-S	S	S	R	MR	S	MR-MS	R	MS-S
Scope	MS-S-VS	MR	MS	MS-S	S	MR	R	MR-MS	MS	-	-	S
Sloop SA	S-VS	MR	S-VS	S	R	S	R	R	S	MS	R	MS-S
Vlamingh	MS-S-VS	MR	MS	MR-MS	S	VS	-	R	S	-	-	S
Yarra	R	MS	MS	S-VS	R	S	R	MS	S-VS	-	-	S-VS
WI4262	VS	MR	MR	R#	R	-	MR	MS	S	-	-	MS-S

* Due to multiple strains of leaf rust, the table provides a range of reactions that may be observed. Different ratings are separated by a -
# These varieties may be more susceptible in some regions with different strains.
R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible
T = tolerant, - = uncertain

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

Key to symbols used

φ – See text on oats

These varieties may be more susceptible in some regions with different strains

R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible

T = tolerant, I - Intolerant, MI - moderately intolerant, - = uncertain

Disease