



Cereal Variety Disease Guide 2017

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Summary of 2016 season and implications for 2017

Some early sowing and plenty of rain should have led to a proliferation of foliar diseases in South Australia in 2016. However, the generally cold winter and spring temperatures kept many diseases like leaf rust and the net blotches at bay. The main features of 2016 were a large number of reports of leaf curling and mottling early in the year from the wheat curl mites, some carrying wheat streak mosaic virus that survived on summer volunteers and spread into early sown crops. And then of course the Russian wheat aphid (RWA) turned up in crops in the Mid-North sown very early to stabilise soils following the Pinery bushfire. The RWA was most likely present in 2015 but, at low levels, went undetected. With effective control of aphids, it appears that little damage was caused by the new pest last year.

At the other end of the year, we had many reports of pink grain in harvested crops. The concern over pink grain is that export markets may think the grain is infected with *Fusarium* and thus carries some associated toxins. In reality the grain tested was all free of the *Fusarium* head scab fungus and this disease continues unrecorded in South Australia. It is most likely that the pink colour is a stain left from saprophytic growth of the yellow leaf spot fungus although proof of that is hard to establish owing to the presence of multiple competing saprophytic fungi.

With lots of thick stubbles left in paddocks and after a wet year, there should be higher levels of yellow leaf spot and take-all inoculum for 2017. *Septoria* in wheat and scald in barley will also be present in stubbles to a greater degree than in recent years. Early sown crops will therefore be particularly vulnerable to these diseases in 2017.

Net form net blotch

The net blotches are favoured by warmer, humid temperatures so had a quieter year in 2016. Despite this, new virulence was observed on Hindmarsh, La Trobe and Spartacus in variety trials at Elliston, Kingsford and Freeling. In these areas at least Hindmarsh and La Trobe should be considered as MS whilst Spartacus should be considered as MSS.

Rusts in wheat and barley

Leaf rust in wheat was observed very early in 2016 and became widespread in autumn. The disease was kept in check by cold temperatures through winter and much of spring but also through effective fungicide management of crops, in most cases as a precaution against stripe rust.

Stripe rust arrived late and never became established as a problem owing to timely and effective use of fungicides. Stem rust was not observed in wheat in 2016.

Barley leaf rust with virulence on Compass was observed from early August on the Far West Coast in South Australia and then was reported more widely as the season progressed. This variety is now rated as SVS, indicating that it is not quite as susceptible to this new strain as Keel was to previous strains.

Eyespot

The frequent wet conditions favoured infection by eyespot and the disease was observed even more widely than in 2015. This continues a trend whereby eyespot is being identified over a wider area each year. In 2016 the symptoms frequently appeared rather different from previous years. Lesions were more numerous on each stem and the normally distinct eyespot shaped lesions were much less discrete. We put these changes down to much higher rainfall and persistent damp conditions leading to more numerous infection points.

Provisional ratings have Trojan as an MS variety. Emu Rock, Darwin and Yitpi are MSS, whereas Aurora, Axe, Beckom, Cobra, Corack, Cosmick, Cutlass, Grenade CL+, Mace, Scepter, Scout, Shield, Tenfour and Wyalkatchem are all susceptible. Varieties such as Emu Rock and Wyalkatchem, which are shorter, are less susceptible to lodging from eyespot. Of the long season varieties Manning and Forrest are rated MS whilst Orion is an S. Among the barleys Fathom and Oxford are rated MRMS, Compass and Scope MS whilst Hindmarsh and La Trobe have been MRMS on the Eyre Peninsula but S in the Mid-North.

Wheat	Rust			Septoria tritici blotch	CCN Resistance	Yellow leaf spot	Powdery mildew	Root lesion nematodes		Crown rot	Common root rot	Flag smut	Black point †	Quality in SA
	Stem	Stripe	Leaf					<i>P. neglectus</i>	<i>P. thornei</i>					
Adagio	SVS	RMR	MS	MR	S	MRMS	MSS	MS	MS	SVS	MS	MS	MR	Red feed
Arrow	S	S	SVS	S	MS	MRMS	RMR	MRMS	MRMS	S	MS	MSS	-	AH
Axe	MS	RMR	SVS	SVS	S	S	MS	MSS	MS	S	MSS	S	S	AH
Beckom	MRMS	MRMS	MSS	SVS	R	MSS	MS	MS	MS	S	MSS	MR	-	AH
Chief CLPlus	RMR	S	R	S	-	MRMS	RMR	-	-	-	-	-	-	APW
Cobra	RMR	MSS	MR	MS	MS	MRMS	MSS	MSS	MSS	S	MSS	S	MSS	AH
Corack	MR	MS	SVS	S	RMR	MR	SVS	MSS	S	S	MS	S	S	APW
Cosmick	MS	MS	SVS	SVS	S	MRMS	MSS	MSS	MSS	S	MSS	SVS	-	AH
Cutlass	R	MS	R	S	MR	MSS	S	MS	MSS	S	MS	MRMS	-	APW
Darwin	MRMS	MR	S	SVS	MS	S	MRMS	MSS	S	S	MSS	MR	MR	AH
Emu Rock	MRMS	MRMS	S	SVS	S	MRMS	MSS	MSS	S	MS	MSS	MS	MS	AH
Forrest	RMR	RMR	MSS	SVS	S	MRMS	MS	S	SVS	SVS	MS	MR	MR	APW
Grenade CLPlus	MR	MRMS	S	S	MR	S	MS	MSS	S	S	MRMS	MR	MS	AH
Harper	MRMS	MS	S	MSS	MRMS	S	S	S	MSS	S	MRMS	RMR	-	APW
Hatchet CL Plus	MS	MRMS	SVS	VS	MR	S	MRMS	MS	MSS	S	MS	RMR	-	AH
Impala	MR	MR	SVS	VS	MSS	MSS	R	SVS	S	S	MSS	SVS	MRMS	Soft
Kiora	RMR	RMR	MRMS	S	MSS	MSS	MS	MSS	MRMS	S	MS	MRMS	MR	AH
Kord CL Plus	MR	MRMS	MS	MS	MR	MSS	MS	MSS	MS	S	MRMS	MR	MRMS	AH
Mace	MR	SVS	MSS	S	MRMS	MRMS	MSS	MS	MS	S	MS	S	MRMS	AH
Manning	MR	RMR	MS	MR	S	MRMS	MS	MSS	S	VS	SVS	R	MRMS	Feed
Orion	MR	MSS	R	MS	MS	MSS	SVS	MS	MSS	S	MSS	S	S	Soft / Hay
Revenue	RMR	R	VS	S	S	MS	R	MSS	MSS	S	SVS	S	MS	Feed
Scepter	MR	MSS	MSS	SVS	MRMS	MRMS	SVS	S	MSS	S	MS	MSS	-	AH
Scout	MR	MS	MS	S	R	SVS	MRMS	S	MS	MSS	S	MR	S	AH
Shield	RMR	MR	R	S	MRMS	MSS	MR	MS	MSS	S	MRMS	S	MS	AH
Tenfour	S	SVS	MSS	SVS	MS	MRMS	MS	MSS	MS	S	MS	RMR	-	Feed
Trojan	MRMS	MR	MRMS	MSS	MS	MSS	S	MSS	MSS	MS	MS	SVS	MRMS	APW
Wyalkatchem	MS	S	S	SVS	S	MR	SVS	MRMS	MS	S	MSS	SVS	MS	APW
Yitpi	S	MRMS	S	MSS	MR	SVS	MRMS	MSS	S	S	MS	MR	MS	AH

Durum

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Aurora	RMR	RMR	RMR	MRMS	MSS	MRMS	MR	MS	RMR	VS	MRMS	R	MS	Durum
Caparoi	RMR	MR	RMR	RMR	MS	MR	MS	MSS	MR	VS	MS	R	MSS	Durum
Hyperno	RMR	MR	R	MS	MS	MRMS	MR	MS	RMR	SVS	MS	R	MS	Durum
Saintly	MR	MR	MRMS	S	MS	MRMS	MSS	MS	MR	VS	MS	R	MS	Durum
Tjilkuri	MR	MR	RMR	MS	MS	MRMS	S	MS	MR	VS	MS	R	MSS	Durum

Triticale

Astute	RMR	RMR	RMR	R	R	MRMS	R	RMR	MRMS	MSS	MS	R	-	Triticale
Bison	RMR	R	RMR	R	R	MR	R	MR	MR	MSS	MRMS	R	-	Triticale
Fusion	R	RMR	RMR	R	R	MRMS	R	RMR	MS	MS	S	R	MSS	Triticale
Goanna	R	MR^	RMR	R	R	MR	R	MRMS	SVS	-	-	-	-	Triticale
Hawkeye	RMR	MR^	R	R	R	MR	R	MR	MS	MS	MSS	-	-	Triticale
Rufus	RMR	MS	R	R	MR	R	R	RMR	RMR	MS	MS	-	-	Triticale

R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible, S = Susceptible, VS = Very Susceptible

, = mixed reaction ^ = some susceptible plants

† Black point is not a disease but a response to certain humid conditions

Tolerance levels are lower for durum receivals

Barley	Leaf rust*	Net form	Spot form	Scald*	CCN	Powdery mildew	Barley grass stripe rust	Covered smut	Common root rot	Root lesion nematodes		Black point
		net blotch*	net blotch*		Resistance					<i>P. neglectus</i>	<i>P. thornei</i>	
Biere	MRMS-S	S	MSS	MR-S	S	R	-	MS	MS	MR	MRMS	-
Buloke	MS-SVS	MR	MS-S	MS-S	S	R-MR	RMR	MS	MS	MRMS	MS	MRMS
Charger	MR-S	VS	S	S-VS	R	R	RMR	MSS	MS	MR	MRMS	MRMS
Commander	MS-S	MS-S	MSS	S-SVS	R	MRMS	R	RMR	MS	MRMS	MRMS	MSS
Compass	MR-SVS	MR-MRMS	MR-MSS	MS-SVS	R	MRMS	R	R	MS	MRMS	MR	MSS
Explorer	R-MRMS	R-S	S	SVS	R	R	-	MRMS	MS	MRMS	MRMS	-
Fathom	MRMS-S	MR-VS	RMR	R-MS	R	MRMS	R	MR	MSS	MRMS	MRMS	S
Flagship	MS-S	MR	MRMS	MS-SVS	R	S	RMR	MRMS	S	MRMS	MRMS	MSS
Fleet	MRMS-S	S-VS	MR	MR-SVS	R	MRMS	RMR	MR	S	MRMS	MRMS	MS
GrangeR	MR-MS	R-MRMS	S	S-SVS	R	R	R	RMR	S	MRMS	MRMS	MS
Hindmarsh	MRMS-S	MR	S	R-VS	R	MR-S	MR	MS	S	MRMS	MRMS	MSS
La Trobe	MRMS-S	MR	MSS	R-VS	R	MR-S	RMR	MS	S	MRMS	MRMS	MS
Maritime	MRMS-S	R-VS	MRMS	MS-SVS	R	SVS	S	MS	MSS	MR	-	MS
Oxford	R-MRMS	MR-SVS	S	MR-SVS	S	R	R	MRMS	MSS	MR	MRMS	MR
Rosalind	MR-MS	MR	MSS	MR-SVS	R	MR-S	-	MRMS	S	MS	MR	MS
Schooner	S-VS	MR	MS	MS-S	VS	SVS	RMR	MR	S	MS	MRMS	MS
Scope	MS-SVS	MR	MS-S	MS-S	S	R-MR	RMR	MS	MS	MRMS	MRMS	MS
Shinestar	MS	RMR-MS	MRMS	MSS-S	R	MS-SVS	-	MS	MS	MRMS	MRMS	-
Spartacus CL	MRMS-S	MR-MSS	S	R-VS	R	MR-S	RMR	MS	MS	MS	MRMS	MS
Westminster	R-MRMS	MR	S	R-S	-	R	R	MR	MSS	MRMS	MS	MRMS

R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible, S = Susceptible, VS = Very Susceptible

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

Oats	Rust		CCN		Stem nematode		Bacterial blight	Red leather leaf	BYDV*	Septoria avenae	<i>P. neglectus</i> nematodes
	Stem *	Leaf *	Resistance	Tolerance	Resistance	Tolerance					
Bannister	MR-S	R	VS	I	-	MI	MR-S	MS	MS	S	-
Brusher	MS-S	MS-S	R	MI	MS	I	MR-MS	MS	MS	MS	MR-MS
Dunnart	MR-S	MR	R	MT	-	MT	MR-S	MS	MR	MR-MS	-
Durack	S	R-S	R	MI-MT	-	I	MR-S	MS	MS-S	S	-
Forester	R-S	MR-MS	MS	MI	S	I	MS-S	MR	MR-S	MR	-
Glider	MR-S	MS-S	MS	I	R	T	R	MR	MR-S	MR	-
Kangaroo	MS-S	MS-S	R	MT	S	MI	MR-MS	MS	MR-S	MR-MS	-
Mitika	MR-S	MS-S	VS	I	S	I	MR	S	MS-S	S	-
Mulgara	MS	MR-MS	R	MT	R	MT	MR	MS-S	MS	MS	-
Tammar	MR-S	MR-MS	MR	MT	R	T	MR	MR-MS	MS	MR	-
Tungoo	MS-S	MS	R	MT	R	T	MR	MR	MR-MS	MR	-
Wallaroo	S	S	R	MT	MS	MI	S	MS	MS	S	MR
Williams	MR-S	R	S	I	-	I	R	MS	MR-MS	MR-MS	-
Wombat	MS-S	MS	R	T	MR	MT	MR-MS	MS	MR	MS	-
Wintaroo	S	S	R	MT	MR	MT	MR-MS	MS	MR-MS	MR-MS	MR-MS
Yallara	S	MS	R	I	S	I	MR-MS	MS	MS	MS	-

T = Tolerant, MT = Moderately Tolerant, MI = Moderately Intolerant, I = Intolerant, VI = Very Intolerant, - = Uncertain

Septoria tritici blotch

This disease was observed in small hotspots across much of SA in 2015 and so was expected to be more visible in 2016. With plenty of rain in winter and spring, conditions were ideal for infection where inoculum was present. Septoria was duly observed in many crops in the medium and high rainfall areas, although given the level of susceptibility in many varieties, damage was less than expected. This was perhaps due to extensive use of fungicides but also because the level of inoculum carryover from 2015 was still too low to be a serious problem. Note that septoria does not spread within a season by wind borne spores so disease spread is limited. This may change in 2017 since inoculum levels carrying over in the stubbles from 2016 will be higher than in 2015.

NVT trial data with the new more virulent fungal population has provided more reliable data on variety susceptibility in this Guide than was provided last year. It would appear, however, that the septoria populations in the South-East and Mid North do differ on some varieties. For this reason South-East data is being used for the long season wheats and Turretfield data will be used for the main season wheats.

Damage is most likely to occur where crops are early sown and good rainfall in winter/spring allows the fungus to splash up the canopy.

Powdery mildew in wheat

Powdery mildew in wheat has been an increasing problem in SA as crops have been getting thicker and more N has been applied to them. Wyalkatchem (SVS) made the problem particularly severe and when this variety was largely replaced by Mace (MSS) on the Lower EP, the problem abated to some degree. Control was enhanced because most Mace crops were treated with fungicide for stripe rust control. Scepter appears to be more susceptible to powdery mildew than Mace, similar to Wyalkatchem, and with stripe rust under better control it is possible this will lead to an increase in powdery mildew in future. We foresee the disease increasing in other medium to high rainfall areas in future, notably the South-East which has not experienced the disease to any extent so far. It is of interest that 10-15 years ago mildew was not a problem in Tasmanian wheat crops but now it has become very severe in crops of Trojan and Forrest, according to local agronomist Geoff Dean.

Powdery mildew exists as a range of pathotypes and it is not clear that the disease ratings applied from nurseries at the Waite accurately reflect the pathogen population in different parts of the state. Ratings should therefore be taken as a rough guide and a more resistant rating treated with some degree of caution.

Loose Smut

Loose smut has been reported from many crops of Spartacus barley similar to Hindmarsh in previous years. Trial data has also shown that Rosalind in NVT trials had significant levels of loose smut which may lead to problems in crops if the levels of infection in supplied seed are similar to that in the NVT seed.

Take-all

Take-all has generally been kept under good control for many years. However, inoculum of this disease has persisted at moderate levels in some areas particularly where rotations away from cereals and pastures have been limited. In paddocks where there has been a risk for this disease in the past, then 2017 is a year to watch out for the disease again.

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 to other growers

Where a '-' is used then the rating is given as a range of scores that may be observed depending on which strain of the pathogen is present.

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 yield losses are rarely severe.

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, not just before a weekend, to the following address:

SARDI Diagnostics
Plant Research Centre
Hartley Grove
Urrbrae SA 5064

Further information contact:
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