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Cereal Rust Report Season 2008

Stripe Rust Situation Statement, August 2008

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Stripe rust continues to cause concern for growers across a wide area of eastern Australia in the current season. The early occurrence of the disease, as noted in recent Cereal Rust Reports, was initiated by susceptible early sown grazing cereals and exacerbated by mild temperatures and good moisture status in early winter. Recent cold weather in late winter has delayed epidemic progress.

These unusual epidemic developments in 2008 has caused many growers and advisors to consider fungicide strategies at crop growth stages that have not been previously encountered. The decision making process has been complicated by variation in pathotype distribution, uncertainty regarding expected variety response and some reports of anticipated shortage in fungicide availability.

Pathotype Distribution

Stripe rust specimens continue to be accessioned at the Cereal Rust Laboratory. Sample numbers received in comparison to previous seasons (Table 1) serve to highlight the unusually early and widespread occurrence of the disease. Stripe rust has now been recorded in all eastern states, including Tasmania. The region of major focus for stripe rust reports during July-August has been southern and central NSW and to a lesser extent north east Victoria, with increasing samples from northern NSW/southern Queensland

from early August. There have been no reports or samples of stripe rust from WA.

The three stripe rust pathotypes noted in the Cereal Rust Report of 30 July 2008 (Volume 6, Number 3) remain the only pathotypes detected to date. The 'Jackie' pathotype is clearly dominant among the early set of 40 samples so far completed. This is no doubt due to the survival and early development of this pathotype, and its rapid dissemination from long

season triticales and wheats during the mild conditions of June-July.

Table 1. Stripe samples received from commercial fields in eastern Australia, 2003 – 2008 (data current at 20 August, 2008)

Year	Stripe Rust Samples Received at PBI Rust Lab			
	June	July	August	Season Total
2003	-	-	30	431
2004	-	-	67	475
2005	3	25	51	393
2006	-	-	51	149
2007	-	2	18	338
2008	14	60	148	??

The 'WA' pathotype and the 'WA Yr17' pathotype remain at low frequencies based on current data. Samples are now being received from a range of Yr17 wheats, eg Ventura, Carinya, Sunstate, Sunvale, Ellison, Bowie. Two of these samples have been processed: a Ventura sample yielded the 'Jackie' pathotype, and a Carinya sample was determined as the 'WA' pathotype.

Variety Responses

Variety responses to stripe rust in the current season are largely meeting the expectations of disease ratings published in state based sowing guides. For a summary of Australian wheat varieties and their expected disease response ratings to current stripe rust pathotypes, see Cereal Rust Report Volume 5, Number 4 (December 2006).

The following comments apply to specific varieties or variety groups:

Yr17 Varieties

In general, the great majority of wheats carrying Yr17 are showing good resistance in commercial fields in the late winter period of 2008. This may be due in part to the apparent dominance of the 'Jackie' pathotype that is avirulent for Yr17 and hence these wheats would be expected to remain resistant. Recent reports of stripe rust hotspot activity in Ventura (several locations in southern NSW) suggest that the 'WA Yr17' pathotype may be emerging. Pathotype determinations cannot be returned quickly enough to affect management decisions, and so the presence of hot spot stripe rust infection in Yr17 varieties should be regarded as indicating the presence of the 'WA Yr17' pathotype. Note the expected disease response of individual Yr17 wheats to this pathotype, and implement fungicide strategies as appropriate.

Sunvale is expected to be moderately resistant to the 'WA Yr17' pathotype, although concerning levels of stripe rust were observed in well grown crops that were infected early. Adult plant resistance has evidently been slow to develop, and in some

situations became effective as late as Growth Stage 39 (flag leaf emergence).

EGA Gregory

Early uncertainties of stripe rust response in Gregory have been allayed with the onset of effective adult plant resistance. Observations suggest that the resistance becomes effective from GS 32 (second node). It is unlikely, based on current information, that an economic response will be realized from crops of Gregory treated with foliar fungicides after GS32.

GBA Ruby

Some concern was raised in regard to the stripe rust response of Ruby (Cereal Rust Report Volume 6, Number 3). This variety carries Yr27 and so the assumption has been that this resistance gene may have been overcome by a new pathotype. Three samples of stripe rust from Ruby (two from Cobram, Victoria; one from Woodlands, southern NSW) have been determined as the 'Jackie' pathotype. This pathotype is avirulent for Yr27 and hence this gene is expected to continue providing good protection. Two recent stripe rust samples from Ruby were carefully observed: both showed rust development on lower leaves, but in both cases the symptoms were consistent with the resistant reaction of Yr27. It should be noted that this gene allows rust to develop on lower leaves to some extent, but spore production is greatly reduced and adult plants remain resistant.

Triticales, Tobruk and Endeavour

The long season triticale varieties Jackie and Breakwell became susceptible to the 'Jackie' pathotype in 2007. Alternative stripe rust resistant long season triticales recommended as replacements are Tobruk and Endeavour. Some concern has been raised in regard to hotspot infections in Tobruk in 2008; an example of infected lower leaves is illustrated in Figure 1. A confounding factor has been the observation of occasional spring habit off-type plants in Tobruk, and the suggestion that these were the source of rust infections. However, the hotspot infections have been clearly affecting true-to-type Tobruk in the early phases of growth. Samples processed from Tobruk have yielded the 'Jackie' pathotype. Although resistance has begun to appear from as early as the fourth leaf, some late sown crops were sprayed. Tobruk is expected to show good adult plant resistance.

Endeavour has been performing to expectations and should show resistance from the very early stages in crop establishment. Both varieties represent significant improvements in stripe rust resistance and agronomic performance compared to Jacquie and Breakwell.



Figure 1. Significant stripe rust development on lower leaves of Tobruk triticale at Holbrook, southern NSW. (Photo courtesy of Janet Walker, District Agronomist, NSW DPI)

Sample Reporting

The reporting of pathotype results for individual samples submitted to the Australian Cereal Rust Survey has been fragmented in 2006 and 2007. This situation is being addressed in the current season, and every attempt is now being made to reply to co-operators for each sample when a pathotype result has been finalized. In order to expedite replies to co-operators, we are seeking to establish a database of email addresses that will allow the development of a semi automated reporting procedure. If you have submitted samples in 2008 and are aware that you have not provided an email contact address, please forward these details to:

keshabk@camden.usyd.edu.au

Please note in relation to reports:

1. The complete survey reports for each season are available from the PBI website (www.agric.usyd.edu.au:8888/pbi/cereal_rust_surveys.htm)
2. While every effort is made to process samples efficiently, it should be noted that the earliest result that can be obtained will be 18-20 days following receipt and data entry at PBI.
3. Samples from co-operators are an important component of the annual Cereal Rust Survey and serve to maintain current awareness of rust pathogen dynamics. The samples are therefore greatly appreciated by the wider cereals industry.

Acknowledgements

The personal contact with so many individual agronomists and farmers has enabled us to learn and report on broad developments in the field, as well as focus on the important individual samples submitted for analysis. Cereal Rust Lab staff gratefully acknowledge this wide industry contact and look forward to continuing co-operation.

Stripe rust developments in 2008 have been unusual in many respects, and there is clearly a long way to go before we can be confident the disease is contained and managed to realize grower expectations for harvest. The co-operative and multi-disciplinary approach that has characterised industry response to stripe rust developments in the season to date builds confidence that we will achieve broad and effective disease control.

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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
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