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PBI

Plant Breeding Institute
Cereal Rust Laboratory

Cereal Rust Report Season 2009

Wheat Stripe Rust Pathogen Population in Eastern Australia September 2009

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(on secondment from NSW Department of Primary Industries)

The early occurrence of wheat stripe rust in 2009 and the subsequent disease development in winter indicated that an epidemic of similar magnitude to the historic severe outbreak in 2008 could be expected. However, rainfall has been erratic in the latter part of winter and early spring and this has lowered yield potential in certain regions and concurrently reduced stripe rust development. In other regions where environmental conditions have been more suited to wheat and the stripe rust pathogen, proactive spray programs in varieties known to be vulnerable have served to mitigate potential crop losses. The 'WA Yr17' pathotype appears to have doubled in frequency in 2009, although the 'Jackie' pathotype continues to dominate.

Disease Development

Stripe rust samples received at the PBI Cereal Rust Lab (Table 1) suggest that the current season epidemic, which is essentially confined to eastern Australia, is distinctly less intense than for the same period in 2008. Nevertheless, early disease development that focused in northern NSW was intensive in the early phases in July to mid August, and considerable spray activity was geared to contain inoculum development. Adjacent regions in southern Queensland and central NSW experienced dry conditions in late winter and this served to limit stripe rust development.

Wheat growing regions including the eastern higher rainfall areas of southern NSW, Victorian Wimmera,

southern Victoria, and the mid north and south-east of South Australia have experienced good seasonal conditions in 2009. These regions were more affected by stripe rust in 2008. In the current season the disease was relatively late arriving in these regions, although increasing reports in mid to late August generated considerable activity in preparation for fungicide spray programs. Factors contributing to the relatively late start in these areas in 2009 include restricted over-summer survival, delayed sowing rain and the promotion of pre-planting fungicide treatments including seed dressings, fertilizer amendments and in-furrow applications.

Pathotype Identifications

Preliminary data for the current season is presented in Table 2. The 'Jackie' pathotype continues the trend of the past seasons in being the dominant pathotype in the population. In the presence of this pathotype, varieties carrying Yr17 and/or Yr27 will be expected to show good resistance.

A notable increase in the frequency of the 'WA Yr17' pathotype seems to be evident at this early stage of analysis (Table 2). In previous seasons this pathotype has been hovering at around 10-15%, but this appears to have increased noticeably in 2009 and is currently at 25%. Although this must be a preliminary outcome from the limited samples processed to date, it is nevertheless a clear indication that this pathotype is potentially causing more damage on vulnerable Yr17 wheats in 2009.

At the time of writing, just two samples of stripe rust have been received from Western Australia. The 'Jackie Yr27' pathotype, detected for the first time at low frequency in late 2008, has not been identified in the current season. In addition, there have been no stripe rust samples received from Yr27 wheats.

Variety Responses

In general, commercial varieties are responding to stripe rust as expected. However certain Yr17 varieties, such as Mace and Crusader, have shown more symptom development than predicted from their stripe rust response ratings and these will be re-examined in the light of data from the current season. The need for re-alignment of disease response must be based in comparative experimental data. This has been previously encountered, and forms the basis for an annual meeting to revise variety response to stripe rust. It is anticipated that the outcome of this meeting will be published in December in order to inform seed retention decisions for 2010.

Rust Samples

Rust samples, especially those from varieties demonstrating more symptom development than expected, should be forwarded without delay to the Australian Cereal Rust Survey. Collection dispatch details appear in the footnote on page 3.

Table 1. Stripe samples received from commercial fields in eastern Australia, 2003 – September, 2009)

Year	Stripe Rust Samples Received at PBI Rust Lab				
	June	July	August	September	Season Total
2003	-	-	30	94	484
2004	-	-	67	306	590
2005	3	25	51	133	407
2006	-	-	51	71	167
2007	-	2	18	138	349
2008	14	60	206	297	820
2009	1	62	136	124 ¹	(323) ¹
% samples pathotyped ¹	100%	77%	53%	6%	

¹As at 25th September 2009

Table 2. Pathotype determinations across regions and time periods in 2009. Note that this is preliminary data (at 25th September 2009) with more samples awaiting analysis.

Region	'Jackie' Pathotype				'WA' Pathotype				'WA Yr17' Pathotype			
	June	July	August	Sep	June	July	August	Sep	June	July	August	Sep
Qld		6	7			1	1			1		
nNSW	1	24	23	2		5	2			7	14	1
sNSW		1	13	7						2	1	5
Vic			2	1			1	1				
SA			5	1							4	
Totals	1	31	50	11		6	4	1		10	19	6
	93 (67%)				11 (8%)				35 (25%)			

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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
Private Bag 4011, Narellan NSW 2567

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