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## Cereal Rust Report Season 2008

### Stripe Rust Situation Statement, Early September 2008

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Although the onset of spring has been slow, it is clear that the early development of stripe rust in eastern Australia and the significant increase in pathogen inoculum over a wide area by the end of winter has set the stage for a potentially damaging epidemic. Management strategies now under consideration will need to give due regard to the expected response of varieties to stripe rust, and this will be governed largely by pathotype distribution. Other factors that will vary on an a case by case basis will include expected yield potential, time of disease onset, costs associated with fungicide application and short range weather forecasts.

#### Pathotype Distribution

The updated figures in Table 1 serve to indicate the relative magnitude of the samples being received at the Cereal Rust Laboratory. At the time of writing, over 360 samples have been accessioned. Note also in Table 1 that many sample accessions received earlier in the season have now been processed for pathotype determination. The outcomes for individual samples have been communicated directly to co-operators as results come to hand. However we have many outstanding accessions moving through the laboratory and greenhouse testing system, and the sheer volume of the work and the times scales involved for each accession will mean that the completion rate will slow

over the next 6 weeks. Nevertheless, results will be communicated as soon as we have the data.

The distribution of pathotypes based on currently available information is presented in Table 2. As noted previously (Cereal Rust Report 2008, Volume 6 Issue 4) the 'Jackie' pathotype has dominated in the early phase of the epidemic, and particularly in southern and central NSW. Although the 'WA' pathotype was initially low in frequency, the data suggests that it is beginning to emerge in late winter, and may be developing more frequently in northern NSW.

In contrast, the 'WA Yr17' pathotype has been slow to develop. Among the six confirmed samples to date, four were from early sown Marombi. Recent samples from H46 (Warren, nNSW) and Ellison (Ariah Park, sNSW) are the first confirmed 'WA Yr17' pathotype isolates from main season wheats. In the past two weeks, there have been an increasing number of samples accessioned from Yr17 carrying wheats, and particularly from central NSW and north to southern Queensland. This suggests that the 'WA Yr17' pathotype could now be making a move into these fields in early spring. In this regard, there are two important points to make:

1. A few early samples from Ventura were shown to be affected by the 'Jackie' pathotype and not the 'WA Yr17' pathotype. Hence the sighting of stripe rust in Yr17 wheats is not necessarily indicative of the 'WA Yr17' pathotype.
2. Nevertheless, serious symptom development in Yr17 wheats must be considered as being under the influence of the 'WA Yr17' pathotype. The limits of sample testing methods mean that a pathotype confirmation cannot return information quick enough to influence management decisions. Where the variety is known to be under threat from the 'WA Yr17' pathotype, serious disease symptoms should trigger decision making processes for disease management.

### Variety Responses

In general, the response of varieties to stripe rust has been as predicted. The comments noted for varieties in the previous report (Cereal Rust Report 2008, Volume 6 Issue 4) continue to apply. The following notes serve as an update to the previous report.

#### Yr17 varieties

Stripe rust samples received from Ellison and Sunvale suggest that the 'WA Yr17' pathotype is now beginning to develop. The illustration in Figure 1 suggests that in the crop of Ellison at the time of inspection, the conclusion taken would be that the 'WA Yr17' pathotype is present. Ellison can be expected to be moderately susceptible and may need fungicide support in situations of early disease development and high yield potential. These comments also apply to other Yr17 carrying wheats that are known to be vulnerable to varying degrees to the 'WA Yr17' pathotype, eg Barham, Bowie, Camm, Carinya, Crusader, Derrimut, Gladius, H46, Hornet, Marombi, Pugsley, QAL 2000, QAL Bis, Sunstate, Sunzell, Trident, Ventura. Sunvale crops have shown good adult plant resistance at flag leaf emergence.

It has been interesting to note that Ventura has performed well to date, even in situations where other Yr17 wheats have shown initial signs of infection. Although the reasons are not entirely clear, it will be important to maintain vigilant monitoring of Ventura given its vulnerability to the 'WA Yr17' pathotype.

### GBA Ruby

There is nothing further to report in regard to a potential altered stripe rust response on Ruby. At present there is no evidence for any pathotype change, although there are still some samples to be processed. The illustration in Figure 2 indicates that Ruby inoculated with a stripe sample collected from a Ruby crop produced a resistant response compared to the adjacent susceptible plant inoculated at the same time.

### EGA Gregory and Strzelecki

Both varieties carry Yr33 derived from the common parent Batavia. Gregory has performed well, despite some earlier concern of symptom development on juvenile leaves. Resistance has been evident from GS 32 (second node). Under high inoculum pressure, the flag leaf may develop symptoms of striping on up to 15% of the leaf area, but with little or no spore development. The question of fungicides to protect this leaf damage in the interests of promoting maximum yield will need to be balanced by considerations of expected crop damage using ground applied boom sprays.

Stripe rust in Strzelecki has been of some concern in the earlier phases of crop development in central and northern NSW. Resistance is becoming effective, although relatively late around GS39 (flag leaf emergence).

### Durum wheats

The current set of seven commercial durum wheats is rated as resistant (Arrivato) or moderately resistant. Recent concern has been expressed in regard to the level of stripe rust developing on younger leaves of EGA Bellaroi in high fertile conditions in northern NSW. While some fungicide has been applied at early stages, it is expected that resistance will become effective at flag leaf emergence.

## Conclusion

The 2008 season has clearly witnessed a most unusual sequence of events that have resulted in serious epidemic development in the eastern states. Flowering and grain filling are yet to occur in most regions, and so the decisions taken over the next days and weeks will be critical to achieving disease control.

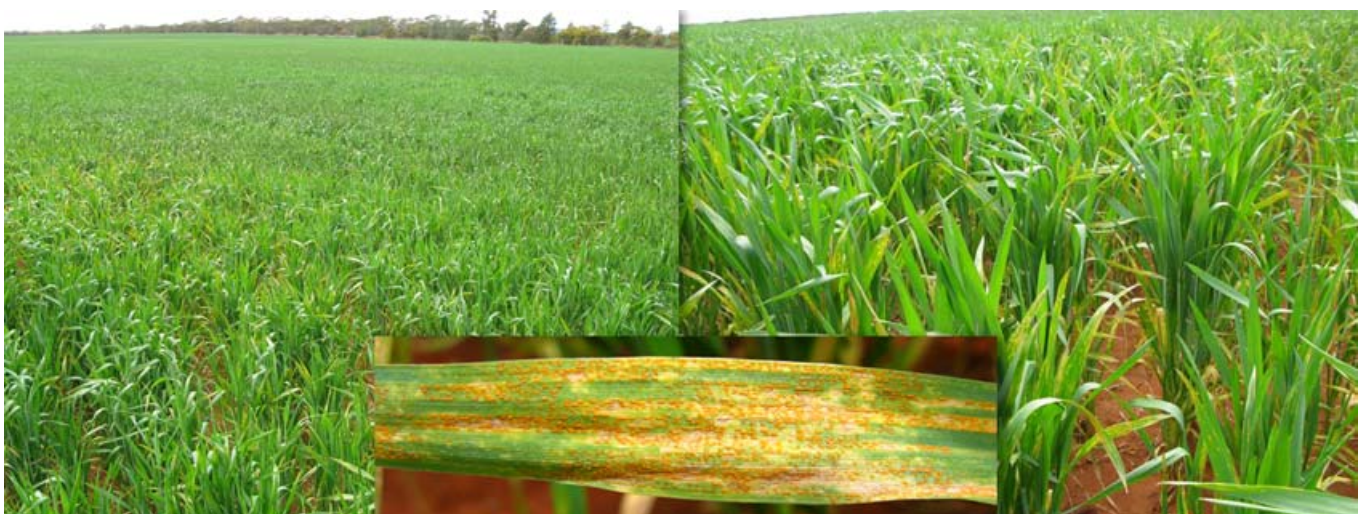
Thank you to all co-operators who are sending rust samples and providing comments on the current field situation. Stripe rust samples will continue to be received at the Cereal Rust Laboratory (see details below). Results for each sample will be reported as data becomes available; please remember to include an email address to expedite communication.

**Table 1** Stripe samples received from commercial fields in eastern Australia, 2003 – 2008 (end of 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   | 206    | ??           |
| % samples pathotyped in 2008 | 100%   | 76%  | 25%    |              |

**Table 2** Pathotype determinations across regions and time periods in 2008. Note that this is preliminary data as at 11.09.2008; a great deal more samples are being processed.

| Region | Jackie Pathotype |      |        | WA Pathotype |      |        | WA Yr17 Pathotype |      |        |
|--------|------------------|------|--------|--------------|------|--------|-------------------|------|--------|
|        | May-June         | July | August | May-June     | July | August | May-June          | July | August |
| QLD    |                  | 1    |        |              |      |        |                   |      |        |
| nNSW   | 1                | 2    | 3      | 1            | 4    | 12     |                   |      | 1      |
| sNSW   | 9                | 27   | 23     | 1            | 3    | 7      | 2                 | 1    | 2      |
| VIC    |                  | 7    | 3      |              |      |        |                   |      |        |
| SA     |                  |      | 1      |              | 1    |        |                   |      |        |
| WA     |                  |      |        |              |      |        |                   |      |        |
| Totals | 10               | 37   | 30     | 2            | 8    | 19     | 2                 | 1    | 3      |
|        |                  | 77   |        |              | 29   |        |                   | 6    |        |



**Figure 1.** A field of Ellison wheat at Goolgowi, southern NSW (early September 2008). Hot spots were evident and closer inspection revealed significant leaf area affected by stripe rust. The preliminary conclusion was that the 'WA Yr17' pathotype was causing the damage, and a sample was sent for confirmation to the Cereal Rust Laboratory, Plant Breeding Institute.



**Figure 2.** Ruby (left) inoculated with a stripe rust isolate collected from a Ruby crop. Resistance is evident as reduced spore production compared to the susceptible plant on the right.

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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 11, Camden NSW 2570

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