

# RUST MANAGEMENT

## FACT SHEET

## Resistant varieties vital to rust management

Growing varieties with resistance to rust is the starting point for rust disease management.

It is also the foundation for an industry-wide program designed to protect Australia's multi-million-dollar investment in a genetic resource on which your wheat industry is based.

You can manage rust risk by:

- choosing the best adapted wheat varieties with good levels of rust resistance;
- not growing any very susceptible (VS) or susceptible (S) varieties;
- knowing the seedling and adult rust-resistance characteristics of the varieties you decide to grow, and identifying whether or not they are likely to require chemical support during seedling growth stages; and
- using appropriate fungicide support to maximise crop performance and minimise disease build-up in your crop as necessary.

### VERIFY THE VARIETY

Reports of rust in varieties identified as resistant or moderately resistant, and what appear to be different levels of susceptibility to stripe rust in the one variety, have raised questions about variety identification.

These apparent discrepancies could be due to:

- a variety with adult plant resistance coming under attack early, before the resistance mechanism takes effect;
- environmental factors such as close proximity to sources of rust infection; and
- mis-identification of which variety is actually being sown.

Buying certified seed should guarantee trueness to type.

Growers saving their own seed are advised to double-check storage records between seasons and have tests done to verify the identity of the variety they are growing.

The appearance of significant stripe rust in varieties rated moderately resistant or moderately susceptible this season demonstrates the need to ensure that the levels of rust inoculum in the environment are as low as possible.

A high inoculum load significantly increases the need for and the cost of rust control. It also increases the risk of pathogen mutation, putting existing rust-resistance genes at risk.

Growing varieties with good levels of resistance will:

- reduce the build-up of rust populations that cause regional epidemics;
- decrease pressure from existing rust strains;
- decrease the risk of mutations in the current strains into more virulent forms;
- decrease production costs from higher chemical use; and
- decrease the risk of rust developing resistance to available chemical fungicides.



## High inoculum levels can cause resistance breakdown

Although stripe rust can be controlled in very susceptible varieties through strategic use of fungicides, these varieties jeopardise the industry as volunteers are building up stripe rust rapidly in autumn – they should not be grown.

Growing resistant varieties keeps the level of rust low. As a result, other control measures are either not required or are more effective. The more rust there is in your crops and in your neighbours' paddocks, the more disease pressure there is on crops across the country. In turn, the faster and more frequently the rust population changes, the greater the chance of 'resistance breakdown'.

Resistance breakdown is caused by high disease pressure and changes in the rust population, not by any change in the genetic resistance of a wheat variety.

The high incidence of stripe rust infection across eastern Australia this season is the result of:

- significant summer rainfall in some regions, favouring green bridge establishment and over-summering of rust;
- significant early sowings of longer season wheat and triticale varieties with susceptibility to stripe rust;
- a mild early winter, which allowed good crop establishment; and
- the occurrence of a new strain in eastern Australia with the ability to attack certain triticale varieties.

Stripe rust infection occurs most readily in humid conditions with night temperatures of 8°C to 12°C.

The combination of ideal conditions for stripe rust development and, in some regions the late start to the

season meant many crops were exposed to high levels of rust inoculum before adult plant resistance developed.

Adult plant resistance, the major mode of resistance in many modern varieties, usually develops between stem elongation and heading, depending on the variety and field conditions.

### KEEPING STRIPE RUST AT BAY

Maximise your chances of keeping stripe rust at bay:

- at harvest, plan to grow more resistant varieties, and avoid particularly very susceptible or susceptible varieties that contribute to disease build-up;
- with adult plant resistant varieties, treat seed with stripe rust-registered, long-acting seed dressing (or plan to use in-furrow fungicide at seeding) where there is risk of early stripe rust occurring;
- eliminate volunteer cereals and other host grasses well in advance of seeding. This will minimise the risk of disease build-up and transmission to susceptible young crops;
- be sure what variety you are growing;
- monitor crops closely and early (if you find rust 'hot spots' in your paddocks, be sure to access the best advice available); and
- be prepared to use chemicals to back up the resistance of your varieties, when justified and economic.

### Cereal rust samples may be collected and posted in paper envelopes to:

Australian Cereal Rust Control Program

Australian Cereal Rust Survey

Plant Breeding Institute, Private Bag 11, Camden NSW 2570

Contact: Colin Wellings, Plant Breeding Institute, Cobbitty NSW

T: 02 9351 8826 E: colinw@camden.usyd.edu.au W: www.agric.usyd.edu.au:8888/pbi/cereal\_rust.htm

### For the most recent status on the Australian cereal rust situation and current management advice go to:

[www.grdc.com.au/rustlinks](http://www.grdc.com.au/rustlinks)

For local information about stripe rust and resistance, contact your local regional agronomist or:

- **New South Wales**  
Steve Simpfendorfer **NSW DPI Tamworth** T: 02 6763 1261 E: steven.simpfendorfer@dpi.nsw.gov.au
- **South Australia**  
Hugh Wallwork **SARDI** T: 08 8303 9382 E: wallwork.hugh@saugov.sa.gov.au
- **Victoria and Tasmania**  
Grant Hollaway **VIC DPI** T: 03 5362 2111 E: grant.hollaway@dpi.vic.gov.au
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