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First detection of the wheat leaf rust pathotype104-1,3,4,6,7,8,10,12 +Lr37 in Western Australia

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For the second time in as many years, a pathotype of the wheat leaf rust pathogen *Puccinia triticina* present in eastern Australia has been detected in Western Australia. Pathotype 104-1,3,4,6,7,8,10,12 +Lr37 was first detected in South Australia in August 2014, and has since spread throughout much of the eastern Australian wheat belt. This pathotype was identified in samples of leaf rusted wheat collected from four separate locations in the northern region of the WA wheat belt in late September 2015. The impact of this pathotype on the wheat cultivars grown in WA will be better understood at the end of this year, with the completion of field testing at the Plant Breeding Institute (PBI). In the meantime, the cultivars Arrino, Binnu, Emu Rock, Envoy, Estoc, Grenade CL Plus, Mace, Tammarin Rock, and Zippy should be monitored closely for leaf rust. If rust is found, it should be sent to the PBI following instructions given at the end of this report.

New wheat rust pathotypes- where do they come from?

New rust pathotypes (aka races or strains) detected in Australia are usually very similar in virulence (ability to overcome rust resistance genes) to an existing one. In these cases, we assume that the new pathotype has arisen locally from the existing one via mutation. However, since wheat rust surveillance began in 1922, staff at the University of Sydney have documented 12 occasions when a new pathotype has been found that is unlike anything seen before- in these cases, the pathotypes are believed to have come to Australia from somewhere overseas.

The most recent example of such an exotic rust incursion is that of wheat leaf rust pathotype 104-1,3,4,6,7,8,10,12 +Lr37, first found in South Australia in August 2014 (see Cereal Rust Update, Volume 12 Issue 3, September 2014). This pathotype has since become established throughout the eastern wheat belt (**Figure 1, Table 1**).

The east – west connection

Experience has shown time and again that when new rust pathotypes are found in WA, they become well established there within a short period of time and then spread to eastern Australia- presumably on prevailing winds. Migration by cereal rusts in the opposite direction, east to west, is less common.

For example, while stripe rust of wheat was detected in Australia for the first time in 1979, it was found in eastern Australia and there are no documented cases of stripe rust inoculum spreading from the east to the west. Stripe rust first occurred in WA in 2002, and was later shown to most likely have originated from North America. Within a year, this North American stripe rust pathotype had spread to eastern Australia.

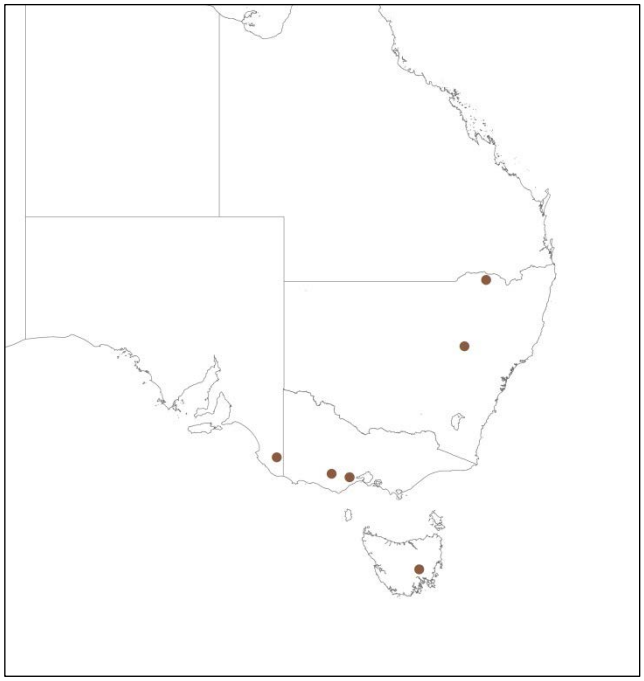

Figure 1. Confirmed locations of pathotype 104-1,3,4,6,7,8,10,12 +Lr37 from eastern Australia, 2015

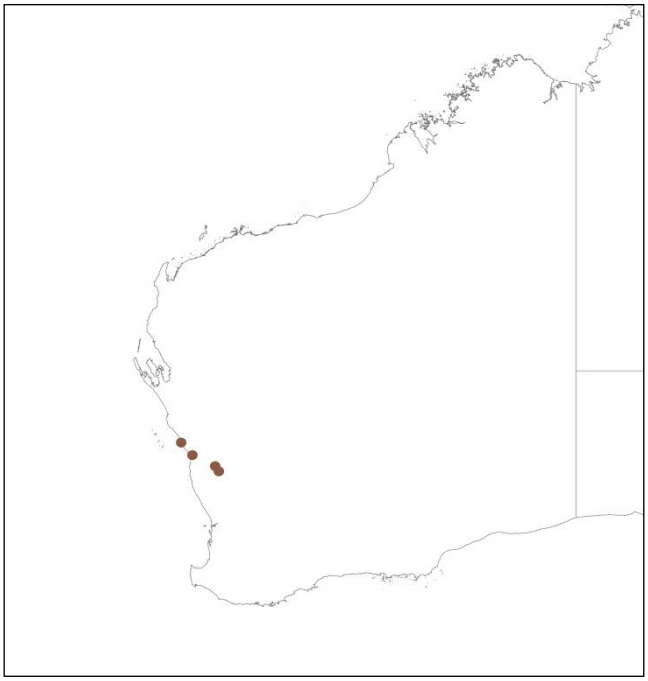

Figure 2. Confirmed locations of pathotype 104-1,3,4,6,7,8,10,12 +Lr37 from WA, 2015

Pathotype 104-1,3,4,6,7,8,10,12 +Lr37 in WA

Pathotype 104-1,3,4,6,7,8,10,12 +Lr37 was isolated from four samples of leaf rust collected from separate sites in the northern region of the WA wheat belt, in late September (**Figure 2**, **Table 2**). In all cases, this was the only leaf rust pathotype present in the samples.

This is only the third example of a wheat rust isolate migrating from eastern Australia to WA in the past 25 years, all being wheat leaf rust: in 1991, an isolate of pathotype 104-1,2,3,(6),(7),11 was first found at Salmon Gums in 1990; in 2013, an isolate of pathotype 76-1,3,5,7,9,10,12 +Lr37 was found at Esperance.

Implications for the leaf rust resistance of wheat cultivars grown in WA

The new pathotype differs from those detected previously in WA in being fully virulent on the complementary resistance genes *Lr27+Lr31*, the adult plant resistance gene *Lr12*, and in combining virulence for *Lr1* with *Lr13*, *Lr17a*, and *Lr26*.

While field tests with this pathotype are underway at the Plant Breeding Institute, initial seedling screening in the greenhouse has indicated that the following cultivars may be rendered more susceptible: Arrino, Binnu, Emu Rock, Envoy, Estoc, Grenade CL Plus, Mace, Tammarin Rock, and Zippy. Growers of these cultivars are advised to monitor crops for the presence of leaf rust.

If any rust is found on any cereal crop, it can be sent to the Australian Rust Survey (see below), where it will be analysed and the sender will be notified of the results. This is a free service, and its success in establishing the distribution and occurrence of known rust pathotypes, and in detecting new rust pathotypes, depends entirely on the collection and submission of samples.

Table 1. Samples of leaf rust from eastern Australia that comprised pathotype 104-1,3,4,6,7,8,10,12 +Lr37

Acc. No.	Date	Host	Location
150008	7/2/2015	Revenue	Inverleigh, Victoria
150009	7/9/2015	Revenue	Derrinallum, Victoria
150010	7/22/2015	Manning	Bool Lagoon, SA
150012	7/30/2015	Revenue	Dunedoo, NSW
150014	8/10/2015	Wheat	Jericho, Tasmania
150066	8/25/2015	Manning	Inverleigh, Victoria
150067	8/25/2015	Revenue	Inverleigh, Victoria
150068	8/26/2015	Morocco	Gatton, Queensland
150070	8/26/2015	Bolac	Inverleigh, Victoria
150105	9/25/2015	Rudd	North Star, NSW
150106	9/25/2015	Revenue	North Star, NSW

Table 2. Samples of leaf rust from WA that comprised pathotype 104-1,3,4,6,7,8,10,12 +Lr37

Date	Location	Host	Collector
25/09/2015	Carnamah	Wheat	G. Thomas
25/09/2015	Yuna	Mace	R. Alderman
28/09/2015	Woorree	Wyalkatchem	C. Beard
28/09/2015	Coroow	Wheat	G. Thomas

GENERAL ENQUIRIES

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RUSTED PLANT SAMPLES
can be mailed in paper envelopes; do not use plastic wrapping or plastic lined packages. If possible, include the latitude and longitude of the sample location.

Direct samples to:

University of Sydney
Australian Rust Survey
Reply Paid 88076
Narellan NSW 2567

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