THE UNIVERSITY OF SYDNEY
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Cereal Rust Report
Plant Breeding Institute

First reports of wheat stripe rust in 2023 suggest widespread overseasoning

Cereal Rust Report 2023, Volume 20 Issue 1

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The first report of stripe rust of wheat was received on 7th July (Jindera southern NSW), with subsequent reports from Bethungra NSW (14th July), Tubbul NSW (20 July), Smeaton Victoria (20th July), Naracoorte SA (24th July), and Cressy/Longford Tasmania (26th July). The first detection of stripe rust in 2023 is around two weeks earlier than the long-term eastern Australian average of July 23rd, and about 7 weeks later than the very early onset of the severe 2022 stripe rust epidemic. Although the later onset of stripe rust this year should mean less disease pressure than last year, the widespread locations from which it has been reported already implicate independent, multi-site over-seasoning and the potential for rapid disease build-up should conditions in the coming months be favourable. We are yet to receive any report of other cereal rust diseases. Please send freshly collected cereal rust samples in paper only to the Australian Cereal Rust Survey, at University of Sydney, Australian Rust Survey, Reply Paid 88076, Narellan NSW 2567.

The first confirmed report of stripe rust of wheat for 2023 was received on 7th July (Jindera southern NSW).

Cereal rust pathogens survive from one cropping cycle to the next on living plants (the "green bridge"). A scarcity of living susceptible plant hosts over the non-cropping summer months in particular means that cereal rust pathogen populations crash during this time.

Stripe rust of wheat has survived every summer since it was first detected in eastern Australia in 1979. Over the intervening period, it has reappeared sometime between May 16th (1984 and 2008) and October 5th (1994), with the overall average being July 23rd. In general, years with the most severe epidemics have been those with the earliest first detection.

The detection of stripe rust on 7th July this year is about 9 weeks later than in 2022; then, it was first detected on May 20th and one of the worst stripe rust epidemics experienced in eastern Australia ensued.

Reports of stripe rust subsequent to the first detection have come from Bethungra NSW (14/07), Tubbul NSW (20/07), Smeaton Victoria (20/07), Naracoorte SA (24/07), and Cressy/Longford Tasmania (26/07) (**Figure 1**).

The broad geographic spread of these locations strongly implicates independent over-seasoning, with the expectation that should conditions favour stripe rust over the coming months, it will ramp up faster than what it would have if it had survived at fewer locations.

We are currently processing the stripe rust samples received with pathotype results anticipated in the next week or so and posted to our regularly updated pathotype distribution map that can be accessed via our a website:

https://www.sydney.edu.au/science/our-research/research-areas/life-and-environmental-sciences/cereal-rust-research.html)

Pathotype dynamics

A clear trend over the past 3 seasons has been the initial dominance of pathotype (pt.) 198 E16 A+ J+ T+ 17+, and the later development of pt. 239 E237 A- 17+ 33+.

Pathotype 238 E191 A+ 17+ 33+, first detected in 2021 (2.3% of all pt. identifications), increased in frequency last year (36.4% of all pt. identifications). Our greenhouse tests have not revealed any obvious reason for this increase in frequency, as it does not appear to be associated with any obvious "breakdown" in the resistance of any specific variety. Research is continuing to understand this rust pathotype, it is of great interest to see how it behaves in season 2023.

Pathotype distribution determines varietal response

As previously detailed in our Cereal Rust Report **18** (1), varietal response to rust is driven by the pathotype or pathotypes present. Long-term nation-wide annual surveys of the virulence of the cereal attacking rust pathogens have been critical in understanding and predicting the responses of cereal varieties to rust diseases and providing direction for resistance breeding. For example, the separation of the eastern and western Australian cereal belts, the common movement of rusts from west to east, and the less common movement of rusts from east to west, have resulted in some important pathotypes (and hence virulences) being restricted to eastern Australia. Monitoring the occurrence, frequency and distribution of pathotypes of the cereal rust pathogens is foundational in genetic approaches to control these diseases. Please send rusted cereal samples using the details below.

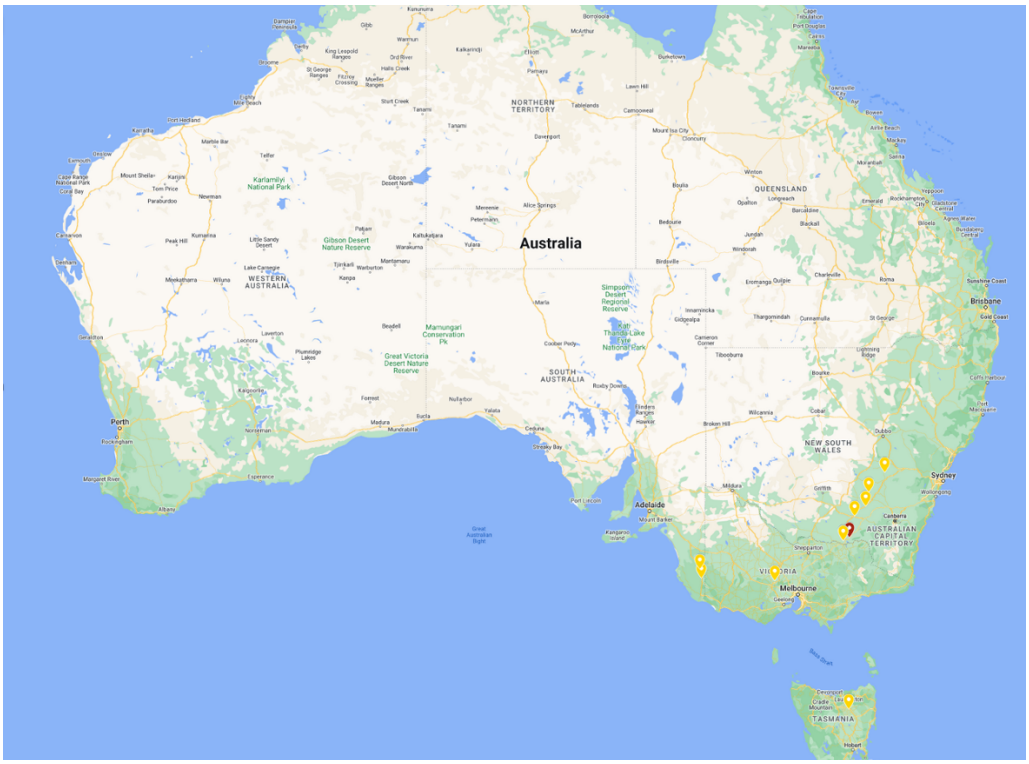

Figure 1: Locations from which stripe rust of wheat has been reported, as at 28th July 2023. First detection is shown as dark red coloured pin, subsequent detections yellow pins.

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The success of our rust surveys depends entirely on the samples received for analysis- hence as always, growers and other stakeholders are encouraged to monitor crops closely for rust in the coming season, and to forward freshly collected samples in paper only to the Australian Cereal Rust Survey, at University of Sydney, Australian Rust Survey, Reply Paid 88076, Narellan NSW 2567.

We cannot stress enough how important it is not to post samples in plastic of any kind – rust fungi do not like this!

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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, date of collection, cultivar, and your full contact details.

Direct rust samples to:

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

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