

Russian wheat aphid: Where are we at with this pest in WA?

Dusty Severtson, Rosalie McCauley, Nichole Hammond, DAFWA South Perth, Jeff Russell, DAFWA Northam, Sharyn Taylor, Plant Health Australia

Key messages

- The Russian wheat aphid (RWA) was first detected in Australia in May 2016 south of Tarlee, SA.
- It was not technically feasible to eradicate RWA following widespread detections in SA and further detections in Victoria and then NSW during 2016.
- RWA was not detected in WA following extensive surveillance conducted during June-December, 2016.
- Growers and agronomists in WA should remain vigilant in the coming season, continue to report presence and absence of RWA and plant damage symptoms in cereal and grass plants, and be prepared to manage this new pest should it be found in WA and unable to be eradicated.

Aims

To provide an update to the WA grains industry on surveillance for RWA in WA and effective management should the pest be found in WA.

Background

RWA is considered a high priority biosecurity risk because of its potential impact on cereal crops, especially wheat and barley. It has in some cases caused 80-100% yield loss to cereal crops overseas. The primary hosts of RWA are barley, wheat, rye, oat and triticale, while maize, sorghum, and rice are considered poor hosts. RWA can also survive and reproduce on grasses.

RWA was first detected in Australia in May 2016 south of Tarlee, SA. It was not technically feasible to eradicate RWA following widespread detections in South Australia (SA) and further detections in Victoria and then New South Wales (NSW) during 2016. This information was distributed to the public through media including the GrowNotes™ Alert system.

There are two common cereal aphid pests in WA: the corn aphid (*Rhopalosiphum maidis*) and oat aphid (*R. padi*). Although RWA is similar in size to these aphids (1.5–1.8 mm in length), the body of RWA is light green in colour, has an elongated spindle -shape (as opposed to a more globular shape of oat and corn aphids), have short antennae (about one-quarter of body length), and a distinctive double-tail (cauda) at the rear end. RWA also lack the visible 'exhaust pipes' (siphunculi) at the top rear.

Unlike the oat and corn aphids, RWA injects a toxin into cereal plants which causes pale streaking on leaves, similar to *Wheat streak mosaic virus*. The effect of the toxin, combined with feeding damage, have caused plant stunting and death, often in patches where hotspots of RWA have occurred.

Method

Immediately following the announcement of RWA in SA, Department of Agriculture and Food Western Australia (DAFWA) staff, growers and consultants carried out surveillance to assess 1) the possibility of RWA being found in WA and 2) whether isolated cases of RWA in WA may be contained and eradicable. Surveillance consisted of inspecting RWA hosts (living cereal and grass plants) in crops and roadsides for aphids and/or plant damage and reporting to DAFWA. Most reports were submitted using the DAFWA mobile phone reporting apps, including MyPestGuide™ Reporter and PestFax reporter apps. These apps were adopted for RWA surveillance because the apps quickly and easily record the GPS location of the report and collect and submit multiple photos of suspect plant damage or suspect aphids which could be viewed and diagnosed quickly and remotely by the department's expert insect taxonomists.

Results

RWA surveillance

Between 1 June and 31 December 2016, 681 reports were submitted to DAFWA of absence of RWA and presence or absence of other aphids on cereal or grass plants (see Fig. 1). This included 485 cases where cereal or grass plants were inspected for RWA and none were found. Furthermore, 196 reports were made where other aphid species were found on these hosts in the absence of RWA. Most of these aphid reports (104) were identified as the common oat aphid.

High priority biosecurity threats of Australia's grains industry are overseen by the Consultative Committee for Emergency Plant Pests and the National Management Group at a national level, while GrainGuard deals with threats of regional importance to Western Australia when pests are present elsewhere in Australia. Therefore, GrainGuard will continue to liaise with the WA grains industry in order to coordinate regional biosecurity activities should RWA be found in WA.

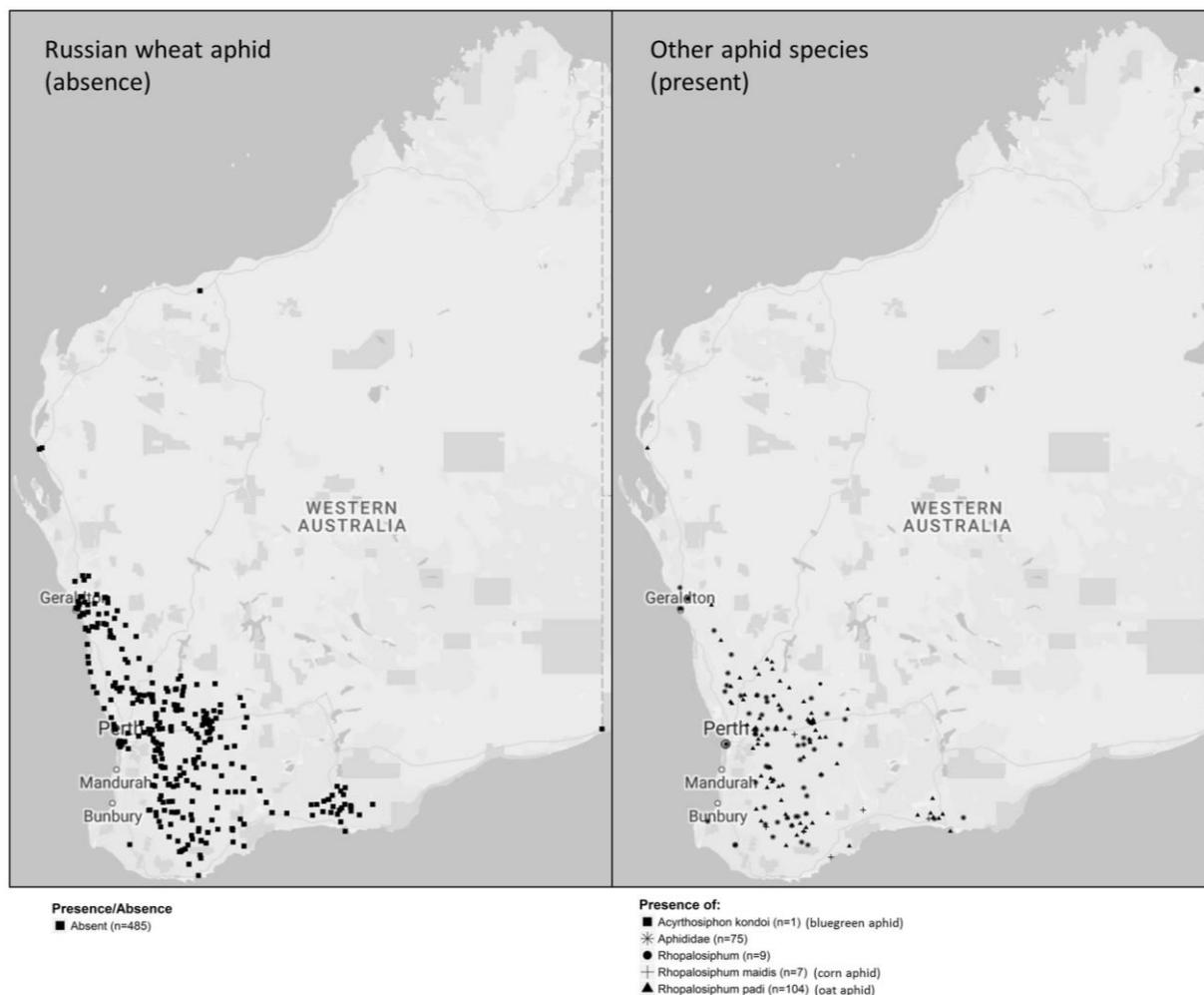


Figure 1. Reports of Russian wheat aphid absence (left) and presence of other aphid species (right) in Western Australia during June-December, 2016. Map data ©2017 Google.

RWA management in cereal crops

The Australian Pesticides and Veterinary Medicines Authority (APVMA) has permitted the following chemicals for use against RWA in cereal crops: imidacloprid (600 g/L) for use as a seed dressing (see permit PER82304) at a rate of 120 mL/100 kg seed, pirimicarb (500 g/kg) at a foliar spray rate of 125-250 g/ha and chlorpyrifos (500 g/L) at a foliar spray rate of 600 mL/ha (see permit 83140).

As advised by the Russian Wheat Aphid National Technical Group (RWA NTG), beneficial insects (including parasitoid wasps) are an important factor in decreasing or keeping RWA populations below damaging levels in crops. Whilst chlorpyrifos and pirimicarb were seen to be effective against RWA in cereal crops in SA during 2016, pirimicarb has the advantage of being less harmful or 'soft' against the predators and parasitoids which are feeding on RWA, and this protection of beneficials may assist in preventing secondary RWA outbreaks. While the damage seen in SA was

attributed to RWA, early management and protection of beneficials, as well as fortuitous heavy rain in spring, reduced numbers below damaging thresholds in the majority of paddocks.

Long term management of RWA overseas has been successful through a combination of effective insecticides and resistant varieties. There are eight known biotypes of RWA which differ in their ability to cause crop yield loss. The GRDC is currently investigating which biotypes of RWA exist in SA, Victoria and NSW and scoping the development of RWA-resistant crop varieties for Australia.

Conclusion

If RWA is found in WA in the coming growing seasons, it is anticipated that it will be manageable with insecticide applications where RWA populations reach damaging levels. However, because RWA seems to be able to cause more damage than the common oat or corn aphids (because of toxins injected into the plants), it is probable that cereal crops will need to be monitored for this pest and more often (than oat and corn aphids) to prevent outbreaks and subsequent economic damage.

The GRDC has supported a series of insecticide efficacy trials in SA and Victoria which will provide further control tactics for RWA, and results will be disseminated to the grains industry upon public release.

Key words

Russian wheat aphid, cereals, pest management, surveillance

Acknowledgments

Thanks are extended to DAFWA staff, growers and consultants who submitted reports. Bill Trend was DAFWA RWA Incident Manager and Dr Vincent Lanoiselet was DAFWA RWA Planning Manager. Thanks also to the MyPestGuide, PestFax and PaDIS teams. Reviewed by Dr Sonya Broughton.

GRDC Project Number: DAQ00201, DEP00002