

Exotic Pest Alert: Identification of Russian Wheat Aphid and associated crop damage

Dr Adrian Nicholas
Senior Research Entomologist, Tamworth

Russian wheat aphid poses a major threat to the Australian grains industry.

Any insect or crop showing symptoms of being infected with Russian wheat aphid should be reported to:

- Your local DPI District Agronomist
 - Exotic Plant Pest Hotline on 1800 084 881
- or
- Adrian Nicholas (RWA diagnostician)
(02) 6763 1100

Russian wheat aphid (*Diuraphis noxia*), a major pest of wheat and barley, has not yet been found in Australia, but poses a major threat to the Australian grains industry. The global distribution of Russian wheat aphid continues to expand, aided by the ease of international travel.

If not controlled Russian wheat aphid can cause up to 80 and 100% yield loss in wheat and barley respectively. Russian wheat aphid is also a minor pest of oats, rye, sorghum and triticale and a vector of barley yellow dwarf virus, brome mosaic virus and barley stripe mosaic virus. The Russian wheat aphid's host range also includes several non-crop grass species that occur in Australia.

Russian wheat aphid is adapted to semi-arid dryland climates where annual rainfall is usually less than 600 mm and therefore it is well suited to survive in Australian grain growing regions.

Detection

Initial detection of Russian wheat aphid is most likely to be by observation of symptomatic plants. Scouting for infested tillers in wheat and barley

crops is the most effective method of detecting Russian wheat aphid under field conditions. Russian wheat aphid is relatively small and a 10x magnification hand lens is essential to locate the leaf damage and aphids when populations are low.

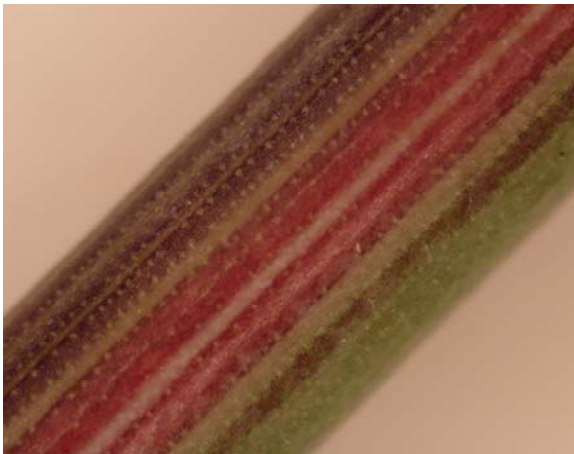
Toxins injected by the aphid during feeding destroy chlorophyll and prevent carbohydrate formation, with heavy infestations killing the plant.

Initially Russian wheat aphid feeding causes a small light brown blotch that can be confused with damage by other insects and more problematically with symptoms caused by disease.



Leaf colour variation (left leaf) caused by Russian wheat aphid feeding (Photo: A. Nicholas, Oklahoma 2011).

Leaves infested with Russian wheat aphid develop continuous white, yellowish and red (sometimes described as purplish) streaks along the length of leaf. The occurrence and intensity of colouration varies, with the coloured streaks on young, lightly infested plants often restricted to the leaf edge. This can be difficult to detect and a hand lens is required.



Examples of leaf colour variation and laminar streaking in wheat caused by Russian wheat aphid feeding (Photos: A. Nicholas, Oklahoma 2011).

Russian wheat aphid will infest the plant at any growth stage, preferring to feed within the new leaves while they are rolled up, i.e. before the leaf opens. This feeding can prevent the leaf from opening and gives the young plant an onion-leaf like appearance.

Feeding on open leaves causes the leaf to roll inwards around the aphid providing a suitable and protected microclimate. Infested flag leaves that remain unrolled trap the awns which prevents the wheat head from fully emerging and reduces grain fill.



Wheat awns trapped by flag leaf damaged by Russian wheat aphid feeding (Photo source: Food and Agriculture Organisation, UN).

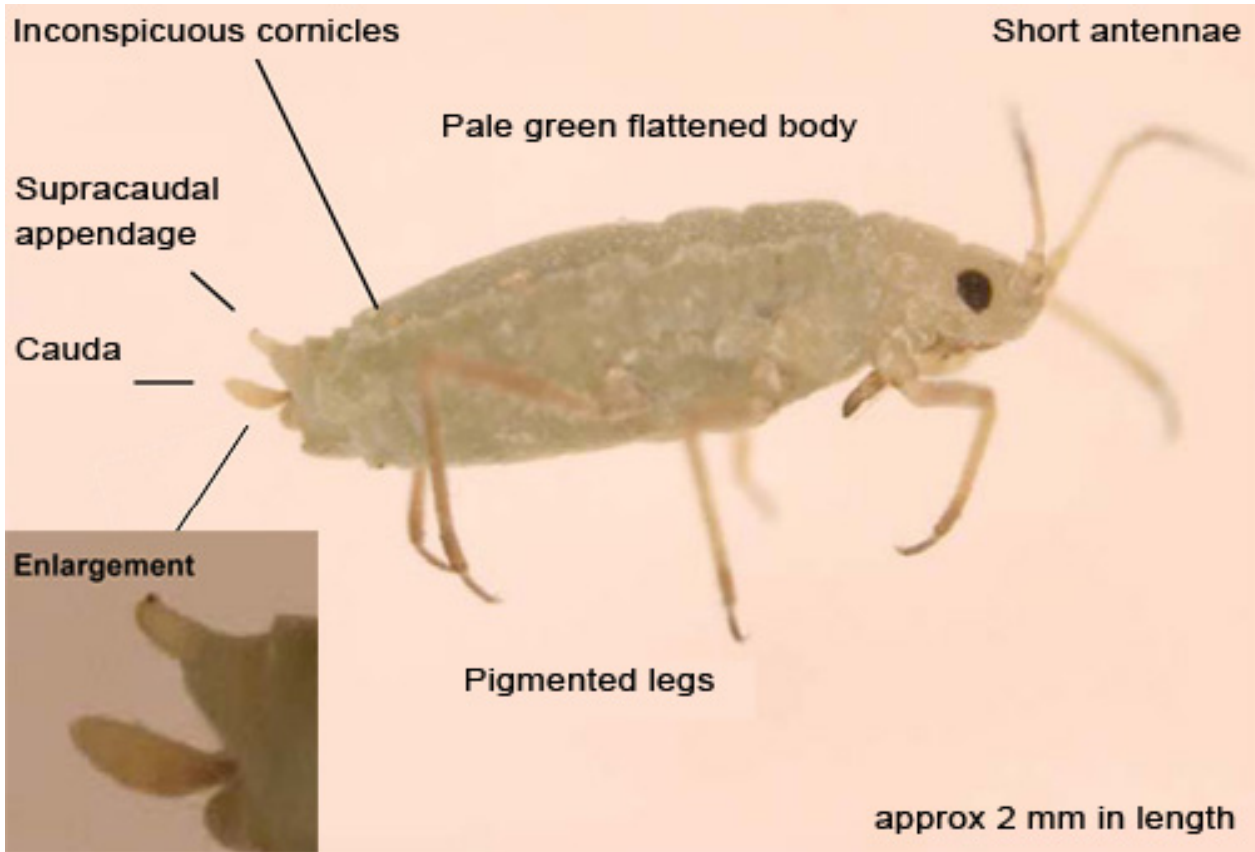
Identification

Russian wheat aphid is a small, (ca 2 mm) slender bodied aphid that varies in colour from pale yellowish-green to grey-green and is usually covered in a waxy fine white powder coating. Winged Russian wheat aphids have dark patches on the thorax and a slightly darker green abdomen than non-winged specimens.

The cornicles (tube-like structures at the rear of the abdomen) are very short, rounded, and although present can be very difficult to see and often appear to be absent.

The Russian wheat aphid's most distinguishing feature and what sets it apart from all other cereal aphids is an appendage above the cauda (tail), a supracauda, giving the aphid the appearance of having two tails.

The Russian wheat aphid's supracauda is large and conspicuous on the non-winged forms but shorter and knob-like on winged specimens. With care the supracauda can be seen with a hand lens.



Key identifying features of Russian wheat aphid (Photo: A. Nicholas, Oklahoma 2011)

© State of New South Wales through Department of Trade and Investment, Regional Infrastructure and Services 2011. You may copy, distribute and otherwise freely deal with this publication for any purpose, provided that you attribute the Department of Trade and Investment, Regional Infrastructure and Services as the owner.

ISSN 1832-6668

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (October 2011). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the Department of Primary Industries or the user's independent adviser.

Published by the Department of Primary Industries, a part of the Department of Trade and Investment, Regional Infrastructure and Services.

Pub11/72