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Russian wheat aphid and its management in wheat and barley

DPIRD-28

Russian wheat aphid is found worldwide and has spread throughout all major grain growing countries. In Australia, Russian wheat aphid is present in South Australia, Victoria, New South Wales, Tasmania, and Western Australia, where it was first detected in 2020.

In Western Australia, Russian wheat aphid is found in low, medium, and high rainfall areas.

Presence of Russian wheat aphid in Western Australia is not an international trade issue and there are no trade implications for the grain industry, as bulk grain is not a host for Russian wheat aphid.



Image 1: Russian wheat aphids on leaf sheath

Identification

Russian wheat aphids appear quite different to other cereal aphids. Identification is possible using a hand lens or smartphone macro lens.

Adults

Size

- About 1.4 to 2.3 mm long

Colour

- Generally light green

Distinguishing features

- distinctive black eyes
- short antennae
- elongated body shape, with bifurcate cauda (that is, two tiny tails at the rear end, which can be difficult to see)
- lack visible 'exhaust pipes' (siphunculi also known as cornicles)

Plant symptoms and damage

RWA injects toxins into the plant during feeding which stunts plant growth. Heavy infestations may kill plants.

Plant symptoms associated with the presence of Russian wheat aphid include:

- damage often found at the base and sheath of newly emerged leaves
- leaf rolling along margins
- crops can become purple
- white, yellow, or purple longitudinal streaks on leaves
- hook-shaped head growth from awns trapped in curling flag leaf
- curling of the flag leaf can cause emerging heads and awns to become trapped
- heads with a bleached appearance
- noticeable loss of green colouration across the crop
- loss of vigour
- stunted plant growth
- damaged areas may appear in hotspots or along field edges
- plant symptoms can be confused for herbicide damage, nutrient deficiencies, or virus symptoms
- from a distance, damage may appear as a general loss of colouration across the affected crop area.



Image 2: Russian wheat aphid symptoms including leaf rolling along the margins and white streak

Factors favouring disease risk and spread

- Russian wheat aphid can be found throughout the year.
- Infestation of wheat and barley starts from the emergence of the crop in autumn and extend to crop maturity.
- Russian wheat aphid can persist over summer on non-crop grasses and then disperse into emerging crops during autumn.
- Wet summers will promote a green bridge and self-sown wheat and barley will increase Russian wheat aphid survival. Controlling volunteer cereals will decrease risk of the pest aphid's presence in paddocks.
- Conditions that favour larger infestations include an early break to the growing season, the presence of hosts in the lead up to sowing, such as volunteer cereals and grasses.

Yield and quality losses

Russian wheat aphid is a pest of wheat and barley, and it can be found in grass weeds. Research by the South Australia Research and Development Institute (SARDI) has found this aphid on 54 different grass species, predominantly on barley grass, brome, rye grass, and wild oats.

During feeding, the aphid injects toxins that retard growth into the plant, and, with heavy infestations of the aphid, this kills the plant.

Even a few aphids can cause symptoms to appear as early as 7 days after infestation.

Yield impact requires aphids must migrate into emerging crops at an early growth stage (during crop establishment) and build to high numbers leading up to head emergence.

The most at risk time for the crop is from stem elongation to flag leaf emergence.

Feeding damage symptoms do not mean there will be yield loss. The percentage of tillers with aphids on them determines whether there will be yield loss. On average, for each percentage of tillers with Russian wheat aphid, there will be 0.28% yield loss.

Monitoring

Growers are encouraged to regularly monitor crops that are not yet flowering for Russian wheat aphid.

- Aphids colonise the edges of crops first, so it is best to monitor the 20 metre (m) edge of paddocks for signs of aphids or crop damage.
- Monitor for Russian wheat aphid by walking through the crop in a 'W' pattern, noting the numbers of aphids per tiller at every few paces. Do this in more than one location in the paddock.
- Colonies are found most frequently near the base of the youngest leaves or on newly emerged flowers or seed heads.
- When inspecting crops, it is useful to look where aphids may hide, such as all tillers of a plant, the base of each leaf, and the crown of the plant.
- Look for Russian wheat aphid in wheat and barley crops, especially crops that are not yet flowering.

Reporting

Russian wheat aphid damage looks like herbicide or mite damage.

Growers, agronomists, and consultants are asked to assist with crop monitoring and report any aphids or crop damage in cereal crops or grassy weeds.

Report using the online tool PestFacts WA on the department website at dpird.wa.gov.au or email PestFactsWA.

Integrated pest management strategies

The best management of Russian wheat aphid is achieved via an integrated management strategy, including destroying volunteers, efficient use of seed treatments and chemical control, where necessary.

Confirmation of Russian wheat aphid in crops will enable growers to implement proven control methods.

Much has been learnt from the research and experiences of growers in Australia's eastern States, demonstrating that timely treatment can be effective, and cereal crops are resilient and can recover to deliver adequate yields.

Yield impact requires aphids to migrate into emerging crops at an early growth stage (during crop establishment) and build to high numbers leading up to head emergence.

Chemical management

Refer to:

- [Public Chemical Registration Information System Search](#) | Australian Pesticides and Veterinary Medicines Authority (apvma.gov.au) for current registrations
- Insecticide spray guides for broadacre crops in Western Australia, on the website at [dpird.wa.gov.au](#).

Chemicals at sowing

Insecticide seed treatments provide effective early season control of Russian wheat aphid. The length of protection against Russian wheat aphid provided by seed treatments is the same as other cereal aphid species.

After harvest, growers should plan seed dressings for the next year.

Before head emergence

As Russian wheat aphid often shelter in the curl of leaves, aphid predators such as lacewings, hoverflies, and parasitoid wasps are effective in controlling the pest, so consider applying aphid specific insecticides to preserve beneficials.

Good spray coverage and consideration of weather conditions such as temperature and rainfall in the 24 hours prior and shortly after application are important.

Growers should monitor after spraying to ensure the insecticide is effective and has reached insects that have sheltered in or under leaf curls.

After head emergence

It is too late to spray if crops are past flowering.

Economic considerations of insecticide applications

Do not spray unless necessary.

Research investment by the Grains Research and Development Corporation (GRDC) has led to the development of an [Russian wheat aphid action threshold calculator](#) | Grains Research and Development Corporation (grdc.com.au) to determine yield loss. This calculator has been tested under WA conditions and it is accurate in its estimate of yield loss.

Factors to consider when deciding on insecticide applications

Insecticide resistance

No insecticide resistance has been reported in Australia.

Contact us

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More information

Refer to the department website at dpird.wa.gov.au for more information about the following:

- PestFacts WA
- PestFacts WA Maps
- Insecticide spray guides for broadacre crops in Western Australia

[Russian wheat aphid action threshold calculator](http://grdc.com.au) | Grains Research and Development Corporation (grdc.com.au)

[Public Chemical Registration Information System Search](http://apvma.gov.au) | Australian Pesticides and Veterinary Medicines Authority (apvma.gov.au)

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