GRAINS FARM BIOSECURITY PROGRAM

RUSSIAN WHEAT APHID

Russian wheat aphid (*Diuraphis noxia*) is a new pest to Australia, first detected in cereal crops in South Australia in May 2016.

While grain growers are used to dealing with aphids and other endemic pests of production, Russian wheat aphid is new to Australia. Overseas, the aphid has caused huge losses if untreated, but it is not yet known what effect it will have here.

HOW RUSSIAN WHEAT APHID DAMAGES CROPS

Russian wheat aphid can cause direct yield losses and damage, unlike other aphids which are a problem because they transmit viruses.

Yield impacts depend on the crop development stage. Aphids feeding during the early booting to soft dough stage can cause direct yield losses. After soft dough stage, it appears that further impact is minimal.

If aphids are controlled plants may recover unless excessively stressed. Overseas data suggests that this aphid does not thrive in conditions above 25oC, but this needs to be confirmed in Australian conditions.

WHERE IS IT NOW?

The latest distribution maps can be found at **http://bit.ly/RWAdist**

IF YOU SEE ANYTHING UNUSUAL, CALL THE EXOTIC PLANT PEST HOTLINE

1800 084 881

USE THE GRDC FITE STRATEGY

1. **FIND** – look for aphids and the characteristic plant symptoms of leaf streaking or leaf rolling on cereal crops and grasses
2. **IDENTIFY** – positively identify the pest in consultation with a specialist
3. **THRESHOLD APPROACH** – consider international thresholds for control, factoring crop growth stage and potential yield losses
4. **ENACT** an appropriate management strategy that where possible preserves beneficial insects.

Plant Health AUSTRALIA

FITE 1. **Find**

Growers and agronomists are urged to check cereal crops and grass weeds for aphids and damage symptoms.

Report suspect detections outside the current known distribution to the Exotic Plant Pest Hotline or directly to each state.

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Russian wheat aphid may infest crops during any stage of crop development, from early establishment to flag leaf development. Russian wheat aphid symptoms can become apparent quickly, with even a few aphids causing visible symptoms as early as 7 days after infestation.

Damage is characterised by:

- Longitudinal rolling of leaves, forming a hollow tube inside which aphids shelter.
- Whitish, yellowish to pink-purple chlorotic streaks along the length of leaves.
- Stunted plants which may appear flattened, with tillers lying almost parallel to the ground.
- Viewed from a distance, damage may appear as a general loss of colouration across the affected crop area.
- In older crops, wheat awns may become trapped in the boot, resulting in hook-shaped head growth and bleaching, and reduced yield.

HOW TO FIND THE APHID

Search strategies for Russian wheat aphid vary with the density of infestation, weather conditions, and crop development stage. Once seedlings emerge, check crops regularly.

Russian wheat aphid feeds in dense colonies, typically at the base and sheath of younger leaves and within leaves curled by their feeding.

In lower densities, it is much easier to detect characteristic leaf streaking and rolling in plants rather than find aphids.

In good weather conditions, the aphids prefer the newest leaves of plants, and are often found on the last two leaves unfurled.

In poor conditions, the aphids will usually be found sheltering within leaf curls. Heavy rain has been found to reduce populations by up to 50%. At high densities they can be found on any leaf parts.

Overseas Russian wheat aphid tends to move into crops in Autumn, shelter inside leaf rolls over winter remaining at low levels and then multiply quickly in Spring. The main aphid flights occur in Spring.

As with other aphids, infestations often begin along crop edges, usually on the windward side or adjacent to infested grasses. Be sure to check areas of paddocks where plants are sparse or adjacent to bare ground.

After initial infestation, aphids can rapidly spread across a paddock.

FITE 2. **Identify**

Positively identify Russian wheat aphid in consultation with a specialist.

Damage from Russian wheat aphid

Albert Gorman

Streaks along the leaf

Albert Gorman

HOST RANGE:

Russian wheat aphid affects more than 140 species of cultivated and wild grasses. These include wheat, barley, triticale, rye, oats, pasture grasses and weeds including brome grass, barley grass, ryegrass and phalaris.

Wheat and barley are most susceptible; triticale, rye and oats less so.

HOW TO RECOGNISE RUSSIAN WHEAT APHID

The pest is small and pale green in colour often with a fine coating of whitish wax.

Compared to other grain aphids, it is elongated in shape.

Wingless (apterous) adults have very short antennae, about a third to half the body length, and have no obvious siphunculi ('exhaust pipes').

The winged (alate) adults are small, up to 2 mm in length, with body-length antennae. They are generally darker green compared with the wingless adults.

They have two short 'tails' (caudal) processes) on the end of the abdomen one above the other, giving the appearance of a double tail.

Russian wheat aphid

Double tail (arrows) and no siphuncles (circled)

Bugwood.org

Adult oat aphid

Has siphuncles (circled) and no double tail

SARDI

FITE 3. **Threshold approach**

In grain growing regions overseas a key management strategy for Russian wheat aphid is to preserve populations of predators and other beneficials to help control aphid numbers. This strategy should be used in Australia wherever possible.

This means that where the aphid has been confirmed, growers need to estimate infestation levels regularly, particularly as temperatures start to rise in Spring.

Based on data from overseas, Russian wheat aphid is likely to warrant chemical control if levels are above thresholds of 10% of tillers infested through the high risk period of early booting to soft dough (Z40 - Z85). During this period, protecting the top three leaves will be a priority for minimising yield loss.

Economic thresholds recommended to guide spraying are:

- 20% plants infested up to the start of tillering
- 10% of tillers infested after tillering

This advice may change once information from Australian trials is completed.

HOW TO CHECK FOR 10% DAMAGE

Check several parts of the paddock to assess infestation.

Five tillers from a total of 50 are showing symptoms (leaf rolling, white or red streaking, head caught in the boot) or Russian wheat aphid is present.

It is important to note that the decision to spray must be based on individual situations and broader consideration of factors including crop yield potential, timing of infestation, number of aphids per tiller and the cost of the chosen control option.

Aphid colony

Frank Peairs, Colorado State University, Bugwood.org

RESEARCH IS UNDERWAY

Research to learn more about the aphid and how to manage it under Australian conditions is underway. GRDC is working on identifying the biotype of the pest, effective chemical control options, yield loss and thresholds for control, resistant varieties of grain crops, the biology and population dynamics of the aphid and the importance of natural enemies.

FITE 4. **Enact**

Growers need to choose an appropriate management strategy based on thresholds, preserving beneficial insects wherever possible.

CHEMICAL CONTROL

If chemical control is warranted, use pirimicarb which is softer (less toxic) on many beneficial species. Pirimicarb is listed for control under Emergency Use Permit (APVMA82792). Follow label directions and consider using lower rates at higher temperatures. Note: pirimicarb has a witholding period of 42 days for grazing and harvest.

Chlorpyrifos is also listed under this Emergency Use Permit at a rate of 600 ml/ha. This rate been shown to be effective in killing the aphid, but it also harmful to beneficials.

Note that killing the natural predators could cause a subsequent spike in numbers of other aphid species or allow any remaining Russian wheat aphids to multiply rapidly.

Good spray coverage is essential to optimize the effectiveness of insecticide spray treatments, particularly where aphids are sheltered in rolled leaves.

RECOMMENDED PROCEDURE: water volumes of at least 100 L/ha, the inclusion of a non-ionic surfactant and nozzle pressures that deliver mid-size droplets.

When considering seed treatment for the 2017 season please note that imidacloprid is listed for control under Emergency Use Permit (APVMA PER8304) at a rate of 120ml/100kg of seed. Follow label directions.

BeeAware

Insecticides can kill foraging bees. It is essential that you contact beekeepers before spraying if you have hives on or near your property. See **beeaware.org.au** for more information.

BENEFICIAL INSECTS

Many growers overseas make use of natural enemies of Russian wheat aphid to control the pest.

Predators in Australia include:

- parasitoid wasps
- generalist predators including lady beetles
- lacewings
- damsel bugs
- hoverflies
- some fungi

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For more information speak to your Grains Biosecurity Officer:

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For more information on Russian wheat aphid visit **http://bit.ly/RWAmanage**