Redlegged earth mite
*Halotydeus destructor*

**Summary:**
The redlegged earth mite is a common and widespread pest of pastures and most broadacre crops. Adult mites are approximately 1 mm in length with a velvety black body and 8 orange-red coloured legs. Redlegged earth mites are commonly controlled using insecticides, however, non-chemical options are becoming increasingly important due to evidence of resistance and concerns about long-term sustainability.

**Occurrence:**
Redlegged earth mites are one of the most important invertebrate pest species in Australian agriculture. They are common and widespread, and active from autumn to late spring in southern Australia, but not in northern NSW. Redlegged earth mites often occur in situations with other mites, such as blue oat mites, *Bryobia* mites and *Balaustium* mites.

![Distribution Map](image)
The known distribution of redlegged earth mites in Australia (Source: *cesar*).

**Description:**
Redlegged earth mites are 1 mm in length. Adults and nymphs have a velvety black body with eight orange-red coloured legs. Newly hatched mites are pinkish-orange with six legs and are 0.2 mm long.
It is important to correctly identify redlegged earth mites because other mite species respond differently to registered insecticides/miticides.

Distinguishing characteristics/description of redlegged earth mites (Source: Bellati et al. 2012)

**Lifecycle:**
Redlegged earth mites reproduce sexually and can have up to 3 generations per season. In autumn, over-summering eggs hatch when there is significant rainfall and the mean daily temperatures fall below approximately 21°C. The first two generations lay eggs that mostly hatch during winter. It takes approximately 4-6 weeks for nymphs to develop into mature adults. In spring, the third generation of mites produce over-summering eggs that are retained in their bodies. When the female dies these eggs remain on the soil surface and will hatch the following autumn.
Behaviour:
Redlegged earth mites are often found on the leaf surface in feeding aggregations, of up to 30 individuals. In the warmer part of the day, redlegged earth mites tend to gather at the base of plants, sheltering in leaf sheaths and under debris.

Similar to:
Blue oat mites, *Balaustium* mites and *Bryobia* mites

Crops attacked:
Redlegged earth mites have a very broad host range, including canola, wheat, barley, oats, lupins, sunflower, faba beans, field peas, poppies, lucerne & vetch, as well as pasture legumes and grasses. While redlegged earth mites are less of a concern in cereal crops and in some pulses, they can cause some initial damage under certain conditions. Weeds can also act as alternative hosts, particularly capeweed.

Damage:
Feeding causes silvering or white discoloration of leaves and distortion or shriveling in severe infestations. Affected seedlings can die at emergence with high mite populations. Feeding symptoms can be mistaken for frost damage. Redlegged earth mites have been found to be directly responsible for a reduction in pasture palatability.
Economic thresholds:

Some crops can compensate for redlegged earth mite damage, highlighting the importance of applying thresholds prior to the use of insecticides/miticides. For example, canola and wheat are susceptible to feeding damage caused by redlegged earth mites at early growth development stages (canola - cotyledon, first and second true leaf stage; wheat - GS10 and GS12). In contrast, both crops can tolerate damage at the later growth stages (canola > third true leaf stage; wheat >GS14). Wheat tolerates and compensates for mite feeding damage to a larger extent than canola.

Economic thresholds for redlegged earth mites vary across crops, although most is known about canola (Arthur et al. 2015):

- **At the cotyledon stage:** If visual mite feeding damage (silvering or whitening) extends to 20% of plants or more and mites are present, treatment is warranted. If not, recheck at the 1st true-leaf stage.
- **At the 1st true-leaf stage:** If there are 10 mites per plant, treatment is warranted. If there are fewer numbers of mites don’t spray. Recheck paddock in 5 days if crop growth is slow, or in 10 days if crop growth is rapid.
- **At the 2nd true-leaf stage:** If there are fewer than 30 plants/m² and the presence of mites, treatment is warranted. If there are greater than 30 plants/m² and the majority of plants show no visual mite feeding damage, then do not spray. Recheck paddock in 5 days if crop growth is slow, or in 10 days if crop growth is rapid.
- **Beyond the 3rd leaf stage:** There is no benefit in spraying, except when plants are under severe stress (moisture stress or waterlogging) coupled with mite numbers greater than 2000/m².

Nominal thresholds for other crops include (Miles 1996):
- Wheat / Barley: 50 mites per 100 cm²
- Linseed: 10 mites per 100 cm²
- Pulses: 50 mites per 100 cm²
- Establishing annual medic pastures: 20-30 mites per 100 cm²

Monitor:
Inspect susceptible pastures and crops from autumn to spring for the presence of mites and evidence of damage. It is important to inspect crops regularly in the first three to five weeks after sowing. Mites are best detected feeding on the leaves in the morning or on overcast days. If mites are not observed on plant material, inspect soil for mites. Be aware of edge
effects; mites move in from weeds around paddock edges. An effective way to sample mites is to use a standard petrol-powered garden blower/vacuum machine. A fine sieve or stocking is placed over the end of the suction pipe to trap mites vacuumed from plants and the soil surface.

Management options:
Biological:
French *Anystis* mites can suppress populations in some pastures. Snout mites and other predatory mites are also effective natural enemies. Leaving shelterbelts or refuges between paddocks will help maintain natural enemy populations.

Cultural:
Do not sow highly susceptible crops (e.g. canola) into pastures or paddocks known to contain high mite numbers. Rotate paddocks with non-preferred crops (e.g. chickpeas and lentils). Pre- and post- sowing weed management (particularly broadleaf weeds) is important. Heavy pasture grazing in spring can help to reduce mite numbers the following autumn.

Chemical:
Resistance to synthetic pyrethroid and organophosphate chemicals has been detected in parts of Western Australia and South Australia. Growers and advisers are strongly encouraged to download the comprehensive resistance management strategy for the redlegged earth mite in Australian grains and pastures. It has been developed to help growers effectively control this pest, while at the same time minimising the selection pressure for further resistance development.

Key components of a resistance management strategy are to use thresholds (where available) to determine if spraying is warranted and rotate insecticide mode of action (MoA) groups. Insecticides/miticides used at or after sowing should be applied within three weeks of the first appearance of mites, before adults commence laying eggs. Insecticides/miticides do not kill mite eggs. Border spraying can be an effective way to control mites, as mites will often move in from crop edges and roadside vegetation. Carefully timed spring-spraying using TIMERITE® will reduce mite populations the following autumn, but could also exacerbate other mite problems.

In paddocks where resistance is known, growers should not apply synthetic pyrethroids to control mites. Redlegged earth mites possess a very high of resistance to all pyrethroid chemicals. Applications of pyrethroids (even at rates above the registered label rate) will not control mites where resistance is found.

For moderate to high mite populations, insecticide/miticide seed dressings are an effective method but should be avoided if the risk of damage from mites and other establishment pests (e.g. green peach aphid) is deemed low.

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In some areas of Australia, redlegged earth mites have developed resistance to synthetic pyrethroids and organophosphate insecticides. Resistance is a risk for all southern grains.

Acknowledgements
This article was compiled by Paul Umina (cesar) and Garry McDonald (cesar).
References/Further reading:


Miles M (1996) Control threshold and sampling recommendations for insect pests of field crops and pastures. Victorian Institute for Dryland Agriculture, Horsham VIC.


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