Cowpea aphid

*Aphis craccivora*

**Summary:**

Cowpea aphids are shiny black with white and black legs. This species is found in medics, vetch and a wide range of summer and winter pulse crops throughout Australia. In autumn, the aphids appear to be able to move large distances to colonise establishing crops and pastures. Cowpea aphids are known to transmit several plant viruses that can contribute to yield losses, including cucumber mosaic virus, bean yellow mosaic virus, alfalfa mosaic virus and pea seed-borne mosaic virus.

**Occurrence:**

The cowpea aphid is a widespread and relatively common pest of legume crops throughout Australia. They have a wide range of host plants and can tolerate warm, dry weather conditions that cause many other aphid species to suffer.

*Cowpea aphids are commonly found on legumes and pulses including field peas, lupins, lentils, faba beans, lucerne, clover and medics.*

**Description:**

Aphids are a group of soft-bodied bugs commonly found in a wide range of crops and pastures. Identification of crop aphids is very important when making control decisions. Distinguishing between aphids can be easy in the non-winged form but challenging with winged aphids. See a pictorial guide to distinguishing winged aphids in canola and pulses at [http://cesaraustralia.com/assets/Uploads/wingedaphids.pdf](http://cesaraustralia.com/assets/Uploads/wingedaphids.pdf).

Apterous (non-winged) cowpea aphid adult and nymph (Source: *cesar*)
Adult cowpea aphids are shiny black in colour and nymphs are dull grey. All stages have white and black legs. Nymphs are lightly dusted with wax. When fully grown adults are approximately 2mm long.

Distinguishing characteristics/description of cowpea aphids (Source: Bellati et al. 2012)

**Lifecycle:**

Winged aphids fly into crops from legume and non-legume hosts, and colonies of aphids start to build up within the crop. Aphids can reproduce both asexually and sexually however in Australia, the sexual phase is often lost.

Lifecycle, critical monitoring and management periods for the cowpea aphid (Source: cesar)
**Behaviour:**

Cowpea aphids are capable of being transported (migrating on the wind) large distances from more favourable hosts, particularly during autumn. They tend to colonise single plants before moving onto surrounding plants to form groups of plants in ‘hot spots’ within a crop.

**Similar to:**

Other aphids.

**Crops attacked:**

Commonly found on faba beans, lentils, medics, lucerne, clover, vetch and lupins.

**Damage:**

**Direct feeding damage:**

Aphids can cause direct feeding damage to plants when in large numbers as they remove sap, which can cause wilting of plants. Cowpea aphids also inject toxins into the plant while feeding. Cowpea aphids form dense colonies on individual plants, with infestations usually starting on the growing tips and spreading down the stem. Initial signs of damage include yellowing or whitening of leaf veins, with heavy colonisation causing rapid wilting of leaves and eventually plant death. Other symptoms include leaf bunching and stem twisting. Secretion of honeydew by aphids can cause secondary fungal growth, which inhibits photosynthesis and can decrease plant growth.

In pulse crops, aphid feeding damage (in the absence of virus infection) can result in yield losses of up to 90% in susceptible varieties, and up to 30% in varieties with intermediate resistance.

**Indirect damage:**

Cowpea aphids cause indirect damage by spreading plant viruses. Aphids spread viruses between plants by feeding and probing as they move between plants and paddocks. Cowpea aphids transmit important viruses including cucumber mosaic virus (CMV), bean yellow mosaic virus (BYMV), alfalfa mosaic virus (AMV) and pea seed-borne mosaic virus (PsbMV). Yield losses in some pulse crops as a direct result of viruses spread by cowpea aphids can reach as high as 80%.

*Cowpea aphids can cause damage by direct feeding when in high numbers and by transmitting viruses including cucumber mosaic virus, bean yellow mosaic virus, alfalfa mosaic virus and pea seed-borne mosaic virus.*

**Monitoring:**

Cowpea aphids are most prominent in spring, but are also active during autumn and persist through winter. Regularly monitor vulnerable crops during bud formation to late flowering. Aphids will generally move into paddocks from roadsides and damage will first appear on crop edges. Aphid distribution may be patchy, so monitoring should include at least five sampling points over the paddock. Inspect at least 20 plants at each sampling point. Search for aphids by looking at the youngest inflorescence of each plant. Look for clusters of aphids or symptoms of leaf yellowing or leaf-curling.

In disease-prone areas, regular aphid monitoring from autumn onwards is recommended to detect aphids moving into crops, particularly along paddock edges. Symptoms of virus infections are very
variable. Autumn is the critical infection period; the earliest-sown crops usually have the highest infection incidence.

Aphid infestations can be reduced by heavy rain events or sustained frosts. If heavy rain occurs after a decision to spray has been made, but before the insecticide has been applied, check the crop again to determine if treatment is still required.

**Economic thresholds:**

**Winter pulses:**

*Lupins - NSW:*  
Treat at first sign of virus infected plants or appearance of aphid clusters on flowering spikes (Hertel et al. 2013); WA: >30% of inflorescences infested with 30 or more aphids (Berlandier 1999).  

*Chickpeas - NSW:*  
No threshold established (Hertel et al. 2013)  

*Faba beans - NSW:*  
Treat low levels of aphids to prevent virus transmission early in the season (Hertel et al. 2013)

When determining economic thresholds for aphids, it is critical to consider several other factors before making a decision. Most importantly, the current growing conditions and moisture availability should be assessed. Crops that are not moisture stressed have a greater ability to compensate for aphid damage and will generally be able to tolerate far higher infestations than moisture stressed plants before a yield loss occurs.

Thresholds for managing aphids to prevent the incursion of aphid vectored virus have not been established and will be much lower than any threshold to prevent yield loss via direct feeding.

**Management options:**

**Biological:**  
There are many effective natural enemies of aphids. Hoverfly larvae, lacewings, ladybird beetles and damsel bugs are known predators that can suppress populations. Aphid parasitic wasps lay eggs inside bodies of aphids and evidence of parasitism is seen as bronze-coloured enlarged aphid ‘mummies’. As mummies develop at the latter stages of wasp development inside the aphid host, it is likely that many more aphids have been parasitized than indicated by the proportion of mummies. Naturally occurring aphid fungal diseases (*Pandora neoaphidis* and *Conidiobolyus obscurus*) can also suppress aphid populations.

If the parasitism trend increases over time, there are good prospects that aphid populations will be controlled naturally.

**Cultural:**  
Control summer and autumn weeds in and around crops, particularly legumes, to reduce the availability of alternate hosts between growing seasons.

Sow crops early to enable plants to begin flowering before aphid numbers peak in spring and use a high sowing rate to achieve a dense crop canopy, which will assist in deterring aphid landings. Select cultivars that are less susceptible to aphid feeding damage.

Consider seed testing to assess the level of virus infection of seed-borne viruses (e.g. CMV) before sowing.
Chemical:
The use of insecticide seed treatments can delay aphid colonisation and reduce early infestation and aphid feeding.

A border spray in autumn/early winter, when aphids begin to move into crops, may provide sufficient control without the need to spray the entire paddock. Avoid the use of broad-spectrum 'insurance' sprays and apply insecticides only after monitoring and distinguishing between aphid species. Consider the populations of beneficial insects before making a decision to spray, particularly in spring when these natural enemies can play a very important role in suppressing aphid populations if left untouched.

Acknowledgements:

This article was compiled by Paul Umina (cesar) and Sandra Hangartner.

References/Further Reading:


Bellati J, Mangano P, Umina P and Henry K. 2012. I SPY. Insects of Southern Australian Broadacre Farming Systems Identification Manual and Education Resource. Department of Primary Industries and Resources South Australia (PIRSA), the Department of Agriculture and Food Western Australia (DAFWA) and cesar Pty Ltd.


Hertel K, Roberts K and Bowden P. 2013. Insect and Mite control in field crops. New South Wales DPI. ISSN 1441-1773.


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