Mirids

Mirids are endemic to Australia and are pests in a wide range of crops including cotton, sunflower, summer pulses, lucerne and other legumes as well as in various fruits and vegetables. They are widely distributed throughout the country and can cause significant damage to berry crops. The main species of concern for berries are **green** mirid (*Creontiades dilutus*), **crop** mirid (*Sidnia kinbergi*), and **brown** mirid (*Creontiades pacificus*).

Identification

Green Mirid
Creontiades dilutus

Adult green mirids are approximately 7–9mm in length with an elongated body, long antennae and transparent wings folded flat over the back.

Recently hatched nymphs are 1.5–2mm in length with long antennae, and change colour as they develop from a pale green in younger instars to yellow-green as adults.

The total lifecycle is as short as 3 weeks under optimal (warm, dry) conditions, enabling rapid population growth.

While traditionally associated with cotton, mungbeans, and lucerne, green mirids can migrate into berry crops from nearby broadacre fields.

Photo credit: NSW DPIRD

Brown Mirid
Creontiades pacificus

Adult brown mirids are approximately 7–9mm in length and similar in shape and appearance to green mirids, however they often have brown colouration on the back and often match foliage making them hard to detect visually.

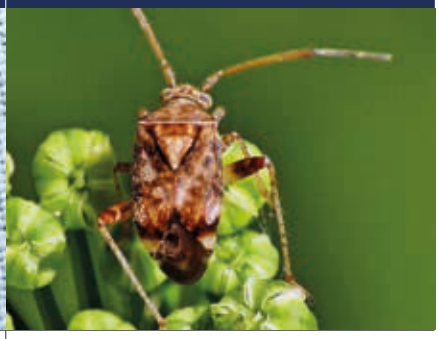
Antennae have distinctive colour banding in alternating red-brown and white.

The total lifecycle is ~ 3–4 weeks, though this can vary depending on temperature and environmental conditions.

Brown mirids are often overlooked early due to their cryptic behaviour and resemblance to beneficial insects like damsel bugs.

Photo credit: Steve Murray

Crop Mirid
Sidnia kinbergi



Adult crop mirids are comparatively smaller than green and brown mirids, approximately 4-7mm in length, grey-green in colour with brown markings or mottled brown on the back and bright green on the underside.

Adults have a distinctive dark 'V' pattern on the back and the tips of the wings are bent down sharply and can therefore be confused with the broken back bug.

Crop mirid nymphs have a distinctive black spot on the back which helps differentiate between them from green and brown mirid nymphs.

Crop mirids are the major mirid pest in Australian Rubus and strawberry crops and are abundant during the entire crop season.

Photo credit: Marianne Broug

Lifecycle

Mirids reproduce sexually, with the lifecycle consisting of an egg stage, five nymphal stages and an adult stage. Eggs are laid onto the leaf, buds or petiole and are embedded into plant tissue, making them almost impossible to spot. Eggs hatch in 4-10 days depending on temperature. Studies have shown the optimum temperature for green mirid egg production is 23-32°C, with eggs and nymphs failing to complete development at temperatures below 15°C. In the warm summer months, green mirids can complete one generation in as little as three weeks from egg to adult, and adults survive for approximately 3-4 weeks.

Mirids are highly mobile and there is evidence to suggest that green mirids can migrate long distances on air currents and high winds, including from arid inland areas to coastal regions in spring and summer. One study suggests green mirids are not able to complete their lifecycle through winter in cooler regions such as Tasmania, and instead the insects migrate across Bass Strait each year, potentially via strong air currents.

Some mirid species can overwinter in low numbers on non-production hosts through the winter period in mild climates and populations increase again through spring as temperatures increase.

Damage

Mirids can cause a range of damage across foliage and fruit in berries. During feeding, mirid adults and nymphs pierce plant tissue and release a chemical which destroys the surrounding cells.

In fruit, this can result in tissue continuing to grow around the impacted area while the impacted cells cease to develop, resulting in deformed berries, a higher proportion of aborted flowers, reduced berry weight and an impact to marketable yield.

In strawberries in particular, mirid damage can cause a characteristic turban-like appearance. Mirids can also feed on leaves and new buds, causing pinhole-like damage through the leaf tissue and deformity around the initial feeding area as the leaf expands.

Mirid damage to fruit can be difficult to distinguish from pollination defects or cold damage, as the fruit deformation can look initially similar.

Mirid nymph on strawberry
Photo credit: Catherine Eckert

Blackberry leaf mirid damage
Photo credit: Emma Nightingale

Crop mirid on strawberry
Photo credit: Sandra Alfonso

Mirid damage to strawberry fruit
Photo credit: Mikaela Valentine

Juvenile mirid on blackberry with potential mirid damage
Photo credit: Tasmanian Institute of Agriculture

Monitoring

Mirids are most commonly found in the warmer months from spring through to autumn and monitoring helps to understand population dynamics in the crop. A crop walkthrough should ideally be done at least once a week to monitor for mirid nymphs and adults, increasing to twice a week when temperatures are warm and reproductive cycles are quickest.

Mirids are highly mobile and patchily distributed. They are most active in the mid-late morning and late afternoon. When monitoring, it is recommended to take multiple samples throughout the field. Beating trays (flat white surfaces – ideally a tray, but a white bucket, sheet of paper, or even a cupped hand can work) are useful for monitoring juvenile insect stages. Gently tap flowers and laterals over the tray to dislodge insects, which are then easier to see against the white background. Sweep nets can be useful for monitoring adult mirids, which are highly mobile and may not be picked up with a beating tray. It is important to also monitor nearby weeds and farm borders for mirids as these plants can act as alternative hosts.

Research in the cotton industry has resulted in the development of a lure and trapping pheromone system for green mirids. The pheromone can be used to lure male green mirids into a trap for monitoring. The pheromone is available for purchase from EcoKimiko IPM.

The current investment projects RB21000 and RB2100, funded through the Hort Innovation Raspberry and Blackberry Fund, aim to improve the use of integrated pest management for monitoring and management of mirids and other pests in Rubus crops. The projects are investigating mirid pheromones for monitoring and management, identifying action thresholds and investigating management techniques to reduce mirid pressure in Rubus crops, for example by investigating potential trap cropping techniques to divert mirids from berry crops.

Management

Cultural and physical

Controlling weeds that act as an alternative host can help reduce mirid populations and their damage. Potential host weeds include flowering brassicas (for example wild mustard), fat hen, wild sunflower, thistles, marshmallow, wild beans and verbena.

Some research recommends the planting of native plant species that are hosts to generalist natural predators. This promotes predator habitat and has the added benefit of reducing the area potentially occupied by mirid host plants.

Biological

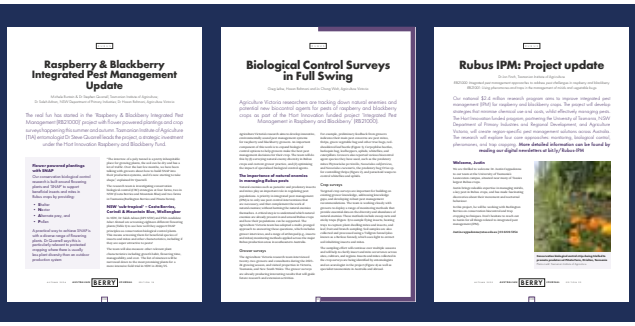
There are currently no commercially available biological control methods for mirids in berry crops. Some generalist predators have been observed to prey on mirids, including pacific damsel bugs, big-eyed bugs, predatory shield bugs, spiders, assassin bugs, and tiger beetles (night stalkers).

Chemical

Chemical management is the most common method of controlling mirids in berry crops and can be very effective at managing populations. However, chemicals for mirids can disrupt existing biological programs in place for other pests, particularly predator establishment for two-spotted spider mites and western flower thrips.

Always consider your overall Integrated Pest Management (IPM) program before spraying for mirids. Re-establishing these biological programs can be time consuming and costly, and it can be increasingly difficult to control pests in the following weeks and months while you work to re-establish predator populations.

Table 1 shows the current registered or permitted chemicals for green mirid in Australia.



To find out more about both the RB21000 and RB21001 projects, visit the berry industry Resource Library at bit.ly/BA-RL where you can download past articles.

Table 1. Chemicals currently registered or permitted for green mirid in Australia

Chemical	Insecticide group	Crops	WHP*	Permit/Label	Crop Mirid
Flonicamid (Mainman®)	29	Raspberries, blackberries	3	PER89214	28/02/2027
Flonicamid (Mainman®)	29	Strawberries	1	Label	N/A
Sulfoxaflor	4C	Cane berries, strawberries	1	Label	N/A

*WHP = withholding period

Resources and further reading

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