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## Armyworm damage in grass pastures

Unusually high levels of armyworm activity (20–30/m<sup>2</sup>) and damage have been reported in dairy pastures in the South West and Gippsland regions of Victoria, and in Tasmania. Damage has been reported in perennial and annual grass pastures, with some paddocks incurring significant and rapid loss of vegetation.

There are three native armyworm species that are pests of grasses and cereals in southern Australia. These are the common armyworm (*Leucania convecta*), the southern armyworm (*Persectania ewingii*), and the inland armyworm (*Persectania dyscrita*). Based on the time of year and locations of infestations, the likely culprits are southern armyworm or perhaps common armyworm. They are difficult to distinguish apart, however, correct species identification in the field is generally not critical because their habits, type of damage, and control are similar.

### Identifying armyworm

The tell-tale feature of armyworm caterpillars is the three white parallel body stripes, always visible on the collar behind the head and usually continuing down the length of the body. Body colour can vary, but they are generally green, brown or yellow.

After hatching, the caterpillars are 1 mm long, and can grow to 40 mm before pupating.

### Life cycle

Armyworms are the larval or caterpillar stage of night-flying moths.

Armyworm eggs are laid in batches of about 5–30, glued together in the hidden, twisted crevices of standing dried grasses, straw and stubble or sometimes in seed heads. The eggs may take 6–20 days to hatch, depending on local temperatures. It is not known which environmental or climatic conditions/ events favour the synchronised laying of eggs, but this results in the wave of intense activity that has occurred recently.

There are usually six stages (instars) of caterpillar growth, and the skin is shed after each. Development is faster at higher temperatures; common armyworm develops faster than southern armyworm.



Armyworm caterpillars in dairy pastures. Note the curled up grubs and lateral striping (Source: Mark Billing)



Armyworm caterpillar damage; green foliage has been removed leaving dead plant material (Source: Madeleine Francis)

The mature caterpillars pupate in the surface of the soil at the base of the plant. The adult moth finally emerges at least four to six weeks (possibly many more) after pupation, and migrates away from the region.

Armyworm infestations can occur year-round but it would be unusual to experience major back-to-back outbreaks in the same paddocks.

### Hosts and feeding behaviour

The diet of armyworms found in southern Australia is generally restricted to grasses (and cereals), with damage to brassica, legume or other broadleaf species a rare occurrence.

Armyworms almost always fly into pastures and crops following medium to long distance migrations. After eggs hatch, they feed exclusively on leaves, although under conditions of food stress they will feed on the seed stem, resulting in head or panicle loss. The change in feeding habit is caused by depletion of green leaf material or crowding. In the unusual event of extreme food depletion and crowding, they will 'march' out of crops and pastures in search of food, which gives them the name 'armyworm'. In this state, the caterpillars become distinctively darker and will march during the day.

It's anticipated that perennial grass pasture damage is limited to the green foliage and stems, and therefore these pastures should be able to recover from feeding damage. Armyworm caterpillars do not damage the plant crown or roots.

While a range of growth stages (5–40 mm) have been observed in dairy pastures recently, it is likely the larger caterpillars cause most intensive damage, as armyworm are most voracious as they approach maturity. The large volume of foliage consumed by masses of maturing caterpillars will also result in large volumes of caterpillar faeces (also known as frass) deposited across the soil. Caterpillar frass is high in nitrogen and can give off an odour. There have been some observations of reduced grazing by dairy cattle in armyworm-affected paddocks, and we suspect that this may be a result of the frass.

### Management of armyworm in pastures

#### Monitoring

Assessing the number of armyworm can be difficult because their movements vary with weather conditions and feeding preferences. Larvae are most active at night, seeking shelter under debris and vegetation on the ground during the day. Armyworm larvae can sometimes be seen during the day feeding on leaves and stems of pastures and crops, but research has shown that larger, more mature larvae are mostly nocturnal. This means that monitoring with a sweep net or bucket during the day is not the best way to assess the number and size of larvae within a crop. Instead, we recommend a direct ground search, along with a sweep net (preferably in the evening) if you have access to one.

Armyworms are easy to recognise if they are present in reasonable numbers, they will be curled up on the ground if disturbed (see photo), or be wedged in the crown of the plant. Also look for signs of feeding on the edges of leaves (photo), or evidence of frass in between the plants, 1–2 mm green pellets that look like mini hay bales.



Armyworm eggs (Source: Flickr @USGS Bee Inventory and Monitoring Lab)



Armyworm caterpillar with characteristic chew marks on the leaf edges (Source: cesar)

### Thresholds

There are several insecticides registered to control armyworm caterpillars. While there are no dynamic economic thresholds established for armyworm in grass pastures, a general rule of thumb to guide spraying decisions is 8–10 caterpillars/m<sup>2</sup>. Be sure to check the withholding periods if spraying is warranted in crops that are close to harvest or grazing. As armyworm tend to shelter at ground level during the day, good spray penetration in the canopy is necessary for effective control. Applying insecticide applications at night is also worth considering.

### Natural enemies

There are a number beneficial natural enemies that attack armyworm caterpillars, and will assist in suppressing populations. These include parasitoid wasps, spiders, carabid beetles, and predatory shield-bugs. Be mindful that the use of broad-spectrum insecticides against a minor infestation may also kill off these beneficial predators that assist keeping populations in check, leaving paddocks vulnerable to subsequent hatchings of armyworm caterpillars.

Humid environments such as those in rank grasses are conducive to fungal (and bacterial) pathogens which can also suppress armyworm populations in some circumstances. Bent over and limp caterpillars are one indication that they are affected by disease which can spread rapidly.

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