



# Identifying and managing key caterpillar pests in capsicum

A closer look at fall armyworm, cluster caterpillar and *Helicoverpa* spp.

Since the incursion of fall armyworm (*Spodoptera frugiperda*; FAW) into Australia there have been detections in capsicum crops and in capsicum fruit post-harvest.

Recent research by QDPI shows important differences in the behaviour of FAW moths and larvae and similar caterpillar pests, cluster caterpillar (*Spodoptera litura*) and *Helicoverpa* (usually *H. armigera*).

## Pest identification

FAW and cluster caterpillar lay eggs in masses, and newly hatched larvae are often in tight groups. *Helicoverpa* lays single eggs.

Early instar caterpillars of these pest species are usually difficult to distinguish based on morphological features. As larvae grow, differences become more clearly visible (see Table 1).

### ID tips



- Take good quality photos for reference
- Compare multiple traits simultaneously
- Use a hand lens or clip-on magnifier for your phone to see features more clearly

For more extensive caterpillar identification resources visit: [www.thebeatsheet.com.au](http://www.thebeatsheet.com.au)

Table 1. Distinguishing large caterpillars

Species	"Y" mark on head	Stripes along back	Segment spots	Body hairs	General appearance
<b>FAW</b>	Present	Three pale stripes	Raised dark spots in a trapeze and square patterns near rear	Some hairs on medium larvae, older larvae mostly smooth	Smaller larvae green, older larvae usually brown
<b>Cluster caterpillar</b>	Present	Three yellow/pale stripes	Dark crescents along back	Very smooth	Colouration variable, tapered head smaller than body
<b>Helicoverpa</b>	Absent	Central stripe often present, lighter thick stripes along sides	Raised dark spots with associated hairs	Hairy	Colour of medium-large larvae highly variable

## Different life stages

	FAW	Cluster caterpillar	Helicoverpa*
Eggs			
Medium larvae			
Large larvae			
Adults			

\*Note: Helicoverpa species in capsicum crops are most likely to be *H. armigera* but may also be *H. punctigera* or *H. assulta*

## Key FAW features



**Left:** Dark dots on the posterior upper-side of body in a square (abdominal segment 8) and trapezoid (abdominal segment 9) arrangement (yellow circles).

**Right:** Head with white Y and mottled pattern on side (white square) and thoracic shield similar in colour to head (yellow triangle). In helicoverpa, the head and thoracic shield are usually different colours.

## Damage symptoms on capsicum

Caterpillars usually enter the fruit from underneath the calyx or via the apex, and the entry holes (particularly for smaller larvae) can be difficult to see.



**Left:** Common entry point of small caterpillars into fruits underneath the calyx (indicated by red arrow).

**Centre:** Feeding/burrowing underneath the calyx by a FAW larva.

**Right:** The apex of the fruit is another weak spot where caterpillars can enter.



**Left:** Medium sized FAW larvae feeding underneath the calyx of a green capsicum fruit.

**Centre:** Helicoverpa larvae damaging a capsicum fruit (FAW and helicoverpa enter the fruit in a similar manner).

**Right:** Typical cluster caterpillar damage to capsicum plants: the pest prefers to leaf feed and typically will defoliate plants rather than feeding in fruits, although large larvae can fruit-feed.

# Understand pest behaviour to guide your sampling

Table 2. Different ways caterpillar pests infest capsicum

Pest	Typical infestation pattern	Sampling techniques
<b>FAW</b>	Moths prefer not to lay eggs on capsicum plants. Infestations are most likely from spillover of moths or larvae from nearby preferred hosts (e.g. sweet corn, maize, sorghum and weeds). Larvae do not preferentially feed on leaves in capsicum crops. Instead, they can be found around fruits – particularly under calyxes or at the apex. These are the common points of entry for small caterpillars and damage and larvae can be difficult to see.	Closely inspect underneath fruit calyxes and at the bottom of the fruit for small caterpillars or feeding damage.
<b>Cluster caterpillar</b>	Moths lay eggs on leaves in both vegetative and reproductive crops. Very small larvae will leaf-feed in clustered groups where they skeletonise leaves. Large larvae 'scallop' leaves and can eventually move into capsicum fruit.	Closely inspect leaves for egg masses and 'clustered' populations of young larvae. Feeding damage will be obvious as larvae develop.
<b>Helicoverpa</b>	Moths will infest capsicum crops from flowering onwards and lay single eggs on leaves and floral sites. Small larvae feed on flowers and eventually fruit. Larger larvae can tunnel into fruit causing obvious damage.	Closely inspect crops from flowering onwards for single eggs. Also inspect inside flowers, under fruit calyxes and at the fruit apex for small larvae.

## Integrated pest management

If left uncontrolled these caterpillars can cause significant damage. Feeding damage and insect presence can not only render fruit unmarketable, but pinhole feeding damage from small larvae can enable the entry of pathogens and cause fruit rot.

FAW and helicoverpa are unlikely to be present in vegetative capsicum crops. During this stage, prioritise IPM-compatible control options (e.g. Bt, chlorantraniliprole, methoxyfenozide) to conserve natural enemies that will help regulate pest infestations during later crop stages.

From flowering onwards, intensify in-field sampling as protecting fruit set and small fruit development is essential. When pest threshold levels are reached at these critical crop stages, select insecticides that have efficacy against the target caterpillars. Note that because of insecticide resistance, both helicoverpa and FAW are not well controlled by several of the older insecticide groups (carbamates, organophosphates, and synthetic pyrethroids).

Follow label/permit instructions to maximise spray efficacy. Rotate chemical mode of actions for insecticide resistance management and adhere to any local resistance management strategies. Ensure that chemical withholding periods align with fruit picking schedules.

## Further reading

*A paper developed from these studies is currently under peer review, and a link will be provided for the final version of this factsheet once the paper is accepted/published.*