Important pests in vegetable crops

This section gives descriptions of common pests found in Australian vegetable crops. They are listed according to the insect order they belong to.

**Moths and butterflies (Lepidoptera)**

**Heliothis (corn earworm, tomato budworm, native budworm)**

*Helicoverpa* spp.

Heliothis larvae feed as leaf eaters and bud and fruit borers on a wide range of plants, including many weeds. Adults lay round, domed, ribbed eggs that are cream when newly laid, turning brownish (‘brown ring’ stage) as they mature. Larvae grow up to 40 mm long and vary in colour from green through yellow and brown to almost black, with a pale stripe down each side. The moths have a wing span of 35–45 mm.

These are some examples of heliothis damage to vegetable crops:

- On lettuce and brassicas, larvae feed on the outer leaves or tunnel into the heart of the plant.
- In tomato crops, eggs are laid on the leaves, flowers and fruit. Young larvae burrow into flowers causing them to fall and they cause pinhole damage to very young tomato fruit. Older larvae burrow into the fruit, creating holes and encouraging rots to develop.
- In capsicum, larvae feed on the fruit and the seed inside the fruit. Eggs are laid mainly on leaves, but also on flowers and buds.
- In sweet corn, eggs are laid on the silks and leaves. Larvae feed on the developing grains on the cob, sometimes on the leaves and often inside the tip of the corn cob.
- In green beans and peas, the larvae feed on the flowers, pods and developing seed inside the pods.

[Heliothis moth at rest]

[Heliothis eggs on tomato shoot]

[Stages of heliothis egg development—freshly laid (left) to mature (right)]

(photograph courtesy of B Scholz, DEEDI)

[Heliothis larva]
**Loopers**

*Chrysodeixis* spp.

Looper larvae feed on the leaves and fruit of a wide range of vegetable crops, including brassicas, lettuce and tomatoes.

The moths are mottled grey or brown with silvery markings on the forewings. They lay round, flattish, ribbed eggs that are white, turning bone as they mature. They are very similar to heliothis eggs, except that the looper eggs are flatter. The larvae grow up to 35 mm in length, are green in colour and older larvae have fine, white lines along the body. Loopers are easily distinguished by their distinctive ‘looping’ movements.

**Cabbage white butterfly**

*Pieris rapae*

The larvae of the cabbage white butterfly are leaf eaters. Young larvae feed on the outer leaves of cabbage, cauliflower and broccoli plants. Mature larvae feed on outer leaves of cabbage heads and the curd of broccoli and cauliflower.

Adults lay bullet-shaped, ribbed eggs that are pale yellow, turning orange-yellow as they mature. Young larvae are light green and opaque with some fine hairs, while mature larvae are 20–30 mm long, dull green and velvety with yellow stripes along the mid line of their bodies.
**Cutworms**

*Agrotis* spp.

Cutworms feed on most vegetable crops. Larvae usually feed at night on the stems of seedlings near ground level. The seedling is often completely severed and wilts and dies. Occasionally, cutworms climb mature plants and feed on the foliage. Moths are a dull brown-black colour. Larvae grow to about 30 mm long, are hairless, with dark heads and darkish bodies, often with longitudinal lines and/or dark spots. They curl up and remain still if picked up. Larvae may be found during the day in the topsoil near damaged plants.

**Cabbage moth (or diamondback moth)**

*Plutella xylostella*

Larvae mine leaf tissue when they first hatch. Within a day or so they emerge to feed on the underside of leaves causing holes or windows. Larvae can damage the heart of cabbages and heads and stems of broccoli and cauliflower.

The moths are about 10 mm long, greyish-brown with a row of pale diamond-shaped markings when the wings are folded at rest. The moths lay very small (0.4–0.5 mm long) oval, flat, smooth eggs that are pale yellow in colour. They turn dark yellow with brown markings at one end as they mature, and are stuck singly or in a small group near leaf veins. The larvae are creamy green when mining the leaf tissue and bright green, plump and 10 mm long when mature. They wriggle backwards and drop from the plant on a thread when disturbed.
Cluster caterpillar

*Spodoptera litura*

Young larvae feed in groups, while older larvae are solitary. Larvae feed on the leaves of many vegetables and can cause severe leaf damage. They may also bore into the hearts of cabbage and gouge large holes in fruit (e.g. tomatoes and capsicums).

Moths are greyish-brown, with silvery markings on the forewings and silvery white hind wings, and a wing span of 30–40 mm. Eggs are laid in clusters covered with a mat of grey-brown hairs. Larvae are brownish-purple in colour, widest several segments behind the head and grow to 40–50 mm long. Older larvae have a row of dark triangular markings along each side of the body.
**Cabbage cluster caterpillar**

*Crocidolomia pavonana*

Larvae feed on the leaves of crucifers and can cause severe damage to head tissue, while outer leaves often are less damaged. Adults are light brown moths with a wing span of about 25 mm. Eggs are laid in masses resembling overlapping scales on the underside of leaves. Young larvae feed in clusters. Older larvae produce a silken web under which they feed. Fully grown larvae are about 20 mm long, green or green with light brown backs, and they have black spots and light longitudinal markings.

**Potato moth**

*Phthorimaea operculella*

Larvae are leaf miners and fruit borers in tomato, potato, eggplant and capsicum. They mine the leaf causing irregular windowing. They may also tunnel into the leaf stalk and stem causing extensive damage. Larvae enter the fruit under the calyx or where two fruit touch. They also tunnel into growing or stored potato tubers.

The adults are small, greyish moths with a wingspan of 12 mm. They lay very small, white eggs singly on the fruit calyx, on the underside of leaves or in the soil. The eggs are very difficult to find in the field. Larvae grow to 10–12 mm long and are cream, pale green or pale pink in colour with a dark head.
**Cabbage centre grub**

*Hellula hydralis*

Larvae are stem borers in brassica crops. Young larvae burrow into the growing point of the plant. This tunnelling causes the death of seedlings or multiple branching, making the heads unmarketable. In older plants, larvae tunnel into leaf midribs.

The moth lays small, oval, pale yellow eggs on the young parts of brassica plants. These eggs are almost impossible to find in the field. The larvae are pale yellow with a dark head and seven brown stripes along the body.

---

**Bean podborer**

*Maruca vitrata*

Larvae bore into flower buds and pods of beans and other legumes. Pods and flowers are often webbed together to form shelters for the feeding caterpillars.

Moths have smoky brown forewings with translucent spots and translucent hind wings with large smoky brown spots on the tips, and a wing span of 25 mm. Moths lay oval, creamy yellow eggs near flower buds. The mature larvae grow up to 20 mm long, are yellowish-green with several rows of dark spots along the body and a dark head.
Eggfruit caterpillar

*Scelioides cordalis*

Larvae tunnel in eggplant fruit, occasionally in tomatoes and capsicums, and in some solanaceous weeds. Their feeding causes extensive internal damage—tunnels are filled with frass and they leave a large (4–5 mm) exit hole when they emerge to pupate.

The moths are mottled yellowish-brown, with a 25 mm wingspan. They sit distinctively with the abdomen curled upwards. Small, flattened eggs are laid singly, mainly on the calyx. They are initially whitish but develop red markings. Newly emerged larvae tunnel into the fruit and spend their entire life in the fruit. Young larvae are creamy white, while mature larvae are pink with a brown head. Mature larvae emerge from the fruit and pupate in a tough, whitish silken cocoon.

Beet webworm

*Spoladea recurvalis*

The larvae feed on the leaves of beetroot and silverbeet, and on weeds such as pigweed. They feed on the underside of the leaves, leaving the top surface, which results in a window-like effect. Eventually the leaves are destroyed, with the remains twisted and held together by silken webbing and frass.

The moths are brown with two white bands on the forewings and one on the hind wings, with a wingspan of 20 mm. Bluish, scalelike eggs are laid in small groups on the lower leaf surface. Initially the larvae are whitish, but then become grey-green in colour with a dark band along the middle of the back. Mature larvae are about 20 mm long. They pupate in the soil.
Cucumber moth

*Diaphania indica*

Larvae feed on many types of cucurbits. They normally feed on leaves, which they can destroy, leaving fragments bound together by silk and frass. They will also feed on flowers, soft stems and shallowly on the skin of fruit.

The moths have white wings bordered by a broad dark band, with a wingspan of about 25 mm. Small, whitish eggs are laid on the undersurface of leaves. The larvae, which grow to about 25 mm long, are green with two white stripes along the length of the body.

Armyworms

*Mythimna* spp. and *Spodoptera* spp.

Larvae of several species from several genera damage sweet corn by feeding on the leaves, resulting in the plants having a tattered appearance.

The moths are quite large, with wingspans of about 40 mm. *Mythimna* moths are pale grey-brown in colour. *Spodoptera* moths have darker grey-brown forewings with dark and pale markings, and pale white hind wings. Larvae can grow to 40–45 mm long and may be pinkish, brown or green in colour with white, pinkish and dark stripes running along the body. Mature lawn armyworm larvae have rows of triangular black markings. Armyworm larvae superficially resemble heliothis larvae but look smoother and are relatively hairless in comparison.
**Chevron cutworm**

*Diarsia intermixta*

A pest in Tasmania, chevron cutworms chew on the foliage of a variety of brassica vegetables and on tubers of turnips and swedes. They also feed on the leaves of vegetables such as carrots, lettuce, rhubarb and potatoes and occasionally on corn silks.

Moths have a wingspan of about 37 mm and at rest their wings overlap flat on the body. Males are beige or dull orange in colour and females are dull purple. Larvae grow to 30 mm. They are dark brown to black on top and paler underneath, with a series of paired black, short V-shaped marks along the back and a pale mark across the rear end.

**Green cutworm**

*Neumichtis* spp.

Minor pests in Tasmania, larvae of the three species feed on leaves of brassica crops and other vegetables such as lettuce, celery and carrots.

Moths are brown (two species) or black (one species) with 34–38 mm wingspans. At rest, the wings are held steeply inclined. Larvae grow to 35 mm. They are green or brown in colour, with pairs of faint, pale, almost inconspicuous spots along the back and a pair of small but very distinct white spots on top of the rear end.
**Bugs, leafhoppers, aphids, whiteflies, mealybugs and scale insects (Hemiptera)**

### Green vegetable bug

*Nezara viridula*

Adults and nymphs feed by sucking sap from young plant tissue, fruit and seeds. A wide range of vegetable crops are attacked. Feeding causes distorted growth, death of seeds and dry and corky fruit tissue. Attacked fruit are small, mottled and blemished.

Adults lay dark, barrel-shaped eggs in groups known as rafts. The emerging nymphs are bright orange to orange-brown and wingless. As nymphs mature they are first marked with patterns of black, yellow and red, then they turn green and develop wings. Adults are up to 15 mm long and shield-shaped. They are green with three small white spots between their shoulders in warm weather, and are brownish-grey in cooler weather.

![Green vegetable bug adults and nymphs on damaged beans](photograph courtesy of DA Ironside, DEEDI)

First instar green vegetable bug nymphs hatching from egg raft
(photograph courtesy of J Wessels, DEEDI)

### Rutherglen bug

*Nysius vinitor*

Adults and nymphs suck sap from leaves, stalks and fruit of a wide range of crops. They often attack in large swarms. If the infestation is severe, leaves and shoots will wilt and die. They can be a problem as a contaminant in harvested products such as lettuce.

Adults are 5 mm long and grey-brown in colour. The nymphs are pear-shaped, wingless and reddish-brown.

![Rutherglen bug adults and nymphs](photograph courtesy of J Wessels, DEEDI)

### Vegetable leafhopper (or vegetable jassid)

*Austroasca viridigrisea*

Adults and nymphs feed by sucking the sap from young shoots, fruit and leaves, often leaving small white spots. Leafhoppers are pests of a wide range of vegetables, including tomatoes, capsicums and potatoes. Large populations may retard crop growth. Adults are up to 4 mm long and torpedo-shaped. Both adults and nymphs are bright green.

![Vegetable leafhoppers and typical damage](photograph courtesy of DA Ironside, DEEDI)
Greenhouse whitefly

*Trialeurodes vaporariorum*

Adults and nymphs are pests of many vegetable crops. They are found on the underside of leaves, sucking sap and so reducing plant vigour. They produce copious amounts of honeydew that can contaminate produce and encourage the growth of black sooty mould.

Adult greenhouse whiteflies are small (1.5 mm), delicate insects covered in a whitish waxy powder. The wings are held quite flat and overlapping (the way the wings are held is an important feature distinguishing greenhouse whiteflies from silverleaf whiteflies). Eggs are bullet-shaped, initially yellow but later dark. The nymphs are scalelike, pale yellow-green and grow to about 0.5 mm long. The final instar nymph (or pupa) has a flat top with numerous waxy tendrils around its circumference, and steep cliff-like sides.
Silverleaf (B biotype) and Q biotype whiteflies

*Bemisia tabaci*

Several biotypes of *Bemisia tabaci* occur in Australia, with silverleaf whitefly (biotype B) and Q biotype being serious pests with a wide host range of broadleaf crops and weeds. The different biotypes are morphologically indistinguishable and can only be separated by biochemical or molecular techniques. They live on the underside of leaves and cause damage by sucking sap (affecting plant vigour), producing honeydew, sooty mould growth on honeydew and transmitting plant viruses. Silverleaf whiteflies cause physiological reactions in some plants.

Adult silverleaf and Q biotype whiteflies are small (about 1 mm), white, waxy insects. They hold their wings quite steeply like a tent, with a clear gap between the wings along the length of the body. Eggs are bullet-shaped and pale yellow to dark in colour. Nymphs are scalelike, pale green-yellow to clear and 0.3–0.6 mm long. The final instar nymphs (or pupae) are dome-shaped, with sloping edges and very few waxy projections.

Potato bug

*Closterotomus norvegicus*

This mirid bug feeds on the buds, growing points, flowers and foliage of many plants, resulting in wilting, deformation and stunting. Its hosts include peas, beans, carrots, potatoes, asparagus and strawberries.

Adults are 6–8 mm long, with long legs and antennae. They are mainly green, although the folded forewings may be yellowish to grey-green. There is a pair of black spots on the top of the thorax. The membrane section of the folded forewings appears as a clear to dusky diamond shape at the rear of the insect. The nymphs are mainly green to yellowish-green with black hairs.
Green peach aphid

*Myzus persicae*

This aphid feeds on a wide range of vegetable crops, stone fruit and weeds by sucking the sap of leaves, growing points and fruit, and produces honeydew that contaminates the plants. Severe aphid attacks may result in leaves and fruit turning yellow, shrivelling and falling off. Adults are 1.5–3 mm long. Wingless adults can be green to pale yellow to pink. Winged adults have a dark head and thorax and a reddish or green abdomen with a distinctive dark patch. Nymphs are olive green. The green peach aphid is distinguished from other aphids by having a deep notch at the front of the head.

The adults and nymphs of many aphids can transmit viruses such as watermelon mosaic, papaya ringspot type W and zucchini yellow mosaic when they feed. The green peach aphid can transmit potato leaf roll virus, as can the potato aphid. Winged aphid adults are known as alatae and wingless adults as apterae.

Cotton aphid (or melon aphid)

*Aphis gossypii*

Cotton aphids (also called melon aphids) have a very wide host range. They suck sap (affecting plant vigour), produce honeydew that contaminates fruit (particularly when sooty mould grows on it) and transmit many plant viruses. Winged adults (1.1–1.8 mm) are blackish-green in colour. Wingless adults (0.9–1.8 mm) are variable in colour, with large ones dark green and smaller ones pale yellow. Most are mottled light to dark green with short dark siphunculi (tubular structures at the end of the abdomen).

Currant lettuce aphid

*Nasonovia ribis-nigri*

Currant lettuce aphid is primarily a contamination pest of lettuce. They infest lettuce hearts and rosettes (their presence makes the lettuce unsaleable) and transmit several plant viruses. Winged adults have a black thorax and a greenish abdomen patterned with irregular, narrow dark bands. Wingless adults (1.3–2.7 mm) are pale yellow to green with a pattern of dark bands on the abdomen and dark-tipped siphunculi. Nymphs are yellow-green.
Cabbage aphid

*Brevicoryne brassicae*

Adults and nymphs feed on crucifers by piercing softer tissue and sucking the sap. Under heavy infestation, plant growth may be suppressed and leaf curling may occur. Adults are 2–3 mm long, greyish-green in colour and have a mealy covering. Nymphs are greenish.

Many cruciferous plants also are hosts of turnip aphids (*Lipaphis pseudobrassicae*, also known as *L. erysimi*), which may be found on the undersurface of leaves or in flowers. Leaf curling may occur and they also transmit viruses. Turnip aphids are medium size and yellow-green, grey-green or olive green in colour with a white waxy bloom.

Carrot aphid

*Cavariella aegopodii*

The aphids feed on the underside of carrot leaves, causing the leaves to curl and plant vigour to be affected. They produce copious honeydew and transmit several viruses. Winged and wingless forms vary in colour from green to yellow to brown, and the winged adults have a black patch on the upper (dorsal) surface of the abdomen. Wingless adults are medium size, elongate oval and flattened with small depressions on the upper surface.

The fennel aphid (*Dysaphis foeniculus*) also attacks carrots. Colonies of grey-green wingless aphids usually occur at or below ground level. Winged adults have a dark green abdomen with a large black patch on the upper (dorsal) surface.

Sowthistle aphid

*Hyperomyzus lactucae*

Sowthistle aphid breeds on the sowthistle weed and spreads necrotic yellows virus to crops such as lettuce. Winged and wingless adults are 2–3 mm long. Adults and nymphs are light green in colour.

Corn aphid

*Rhopalosiphum maidis*

Corn aphid is a pest of sweet corn and other grasses. The aphids suck sap from the leaves and can reduce plant vigour. Contamination from honeydew, sooty mould and the aphids themselves on cobs is a problem. Corn aphids are yellow-green to dark olive green, with short antennae and short, dark siphunculi.

Note: In many cases, laboratory microscopic techniques are necessary to properly identify aphids.
**Solenopsis mealybug**

*Phenacoccus solenopsis*

Female adults are wingless, around 4 mm long, oval-shaped and covered by waxy filaments, giving them a mealy appearance. Females often have two dark stripes on the upper (dorsal) surface of the abdomen. Nymphs or ‘crawlers’ are smaller but similar in appearance. This sap-sucking insect forms dense, white, cotton-like, waxy colonies on stems, shoots and leaves of plants. Males (which do not feed) are small, aphid-like, winged insects.

The pest is known to affect a range of plants, including cotton, tomatoes, eggplants, chillies, melons and potatoes. Their feeding can reduce plant vigour and cause contamination from honeydew and sooty mould.

**Thrips (Thysanoptera)**

Note: Specialised training and laboratory microscopic techniques are necessary to properly identify thrips species.

**Onion thrips**

*Thrips tabaci*

Adults and larvae feed on many vegetable crops and other plants. On onions they rasp the leaf surface and suck the sap, leaving a white, flecked or silvery white leaf. Bulb size may be affected if the thrips population is large (more than 50 thrips per plant). Adults are 1–1.2 mm long and yellowish-grey to brownish in colour, with grey simple eyes (ocelli) in fresh specimens. Only females are found in Australia. Immature thrips (larvae) are white to pale yellow. Onion thrips are vectors of tomato spotted wilt virus and iris yellow spot virus.

**Plague thrips**

*Thrips imaginis*

Adult plague thrips feed by rasping the surface cells and sucking the sap from the blossoms of weeds, fruit trees, vegetables and ornamental garden plants. Immature thrips feed on young leaves and the pistil and stamens inside the flowers. This can interfere with fruit set and damage young fruit. Adults are light brown to grey and 0.8–1.3 mm long. Immature plague thrips are creamy yellow.

**Melon thrips**

*Thrips palmi*

Melon thrips feed on many weeds and vegetables, and are important pests of cucurbits, eggplant, capsicums and beans, damaging leaves and fruit with their feeding. They transmit tomato spotted wilt virus and capsicum chlorosis virus. Adults are about 1 mm long and yellow with red simple eyes. Both females and males occur in Australia. Immature melon thrips are white to pale yellow.