

Quality Issues, Key Pests and Beneficials in Asian Baby Leaf Vegetables

Key Pests

Rutherglen Bug



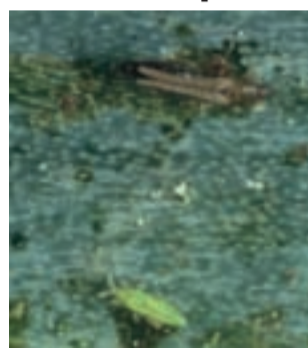
- Adults are around 5mm long, grey with transparent wings and prominent eyes.
- Nymphs are red brown in colour and have no wings.
- Sap sucking insects that feed mainly on shoots and stems.
- Can also cause contamination of baby leaf product post harvest

Aphids



- Main aphid pests are cabbage aphid or green peach aphid.
- Adults are winged or wingless and up to 2.5mm in length.
- Often found on the underside of leaves.
- Above: Green peach aphid colony

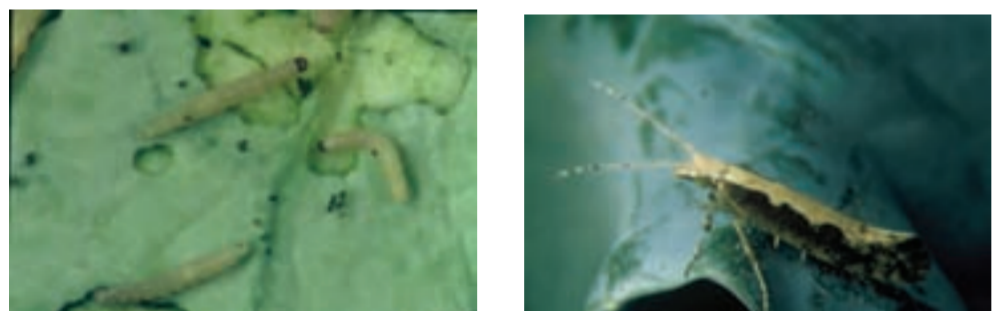
Onion Thrip



Thrip pests include: western flower thrip, onion, plague and tomato thrip and vary in size and colour depending on species.

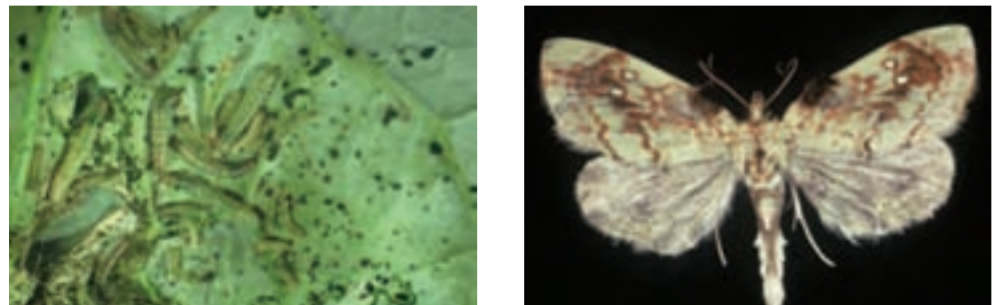
- Adults are winged torpedo shaped tiny insects 1-2mm long.
- Nymphs are wingless and tend to be white or yellowish.
- Cause silvery or flecking of leaves and sometimes can result in curled or wilted leaves and distortion.

Diamond Back Moth



- Moths are small and brown up to 10mm long with a diamond pattern on their back.
- Caterpillars grow up to 5mm long and leave numerous holes in the leaf or may leave a feeding window.
- Larvae often have a silk thread attached to the leaf.

Cabbage Cluster Caterpillar



- Moths are grey and have a wingspan of around 15mm.
- The young caterpillars feed in clusters are cream coloured when young and become light green with yellow stripe and grow to 25mm.

Leaf hopper

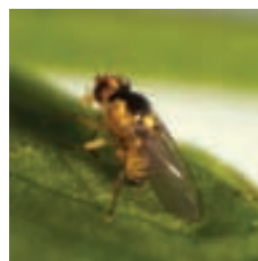


- Adults are torpedo shaped, colour varies from light green to cream and mottled brown and have wings which are held at an angle close to the body.
- They suck the sap and leave yellowish spots on leaves and if extreme can cause silvery and wilting.
- They quickly jump when disturbed.

Leaf miner



Adult fly

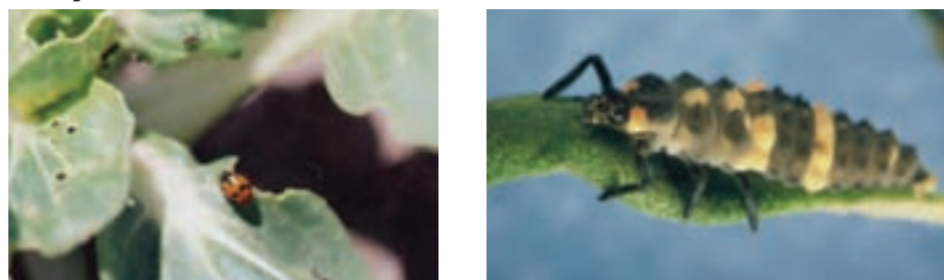


Larvae cause leaf damage by burrowing into the leaf leaving mines and trails through the leaf.

Other pests include: *Helicoverpa* spp (native budworm and corn earworm). A range of mites, cabbage white butterfly, fungus gnat and mired.

Key Beneficials

Ladybird



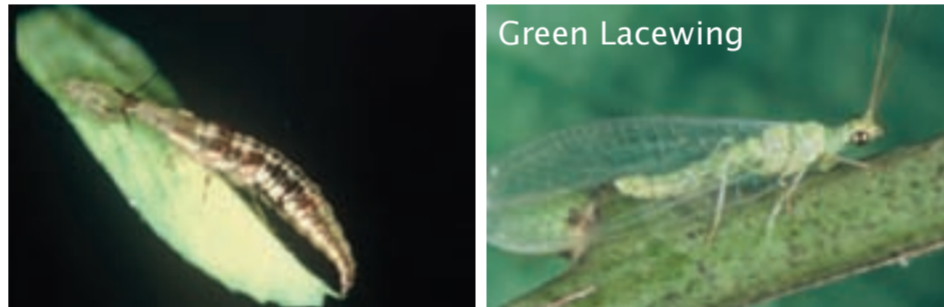
- A number of species may be seen in crops.
- The white collared ladybird beetle seen here is one common species.
- Adults and larvae feed mainly on aphids but may also attack thrips, insect eggs and small caterpillars.

Hoverfly



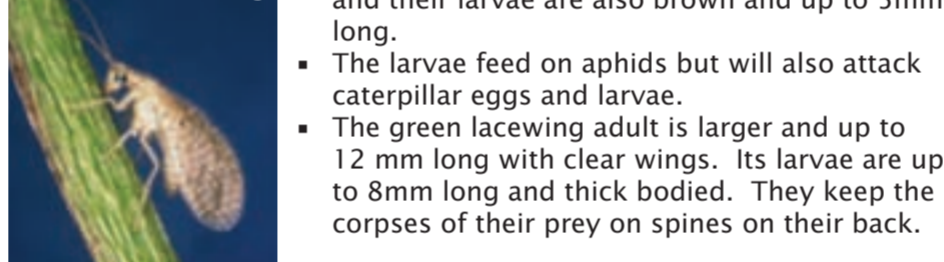
- The adult hoverfly is up to 9mm in length with yellow bands on the abdomen and has a characteristic hovering behaviour.
- The larvae feed heavily on aphids and grow to around 10mm and are transparent cream to green and have no legs.

Lacewing



Green Lacewing

Brown Lacewing



- Brown lacewing adults are up to 6mm in length and their larvae are also brown and up to 5mm long.
- The larvae feed on aphids but will also attack caterpillar eggs and larvae.
- The green lacewing adult is larger and up to 12 mm long with clear wings. Its larvae are up to 8mm long and thick bodied. They keep the corpses of their prey on spines on their back.

Wasps

There is a wide range of wasp species that are parasitoids and lay their eggs inside caterpillar eggs or larval stages of some pests such as DBM or aphids.

Caterpillar parasitoids	<i>Trichogramma</i> spp	Lays in moth eggs
	<i>Telenomus</i>	Lays in moth eggs
	<i>Microplitis demolitor</i>	Lays eggs in early stages of caterpillar
DBM parasitoids	<i>Diadegma</i>	Lays eggs in young caterpillars
	<i>Diadromus</i>	Lays eggs into newly formed DBM pupae
Aphid parasitoids	<i>Aphidiidae</i>	Eggs laid inside larval aphid
Cabbage white	<i>Cotesia</i>	Eggs laid in small larvae



Aphid and aphid mummy (bronze coloured empty shell) (top left) of aphid parasitised by *Aphidiidae* wasp (above).



Diadegma wasp cocoon inside cocoon of DBM.

Other beneficials include: spiders, soldier beetle, red and blue beetle, assassin bug, pirate bug, tachnid fly, rove beetle, pirate bugs, big eyed bugs and predatory mites (cucumeris and hypoaspis).

For further information about other pests and beneficials or more detailed information on those depicted here see the Field Guide to – Pests, Diseases and Disorders of Vegetable Brassicas.

Quality Issues

Chewing Damage



Leaves may appear tattered and torn or have symmetrical round holes and under extreme levels of damage may have a netted appearance. The damage is primarily done by caterpillars from Diamond Back Moth, Cabbage Centre Grub, Cabbage Cluster grub and Cabbage white butterfly with the pests of most concern DBM or Cabbage centre grub.

Leaf Mines



These are caused by leaf miner larvae that feed under the surface of the leaf and leave zig zag patterns or long canals under the surface of the leaf. There are three species of leaf miner from the Diptera family with the suspected pest in Tat soy, agromyzid fly, *Liriomyza betae* (Diptera), *Scaptomyza flava leaf miner* (Diptera) or *L.chenopodii* (Diptera).

Leaf piercing



The leaf has an appearance of pin like holes, which can be numerous and cover significant areas. The holes are much smaller than those caused by caterpillars and are caused by the different stages of rutherglen bug piercing young leaves. Rutherglen bugs are sap sucking insects but cause leaf damage resulting in the pin prick holes as the leaves grow.

Thrip/Aphid damage



- Adults and young feed on the underside of leaves.
- The leaf tissue becomes thickened and leathery due to sap being sucked out.
- Thrips have piercing and sucking mouthparts and tend to cause silvery of the leaf and distortion.
- Aphid damage tends to result in more yellowing of the leaf.



Leaf hopper damage these are sucking insects and their feeding causes a yellowish flecking of the leaves often in clusters. They feed on the underside of the leaves and will hop rapidly to other leaves if disturbed.



Downy mildew causes leaf yellowing. It appears first as yellowish spots on the top of leaves and may appear angular due to limitation by the leaf veins. The underneath of the leaf surface may have a downy grey brown appearance.

Acknowledging the use of images for Caroline Donald, Department of Primary Industries. Published by the Department of Primary Industries, June 2009

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Authorised by the Victorian Government, 1 Spring Street, Melbourne 3000
ISBN 978-1-74217-367-2

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