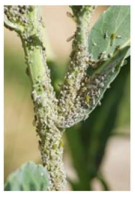
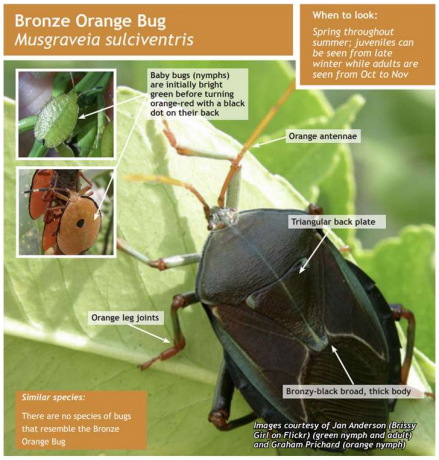
Pests



Bronze Orange Bug (Stink Bugs)



Often known as the Orange Stink Bug because when disturbed, the bug squirts a foul-smelling fluid that can stain and burn human skin and eyes. This is used for defence against potential predators.

A member of the Giant Shield Bug family Tessaratomidae

Identification – Baby bugs (nymphs) are initially bright green as are the eggs from which they hatch, before turning orange-red with a black dot on their back. An adult is bronzy-black with a broad thick body and a triangular back plate. Its head is small in relation to the rest of its body and it has orange antennae and leg joints.

Size – Eggs are about 2.5 mm in diameter; adults are about 2.5 cm long.

Diet – Sap from citrus plants, including orange, lemon and lime trees, which it sucks through its tube-like mouthparts. It may also feed on the fruit and flowers of these plants.

Flight – A strong flyer. They fly in from surrounding areas.

Breeding – After mating, females lay eggs on the underside of host leaves, and the bright green eggs hatch into baby bugs (nymphs) about one week later.

When – From spring and throughout summer. Young can be seen from late winter. Adults are commonly seen in October and November.

Deterrents – companion planting basil, marigolds or tansy. Ladybugs and parasitic wasps prey on the eggs. Fine insect netting is a physical barrier, but also inhibits pollinators.

28 Spot Ladybirds

(Epilachna vigintioctopunctata)



Identification – The larvae are round and yellow with sparse stiff dark hairs. Adults look like friendly ladybirds but have too many spots to count!!

Lifecycle – Adults and larvae strip the surface layers from both sides of the leaves. The damage causes loss of water, and the leaves dry, curl and die.

The oval yellow eggs (1 mm by 0.4 mm) are laid upright in batches of 10–20 on the underside of a leaf. They hatch in about 4 days. The pale yellow–whitish larvae have long, dark–tipped branched spines on their backs, they grow to 6 mm through three moults in the next 18 days, before attaching themselves to the undersides of the leaves and developing into pupae. This stage lasts another 4 days.

The adults fall to the ground when disturbed, pretending to be dead. They also produce a yellow fluid that wards off predators. Spread occurs when the adults take to the wing.

Diet – They feed on various members of the plant family Solanacae, being agricultural pests on potatoes, tomatoes and eggplant. A wild population is maintained on weeds such as Black Nightshade. They also attack crops from the family Cucurbitacae such as zucchini, marrow, squash (Cucurbita pepo).

Control – Squash by hand or knock them into a bucket of slightly soapy water. Birds may eat them, but if you know you have a problem with them, you won't want to chance nature's control. Once the larvae get going your plants deteriorate pretty quickly.

Cabbage White Butterfly

- An introduced species from Europe, first recorded in Melbourne in 1929
- It has become a pest, feeding on cabbages and other vegetables
- Two species of wasp introduced to control it have helped reduce the number and impact of the butterfly.

Identification – The caterpillar (larva) is initially pale yellow with fine hairs, before turning green. It has narrow yellow lines on its body which are sometimes hard to see. The upper side of the butterfly (adult) is white with a black tip on its forewing (front wing) and a black patch on the front edge of its hindwing. A male has one black spot on its forewing, while a female has two black spots. Looking from underneath, the forewing is white with two black spots and the hindwing is yellow.

Size – Caterpillar about 3.5 cm; Butterfly up to 5 cm wingspan.

Diet – Caterpillars eat mainly the leaves of cultivated and introduced plants in the family Brassicaceae (such as cabbage and cauliflower), and can be a major pest of these crops. Adults feed on nectar from a variety of plants. Before it starts to eat, a caterpillar lays down silk to which it attaches itself for support.

Movement – When resting, a caterpillar aligns itself with the leaves of the host plant so that the yellow lines on its body look like the veins of the leaf, but if strongly handled or attacked, it ejects a fluid which can act as a repellent.

Flight – Adults start flying from early spring.

Breeding – The females lay single eggs on the underside of host leaves after mating in spring. The eggs hatch into caterpillars after about four days and the caterpillars then eat for 17 days, before becoming pupae for eight days. They finally emerge as white butterflies. There may be several generations each year.

Deterrents – Butterflies also lay eggs on nasturtiums. Some people plant nasturtiums close to veggie beds, but the butterfly doesn't prefer one or the other, they will lay eggs on either.

Netting is the most effective method. Look for eggs on the underside of leaves otherwise.

Cabbage Aphid (Brevicoryne brassicae)



Identification – Difficult to see, so the first visible sign of an aphid infestation will often be wingless adults congregating on the undersides of leaves. Up to 3mm in length and greenish-grey with a pale waxy coating. As the infestation progresses, the population may group around the growing tips and flowering parts of the plant.

Lifecycle – Spread with incredible speed. The adult females reproduce asexually for most of the growing season, producing clones of themselves when conditions are favourable and there's plenty of food around. Their offspring are themselves ready to reproduce in around eight days, and can go on to create five clones a day of their own for up to a month. Populations peak in autumn and late winter/spring, at temperatures of 20-25°C.

Male cabbage aphids are relatively scarce, mainly appearing toward the end of the season to fertilise eggs which overwinter in cold climates, starting the whole cycle going again come spring. In warmer areas of Australia the sexual phase may be skipped altogether, as they reproduce slowly at temperatures as low as 5°C.

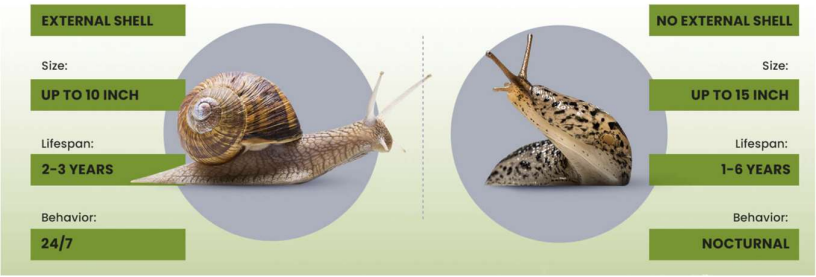
Diet – Eat the soft growth of the brassica, particularly its young leaves, flower buds and tender stalks, then sucking out the sap within. This stunts the plant, causes yellowing and curling leaves, risks bacterial infection, and ultimately reduces or even ruins the harvest. Also transmit several diseases including cauliflower mosaic virus and turnip mosaic virus (otherwise known as cabbage ring spot virus), injecting the pathogens directly into the plant as they feed.

Prevention and Control – Their brassica diet tends to make them taste mustardy and sulphurous, deterring many casual feeders. Lacewings, hoverflys and ladybirds are effective predators. Parasitic wasps also lay eggs in the aphid bodies. Hose the plant down, the aphids are not so likely to survive in the soil. As soon as you see an early infestation, remove either the affected leaves, or ideally the whole plant, and dispose of the waste in compost.

A strong herbal tea made with peppermint can be sprayed onto young plants to act as a repellent, discouraging egg laying and preventing infestations. Mixing the same tea with a little horticultural soap can work to bog down and suffocate any adults already around. Attract ladybirds by growing alyssum, yarrow, geraniums, and tansy.

Some plant species release aromas or chemicals which actively repel aphids, encouraging them to lay their eggs in a more enticing location. Examples of these plants include catnip, radish, chives, garlic, marigold, petunias, and coriander.

Slugs & snails



Common garden snails (Cornu asperum) are introduced species – in Australia for well over 120 years.

There are numerous other introduced species that may cause more problems into the future.

Lifecycle – In spring, they seek shelter in the soil or under debris and aestivate to avoid the hot ground temperatures over summer. They need the damp and become active again after the autumn rains. 1-2 mm of rain triggers feeding. Mating occurs 2-3 weeks after good autumn rains and lower temperatures and egg laying commences soon after mating. Egg clusters are laid in the top soil from autumn to spring. In moist conditions Reticulated Slugs will continue breeding. Eggs hatch about 2 weeks after laying. The juveniles feed in winter and spring and aestivate over summer to become sexually mature at one year old.

Hermaphrodites, all individuals may lay eggs – up to 500 per year.

Habitat – They thrive in wet, rainy, cool, moist weather and usually only appear during the day if it's raining. They are mainly active when temperatures are 15-25 degrees C. They are less active during heavy rain and in high winds. Usually in daylight hours they hide under pots, in clumps of thick-leafed plants, under boards and anywhere else it is damp and moist. They're busiest time is at night, meaning you probably won't see them and can only tell they've been busy because of their slimy trails or the damage they've done. Slugs will also bury themselves in the soil and hide under mulch. During dry times, snails retreat into their shells and make a cover called an epiphragm, over the entrance. In this state of hibernation they survive for months without water. Prefer loamy to heavy soils. They can't survive in light sandy soils or in compacted soils.

Diet – Snails and slugs use their rasping tongues to eat newly emerged seedlings. They especially like

- Young peas and bean leaves.
- Young leaves on citrus trees
- Strawberries and tomatoes.
- They also eat decaying organic matter.

Control strategies – The body need to remain moist making them susceptible to dehydration.

Manual picking at night.

Put them in a bucket of soapy water. Check inside old pots and under planted pots, bits of wood on the soil, inside your worm farm and around the compost heap, as well as in all your strappy-leaved plants.

Biological control

Ducks, blue-tongue lizards, wild birds like magpies, kookaburras and mudlarks, frogs, some beetles are known predators. A wildlife friendly diverse garden is a huge benefit here.

Traps and baits

Place upturned pots, halved citrus skins, or a board on the soil (more likely to attract slugs).

Bowls with beer, wine and other liquids containing yeast and place them amongst your vegies. They will attract and drown both slugs and snails but are particularly effective with slugs, especially if you do it over many weeks. A 5 per cent sugar solution in water also works for slugs.

Barriers

Many things can be used as barriers around young seedlings and tender plants. These include diatomaceous earth (bought from garden centres), coffee grounds, wood ash, sawdust and crushed eggshells – all of which will be effective for short periods and if it doesn't rain heavily.

Copper tape. This tape is purchased in rolls from garden centres and hardware stores (or online) and has a sticky back. The copper gives a sort of electric shock to snails and slugs and they just fall off, refusing to cross the tape. Cut lengths of PVC downpipes and put the tape around the top of each. Deploy them when you plant seedlings or sow seeds.

Sprays

Make a coffee or wormwood tea mix and spray onto the soil and the leaves of plants. This acts to both repel and kill snails and slugs. Repeat after heavy rain.

Things not to do

Definitely don't crush or stomp on snails as this releases any eggs they're carrying into the soil beneath, where they'll hatch out at a later date.

Don't feed them to your chooks. They can be a vector for tapeworm and pass it on to chooks. But ducks love and are fine to eat snails and slugs as they are not susceptible to this tapeworm.

Don't throw them over your fence into the neighbour's yard or even out onto the road. They'll likely just come back. Research has shown they have a homing instinct and will travel up to 30 metres to find their way home.

Brush Turkeys

Identification – A large bird, the brush turkey grows to 60–75cm long and has a wingspan of 85cm. Males and females are a similar size. Coloured blue-black, the brush turkey has an upright fanlike tail and grey-edged breast feathers. It has strong legs and a featherless, deep red head and neck.

The male brush turkey has a large, bright yellow flap of skin that hangs from its neck, while the female has a smaller and paler wattle. Chicks don't look much like their parents, as they're small, plump birds with rich brown feathers. They grow fast and are left to find for themselves right from hatching. They can fly within a few hours. Within a few months a chick will have the dull blue-black plumage and the characteristic upright tail. Its head and neck will have become a featherless rich pink.

Habitat – They live in rainforests near the coast and in drier scrub further inland. They spend most of their time on the ground but roost in trees at night. While naturally shy in the bush and most of its time alone, in the suburbs, the species has become used to people and is regularly seen in groups. Recently their range has increased southwards, back to where they once roamed prior to being decimated by hunters, cats and dogs.

Lifecycle – Use mounds of decomposing organic material to generate heat for incubation. These can be four to six metres wide and up to a metre and a half high. The male has a special heat sensor in its palate to monitor temperature and regulates the mound by adding or removing leaf litter. Ideal temperature is 33-35 degrees C but the eggs tolerate a wide variation due to heavy rain or hot weather.

Mound building is around mid August to mid-February, depending on rainfall. Females lay eggs from about mid September to late January. Several females lay in each mound. Unlike any other bird known, the temperature of the mound affects the sex ratio of the babies. The babies are born tough – they are the most developed chicks of all birds and have to look after themselves from birth!

Turkeys play an important role in a healthy ecosystem by dispersing seeds, airing the soil, controlling the insect population, and are food for large birds like powerful owls. They are an integral part of Aboriginal stories and art.

Control Strategies –

Brush turkeys like to build in areas with intermittent shade, tree litter and moist mulch, with ground cover nearby, so gardens near the bush are the most common choice. Well-established gardens are not as vulnerable as newly planted or mulched areas. There are some things you can do to discourage them or to protect your plants:

1. Reduce or remove food sources. Brush turkeys eat almost everything including pet and chicken food, bird seeds, and food scraps. Cover your compost heaps with tarpaulins. Remove unnecessary water sources.

2. Reduce the availability of building material for mounds. Cover spare organic mulch with tarpaulins. Consider gravel-based mulches where possible.

3. Protect veggie gardens by building raised beds over 70 cm high or fence the garden beds with wire or shade cloth. Only a very adventurous individual might hop over fences or into raised beds – in this case a fence or cover is needed.

4. Make it hard for the birds to rake the ground for mulch. Cover the ground with small rocks, large gravel, large heavily branched stocks or logs, especially around the base of new plants. Plant native areas with thick ground covers like Lomandra, Dianella, Grevilleas and Bromeliads.

5. Use tree guards to protect plants, time your plantings to co-incide with the non-breeding season, and develop the garden in stages with good protection.

6. If a male starts to build, cover the mound with a heavy duty tarpaulin or shade cloth. Please note it is illegal to do this after the first 2-3 weeks of building when the female may have laid her eggs in the mound!

Once the mound is established it is very difficult to get the male to relocate. Enjoy his company, do your best to protect your veggie gardens with fences, and look forward to the company of fluffy brown baby brush turkeys, and an amazing supply of rich compost from the mound once breeding season is over!

Possums

Habitat – In Australia, the brushtail possum is prevalent and can be found throughout the country. They will nest in any warm, dry space they can find whether that be your roof cavity, or a tree. They are habitual creatures which will follow the same trail night after night if food is available, walking mainly high up through branches, on buildings or fences.

Lifecycle – Possums are like kangaroos in that they carry their young ones in pouches – animals with this trait are referred to as marsupials. A possum will go through a 17 day gestation period after which they'll produce a single offspring. They usually breed between the months of May and June. A newborn possum is very tiny weighing in at 2 grams and measuring about 1.5 cm.

Despite the small size, a baby possum can climb into their mother's pouch unaided. Once it gets there, the newborn attaches to a teat and begins feeding. The fragile possum will remain inside the pouch for about 5 months as it develops. After this period, the more mature possum will shift to its mother's back where it will stay for 2 months. Males do not play a role in the rearing of offsprings.

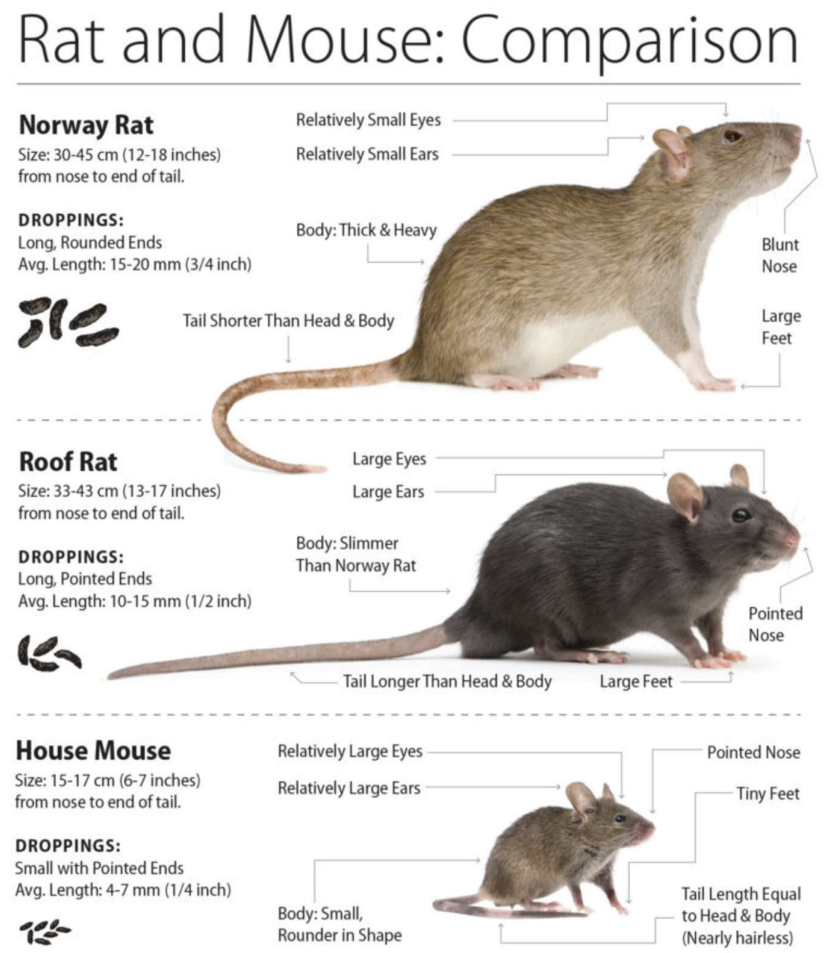
After seven months of dependency, the young possum can now live independently and will have matured fully by the tenth month. Females start breeding as early as twelve months while males will stay up to 2 years before reaching sexual maturity.

Diet – Possums damage regenerated forests, flowers, fruit trees and pine plantations. They'll also munch on vegetables and decorative plants when they manage to sneak into your garden causing major destruction. Being true omnivores, possums also feed on frogs, snakes, birds (and their eggs), mice, rats, voles, and snails.

Control Strategies – Cover your outdoor bins. Clean up food leftovers on your property. Leftovers from barbecues should be cleared immediately. Collar trees with smooth plastic or metal.

Their sense of smell is so keen that some scents put them off, literally. These are some smells and tastes that keep possums away: Moth balls, Camphor balls, Bleach, Ammonia, Animal-based fertiliser, Hot chillies, Fish oil, Garlic, Quassia chips, Tea, Molasses.

Rats & Mice Control Strategies



Use both prevention and control strategies together.

Prevention.

Keep rubbish at bay – Ensure all rubbish in and around your yard and inside your home is kept in sealed containers with bin lids well and truly secured.

Clear out sheds – Regularly clear out sheds and storage areas and remove anything you no longer use. The less clutter, the less nesting places available for them.

Store piles off the ground – Stack firewood and bricks etc. off the ground (about 30cm is recommended) as this minimises nesting and thoroughfare locations for rodents.

Pick your fruit – Ensure you collect and dispose of any fallen fruit from the ground and surrounding areas.

Cut your grass – Long grass and un-kept yards are havens for rats and mice so keep your grass mown and your yard clear of debris.

Seal compost bins – Unless you're hoping to offer the neighbourhood rats a nightly smorgasbord, ensure your compost bin is completely sealed and preferably off the ground.

Feed domestic pets only what they need – leave out only enough food that they'll eat in one day. Rats love dog, cat, bird and chicken food.

Store pet food away – Store all food in a sealable vermin-proof container. Be mindful that if rats are particularly hungry, they can chew through plastic containers.

Plug holes and cover drains – Cover or repair any cracks, holes or crevices in homes, buildings, garden sheds and outdoor areas that could be nesting points for rats. If you have any uncovered drains, cover them with wire mesh to prevent rats from using the pipe or drain as a thoroughfare.

Control

Rats can smell humans a mile off. If you are setting baits or traps use gloves to mask your scent. Also they take a day or two to get used to a change in their environment. Only young rodents will dive straight into a newly laid trap. Mature rodents are likely to observe before interacting, they are clever!!

Poison them – Rat poisons and rat baits are usually a short-term solution for larger populations. Rats usually feed on baits and poisoned foods and then go away to die. There are down-sides to using poisons however as there are risks to pets and children ingesting mislaid baits or baits moved by pests.

Trap them – check every day and only really good indoors for small populations. You will still need to deal with the live rat once they are trapped.

Snap them – Snap traps are a fast and humane way of controlling rats. Traps can be purchased at most grocery and hardware stores and can be set with bread, meat, cheese, chocolate or fish. Traps like these need to be set across rat-traffic areas or near nests and need to be checked daily. These traps have the tendency to get quite messy so if you have a weak stomach, arrange for someone else to dispose of your 'trap victims'.

Electronic Rodent Repellers – Devices that emit a range of electromagnetic, ultrasonic and ionic technologies to keep the pesky rodents far away. Some even come with flashing lights as a further deterrent. You can get them in a range of battery, electric or even solar powered devices and are some of the safest alternatives for minimising your rat population especially if you have children or domestic animals.

Fruit Fly

Qld Fruit Fly – (Bactrocera tryoni)



Identification – Fruit Flies are flies whose larvae feed in the fruits of various fruit trees, as well as in the fruits from several fruiting vegetables. They should not be confused with the fly that breeds in compost bins (Drosophila melanogaster) and is known in Australia as the 'Vinegar Fly', but in the US as 'Common Fruit Fly'. Vinegar Fly is from a different family – Drosophilidae – and not from the family of true Fruit Flies – Tephritidae.

Adult Queensland fruit fly are typically about 7 millimetres long and are reddish-brown in colour, with distinct yellow markings. Fruit fly are often not discovered until fruit is cut open and a visual inspection detects creamy white 7-9mm maggots burrowing inside.

Other indicators of fruit fly activity include the detection of small puncture marks or stings on the skin of fruit. These marks are left from female fruit fly after the laying of eggs and prematurely ripen fruit.

Lifecycle – Fruit fly activity generally increases in spring as the weather gets warmer, however is not restricted to a particular season. The life cycle can be completed in about four weeks in warm, moist conditions and there may be as many as six generations per year. In cooler weather, life cycles may take up to 4 months to complete. Fruit Fly activity peaks in late summer but can occur from spring to autumn in warmer regions.

Eggs – Female fruit fly puncture host fruit to lay eggs. Eggs are white in colour and banana-shaped. Eggs are generally not detected by gardeners at this stage as the eggs are very small. Over it's lifetime, a female fruit fly can have the ability to lay 400 eggs or more.

Larvae – Maggots (Larvae) typically eat towards the centre of the fruit which promotes rot, despite it appearing to be unaffected from the outside. It will eventually chew its way out of the fruit when fully mature – which by this stage has usually fallen to the ground.

Pupae – The fruit will fall to the ground after ripening and rotting. The fully matured larvae leave the fallen fruit and burrow into the soil to pupate. The maggot becomes inactive and changes into an oval, brown, hard pupa.

Adult – The adult fruit fly develops within the pupa and after hatching emerges from the ground. After feeding and mating, females search for suitable ripe fruit to lay their eggs, about 500 – 800 in a four month period. The punctures or stings are very small and are not usually recognisable to the untrained eye.

Diet – A huge number of species of fruit and vegetables!!!

- Citrus, including: Cumquats, Lemons, Limes, Oranges
- Pome fruits, including: Apples, Nashi, Pears, Quinces
- Stone fruit, including: Apricots, Nectarines, Peaches, Plums
- Tropical Fruits, including: Avocadoes, Banana, Figs, Guava, Loquats, Mangoes, Passionfruits, Persimmons, Pomegranates, Strawberries
- Fruiting vegetables, such as: Capsicum, Eggplant, Tomatoes (Cherry tomatoes are less susceptible)

Control Strategies

Monitor – Watch for small flies around your fruit trees. Use commercially available Fruit Fly lure traps to catch flies. Some traps only catch males, which alert you to the first active flies of the season, helping with timing of control methods. A trap which catches males and females is best. Even then you will need to employ other treatments to fully control this pest.

Make your own lure trap. Make up a bait fluid in a jar and suspend it in one of your trees. There are several bait recipes online such as a mixture of 80 g white sugar, 1.5 g dry brewer's yeast and 920 mL water.

Prevent – Use paper or fine mesh cloth exclusion bags. Use exclusion netting on the whole tree. The net must have a weave of about 2 mm x 1 mm. Make sure the net is not touching any fruit. Pick up any fallen and infested fruit and dispose of in a plastic bag. Pick ripe fruit immediately to reduce breeding sites. Prune fruit trees to make harvesting fruit manageable.

Natural Enemies – Assassin Bugs, Mantids and Spiders eat adult flies. Parasitic Wasps sting Fruit Fly larvae in fruit (see beneficial wasps).

Pollinators

&

Predators

Ladybirds

Ladybirds are great to have as buddies in your backyard. In many cultures they are considered so lucky that killing one will bring sadness and misfortune. Not sure what they would make of the 28 spot variety....

About 500 species in Australia. You might know ladybirds as ladybugs or ladybeetles, but whatever name you use the friendly species are fantastic at keeping your garden healthy.

Identification – Can be many different colours – some are all one colour, some are striped and some are even hairy! See accompanying sheet for some examples.

Diet – Most ladybird species eat insects, aphids, mites, beetle larvae, pollen, sap and nectar.

Lifecycle – They have four life stages: egg, larva, pupa and adult beetle. The adult beetle can fly long distances to find new food sources or mating partners. A female ladybird can lay up to 2,000 eggs in her lifetime.

Attracting Ladybirds – Plants with small numerous flowers such as coriander, fennel and dill. The Umbelliferae family contains numerous examples. Having a water source nearby is great.

Ladybirds don't like – Insecticides. Any insecticides, even low toxic or environmentally friendly ones, are harmful to ladybirds and they destroy the ladybirds' food sources. Cold weather. Very dry gardens.

Ladybird life stages

Most ladybird eggs are yellow to orange, shaped like grains, and laid in rafts.

After hatching, most ladybird species pass through four immature stages before pupating and developing into the commonly recognised round orange beetle patterned with black spots or stripes. Both ladybird adults and larvae are predaceous, attacking a range of small insects and mites. Five of the species most commonly seen in broadacre crops are listed below, along with two smaller ladybird species that are also voracious predators.

		Instars 1-4	Pupa	Adult
Large ladybirds (8 mm)	**Three-banded ladybird** *Harmonia octomaculata*			
Medium ladybirds (5-6 mm)	**Transverse ladybird** *Coccinella transversalis*			
	Variable ladybird *Coelophora inaequalis*			 Variable ladybird adults display several different patterns
Small ladybirds (4 mm)	**White collared ladybird** *Hippodamia variegata*			
	Striped ladybird *Micraspis frenata*			

The two-spotted and mealybug ladybirds are much smaller and their juvenile stages look different to the species above. Mealybug ladybirds often lay their eggs directly into mealybug egg masses.

Very small ladybirds (2-3 mm)

Minute two-spotted ladybird
Diomus notescens

Egg | Larva | Pupae | Adult

Mealybug ladybird
Cryptolaemus montrouzieri

Eggs | Young larva | Older larva | Pupa | Adult

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Last updated January 2020

the complete bee life cycle

Queen LAYS EGG

DAYS 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Drone — 24 days emerging as adult

EGG 3 days | LARVAE fed for 7 days | PUPA

UNFERTILISED — EGG LAID IN LARGER CELL

LARVAE FED ROYAL JELLY 3 DAYS | LARVAE FED BEE BREAD 4 DAYS

CELL IS CAPPED | PUPA SPINS COCOON AFTER CAPPED

PUPATES FOR 14 DAYS IN LARGER CELL WITH DOMED CAP

BEE EMERGES

DRONES LIVE FROM A FEW DAYS TO SEVERAL WEEKS

Worker — 21 days emerging as adult

EGG 3 days | LARVAE fed for 6 days | PUPA

FERTILISED — EGG LAID IN CELL

LARVAE FED ROYAL JELLY 2 DAYS | LARVAE FED BEE BREAD 4 DAYS

CELL IS CAPPED | PUPA SPINS COCOON AFTER CAPPED

PUPATES FOR 12 DAYS IN CAPPED CELL

21

BEE EMERGES

WORKERS LIVE FROM 6 WEEKS TO A FEW MONTHS

new Queen — 16 days emerging as adult

EGG 3 days | LARVAE fed for 5½ days | PUPA

FERTILISED — * EGG LAID IN REGULAR CELL WHICH IS THEN CONVERTED TO A SPECIAL QUEEN CELL

LARVAE FED ROYAL JELLY 5½ DAYS

CELL IS CAPPED | PUPA SPINS COCOON AFTER CAPPED

PUPATES FOR 7½ DAYS IN CAPPED QUEEN CELL

16

BEE EMERGES

A QUEEN LIVES FOR 2 -3 YEARS OF PRODUCTIVE LIFE

These times above are variable, depending on conditions inside and outside the hive

EGG LAID BY QUEEN

IN 3 DAYS, ALL EGGS HATCH TO LARVAE

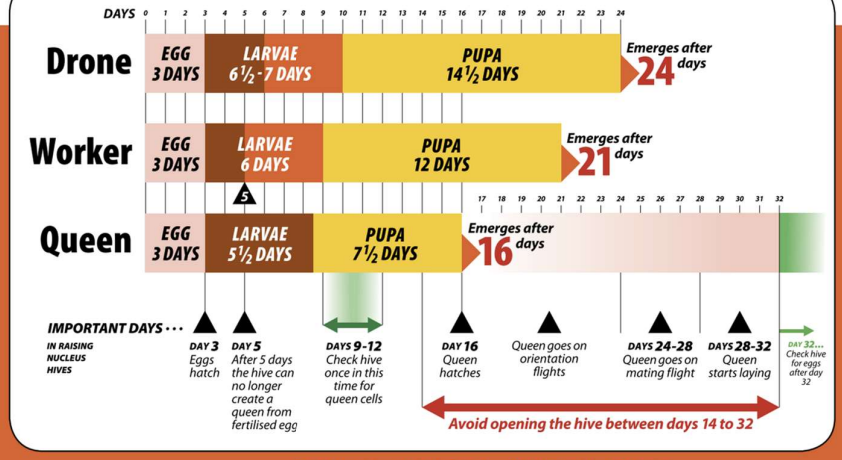
AT THIS STAGE, THE LARVAE ARE ACTUALLY CURLED UP INSIDE THE CELL

CELL IS CAPPED AFTER THE LARVAE STAGE

PUPA SPINS COCOON SOON AFTER CAPPED

NOTE : BEES EMERGE BY CHEWING THROUGH THE CELL CAP

In a nutshell:



- During the six days that worker bee larvae is fed, each individual larvae will be visited between 8,000 -10,000 times!
- When the queen dies, and there are no eggs/larvae to raise as a new queen, worker bees may lay eggs (from which only drones hatch since they will be unfertilised). A worker bee is capable of laying 28 eggs in her lifetime.

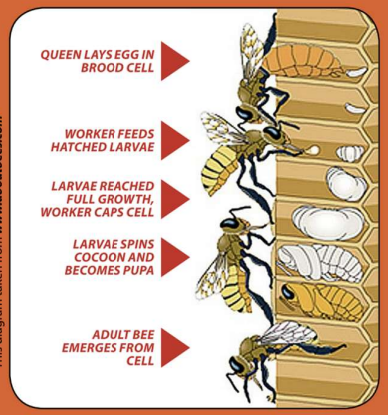
The life of a worker bee :

- Up to day three - clean out the cells in the hive.
- From day four - as a house bee - feed the older larvae with bee bread, and do orientation flights outside the hive.
- From day seven - maxillary glands develop, so able to secrete royal jelly, begin to feed royal jelly to queen and larvae.
- Day 12 to day 18 - house bees develop special wax glands (located on the last four segments of the abdomen) and produce wax scales* (flakes), and work on building comb. During this time, bees also guard the hive, examine the nectar, and help keep the brood warm.
- Day 15 to 18 - worker bees start taking on their most responsible job - as field bees, out foraging for and collecting nectar and pollen. They continue with this until they wear themselves out, or are taken by one of the many bee-eaters.

* Note : There are around 4 million scales of beeswax required to make 1 kilo. 50 scales are required to build a single cell.

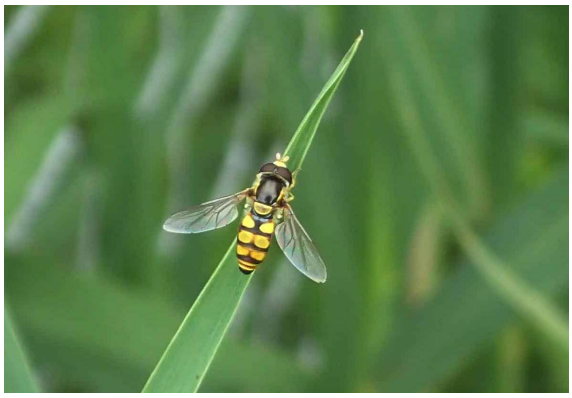
This info taken from ***Bees and People*** by Naum Ioyrish

This diagram taken from ***www.aboutbees.com***



Compiled by Athol Craig • Designed by Glenbo

Hoverfly



Identification – Hover flies have a characteristic flight pattern – hovering in one spot, moving suddenly forwards or sideways, then hovering again. There are many species of varying sizes but they all have the characteristic black-and-yellow-banded body. They can be mistaken for wasps, and do in fact mimic them. However, they have a flatter abdomen and don't have a 'waist' between the thorax and abdomen. They also have two wings, whereas wasps and bees have four. Wasps often have black dots along their abdomen. Their ability to hover (hence the name) and dart around flowers makes them easy to identify. The larvae are 8-10mm in size, legless and maggot-like, and can be green or brown. Adult size: 8-10 mm.

Lifestyle – The eggs are white and oval-shaped, laid singly or in small clusters within or near aphid infestations. Females will overwinter if temperatures are low. They are most numerous during summer and autumn when aphids are about.

Habitat – They are common throughout Australia apart from desert areas. Hover flies live in most habitats.

Diet – They linger in gardens to feed at flowers and to seek shade. Many species perform the useful role of ridding the garden of aphids, as they lay their eggs in aphid colonies and the larvae (maggots) feed on the aphids.

Attraction Strategies – Companion Planting

White and yellow yarrow / Alyssum / Caraway Chamomile / Chives / Dwarf marigold / Daisy family (Coreopsis) / Coriander / White cosmos / Dill / Fennel Feverfew / Candytuft (Iberis umbellate) / Lavender Statice / Lupin / Nasturtium / Parsley / Queen Anne's lace Thyme / Zinnia / Pincushion flower / Buckwheat / Alyssum Lemon balm / Pennyroyal / Spearmint / Wild bergamot

Paper Wasps

Polistes humilis

Identification – Paper wasps have a small head, with medium sized eyes and medium length antennae. The body is slender, with a very narrow waist. There are two pairs of brown-tinted wings, with the first pair larger. The abdomen has some yellow/orange bands, but is mainly black. Recently, the introduced Asian Paper Wasp (Polistes chinensis) has been reported from several inner city suburbs of Sydney. This closely related species is larger than the native Polistes and tends to have more distinctive yellow and brown bands. The nest of the paper wasp is a series of cells shaped like an inverted cone made from saliva mixed with wood fragments. When it dries the mixture is quite paper-like, and gives these wasps their name.

Lifecycle – In the spring, nests are founded by females that have overwintered and have been previously inseminated. After founding, worker females are produced in the late spring and early summer. Males and queen females are produced in the late summer and early autumn.

Diet – The adult paper wasps catch caterpillars to feed the larvae, but the adults themselves feed on nectar.

Habitat – Paper wasps live in urban areas, forests and woodlands, and heath. The nests are built anywhere they can find a dry overhanging spot, such as under a door jamb, roof eaves etc. They tend to only be aggressive when defending their nests, and are otherwise beneficial insects to have around the garden.

Lacewings

Identification – More than 600 species found in Australia. The most common lacewing in Australian gardens is Mallada signatus, which is a vivid green in colour, around 15mm long, with large, lacy wings that fold over at the back in an inverted 'V' shape. Brown lacewings tend to be a little smaller, at around 8mm in length, but all have two sets of delicate wings with a prominent network of veins.

Lifestyle – Adult female lays eggs onto the undersides of leaves. Brown lacewings lay their eggs directly on the leaf, while green lacewings lay their eggs on the end of short stalks, which helps to protect them from being predated by ants.

Eggs can be laid singly, or in clusters, rows or u-shapes, with each female laying up to 600 eggs over three to four weeks depending on the species. After about four days, the eggs hatch to produce tiny brown or white larvae with a ridged body and a distinctive look that's sometimes compared to an alligator. The larvae then begin to feed voraciously, eventually reaching up to 15mm in length.

Lacewing adults are nocturnal and attracted to light, and are most active in warmer climates. In most cases, they live for just three to four weeks in their adult stage. In cooler areas, though, lacewings may hibernate over winter.

Diet – The adults feed mostly on nectar, pollen and honeydew, but they'll also consume small insects or eggs given the opportunity. Their main diet helps with pollination in the garden, but lacewing larvae can devour up to 60 aphids an hour, they'll also feed on caterpillars, mealybugs, psyllids, scale and lace bugs, increasing their all-round value as a natural pest controller.

Attraction Strategies –

1. Reduce Chemical Use

Many common pesticides and other chemicals are toxic to lacewings.

2. Keep Ants Under Control

Ants and lacewings feed on many of the same insects, including scale and mealybug, however, ants feed on the honeydew that aphids produce, and they actively 'farm' the pests to ensure they have a constant supply of food. This can also mean protecting aphids from lacewing predation, sometimes aggressively. Consequently, ants and lacewings don't live happily side by side. Keeping your garden's ant population under control is essential to maintaining healthy lacewing numbers.

Considering that ants are also valuable garden inhabitants, helping with pollination, caterpillar control and recycling of organic debris, you probably don't want to eliminate them completely. A balanced approach could mean removing nests in and around your veggie patch while leaving them alone elsewhere in your garden so that both creatures can co-exist.

3. Provide Suitable Habitat

A simple way to increase lacewing numbers is to provide them with a safe, sheltered habitat, which is particularly important for an overwintering population. As lacewings are flying insects, they'll generally prefer to nest somewhere raised around two metres off the ground, so installing an insect hotel on a wall or tree trunk is ideal.

Alternatively, dedicate a corner of your garden to a high, dense hedge, which will provide natural shelter and concealment.

4. Grow Companion Plants

Umbelliferous and daisy-like flowers seem to be the most attractive, particularly alyssum, dill, calendula, angelica, golden marguerite, coriander, cosmos, Queen Anne's lace, yarrow, fennel, tansy and dandelion.

5. Tolerate Early Aphids

Lastly, being a little lenient with the first aphid infestation of the season can help to develop a lacewing presence and reduce future problems. If you can tolerate the first outbreak of the season, the ready supply of aphids can encourage any passing lacewings to lay eggs and establish a breeding population.