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Beneficial organisms in the home garden

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Not all insects and pathogens are harmful to plants in the garden; many are beneficial and feed on other organisms and prevent them from becoming pests.

To encourage beneficial organisms into your garden it is important to minimise insecticide and herbicide use and provide natural habitats and shelter. For example, ponds can attract frogs while native trees and the absence of cats will encourage native birds.

Some plants are 'lures' for beneficial organisms, providing both shelter and food. These include plants in the parsley (Apiaceae), and sunflower or daisy families (Asteraceae). The following plants will encourage beneficial insects and birds to your garden: parsley, dill, caraway, coriander, dahlias, daisies, asters, cosmos, calendula, zinnia, sunflowers and native plants and flowers.

Figure 1. According to the owner, this chemical-free garden has a number of insect pests but they never reach nuisance levels because numerous birds, predatory insects and a large population of frogs keep everything in check.

Figure 2. Beneficial insect habitat (at City Farm, East Perth).

This Gardennote describes some common beneficial organisms. Some are native and may already be present in your garden and some are commercially available.

Beneficial organisms can be grouped into insects, pathogens and nematodes, and vertebrates.

Beneficial insects

Some beneficial insects can become so numerous that gardeners may require identification, fearing that they are a new pest. There are many different species of beneficial insects and it is beyond the scope of this Gardennote to describe them all. Often a beneficial insect may attack only one pest species.

Most insecticides kill beneficial insects along with pests. Since many home gardeners prefer using alternative methods of pest control, they may wish to consider introducing beneficial insects. However, it usually takes time for beneficial insect numbers to 'catch-up' with pest outbreaks and control them. Observant gardeners may notice when beneficial insects become active.

Types of beneficial insects

There are two main groups of beneficial insects:

Predators - attack and eat other insects. Either adult or larvae, or both may be predatory.

Parasites - lay eggs on or in other insects. The eggs hatch and the developing larvae consume the host, usually from the inside.

Other beneficial insects perform many useful and important functions. For example, **dung beetles** bury animal droppings; **weed-eating** insects are being introduced to control dock, Paterson's curse, and double-gees; and **bees** pollinate flowers and produce honey.

Bugs and beetles

Predatory bugs

Bugs are a large group of insects which include many plant pests. However, they also include important natural enemies of other insects that occur naturally in WA gardens. Bugs have sucking mouthparts which they use to draw up plant juices and the juices of their prey. Unlike beetles, bugs have no pupal stage.

Figure 3. Assassin bug attacking a caterpillar. Photo courtesy of Australasian Biological Control Association (ABC).

Figure 4. Converse ladybird.

Predatory beetles

Beetles are a very large and diverse insect group. Beetles can be distinguished from bugs because they have mandibles (chewing, rather than sucking mouth parts), a rigid pair of fore wings which is often mistaken for a shell, with a pair of fine, hind wings folded beneath., Unlike bugs, beetles have larval, pupal and adult stages.

Predatory mites

Predatory mites feed on the young stages of thrips and some mites. Predatory mites tend to move much faster than pest mites and are often bright red or yellow in colour.

Figure 5. Predatory mite (Phytoseiulus persimilis) *(left) and two-spotted mite. Egg (upper right) is of two spotted mite; other egg is of* Phytoseiulus persimilis. *Photo courtesy of ABC.*

Lacewings

Lacewing larvae are predators of a wide range of pests including aphids, moth eggs and small larvae, scales and whiteflies. Lacewings occur naturally and are most common in spring; they are attracted to light and can sometimes be found near light sources. The larvae are often called trash bugs because of their habit of putting the remains of their prey on their backs. The adults are bright green or brown and have delicate, lacey wings, hence the name.

Figure 6. Adult green lacewing.

Parasites

Parasites deposit eggs on or into the pest or its eggs. The larva then hatches and ultimately consumes and kills the pest. Parasites tend to be host-specific, that is, they will only attack a particular species of pest. Most species of parasite are either wasps or flies.

Figure 7. Aphytis wasp laying eggs in red scale. Photo courtesy of ABC.

Spiders

Spiders are voracious predators that feed on a wide range of pest insects. It is estimated that the weight of insects eaten annually by spiders outweighs the total weight of the entire human population! All spiders spin silk, but not all build webs for the purpose of catching prey.

Spiders such as the common wolf spider run down their prey as would a wolf, whilst a trapdoor spider lays in wait in its burrow until some prey happens past. Hunting spiders can play a part in controlling cockroaches in the house, whilst the unsightly webs of black and garden spiders contribute to control of flying insects in the garden. It is therefore beneficial to keep spider-activity at a reasonable level in home and garden. But be careful: species such as the redback spider can give a nasty bite.

Figure 8. Jewel spider, a well-hidden ambush specialist.

Preying mantids

Preying mantids eat whatever they can catch, including pests. Mantids are found on leaves, flowers and the branches of plants. They can blend into the background, making them difficult to see. Mantids use their two front legs to capture and hold prey.

Figure 9. Praying mantis. Photo by Whitney Cranshaw.

Hover flies

Hover fly larvae are often found among large populations of aphids. Adults feed on pollen and nectar and are often mistaken for bees. However, unlike bees, adults will hover in the same place. The larvae feed on aphids and other soft-bodied insects.

Figure 10. Hover fly larva attacking an aphid. Photo courtesy of ABC.

Beneficial pathogens

Pathogens – include target-specific bacteria, fungi or viruses, of which there are some commercial preparations available. Bacillus thuringiensis (BT) is one of the most commonly used pathogens. It controls young caterpillars of moth and butterfly pests.

Entomopathogenic (parasitic) nematodes

These are parasitoids because they will kill their host in the process of completing their life cycle.

Entomopathogenic nematodes are microscopic, simple round worms. They kill insects by entering them and releasing a bacterium that multiplies within the insect. The bacterium, harmless to humans and other animals, serves as a food source for the nematode.

Figure 11. Nematode-infested scarab beetle larvae, with a healthy larva in the centre for comparison. Photo courtesy of ABC.

Beneficial vertebrates

These are birds including chickens and ducks, frogs and other vertebrates which consume insects, snails and slugs as part of their diet.

Frogs

Frogs eat mosquitos, cockroaches, flies and slaters. Because their presence in your garden is considered to be a reflection of good environmental health, they are often referred to as an 'indicator' species. Frogs need moisture to survive, and also require food, shelter and places to breed. Build a pond to attract frogs.

Figure 12. Western Green Tree Frog (Litoria moorei). Photo courtesy of Robert Davis.

Figure 13. Willy Wagtail (Rhipidura leucophrys). *Photo by Steve Axford.*

Birds

Birds are part of the natural ecosystem, and many are attracted to insects and flowers. Plant local native plant species and create a diverse community of different insects and flowers to attract birds into your garden.

Commercially available beneficial organisms

The increasing popularity of integrated pest management (IPM) which facilitates pest control with a minimum of chemicals has resulted in the formation of the Australasian Biological Control Association (ABC).

For further information on beneficial organisms including availability and suppliers, consult their website: www.goodbugs.org.au.

Before importing beneficial organisms from other states, consult with the Inspection Service of Quarantine WA to confirm if such organisms are permitted into Western Australia. Telephone 9334 1800.

Further reading

The Good Bug Book, 2nd ed. Published by Integrated Pest Management Pty Ltd, for Australian Biological Control Inc., PO Box 436, Richmond, NSW 2753. Telephone (02) 4570 1331.

Backyard insects by Horne, P. A. and Crawford, D. J. (1996). Melbourne University Press, (232 pp).

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