Glossary

Biological Control Agent
An organism (naturally occurring or imported from another region) used to control an undesirable organism. Examples include the whitefly parasite, *Encarsia formosa,* and the two-spotted mite predator, *Phytoseiulus persimilis.*

Caterpillar
The immature stage (called a larva) of a moth or butterfly. Caterpillars have elongated, soft, segmented bodies, three pairs of true legs and several pairs of fleshy false legs (called prolegs). Formulations of *Bacillus thuringiensis* are effective against many but not all caterpillars.

Crawler
A term for the tiny, active, mobile stage of scale insects and whiteflies. Crawlers are the newly hatched, first instar of the immature stage; they rarely move more than a few centimetres before moulting to the next, non-mobile instar.

Cultural Control
Techniques of crop management that also help suppress pest populations. For example, removing weeds that may be alternate hosts for insect pests or changing planting times and densities to reduce spread of powdery mildew.

Diapause
A period of dormancy, usually for winter, during which activity and growth cease. It allows insects and mites to survive unfavourable conditions. Diapause is usually triggered by a combination of lower temperatures, shorter days and reduced food supply.

Grub
The plump larva of beetles, such as black vine beetle. They have a well developed head and true legs but no other abdominal appendages.

Honeydew
A sticky, sweet liquid excreted by insects, such as aphids and scales, that suck plant sap. The sugars in the honeydew support the growth of sooty moulds on leaves, which blocks light from reaching the leaf. Honeydew also attracts parasites and predators of the insects that produce honeydew as well as ants, which “milk” aphids to obtain the droplets of honeydew.

Host
The organism on, or in which, a parasite lives or feeds.

Hyperparasite
Organisms that parasitize other parasites. The aphid parasite, *Aphidius,* has several hyperparasites. In late summer hyperparasites may significantly interfere with biological control of aphids with *Aphidius matricariae.*

Insect

A class of animals (arthropods) with hard outer skeletons and jointed legs. They have three main body parts (head, thorax, and abdomen) and three pairs of legs. Most have one or two pairs of wings as adults. Mites and spiders are not insects, however, they are close relatives.

Insect Growth Regulator (IGR)
Insecticides that mimic the hormones that regulate insect growth, thus disrupting normal development. They are fairly specific to target insect groups. Kinoprene (Enstar®) is an IGR that is effective against the insect order *Homoptera* (aphids, whitefly, scales, and mealybugs).

Instar
A stage of larval development between each moult to a larger size. During each instar the larva or nymph increases in size but does not change radically in form. A larva may pass through several instars before it moults to become a pupa.

Integrated Pest Management (IPM)
An approach that uses a combination of techniques in an organized program to suppress pests. IPM is a decision process involving identification, monitoring, preventative measures and a variety of controls.

Larva (Plural = Larvae)
An immature stage of any insect that passes through a total transformation (called complete metamorphosis) during a pupa stage to become an adult. The larva looks completely different from the adult and usually uses a different food supply (for example, a caterpillar is a larva of a butterfly).

Looper
A caterpillar that moves like an inchworm. They usually have a long body with true legs at the head end and fleshy, false legs (prolegs) at the tail end.

Maggot
The legless, worm-like larva of flies and midges (such as fungus gnats or predatory midges). They may have an obvious head or the head may appear to be a small point with barely visible mouthparts.

Nymph
The immature stage of an insect that does not have a pupal stage (e.g., minute pirate bugs); these pass through a number of moults to gradually develop to the winged adult form (called gradual metamorphosis).

Parasite
An organism that lives most of its life attached to a single host. Parasites, such as fleas and lice, do not usually kill their host, however, parasitic wasps, which lay their eggs in insects, do kill their host as they develop inside. Parasitic wasps are often called parasitoids to distinguish them from external parasites such as fleas.

Physical Controls

Controls or techniques that physically remove pests or stop them from reaching plants, such as screens, light traps and sticky traps.

Predator
An organism that attacks and feeds on other, usually smaller, animals (prey). Predators usually eat many prey in their life time. Some predators feed on particular species, others, are generalists, feeding on a variety of prey.

Prey
The organism that a predator eats.

Pupa (Plural = Pupae)
An immobile stage occurring after the larva stage of an insect, in which the body form completely changes (undergoes complete metamorphosis) to the adult form. The pupa is a difficult stage to control because it is not feeding or moving around and, therefore, may not be affected by pesticides or biological control agents.

Residue
The often invisible traces of a pesticide that remain on foliage long after a pesticide application. Residues of some pesticides can continue to harm non-target, beneficial organisms for many weeks, although they are at concentrations too low to control pests.

Sanitation
The practise of maintaining clean plants and growing areas, including removing plants or plant waste that acts as a breeding site for pests. Other sanitation measures include placing sterilizing shoe baths at entrances to the greenhouse and cleaning tools, benches, floors, and greenhouse structures.

Scavenger
An animal that can feed on dead plants or animals. The soil mite ‘Hypoaspis’ can survive as a scavenger.

Target /Non-target Organisms
Target organisms are the intended victims of a particular control measures. Non-target organisms are the "innocent bystanders" that can be directly or indirectly affected. For example, a pirimicarb spray reduces the target pest population (aphids) but it also repels a non-target organism (the aphid predator ‘Aphidoletes’) from the plants for several weeks.

Treatment Threshold
The level of pest infestation, at which the value of the damaged crops begins to be worth more than the costs for control. It is the point at which it is worth taking measures to control the pest. This threshold varies with the crop, the pest and cost of the control measures. For example, sweet peppers can tolerate a significant loss of leaf area due to looper feeding without affecting the crop yield, so the economic threshold for looper damage is high. On the same crop, pepper weevils cause direct losses by destroying every fruit they feed on, so the economic threshold for pepper weevils is very low.