

Integrated pest management in ornamentals information kit

Reprint – information current in 2000



REPRINT INFORMATION – PLEASE READ!

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This publication has been reprinted as a digital book without any changes to the content published in 2000. We advise readers to take particular note of the areas most likely to be out-of-date and so requiring further research:

- Chemical recommendations—check with an agronomist or Infopest www.infopest.qld.gov.au
- Financial information—costs and returns listed in this publication are out of date. Please contact an adviser or industry body to assist with identifying more current figures.
- Varieties—new varieties are likely to be available and some older varieties may no longer be recommended. Check with an agronomist, call the Business Information Centre on 13 25 23, visit our website www.deedi.qld.gov.au or contact the industry body.
- Contacts—many of the contact details may have changed and there could be several new contacts available. The industry organisation may be able to assist you to find the information or services you require.
- Organisation names—most government agencies referred to in this publication have had name changes. Contact the Business Information Centre on 13 25 23 or the industry organisation to find out the current name and contact details for these agencies.
- Additional information—many other sources of information are now available for each crop. Contact an agronomist, Business Information Centre on 13 25 23 or the industry organisation for other suggested reading.

Even with these limitations we believe this information kit provides important and valuable information for intending and existing growers.

This publication was last revised in 2000. The information is not current and the accuracy of the information cannot be guaranteed by the State of Queensland.

This information has been made available to assist users to identify issues involved in ornamental horticulture. This information is not to be used or relied upon by users for any purpose which may expose the user or any other person to loss or damage. Users should conduct their own inquiries and rely on their own independent professional advice.

While every care has been taken in preparing this publication, the State of Queensland accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained in this publication.



Glossary

What can you expect to learn from this section?

Definition of terms found within this information guide.

Abdomen: The tail end of an insect or mite.

Abiotic: Non-living.

Acaricide: A chemical that harms mites and ticks.

Action threshold: The point at which action is taken to avoid economic plant damage.

Active ingredient (or active constituent): The specific chemical in a formulated pesticide that is responsible for harming the pest.

Bagasse: Sugarcane mulch. A by-product of sugarcane sometimes used as the organic component in growing media.

Beneficial organisms: Any commercially produced or naturally occurring insect, mite, nematode, fungal predator or parasite that will help control a pest.

Biocontrol (biological control): The use of one living organism to control another.

Biocontrol agent (BCA): A living organism used to control a pest. Examples include the whitefly parasitoid, *Encarsia formosa*; the two-spotted mite predator, *Phytoseiulus persimilis*; fungus gnat entomopathogenic nematode *Steinernema feltiae*; and the thrips pathogenic fungus *Beauveria bassiana* (see *Beneficial organisms*.)

Biorational pesticide: A pesticide that is less harmful to biocontrol agents and the environment, yet still able to control the pest. Also referred to as 'safe', 'soft' or 'reduced-risk'.

Burlap: Hessian. A strong fabric made from jute.

Caterpillar: The immature stage (called a larva) of a moth, butterfly or sawfly. Caterpillars are segmented, soft bodied and usually have three pairs of legs on the jointed thorax and two or more pairs of legs on the abdomen.

Chemical control: A method of reducing pests with the use of chemicals (natural or synthetic).

Cornicle: Short blunt horns, tubes or rounded projectiles at the tail end of the abdomen of aphids.

Crawler: The first instar nymph of a scale insect, mealybug or whitefly which is able to crawl a short distance before settling to become a non-mobile nymph.

Cultivar: A type of cultivated plant that differs from others in the same species and keeps the distinctive features when reproduced.

Cultural control: Manipulation of the cropping system to reduce pest damage, for example changing crops, using resistant cultivars, removing weeds, crop rotation, and irrigation practices.

Curative application: A treatment (chemical or non-chemical) applied to a pest infestation to gain control.

Deutonymph: The second nymphal stage of a mite, after egg, larva and protonymph.

Diapause: A prolonged state for insects or mites in which development stops, triggered by low temperatures and short days. Helps the organism to survive harsh conditions.

Disease: Any condition within a plant that interferes with normal functioning or development, caused by fungi, bacteria, viruses, nematodes or environmental imbalances. Plant problems caused by environmental factors are referred to as non-infectious diseases.

Economic threshold (economic damage): The point at which pest damage reduces the crop's value. This point varies for different crops and different pests.

Ectoparasite: A parasite that lives on the outside of its host.

Endoparasite: A parasite that lives on the inside of its host.

Entomopathogenic: A disease organism that kills insects and mites.

Environmental control: A practice well suited to greenhouses, where it is possible to manipulate temperature, relative humidity, light and soil characteristics to get the most value out of a crop and biocontrol agents.

Greenhouse: A structure made of glass or plastic that encompasses the cultivation and production of plants, giving increased environmental control.

Grub: Often found in the soil, grubs are thick-bodied larva of the Coleoptera (beetle and weevil) family.

Hard chemical: A chemical that is toxic to both the target pest and non-target organisms.

High volume sprays (HV): Sprays applied at volumes in excess of 1000 L/ha, for which the droplets of liquid are greater than 100 microns, possibly as large as 700 microns.

Honeydew: A sticky, sugary excretory material produced by sap-sucking insects of the order Homoptera, including aphids, soft scales, mealybugs and whiteflies. The sugars in the honeydew can attract growth of black sooty mould on leaves, which blocks light from reaching the leaf. Ants are attracted to honeydew as a food source.

Host: The organism on or in which a pest lives or feeds.

Hot spots: Areas in the crop where the pest is most concentrated.

Hygiene: The practice of keeping a greenhouse clean, which includes the removal of weeds and plant debris, sterilisation of growing media and pots, and disinfection practices.

Hyphae: Fine threads of fungi used to spread the pathogen and obtain nourishment.

Infection: When diseases arrive and multiply to a considerable number, causing plant damage. It can also refer to established disease populations.

Infestation: When pests arrive and multiply to a considerable number, causing plant damage. It can also refer to established pest populations.

Insect: Segmented animals with tough outer skeletons and jointed legs. They have three main body parts (head, thorax and abdomen) and three pairs of legs. Mites and spiders are not insects.

Insect growth regulator: Specific insecticides such as growth hormones that disrupt the normal development of insects.

Insecticidal soap: A mixture of lineolate, stearate and oleic salts formulated to mix in water for treatment against pests infesting plants. Safe to humans and non-residual.

Instar: The life stage between successive moults. During each instar, the larva or nymph increases in size but does not change its appearance. A larva can pass through three to six instars before it moults to become a pupa.

Integrated pest management (IPM): An approach to pest and disease management that uses regular monitoring to determine if and when treatments are needed. It employs a combination of physical, chemical, cultural and biological strategies to keep pest numbers low enough to prevent economic plant damage from occurring.

IR: Infra-red.

Larva (plural = larvae): The immature stage occurring between egg and pupa of an insect with complete metamorphosis, for example a caterpillar is a moth or butterfly larva.

Life cycle: The development of an organism from the egg (or live birth) to the reproductive stage.

Looper: A caterpillar that loops its body as it moves. Usually has a long body with true legs at the head end and prolegs only at the tail end.

Low volume sprays (LV): Sprays applied at volumes between 100 L/ha and 1000 L/ha, for which the droplets of liquid are 30 to 100 microns in diameter.

Maggot: The legless, worm-like larva of flies. Can have a distinct head or the head may appear to be a small point with barely visible mouthparts.

Meristem: Growing regions of a plant in which cells that have retained their embryonic characteristics, or have reverted to them secondarily, divide to produce new cells.

Metamorphosis, complete: Insects with complete metamorphosis have four life stages—egg, larva, pupa and adult—each very different in morphology.

Metamorphosis, gradual: Insects with gradual metamorphosis have three life stages—egg, nymph and adult. Nymphs resemble adults, but lack fully developed wings.

Metamorphosis, simple: Insects with gradual metamorphosis have young adult stages, which differ in size only, for example, springtails. No stage has wings.

Micro-organisms: Extremely small organisms that can only be seen with a microscope.

Miticide: A chemical with specific activity against members of the Acari (mites and ticks) family.

Monitoring: The use of sticky traps and plant inspections on a regular basis in a crop, to examine and record the presence of pests and diseases.

Natural enemy: A naturally occurring beneficial organism.

Nematode: A tiny microscopic worm, many of which are parasitic on plants or insects.

NIAA: Nursery Industry Association of Australia.

NIASA: Nursery Industry Accreditation Scheme, Australia.

Non-target organisms: ‘Accidental victims’ directly or indirectly affected by the control measure used.

NRA: National Registration Authority for Agricultural and Veterinary Chemicals.

Nymph: The stage of an insect (which undergoes gradual metamorphosis) between egg and adult. It is the stage in which growth occurs.

Off-label permit: Permits issued for minor or emergency uses by the National Registration Authority. Permits legalise use of unregistered products and unapproved use of registered products.

Organism: A life form in its entirety.

Outbreak: When pests arrive and multiply to considerable numbers, causing plant damage.

Ovicide: A chemical which acts on the egg stage of an insect or mite.

Parasite: Any plant or animal that lives in or on another organism (host), usually to the detriment of the host.

Parasitoid: A form of parasitism in which the larval stage is specially adapted to live inside the host, the larva eventually killing the host. The parasitoid is relatively large in relation to the host (an example is the whitefly parasitoid *Encarsia formosa*).

Pathogen: Infectious micro-organisms that cause plant diseases, for example fungi, bacteria, viruses and nematodes.

Pest: An organism that has the capacity or potential to cause economic harm to plants. It includes unwanted bacterium, fungus, virus, insect, mite or other living organisms.

Pesticide: A chemical formulation capable of controlling, preventing, destroying, repelling, or reducing any pest.

Phloem: Part of the cell tissue within a plant that carries food.

Physical controls: A method of preventing or reducing pests by the use of physical barriers, for example insects screens, traps and quarantine of new plants.

Phytotoxicity: A term used to describe plant damage caused by a substance following its application to, or near a plant.

Predator: An organism that attacks and feeds on other organisms (prey).

Preventative application: A treatment (chemical or non-chemical) applied before pest or disease arrival to prevent infestation or infection.

Prey: The organism that a predator attacks and eats.

Protonymph: The first eight-legged stage after the egg and six-legged larva in a mite.

Pupa: The immobile stage between the larva and adult in which the body form completely changes.

Registration: A licence for a chemical product given by the National Registration Authority for Agricultural and Veterinary Chemicals (NRA), which allows the legal use of the product to control specific pests on specific crops in specific States.

Residue: Traces of a pesticide that remain on foliage or greenhouse structures after a pesticide application. Residues must be considered before using biocontrol agents in a crop.

Sanitation: A method of preventing the introduction of pests into a greenhouse by maintaining clean plants and growing areas, removing plant waste that acts as a breeding site for pests, placing sterilising shoe baths at entrances to the greenhouse and cleaning tools, benches, floors, and greenhouse structures (see *Hygiene*).

Soft (or safe) chemical: A biorational pesticide, which is toxic to the target pest but harmless to biocontrol agents and other non-target organisms.

Spore: A tiny, reproductive body (like a seed), produced by fungi.

Spot spray: To only apply a chemical treatment to limited areas of pest infested plants within a crop.

Surfactant: An ingredient that helps in wetting, emulsifying or spreading a pesticide.

Systemic: A substance that is absorbed through the plant surface (above or below ground) and translocated throughout the body of the plant.

Target organisms: The unwanted pests you intend to kill.

Thorax: The middle region of an insect's body, between the head and abdomen, where wings and legs are attached.

Translaminar: When a substance contacts one side of the leaf and moves across to the other side.

Translocation: When a substance is taken in through the plant surface and moved throughout the plant (see *Systemic*).

Transpiration: The evaporation of water from the leaves of a plant.

Ultra-low volume sprays (ULV): Sprays applied at rates less than 100 L/ha, for which the droplets of liquid are smaller than 30 microns in diameter.

UV: Ultraviolet.

Venation: The pattern of veins on an insect's wings.