Organic Garden Pest Management

Kimbriki Eco House & Garden

This course will cover:

1. What is an Organic Pesticide
2. The Importance of Healthy Soil
3. Companion Planting & Beneficial Bugs
4. Homegrown Pest Control
5. DIY Pest Control Recipes
6. Additional Organic Pest Prevention Strategies
7. Recognising and Identifying Garden Pests
8. Commercial Organic Pesticide Options

1. What is a Pesticide? – Organic vs Synthetic

Organic vegie gardeners **do not** use any poisonous chemicals such as insecticides, herbicides, fungicides, etc. The word 'cide' comes from the Latin and means 'to kill or death'. Organic gardening also means no longer using any 'synthetic' acid soluble fertilisers.
Something designed to kill or control a "pest" which could be plant, animal or fungi. Pesticides range from single elements through to complex organic molecules and are sometimes grouped based on what they target.

Synthetic Pesticides are created in a laboratory, not through natural processes.
Organic Pesticides are derived from a natural botanical, geological or microbial source.

Insecticide – for insects
Herbicide – for weeds
Fungicide – for fungi
Miticide – for mites
Rodenticide – for rats and mice
Nematocide – for nematodes
Bacteriocide - for bacteria
Biocide – for a broad range of living organisms

About three million tonnes of agricultural pesticides are used across the globe each year (Low, Luisa 2023). Pesticides are the leading source of self-poisoning deaths in the world (World Health Organisation 2025) "WHO recommends reducing the use of pesticides when possible. First, determine to what extent the use of pesticides are needed. **Look for ways to solve the issue with non-chemical pest management where possible.**

Not only is organic pest control better for your garden ecosystem, but it is also better for the health of you and your loved ones. Many of the synthetic compounds found in non-organic pest control products are known or suspected **carcinogens or irritants** of some form (often this information can't simply be gleaned from the label). The same way these compounds can persist in soil; they also persist in your body.

Glyphosate, aka RoundUp – Synthetic herbicide

The herbicide glyphosate (also known as RoundUp) as well as pesticides malathion and diazinon, are regarded by the World Health Organisation (WHO) as "probable carcinogens". Despite this, the use of RoundUp has not been reformed in Australia on a national scale, with only some local governments banning its use. Many other countries have banned it's use nationally or in most of the country.
Although, in the environment it is highly degradable, glyphosate degrades in the surrounding environment into smaller molecules that are still highly persistent and toxic to humans and animals alike. We advise you to avoid this product entirely.
Note: Certain noxious weeds are impossible to completely remove without the use of glyphosate or other poisons via stem injection or cut-stump methods. Use with caution and only in extreme circumstances.

Second Generation Anticoagulant Rodenticides (SGAR) – Synthetic Rodenticide

Anticoagulant poisons are classified as first generation or second-generation products; first-generation poisons are less toxic and require several feeding events over several days to kill an animal, whereas second generation anticoagulant poisons are much more toxic and may kill an animal after only one feeding event and remain active in the carcass of dead animals. This means that secondary poisoning is likely to occur if the dead carcass is consumed by our native birds of prey or domestic pets. Studies have shown that SGARs do pose lethal risks to birds, particularly birds of prey.
Sale of SGARs are regulated in the US, Canada and the EU, but not in Australia. As well as harming native wildlife, unattended rodent baits may accidentally be consumed by domestic pets, livestock, and even children.

2. The Importance of Healthy Soil

Your plants health is **directly related to the diversity of life in the soil**. Plants with a healthy immune system will be more resistant to insect and disease attack. Good organic gardeners realise that a **small percentage of their plants will be food for insects.** Insects are an important part of a balanced system, but we don't want them to take over. Most insects see in the infra-red spectrum and will be **attracted to plants with weakened immune systems**. Stressed plants emit a different colour of infra-red light. Turn your attention to the soil the plant is growing in, rather than the plant itself.

When we use unnatural or synthesised chemicals on and around our garden, the soil is inevitably where these substances end up. Some of these substances can persist for years, **damaging the soil life** as well as your plant's ability to interact with it. Soil microbes are the foundation of all life on earth, and we need to learn to respect and care for them.

Healthy soil has:

- A good amount of decomposed organic matter (called **humus**) which is evident through the dark brown to black colour. Humus holds water and important minerals and nutrients for plants. It is essential in supporting **soil microbes**.
- **Mineral** components including clay, sand and silt.
- **Aliveness**. Soil that is not alive is just dirt.

Build the health of your soil:

1. Add quality compost or matured horse or ruminant (sheep, cow, goat) manures during growth periods.

2. Learn to make you own healthy compost or use fresh, diluted worm juice from worm farms too boost microbial life. Bonus, dispose of your household food waste sustainably at the same time.
3. Keep on top of watering to ensure your soils don't suffer from extended dry periods and turn hydrophobic (water repellent). Want to learn how to compost or worm farm effectively? Ask our team about any upcoming workshops or visit the Kimbriki Eco House and Garden website.

3. Companion Planting – *Prevention is Better than a Cure*

It is important to remember that your garden is an ecosystem with predators, prey and everything in between. Keep this in mind when using harsher chemical pesticides or some organic solutions that may inadvertently target other beneficial species. **Planting flowering plants or letting old plants go to flower are simple ways to increase biodiversity in your patch**. Blue and purple flowers are particularly attractive, as well as flowers that have umbelliferous shaped inflorescence (think carrot flower, elderflower, dill flower etc.). Some bugs have smaller or bigger mouth parts and prefer certain types of flowers. Do some research if you are looking for a particular bug.

Observation is key. Whatever stage your garden is at, it will be useful to spend some time observing the creatures that pass through. Spend half an hour, on a few different occasions (ideally in fine sunny weather) at different times of the year and record different species you see and how many. Also take note of evidence (i.e. Eaten leaves, cocoons, webs, holes in the soil). Be patient and look closely. This will give you a baseline idea of whether you need to do some work to attract beneficial insects.

Beneficial Bugs

Here are some key beneficial bugs that you should try to encourage. The list of pests they help to control is not exhaustive.

- Assassin Bugs – hunt mosquitos, beetles, flies and caterpillars.
- Bees – pollinators, of course.
- Large Butterflies – pollination and eat slugs and weed seeds.
- Hover flies - pollinator, larvae eat aphids.
- Robber flies – eat grasshoppers, white grubs and leafhoppers.
- Green Lacewings – eat aphids, caterpillars, whitefly, scales, leaf miner, nymphs.
- Ladybugs – larvae eat aphids, spider mites, mealy bugs, scales, whiteflies and thrips.
- Pirate Bugs – thrips, leaf miner.
- Praying Mantis – eat moths, beetles and flies.
- Spiders – Capture and eat a myriad of pests.
- Wasps – eat aphids, caterpillars, cabbage worm, hornworm. Larvae are often parasitic to pests.

Invite them to stay. If you find these creatures in your garden, research how to help them stick around. A good place to start is building an insect hotel and being mindful when clearing up in autumn as many bugs over-winter in leaf litter and protected, scrubby areas.

Common Companion Plants for Attracting Beneficial Bugs

- Flowers that attract both predators and pollinators: Marigolds, daisy, carrot & mint families.
- *Predators*: Calendula, coriander, cosmos, dill, bronze fennel, parsley and Queen Anne's Lace.
- *Pollinators*: Borage, alyssum, coriander, comfrey, salvias/sage, let some herbs and leafy veg go to flower. Any purple, blue or yellow flowers good for pollinators.

4. Homegrown Pest Control

Many of the edible plants we know, and love have substantial pest-deterring or exterminating qualities.

The plants listed below give off a scent or harbour an essential oil or compound that repels or kills certain pests. Each has their unique properties and there is no one solution fits all. Some simply need to be planted nearby, others need to be prepared using recipes like those found in the DIY Organic Pest Removal Recipes table further along in these notes. It will be most effective to plant the right pest deterring plants, near those vegetables that are particularly susceptible to a certain type of pest.

- Bay leaves – moths
- Basil – mosquitoes, flies, aphids
- Catnip – flies, ants, weevils
- Chamomile- mosquitoes
- Chilli – aphids, whitefly, caterpillars, possums
- Chives – aphids, Japanese beetles, carrot flies
- Citrus fruit – aphids, whiteflies, ants, rats
- Cloves – mites, aphids, ants, moths, mosquitos
- Fennel – slugs, snails, aphids
- Garlic – Japanese beetle, aphids, mites, whitefly
- Lavender – aphids, mealybugs, stink bugs, moths
- Marigolds – nematodes, whiteflies
- Mint – mosquitos, spiders,
- Mustard – caterpillars, aphids, fungus gnats
- Nasturtiums – whitefly
- Onions & leeks – carrot flies, aphids
- Rosemary – white cabbage butterfly, mosquitos
- Sage – general pest deterrent
- Pyrethrum daisy – grasshoppers, cockroaches
- Tansy – general pest deterrent
- Wormwood – slugs & snails

5. DIY Organic Pest Control Recipes

Note: Remember to **apply these solutions to gardens in mild temperatures** (<25 degrees) ideally in the early morning or late afternoon. Rain will likely wash your solutions away so best to apply afterwards.

Recipe	Pest
Garlic Insecticide/fungicide Garlic is a natural insect repellent and has antibacterial and antifungal properties. **Recipe:** Crush 3 cloves of garlic and mix them with 1 litre of water. Let the mixture sit for a few hours or overnight. Then, strain it and add 1 teaspoon of neutral soap to increase effectiveness. Spray the mixture on affected plants, especially on the underside of leaves where pests usually hide.	Aphids, caterpillars, mildew, thrips, antibacterial.
Soap Spray insecticide The soap dissolves the membranes of the insects and kills them without harming the plants. **Recipe:** Add two tablespoons of soap flakes (or 1 tablespoon of liquid neutral soap) to one litre of water and stir thoroughly until completely dissolved. There is no need to dilute this further. Spray the mixture on the affected plants, making sure to cover the leaves, stems and roots if possible.	Aphids, mealybugs, spider mites, stink bugs, caterpillars.
Homemade White Oil pesticide Works as a suffocant, smothering insect pests rather than poisoning them. **Recipe:** 2 cup sunflower or vegetable oil and 1 cup greywater safe dish washing liquid. Shake together in a container until the solution turns white. Use diluted: 1 tablespoon oil solution to 1 litre of water. Apply when mild, clear and calm. Apply to all parts of the plant once every 3 weeks to maintain.	Scale, aphids, white fly, leaf miner, stinkbugs, mites and mealy bugs.

Recipe	Pest
Chili Onion Garlic insecticide The spiciness and sulphur compounds irritate insects and scares them away. **Recipe:** Peel 5 cloves and soak in 2 cups of water for several days. Chop 4 large onions, 5 soaked cloves of garlic, and 4 hot chillies. Mix them together and cover with warm, soapy water and leave it to stand overnight. Strain off that liquid and add it to 5 litres of water. Spray the mixture on the plants, especially where pests are found, careful to avoid ladybeetles or hoverflies.	All round insect irritant, caterpillars, possums, aphids, caterpillars and spider mite.
Citrus peel insect repellent The Limonene in peels is generally unappealing to some insects. **Recipe:** Place citrus peels (about 4-5 orange or lemon peels) in 1 litre of hot water. Let it sit for 24 hours, then strain and spray it on the foliage of plants.	Aphids, whiteflies, mosquitos, rats and mice.
Mint and Rosemary insect repellent Herbs such as mint and rosemary have natural repellent properties for many pests. **Recipe:** Boil a handful of mint and rosemary leaves in 1 litre of water for about 10-15 minutes. Let cool, strain the mixture and spray on the plants.	Mosquitos, aphids, spider mites.
Eggshell Powder insecticide Works as a DIY alternative to Diatomaceous Earth. **Recipe:** Dry eggshells out by leaving them out for a few days. Smash shells and then crush into a powder using a coffee grinder. Use directly on pests to keep beneficials safe. Store in a dry place.	Aphids, mites, thrips, beetles, fleas, cockroaches, slugs and snails
Mustard Spray insecticide Sinigrin in mustard is a skin irritant for soft bodied pests and animals. **Recipe**: In a spacious mixing bowl, combine 60ml of mustard powder with a gallon of water. Vigorously stir is necessary to ensure the mustard powder integrates with the water, leaving no residue or clumps behind. Pour solution into a spray bottle and spray directly onto effected leaves or use as a deterrent.	Caterpillars, aphids, mites, mealybugs, slugs and snails.
Vinegar herbicide Most effective on young annual weeds causing cell damage upon contact to plants. **Recipe:** Spray or brush double strength vinegar directly onto the foliage of unwanted plants. Repeat as necessary. A stronger strength vinegar will be more effective. 20% strength is ideal for a one-time application. Mix in with a small amount of soap for more even leaf coverage.	Softwood weeds
Milk spray fungicide Milk proteins interact with sunlight to create an antiseptic effect. **Recipe:** Mix one part full-fat organic milk to ten parts water. Spray on leaves plants as treatment and prevention. Reapply after heavy rain.	Surface mildews
Bicarbonate soda fungicide Slightly stronger than the milk spray creating an alkaline environment on the leaf surface which inhibits the germination of fungal spores. **Recipe:** 1 teaspoon bicarb to 1 Litre of water and mix. Spray onto affected leaves in the cool of the morning. Can be used as treatment and prevention. Reapply after heavy rain.	Surface mildews
DIY Pyrethrum Spray insecticide Pyrethrum is a naturally occurring pesticide utilised commercially. **Recipe**: Soak ½ cup of dried, crushed pyrethrum flowers in 1 litre of just boiled water with the lid on then allow to cool for at least 3 hours. Then add a teaspoon of soap flakes and put into a spray bottle. Spray directly on pests using a fine jet.	Stink Bugs, general insecticide.

6. Additional Organic Pest Prevention Strategies

Slugs and snails: Not all snails are bad. Leopard slug eats only dead decaying matter and fungi. Native snails eat introduced snails. For introduced snails and other slugs, check out the following options;

- crushed eggshells or copper edging tape around pots or plants.
- beer traps for slugs – google this.
- leaving halved citrus skins out overnight will attract the snails. In the morning, collect the skins and kill the snails or slugs in soapy water (or feed to duck/chickens).
- *Coffee Deterrent Recipe*: Add to 10 parts water, one part espresso coffee (not instant). Spray over the surface of leaves and soil where snails and slugs might crawl. Reapply after heavy rain.

Possums and Rabbits: In Australia, due to the protection laws around native wildlife (and general kindness to other living things) you cannot kill or harm possums. In extreme circumstances they can be caught and relocated but this must be done by a professional, if at all. The best methods for protecting your precious plants from possums or rabbits is **exclusion** (meaning, creating a physical barrier they cannot breach).

- **Netting**. Be mindful when placing nets to ensure other wildlife, including birds, aren't at risk of getting tangled and hurt. We recommend not to use netting with a hole size wider than 5mm x 5mm at full stretch. This is not a legislated requirement in NSW but best practice to protect wildlife. It is legislated in Victoria.
- **Wobbly fence.** A ground level exclusion fence made from chicken wire or other wire needs to be at least 30cm tall (88cm for rabbits) and 'wobbly' (for possums). If the fence is too stable, a possum will climb right over. To exclude rabbits, you will also want to bury some rabbit mesh or securely lay it flat on the ground at least 20cm beside the fence as well, to prevent digging under.
- **Cover the individual fruit** with small nets, fabric bags or by cutting on old plastic pot down one side and enclosing the fruit inside the upside-down pot. This is good for larger fruits and trees.

Rats and Mice: Left unchecked, rodent problems can grow and become harder to remedy. As always prevention is better than a cure. Ensure that no food waste is left in the open and you are visiting your garden regularly.

- **Rodent proofing** materials like wire mesh and keeping your yard free from open food waste helps to ensure you don't need poisons, because you haven't got issues with pest rats or mice. If you have compost in the garden, it is a good idea to install rodent control under any open base models. A high-quality version of this is available in our shop at Kimbriki EHG.
- **Classic snap-trap** mousetraps or other mechanical mouse traps remain one of the best ways to control pest rodents and are widely available. Just remember to use them away from other wildlife (e.g. indoors).
- **Flushing** rodent burrows thoroughly with water from a hose can make life very unpleasant for rodents and should encourage them to flee and move on. Rodents do not like wet or disturbed conditions.
- **Poisons** should always be a last resort, because rodenticides pose risks to non-target wildlife and pets. ALWAYS Read the label to find the active ingredient. Always avoid freely scattering bait pellets or paste in fear of poisoning non-target species including pets and children. Visit BirdLife Australia's website for up-to-date info on what baits to avoid https://www.actforbirds.org/what-to-buy-and-avoid. Some "safer" poison options:
  - ***Active Ingredient: Corn Gluten Meal & Sodium Chloride*** **e.g. Ratsak Naturals** – A non-anticoagulant. A human and non-rodent pet safe option. Causes rodents to dehydrate, by targeting rodent gut anatomy, specifically.
  - ***Active Ingredient: Cholecalciferol*** **e.g. Selontra** – A non-anticoagulant. Note that while Cholecalciferol poses a lower secondary poisoning risk for animals, there is no antidote if poisoning occurs. It is important to ensure that children, pets, and non-target wildlife cannot access this type of bait.

Brush Turkeys: These pesky birds can be very disruptive to veggie gardens as they have a habit of scratching up seedlings and tossing soil and mulch around. A key thing to remember when dealing with brush turkeys is that these are the composting champions of the bush. Their nesting mounds compost large volumes of native leaves and build healthy soil in the bush. Trapping, killing, poisoning or relocating them is not an option.

- **Physical barriers** such as weighting down mesh or placing large heavier objects in the locations of their scratching can be a good way to deter them and convince them to move on.
- **Give them what they want:** Some people swear by the tactic of placing purposeful heaps of native leaf litter in a less prized, decoy area of the garden for them to scratch through. This helps turn their attention away from your precious veggie patch.

Ants: Love dry, undisturbed areas to build their nests. They can also often be found to farm and protect some garden pests (aphids, scale and mealybugs) in exchange for the sweet honeydew they excrete. Once again though, ants contribute to the diversity of the garden and should be left alone if they aren't causing any major problems.

- In general, ant colonies will move on if they are disturbed or the conditions become too wet.
- **Physical barriers:** are the best solution to prevent them from farming the pests. Cardboard collars with glue will deny them access to larger trees. Do not apply glue directly to the trunks.
- **Boiling water:** can be poured directly into the top of ant nests if you absolutely need them to move on. Stand back as they won't be very happy about it.
- **Diatomaceous Earth**: sprinkled can create an uncrossable barrier and if it comes in contact with the ants, it will kill them.

7. Recognising the Problem

An important step to solving a pest issue is identifying the pest you're dealing with. Sometimes it can be multiple things at once which makes it even harder. Observation is key. You should **visit your plants often, check the underside of leaves, and remove dead or dying leaves.**

This course can only touch on a handful of the most common pests. For more extensive pest identification, the internet is your friend. **A simple google search of symptoms** can help you understand what may be affecting your plant.

- Aphids
- Caterpillars
- Leaf miners
- Mealy bugs
- Stink Bugs
- Slugs and Snails
- Thrips
- Whitefly
- Downy Mildew
- Powdery Mildew
- Spider Mites

Note: **Nutrient deficiencies** can cause symptoms similar to some pests – which relates back to the importance of healthy soil.

8. Commercial Organic Pest Control Options

Pyrethrum or Pyrethrins – organic insecticide

Can be bought as a spray or dust. Controls grasshoppers, ants, aphids, caterpillars and thrips. Organic pyrethrum is naturally derived from the Pyrethrum daisy group or *Tanacetum sp.* Pyrethrum is **non-toxic** to humans, birds and pets and is **biodegradable**. Some people even plant the flowers around their garden to passively deter pests. Synthetic pyrethrum is a safe alternative to certified organic pyrethrum.

Neem Oil – organic insecticide

Neem Oil is the oil pressed from the seed of a neem tree (*Azadirachta indica*). When the Neem plant is grown organically, this product is classified as an organic pest solution – Eco Neem. Unlike many commercial pesticides, **Neem oil is non-toxic to humans, pets, birds, bees or worms**. Yet it targets a broad range of mites, nematodes, leaf minors, fungi, bacteria and even some viruses. The plant absorbs the new oil via a foliar spray or through their roots with a root drench. Then, bugs who bite, suck or chew on a plant will ingest the neem oil. It targets a broad range of mites, nematodes, leaf minors, fungi, bacteria and even some viruses, caterpillar, mealybugs, curl grubs, citrus leaf miner, fungus gnats, spider mites, aphids, whitefly, lawn armyworm and sooty mould.

Diatomaceous Earth – organic arthropodicide

Diatomaceous Earth is made from the fossilised remains of diatoms, which are microorganisms with skeletons made from silica. It is a profoundly useful household ingredient that can eradicate any soft bodied, segmented bugs with an exoskeleton (bed bugs, aphids, pill bugs, mites, thrips, beetles, fleas, cockroaches, slugs and snails. However, some bugs are more susceptible than others. **Buy food-grade diatomaceous earth, which is safe for pets and humans**, this can be purchased readily online. The diatomaceous earth you buy looks like a fine, white powder but it has small modules with sharp edges. These sharp edges cut through the exoskeleton of the bugs and drain out the water and fat, dehydrating and destroying. It is used by sprinkling a fine dust over top and underside of plant leaves and the tops of soil, just after rain or morning dew. If it rains after the application, it will be washed away before it has a chance to work. You can also apply the diatomaceous earth after mixing it with water. This will help prevent the dust from spreading all over your garden. Being a fine white powder, it has the potential to disrupt respiratory symptoms if it becomes airborne. Please use relevant PPE.

Pelargonic acid/nonanoic acid (Slasher) – herbicide – non-selective

Nonanoic acid (often called pelargonic acid) is a naturally occurring medium-chain fatty acid. It is colourless with a weak odour and is both **antifungal and herbicidal**. It is found and extracted from a few different plant species and is an organic herbicidal solution. It is not selective as to which plants it affects so care should be taken when applying it around the garden. Nonanoic acid is the main active ingredient in the product sold as *Slasher.* Keep in mind that simply because it is naturally occurring does not mean that appropriate preventative measures and PPE should not be considered when using it. It is known to be a skin and eye irritant in humans. Always refer to the safety information on the label.

Wettable Sulphur – fungicide, miticide

Used for centuries in agriculture. Safe when used correctly. Useful for surface fungal pests like powdery mildew, black spot and rust. Useful against spider mite and citrus mite infestations.

Further Reading

BirdLife Australia, 2025 '*What to buy and What to avoid'* https://www.actforbirds.org/what-to-buy-and-avoid.

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