COMPANION PLANTING & ORGANIC BUG SPRAYS

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Learn how to appreciate insects……Add another dimension to how you garden; this could lead to some interesting new friends. There are insects all around us. The hidden world of garden creatures is fascinating and all part of the eco cycle that we live in. The insect world is vast. In Australia alone there are an estimated 85,000 different species of insects, with more being discovered all the time. Insects, along with other animals like spiders, snails and millipedes are all invertebrates. They are an extraordinarily diverse group in appearance and what they do. They have a very important role to play in the bush and in the garden.

There are composters, recyclers and scavengers that eat dead animals or fruit that has fallen out of trees, pollinators like butterflies and bees, soil aerators such as worms and defoliators like caterpillars, which are vital to the ecosystem. By eating foliage, shoots and growth on plants is encouraged to grow. This frenzy of eating usually happens only once a year as butterflies and caterpillars are mostly seasonal. This natural pruning is good for plants in the bush, but perhaps not so welcome in gardens.

There are nearly a hundred species of Huntsmen spiders in Australia. They are efficient predators and are good to have around the garden because they eat cockroaches, flies, mosquitoes, moths and other insects. Contrary to what some people think, they are not dangerous and cannot kill you. Learning to love spiders is one way that you can encourage and learn to care for the myriad of insects that keep our gardens flourishing. The compost bin is one place where you can witness just how efficient these creatures are. There are many different sorts creatures like earwigs, fruit flies, white flies other assorted flies and their larvae that are scavenging and composting the food scraps in a bin, converting it into nutrient-rich compost that can be added to the soil.

Garden snails are often regarded as pests that eat foliage in the garden, but they are also like small vacuum cleaners. As they move over logs, rocks and pathways, they clean the paths that they follow by eating litter, algae and lichen. They are themselves food for birds and other creatures in the garden, like Blue Tongued Lizards, who love to eat snails.

LOOKING THROUGH A MICROSCOPE Many insects have bizarre body shapes and structures, some are scary and some are just plain beautiful. Stick insects are one species that have always held a fascination for both young and old. Some of these are longer than an average hand. These defoliators usually only eat large eucalypts and wattles and won't come out of trees to eat ornamental plants in the garden. If they inadvertently make their way into the garden they are quite harmless and won't bite or sting.

Companion Planting: ideal for organic gardening because in nature, where plants grow without cultivation, there is always a mixture of plant types growing in an area. The selection of the plants living in an area depends on the soil type, local climactic conditions, and horticultural history.

With few exceptions, the plants that grow together in the wild are mutually beneficial in that they allow for maximum utilization of light, moisture and soil. Plants needing less light live in the shade of those which must have full light, while the roots of some plants live close to the surface and others send their roots far down into the ground. This is known as companion planting. Companion planting enables gardeners to make maximum use of sun, soil and moisture to grow mixed crops in one area.

Beneficial effects of Companion Planting: Some plants have a beneficial effect upon the garden because of some peculiar characteristic of their growth, scent, or root formation and soil demands. Odoriferous plants (the smelly ones), including those with aromatic oils, play an important part in determining just which insects visit the garden. Hemp, for instance, is said to repel the cabbage butterfly. But while some plants can repel insects, they can also hinder the growth rate of other plants or otherwise adversely affect them.

Below are combinations of vegetables, herbs, flowers and weeds that are mutually beneficial, according to reports of organic gardeners and companion planting guides.

Plant	Companion(s) and Effects
Asparagus	Tomatoes, parsley, basil
Basil	Tomatoes (improves growth & flavor); said to dislike rue; repels flies & mosquitoes
Bean	Potatoes, carrots, cucumbers, cauliflower, cabbage, summer savory, most other veggies & herbs
Bean (bush)	Sunflowers (beans like partial shade, unless you live up north, sunflowers attract birds & bees for pollination), cucumbers (combination of heavy and light feeders), potatoes, corn, celery, summer savory
Bee Balm	Tomatoes (improves growth & flavor).
Beet	Onions, kohlrabi
Borage	Tomatoes (attracts bees, deters tomato worm, improves growth & flavor), squash, strawberries
Cabbage Family (broccoli, brussel sprouts, cabbage, cauliflower, kale)	Potatoes, celery, dill, chamomile, sage, thyme, mint, pennyroyal, rosemary, lavender, beets, onions; aromatic plants deter cabbage worms
Caraway	Loosens soil; plant here and there
Carrot	Peas, lettuce, chives, onions, leeks, rosemary, sage, tomatoes
Catnip	Plant in borders; protects against flea beetles
Celery	Leeks, tomatoes, bush beans, cauliflower, cabbage
Chamomile	Cabbage, onions
Chervil	Radishes (improves growth & flavor).
Chive	Carrots; plant around base of fruit trees to discourage insects from climbing trunk.
Corn	Potatoes, peas, beans, cucumbers, pumpkin, squash
Cucumber	Beans, corn, peas, radishes, sunflowers
Dead nettle	Potatoes (deters potato bugs)
Dill	Cabbage (improves growth & health), carrots
Eggplant	Beans
Fennel	Most plants are supposed to dislike it.
Flax	Carrots, potatoes.
Garlic	Roses & raspberries (deters Japanese beetle); with herbs to enhance their production of essential oils; plant liberally throughout garden to deter pests.

Horseradish	Potatoes (deters potato beetle) around plum trees to discourage curculios.
Hyssop	Cabbage (deters cabbage moths), grapes; keep away from radishes.
Lamb's-quarters	Nutritious edible weeds; allow to grow in modest amounts in the corn.
Leek	Onions, celery, carrots
Lemon Balm	Here and there in the garden
Marigold	The workhorse of pest deterrents; keeps soil free of nematodes; discourages many insects; plant freely throughout the garden.
Marjoram	Here & there in the garden.
Mint	Cabbage family; tomatoes; deters cabbage moth.
Nasturtium	Tomatoes, radish, cabbage, cucumbers; plant under fruit trees; deters aphids & pests of curcurbits.
Onion	Beets, strawberries, tomato, lettuce (protects against slugs), beans (protects against ants), summer savory
Parsley	Tomato, asparagus
Pea	Squash (when squash follows peas up trellis), plus grows well with almost any vegetable; adds nitrogen to the soil.
Petunia	Protects beans; beneficial throughout garden.
Potato	Horseradish, beans, corn, cabbage, marigold, limas, eggplant (as a trap crop for potato beetle).
Pot marigold	Helps tomato, but plant throughout garden as deterrent to asparagus beetle, tomato worm & many other garden pests.
Pumpkin	Corn
Radish	Peas, nasturtium, lettuce, cucumbers; a general aid in repelling insects.
Rosemary	Carrots, beans, cabbage, sage; deters cabbage moth, bean beetles & carrot fly.
Rue	Roses & raspberries; deters Japanese beetle; keep away from basil.
Sage	Rosemary, carrots, cabbage, peas, beans; deters some insects.
Soybean	Grows with anything; helps everything.
Spinach	Strawberries
Squash	Nasturtium, corn.
Strawberry	Bush beans, spinach, borage, lettuce (as a border).
Summer Savory	Beans, onions; deters bean beetles.
Sunflower	Cucumbers
Tansy	Plant under fruit trees; deters pests of roses & raspberries; deters flying insects, also Japanese beetles, striped cucumber beetles, squash bugs; deters ants.
Tarragon	Good throughout garden.
Thyme	Here & there in garden; deters cabbage worm.
Tomato	Chives, onion, parsley, asparagus, marigold, nasturtium, carrot, limas.

Valerian	Good anywhere in garden.
Wormwood	As a border, keeps animals from the garden.
Yarrow	Plant along borders, near paths, near aromatic herbs; enhances essential oil production of herbs.

Natural Bug Sprays

Caution, please: not all house and garden insects are enemies to the propagation of healthy plants. Ladybugs, praying mantis, lacewings, spiders, and horsehair snakes are among the many winged or crawling "friends" in the garden who eat harmful insects. Please check before you spray.

Alcohol Sprays: The idea of using rubbing alcohol as a spray for plants pests has been around for years. Can cause leaf damage on African Violets, and Apple trees.

Protection offered: Alcohol sprays work on aphids, mealybugs, scale insects, thrips and whiteflies. Alcohol sprays have been used successfully on houseplants and tropical foliage plants. Most of these have heavy, waxy cuticles that are not easily burned.

How to Make: Use only 70% isopropyl alcohol (rubbing alcohol): mix 1 to 2 cups alcohol per quart of water. Using undiluted alcohol as a spray is very risky for plants. You can also mix up an insecticidal soap spray according to the dilution on the label but substitute alcohol for half of the water required.

How to Use: Since alcohol can damage plants always test your spray mix on a few leaves or plants first. Tests results should show up within 2 or 3 days.

Tomato Leaf: Nightshade family plants, such as tomatoes, potatoes and tobacco, have toxic compounds called alkaloids in their leaves. These toxins are water soluble and can be soaked from chopped leaves and made into home-made sprays. These sprays also work by attracting natural pest enemies. The good bugs follow the smell of the spray in looking for prey.

Protection Offered: Tomato leaf sprays have been used to protect plants from aphids. Also, spraying tomato leaf spray on corn may reduce corn earworm damage. The corn earworm is also called the tomato fruitworm, as it also attacks tomato plants. A scientific study has shown that corn plants sprayed with tomato leaf spray attracted significantly more Trichogramma wasps to parasitize the corn earworm eggs than the unsprayed did.

How to Make: Soak 1 to 2 cups of chopped or mashed tomato leaves in 2 cups of water overnight. Strain through cheescloth or fine mesh, add about 2 more cups of water to the strained liquid, and spray. For aphid control, be sure to thoroughly cover the leaf undersides, especially of lower leaves and growing tips of plants where aphids congregate.

How to Use: Spray plants thoroughly, particularly undersides of lower leaves and growing tips where aphids congregate. While this spray is not poisonous to humans on contact, use care in handling, especially if you are allergic to the nightshade family.

Garlic Oil Sprays: Organic gardeners have long been familiar with the repellent or toxic affect of garlic oil on pests. When it is combined with mineral oil and pure soap, as it is in the recipe that follows, devised at the Henry Doubleday Research Association in England, it becomes an effective insecticide. Some studies also suggest that a garlic oil spray has fungicidal properties.

Protection Offered: Good results, with quick kill, have been noted against aphids, cabbage loopers, earwigs, June bugs, leafhoppers, squash bugs and whiteflies. The spray does not appear to harm adult lady beetles, and some gardeners have found that it doesn't work against the Colorado potato beetles, grape leaf skeletonizers, grasshoppers, red ants, or sowbugs.

How to Make: Soak 3 ounces of finely minced garlic cloves in 2 teaspoons of mineral oil for at least 24 hours. Slowly add 1 pint of water that has 1/4 ounce liquid soap or commercial insecticide soap mixed into it. Stir thoroughly and strain into a glass jar for storage. Use at a rate of 1 to 2 Tablespoons of mixture to a pint of water. If this is effective, try a more dilute solution in order to use as little as possible.

How to Use: Spray plants carefully to ensure thorough coverage. To check for possible leaf damage to sensitive ornamentals from the oil and soap in the spray, do a test spray on a few leaves or plants first. If no leaf damage occurs in 2 or 3 days, go ahead and spray more.

Herbal Sprays: Many organic farmers are familiar with using sprays made from aromatic herbs to repel pests from the garden plants. Several recent studies confirm the repellent effect of such sprays. The essential oil of Sage and Thyme and the alcohol extracts such as Hyssop, Rosemary, Sage, Thyme, and White Clover can be used in this manner. They have been shown to reduce the number of eggs laid and the amount of feeding damage to cabbage by caterpillars of Diamond back moths and large white butterflies. Sprays made from Tansy have demonstrated a repellent effect on imported cabbageworm on cabbage, reducing the number of eggs laid on the plants. Teas made from Wormwood or Nasturtiums are reputed to repel aphids from fruit trees, and sprays made from ground or blended Catnip, Chives, Feverfew, Marigolds, or Rue have also been used by gardeners against pests that feed on leaves.

Protection Offered: Try herbal sprays against any leaf-eating pests and make note of what works for future reference.

How to Make: In General, herbal sprays are made by mashing or blending 1 to 2 cups of fresh leaves with 2 to 4 cups of water and leaving them to soak overnight. Or you can make a herbal tea by pouring the same amount of boiling water over 2 to 4 cups fresh or 1 to 2 cups dry leaves and leaving them to steep until cool. Strain the water through a cheesecloth before spraying and dilute further with 2 to 4 cups water. Add a very small amount of non-detergent liquid soap (1/4 teaspoon in 1 to 2 quarts of water) to help spray stick to leaves and spread better. You can also buy commercial essential herbal oils and dilute with water to make a spray. Experiment with proportions, starting with a few drops of oil per cup of water.

How to Use: Spray plants thoroughly, especially undersides of leaves, and repeat at weekly intervals if necessary.

"Hot" Dusts: Black pepper, chili pepper, dill, ginger, paprika, and red pepper all contain capsaicin, a compound shown to repel insects. Synthetic capsaicin is also available for field use. Researchers have found that as little as 1/25 ounce of capsaicin sprinkled around an onion plant reduced the number of onion maggot eggs laid around the plant by 75%, compared to a control plant.

Protection Offered: Capsaicin-containing dusts repel onion maggots from seedlings, as well as other root maggot flies from cabbage family plants and carrots. Pepper dusts around the base of the plants help repel ants, which is desirable in a garden where ants often protect and maintain aphid colonies on plants.

How To Make: It can be rather expensive to buy enough packaged pepper dusts to sprinkle throughout your garden. However, if you grow and dry your own red peppers, chili peppers, or dill, you can make lots of dust at low cost. Use a mortar and pestle to grind the peppers, or dill, including the seeds, to dust. Be careful handling the hot peppers because they irritate sensitive skin.

How to Use: Sprinkle along seeded rows of onions, cabbage, or carrots, in a band at least 6 inches wider than the row or planting bed. A fine sprinkling will suffice, but the more dust you use, the better the effect. Renew after a heavy rain or irrigation. To protect plants from ants, sprinkle around the base of plants in an area as wide as the widest leaves.

Pyrethrin: The dried, powdered flowers of the pyrethrum daisy, Tanacetum cinerarifolium, were used as early as 1880 to control mosquitoes. The popularity of pyrethrum insecticides waned when synthetic insecticides were introduced, but they are now enjoying a commercial comeback.
Many new products formulated with natural pyrethrums are available. Pyrethrins are the insecticidal chemicals extracted from the pyrethrum daisy. Do not confuse them with pyrethroids, the term for a new class of synthetic pesticides.

Pyrethrums, which are mainly concentrated in the seeds of the flower head, are a contact insecticide, meaning the insect only has to touch the substance to be affected. Pyrthrins have a quick knockdown effect on insects: Flying insects are paralyzed. Pyrethrins can be applied up to one day before harvest because they are quickly destroyed by light and heat and are not persistent in the environment. Pyrthrins will kill lady beetles but do not appear to be harmful to bees. They are toxic to fish and to the aquatic insects and other small animals that fish eat but do not seem to be toxic to birds or mammals.

Protection Offered: Pyrethrins are registered for flowers, fruits, and vegetables, including greenhouse crops. They are effective on many chewing and sucking insects, including most aphids, cabbage loopers, celery leaftiers, codling moth, Colarado potatoes beetles, leafhoppers, Mexican bean beetles, spider mites, stink bugs, several species of thrips, tomato pinworms, and whiteflies. They are especially good against flies, gnats, mosquitoes, and stored products pests. Flea beetles are not affected, nor are imported cabbageworms, diamondback moths, pear psylla, and tarnished plant bugs.

How to Make: If you grow your own pyrethrum daisies, you'll have the main ingredient for a make-it-yourself spray. The concentration of pyrethrums is at its peak when the flowers are in full bloom, from the time the first row of florets open on the central disk opens too the time all the florets are open. Pick flowers in full bloom and hang them in a sheltered, dark spot to dry. Once the flowers have dried thoroughly, grind them to a fine powder, using a mortar and pestle, old blender or small hammer mill. Mix with water and add a few drops of liquid soap. Store in a glass jar and keep the lid tightly closed, because the mixture looses activity if left open. You'll have to experiment with the amount of water to add, because the concentration of pyrethins in the flowers is an unknown variable. If the spray you make does not seem to kill insects, use less water the next time you make the concentrated spray. Also keep in mind whole flower heads stay potent longer so do not grind until ready to use.

How to Use: Pyrethrins are more effective at lower temperatures, so for best results, apply in early evening when temperatures are lower. Spray both the upper and lower surfaces of the leaves, because spray must directly contact the insects such as thrips that hide in leaf sheaths and crevices. The first spray will excite them and bring them out of hiding, the second will kill them. Never use pyrethrin products around waterways and ponds.