



Grow It

**Making it easy to create gardens, grow
food
and compost in Nelson**

Urban Food Growing Resource

Partnership members:

Victory Community Centre, Nelson Marlborough District Health Board, Nelson City Council, Nelson
Environment Centre, NZCU South, Waimarama Community Garden



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CHOOSING YOUR VEGETABLE GARDEN SITE

There are several factors to consider when deciding where to place your vegetable garden or gardens to provide the best growing conditions for your vegetables.

Things to consider:

- **Adequate sunlight** – ideally the vegetable garden will receive six hours sunlight each day.
- **Protection from strong winds** – strong winds can damage plants especially taller plants such as corn and Brussel sprouts, which may be uprooted and blown over.
- **Shade** – shady areas may not receive enough sunlight for the vegetables to grow and the shaded areas will be different in summer than winter because of the angle of the sun.
- **Frost pockets** – some areas of your section may receive more frost than others and it is best to site the vegetable garden where less frost occurs, if possible.
- **Trees** – nearby trees may create shade (remember deciduous trees lose their leaves in winter but create shade in summer with their leaves). Some trees are greedy e.g. willows, and their roots may be a problem if they spread into the vegetable garden for the rich soil.
- **Access to water** – it is easier to water the garden if there is a tap nearby or a hose that can reach the vegetable garden.
- **Proximity to house and areas of the property regularly used** – if the vegetable garden is out of site, it will probably be out of mind! Ideally grow vegetables that you harvest regularly e.g. salad greens or ones that need more care close to the house and vegetables like potatoes, can be grown further away from the house because they need less attention. This means you will see when a plant needs extra care, for example, you'll notice holes in the leaves of your cabbage and deal with the caterpillar before it causes too much damage.

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GARDEN TOOLS

Tool Selection & Purchase

A tool usually comes in several shapes and styles, to provide for particular uses. Get tools that are reasonably lightweight and balanced, but have heavier steel heads. Try a new tool out in the store by handling it as if you were using it in your garden.

Basic tools:

- Shovel
- Spade
- Fork
- Rake
- Hoes (chop and push versions)
- Hand trowel
- Hand fork
- Wheelbarrow

Guidelines for Selecting the Best Tool for You :

- ✓ the tool **handle** is a comfortable length for your body, and is solidly attached – decide on a wooden, plastic or metal handle
- ✓ the **blade** length, width and shape is the one which is right for your needs
- ✓ the **welding joint** is strong, and not done where the tool blade meets the stem at the narrowest point – the best blades (but the most expensive tools) are where the blade and stem are cast as one unit
- ✓ for **digging tools** – the top of the blade is rolled over into a good **lip**, so that you can press down hard with your foot without pain

Tool Types:

Shovel: Used to lift and throw loose materials. A good shovel has a broad open blade with a 'rolled' lip on top for boot support.

Spade: Designed to dig straight down and loosen compact soil and to dig holes. The flat, narrow blade isn't the best tool for turning or moving earth.

Fork: For loosening up soil, and rapidly turning soil.

Rake: Used to loosen or level the surface of the ground.

Hoes:

'Chop or Cultivating Hoe' – a rectangular blade attached to a 'swans neck', which is bent so that the blade is parallel to the soil when held. This angle allows you to rapidly and easily cut off weeds just below the soil surface, whilst loosening the soil. This is done by pulling the blade towards you approximately 1cm under the surface. You can also use the corner of the blade to chop out resistant clumps of grass and large weeds, make furrows for planting into, and weed compact soil, including paths.

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'Push-pull Hoe' – an elongated-oval-shaped blade with a sharp point at both ends. This works by gliding back and forth through soft cultivated soil, cutting weeds off just below the surface on both push and pull strokes.

Hand tools: A hand-trowel and hand-fork are good for close-to-ground work (e.g. planting seedlings, weeding between plants) and are also suitable for children. Other excellent hand-tools which are harder to get hold of are: *angle-weeder (niwashi)*, *sickle*, *kama (Japanese sickle)* and *hand grubber*.

Wheelbarrows:

A good general purpose wheelbarrow with a wide and shallow tray is great for home gardens. Load your barrow so that most of the weight is at the end farthest from the handles, and evenly balanced on both sides to make pushing easier.

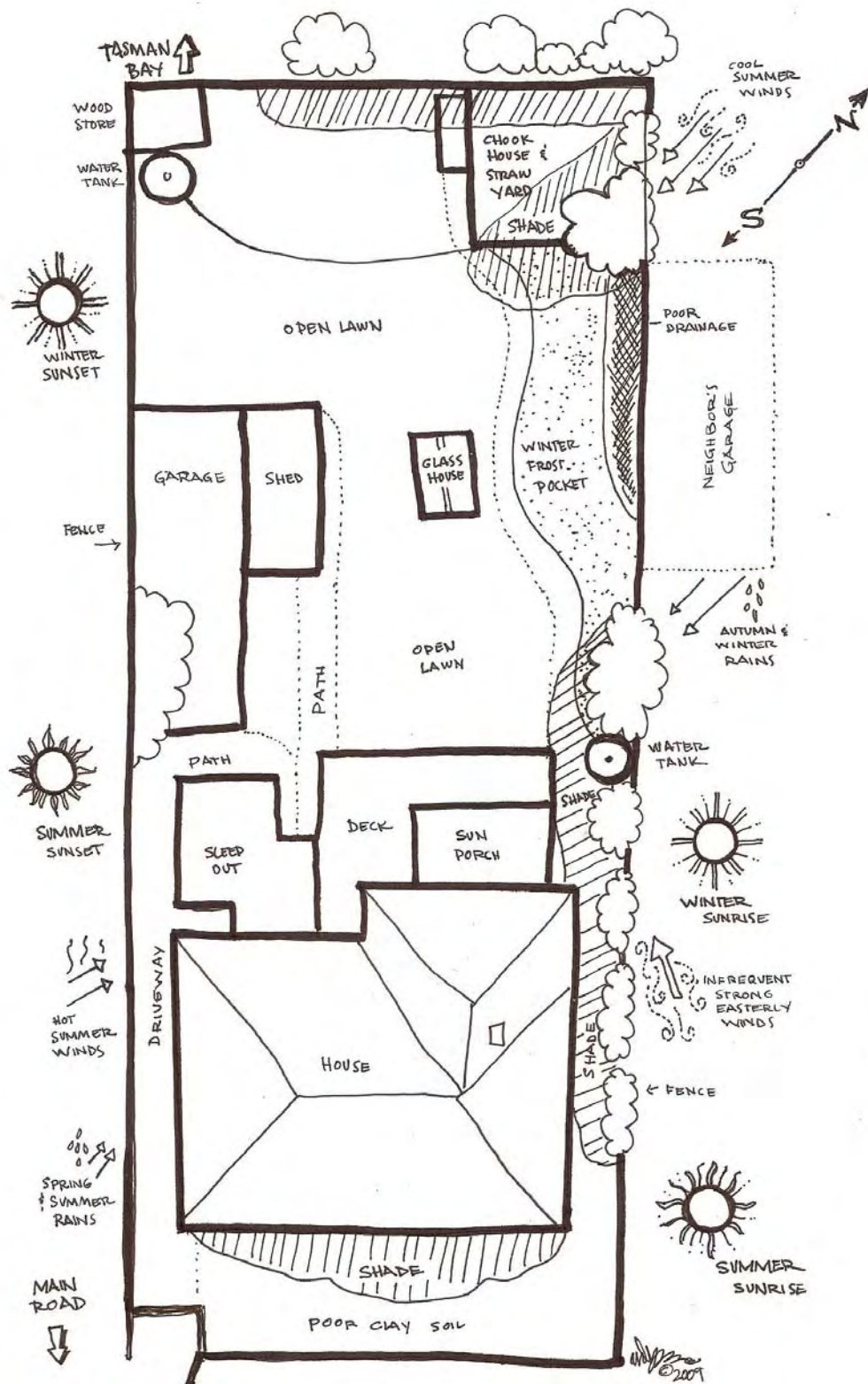
Tool Care

- * Clean your tools straight after use, removing dirt with a wire brush, or a strong scrubbing brush and water, and then dry them in the sun.
- * Keep in a non-moist environment to prevent rusting. Keep blades reasonably sharp.
- * If you have wooden handles, oil them with boiled linseed oil or coconut oil on a soft rag.
- * Oil the steel with mineral/machine oil (e.g. used diesel/crankcase oil).

Remember, your tool is like a best friend, and if taken care of, it can last a lifetime!



HOW CLIMATE AFFECTS A SUBURBAN SECTION

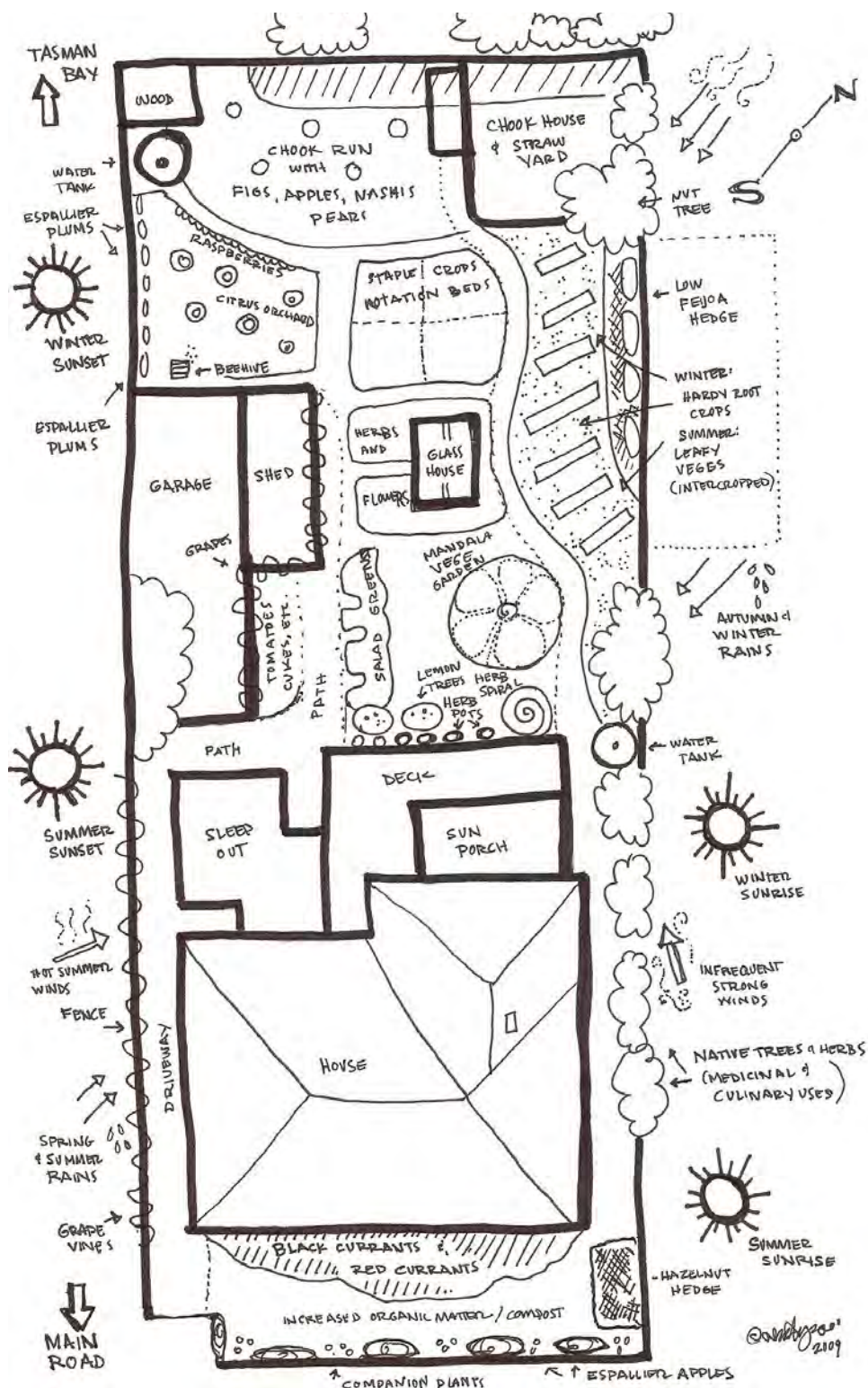


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BEST USE OF SPACE FOR PRODUCING FOOD



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SOIL TESTING – SOIL ASSESSMENT CHART

(Earth Care Aotearoa)

<i>Sampling Spot</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<i>Current Land Use (describe)</i>				
<i>Current Cover Plant Species</i>	0----- -----10 Diversity	0----- -----10 Diversity	0----- -----10 Diversity	0----- -----10 Diversity
<i>Current Cover Insect Life</i>	0----- -----10 Diversity	0----- -----10 Diversity	0----- -----10 Diversity	0----- -----10 Diversity
<i>Soil Colour</i>	Light----- -----Dark	Light----- -----Dark	Light----- -----Dark	Light----- -----Dark
<i>Soil Texture Finger Rub Test (moisten) Describe</i>				
<i>Soil Life</i>	0----- -----10 Diversity	0----- -----10 Diversity	0----- -----10 Diversity	0----- -----10 Diversity
<i>Sausage Test</i>				
<i>Jar Test</i>				
<i>PH Test 7.5 → 7.0 → 6.5 → Alkaline Neutral Acidic</i>				

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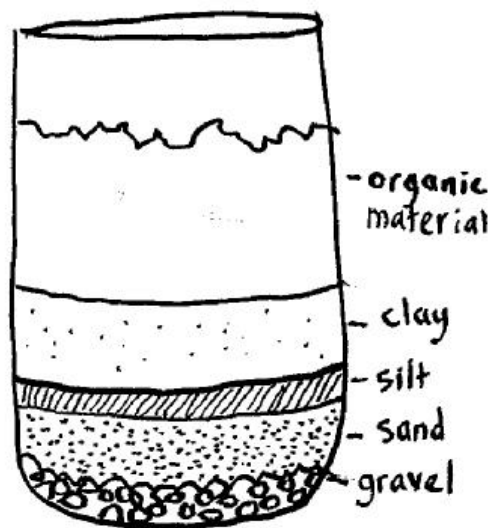
SOIL ASSESSMENT – JAR TEST

For this test you need one flat bottomed glass jar and lid.

Fill the jar with:

- $\frac{1}{4}$ soil
- $\frac{3}{4}$ water

Put the lid on the jar and shake vigorously then leave the jar to stand for 24 hours. After 24 hours the layers will settle (see diagram)









(diagram showing example of how layers can settle in the water)

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SOIL TESTING: 'SAUSAGE TEST' FOR SOIL TYPE

WHAT SOIL LOOKS LIKE	WHAT SOIL FEELS LIKE	WHEN ROLLED INTO A SAUSAGE	SOIL SAMPLES	THE SOIL IS
VERY SANDY	VERY ROUGH	CANNOT BE ROLLED INTO A SAUSAGE		VERY SANDY
QUITE SANDY	ROUGH	CAN BE ROLLED INTO A SAUSAGE BUT IT CANNOT BEND		SANDY
HALF SANDY AND HALF SMOOTH	ROUGH	SAUSAGE CAN BEND A LITTLE		SANDY LOAM
MOSTLY SMOOTH	A LITTLE SANDY, QUITE SMOOTH BUT NOT STICKY	SAUSAGE CAN BEND ABOUT HALF WAY ROUND		LOAM OR SILT LOAM
MOSTLY SMOOTH	A LITTLE SAND, QUITE SMOOTH AND STICKY	SAUSAGE CAN BE BENT MORE THAN HALF WAY ROUND		CLAY LOAM OR SANDY CLAY
SMOOTH	SMOOTH AND STICKY	SAUSAGE CAN BEND INTO A RING		CLAY

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IMPROVING YOUR SOIL: COMPOSTING, WORM FARMS & BOKASHI

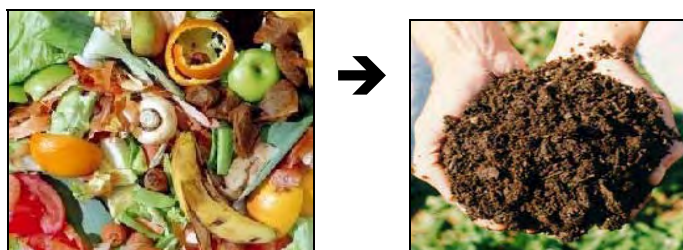
For a comprehensive on-line resource on composting, worm farms and bokashi, go to www.createyourowneden.org.nz, and don't forget to check your local council website for any subsidies on bin purchase/retailers.

Examples of bins and worm farms:



Composting is a process which mimics nature by recycling organic garden material and food scraps in a valuable, humus-rich soil called compost.

The method you choose will depend on what resources you have available, the space you have and how you want to use the end product. If you're not sure, have a look at the Create Your Own Eden website for some ideas. For smaller regular quantities of food scraps, a worm farm or Bokashi bucket (using a dried mix of micro-organisms which 'pickle' your food scraps) is best. Both can sit in your kitchen or on your verandah. Compost bins or heaps need to be outdoors, and if you are including garden waste you will need a larger bin or heap.



- Materials:** Use a good mix of green and brown materials – see note below
Water: Ensure the heap is damp but not waterlogged
Air: Your heap will benefit from being turned occasionally so some air can get in
Greens = grass, food scraps (particularly fruit and veg), weeds, green leaves, manure..

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Browns = twigs, sawdust, wood chips, bark, paper and cardboard (torn into small bits), egg cartons, straw/hay

Materials to avoid:

Meat, fish and dairy products, dog and cat waste, oils and fats, diseased plants, bamboo, flax and cabbage tree leaves, weeds that have seeded

Setting up a compost bin or heap:

- Choose a warm, sheltered site away from close neighbours and water greedy trees such as willows
- Start with a layer of course brown materials – twigs are ideal – then build alternate layers of green and brown materials
- Continue to add a good mix of greens and browns
- Once your bin starts filling up, turning the contents using a garden fork will speed the process and give a more consistent result
- Avoid excessive moisture by keeping your compost covered.
- If you have a smaller bin or heap, composting will take longer as the material may not heat up as much
- Compost is ready when it becomes a dark crumbly material with an 'earthy' smell, and you can no longer recognize the materials that were added
- Compost can be used as a mulch to prevent weeds growing and to keep moisture in soil
- Compost can also be dug in to improve soil fertility and drainage
- Small amounts of sieved, mature compost can be used as a component of potting mix

FREQUENTLY ASKED COMPOSTING QUESTIONS:

What makes my compost smell?

Compost will start to smell if you have too many nitrogen rich materials ('greens'), and if it gets too wet. This means that fresh air can't get in to the pile, which becomes acidic. Adding some garden lime will help in the short term, but the best way to avoid smells is to make sure you have a good mix of greens and browns (Carbon rich). Turning your pile will also help.

How do I stop rodents getting into my compost bin?

Add grass clippings to increase heat and turn regularly. Wire garden mesh can be used to create a physical barrier.

How long do I have to wait till I get compost?

A well maintained compost bin will produce compost in 3-4 months in summer and up to 6 months in winter. However, it can take a shorter or longer time depending on the method, what goes into the bin, time of year and regularity of turning.

Do I need to add water to my compost bin?

If your compost is sited in a sunny spot, it may be necessary to add water over the summer.

How will compost help my garden?

Compost feeds the soil, helps with water retention and encourages earthworms into your garden.

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My pile isn't breaking down?

This can be because there isn't enough material in your pile, or there is a lack of nitrogen rich materials ('greens') in your pile, or because it has dried out. Adding more green material will help to kick-start the process.

There are loads of flies in my compost?

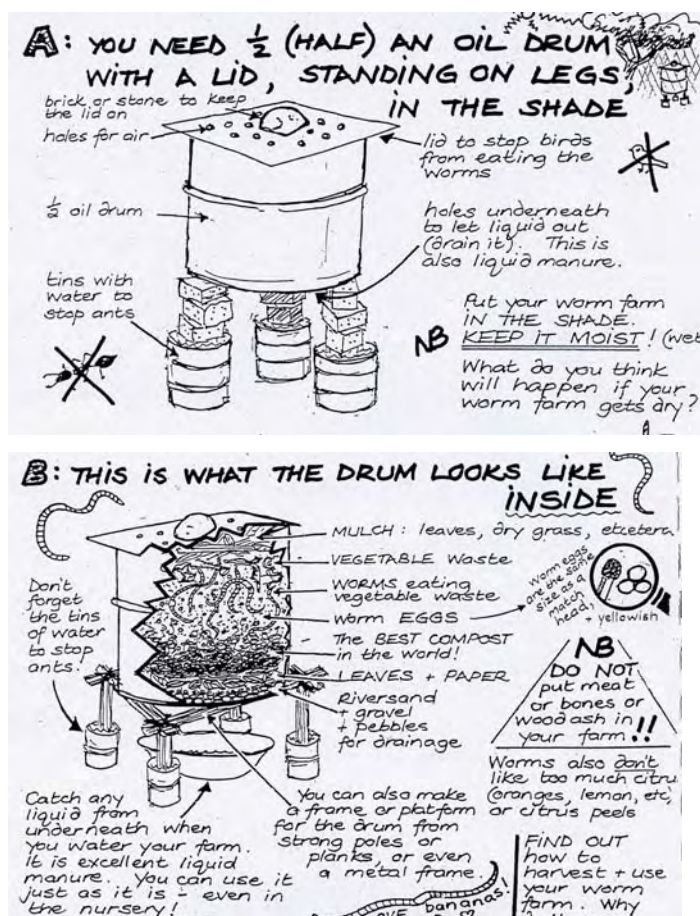
Small fruit flies will appear wherever there is fruit waste breaking down. They will not affect the compost and may attract birds to your garden. To minimise fruit fly numbers, keep the lid on your compost and bury fruit waste under a layer of grass or leaves.

(Larger house flies are attracted by meat waste – make sure that you don't add any to your heap.)

WORM FARMS:

Creating a mini-worm farm is a great way of dealing with household waste and producing vermicast and worm juice – both great for growing food. Worms demolish most food scraps as long as balanced with moist carbon-type materials such as paper. Worm bins need a hole in the bottom so the worm juice can drain and a container underneath to catch the worm juice. Put damp soil or compost in the bottom (about 15 cm deep) to begin with. Cover the bin to keep it dark and regulate moisture.

How to make a worm farm using a recycled drum, bath or other container:



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NB: ants are not such a problem here, so less need to worry about the tins of water in the diagram.

BOKASHI:

Bokashi is a great indoors solution - using a two bucket system to create fast, non-smelly high quality black organic compost, literally pickling food through the use of a micro-organism additive. It's a good solution where there is insufficient space outside for composting, or organic waste quantities are relatively small. It's a versatile anaerobic system which can take just about any type of food waste except for meat bones and liquids, but unlike compost and worm farms, it doesn't take paper or other carbon-type materials.

Step by step guide to Bokashi:

- Put your bucket in a warm spot but out of direct sunlight and add a tablespoon of Bokashi mix.
- Add food, all foods are OK including meat and citrus. Avoid excessive liquids and oils, paper and plastic.
- Press down on food to avoid air pockets and break up large pieces of food.
- Sprinkle about 2 tablespoons of Bokashi over the food as you add it (about 2 tablespoons per ice-cream container of food). Close the lid between uses, make sure the lid is sealed.
- Drain the juice once or twice a week.
- Keep adding food, sprinkle with Bokashi until the bucket is full.
- Stand in a warm place for 7-10 days.
- You now have a bucket of nutrient-rich compost! Note the food will not change its appearance or decompose in the bucket – this is normal. You may notice a white mould, this is a good sign. The mix will decompose once buried in the soil, or your compost heap.
- Simply dig into your veggie garden – dig a trench or holes about 30cm deep, mix with soil, and cover with soil. (Note – You can choose to put the fermented bokashi food into your compost heap – this is great for your compost and will break down very quickly.)
- 3-4 weeks later you will have black organic plant food.
- If using around trees dig holes at about 60cm spacing on the drip line of the tree.
- Note you can plant into your Bokashi after about 2 weeks. Any sooner than this may burn the roots of plants.
- Using the juice – the amount and colour produced will depend on the food in your bucket. Bokashi juice makes great liquid fertilizer. Add 4 tablespoons to 4 litres of water and pour around plants.
- You can also neat use Bokashi juice to clean drains!

TRENCHING:

Trenching is an old fashioned method that appears to be gaining in popularity again because it's so simple.

Basically, dig a trench in your garden and leave the soil beside the trench. Empty your food scraps into one end of the trench and cover with the soil. Continue until the trench is finished and then start another trench (or you could just bury food scraps but this system allows you to clearly see where you have buried your waste).

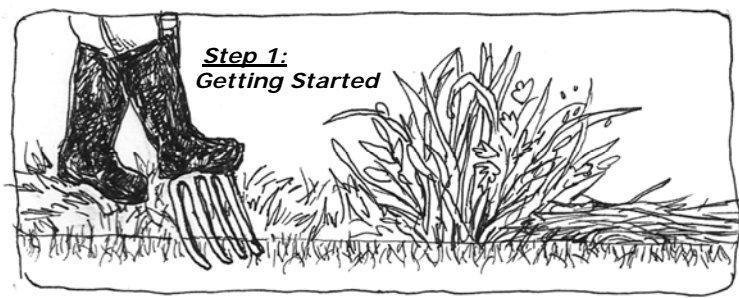
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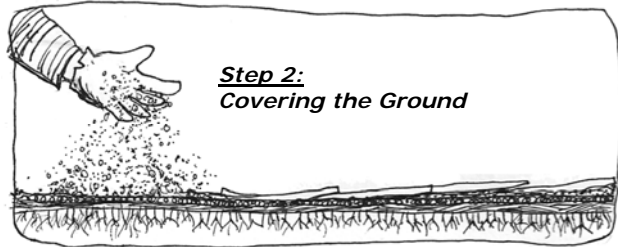


NO-DIG GARDENS

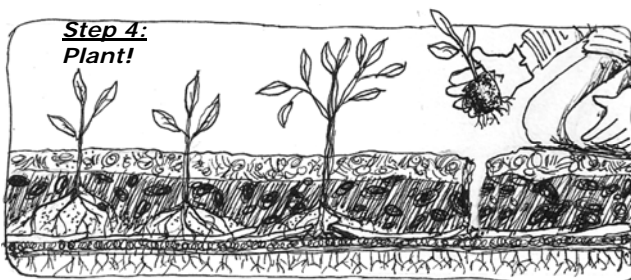
A bed built in layers, directly on the ground. Not using the existing soil but creating it anew from the materials you introduce. Ideal for using with compact & clay soils – even concrete!



Clear the surface ground you want to make your garden on. No digging is necessary at all. If there are weeds, simply slash them down and lay them evenly over the area to be worked on. Leave their roots in the soil (food for earthworms!). Rock back & forth on your fork to open up airspaces in the soil. Don't turn the soil over.

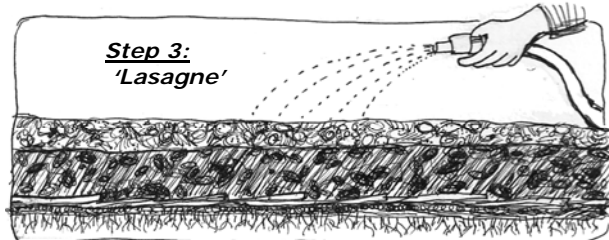


Apply a sprinkling of organic fertilizer. Wet your newspaper or cardboard (soaking in a wheel-barrow works well). Overlap cardboard or newspaper 'wads' approximately one hand-length on top of neighbouring ones. If using newspaper instead of cardboard, put each 'wad' 7 layers thick.



YOU WILL NEED

- a fork
- **organic fertiliser** (for 1st layer)
e.g. blood & bone, seaweed meal, lime, broken down animal manure
- **flattened cardboard boxes** (remove tape) or non glossy newspaper.
- **for CARBON (dry) layers:**
straw, hay, old sawdust, dead leaves, shredded paper, old fine bark
- **for NITROGEN (moist) layers:**
food scraps, fresher manures, weeds (non invasive types), fresh grass clippings, other plant material.
- **water** for wetting cardboard and spraying dry layers
- **compost and topsoil** (if planting in immediately)



Alternate carbon & nitrogen layers to at least 30cm high. Carbon (= 'dry brown'), then Nitrogen (= 'moist green, moist brown or moist multi-colour', i.e. food scraps), and then Carbon again, and so on.

NB: Use food scraps near the bottom. Don't use meat - too slow to break down and too attractive for dogs to dig up!

If planting immediately into the bed, create 'wells' for seedlings, and 'furrows' for seeds, put compost-topsoil mix in them and plant into that. However, the preference is to not plant for approx 3 months - until materials are decomposed.

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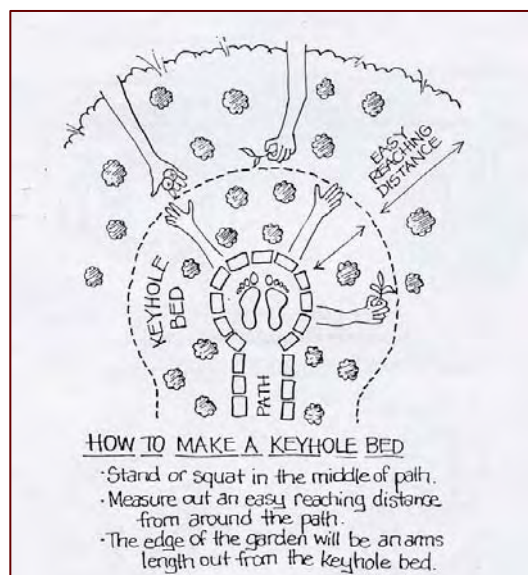
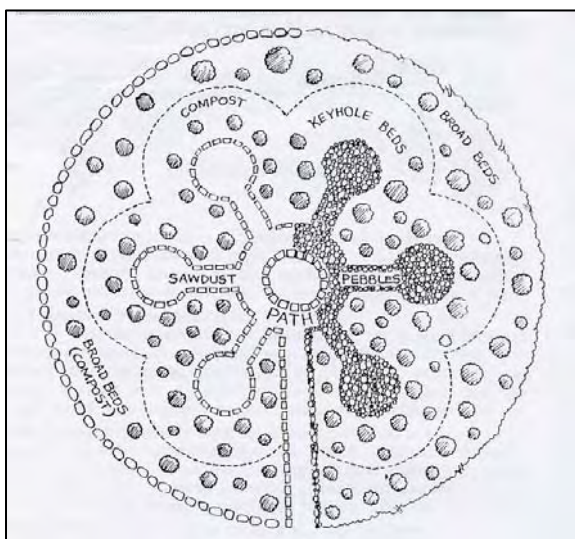
KEYHOLE BEDS AND MANDALA GARDENS

Each time you walk on your vegetable garden you compact the soil. This damages the soil structure, making it harder for water to be absorbed, harms the micro-organisms in the soil, and damages plant roots. Therefore it is best not to walk among your vegetables, and instead shape your garden beds so you can reach all of it from the paths. Keyhole beds are good for this, but if you prefer more traditional square or rectangular beds, make sure the beds are no more than a metre wide so you can reach any growing area without standing on the soil.

Keyhole beds are semi-circular beds around a central access spot, where you stand to work or harvest from. You can also work from the outside edge of the bed. Use keyhole beds alongside a path or a verandah, or even join them together in a circle to form a 'mandala garden' (see illustration below) with something special in the centre e.g. herb garden, worm pit, bean tripod, small fruit tree, tyre pond.

The width of a keyhole bed will be determined by how far you can reach from the keyhole itself into the middle of the garden area, and from the outside of the garden into the middle of the planting area. Make the keyhole big enough to stand or squat in.

It is easy to make a keyhole bed from a sheet-mulch/no dig garden. Simply make up a circular shaped no-dig garden, and before putting the top layer of mulch on, use a piece of rope to mark out the keyhole shape, dig it out and place the contents on top of the rest of the no-dig bed, then put the mulch layer over it.



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DOUBLE-DIG GARDENS

This method is for soils that are compact or low in fertility. It is not needed for sandy or loamy soils. It 'fluffs up' the soil, bringing airspaces into it, enabling the soil to 'breathe'. Part of the process is to put in an underlay of 'soil food' to be broken down by micro-organisms and earthworms over time, to become enriching food for the vegetables grown there. Although it takes a bit of time and sweat, it only needs to be done once, and from there on simply aerated from time to time by putting in a fork and rocking on it back and forth, over the whole bed.

Double-Digging Steps

Step 1:

(a) Mark out your bed length and width. For accuracy, use a 'string line' for all the edges. This is a strong string (of easily visible colour) the length of your bed or more, wound around a stick at both ends which you anchored into the soil once you have marked out the length.

(b) If the area is weedy or has long grass, scrape the weeds off with a sharp spade and put to one side to use later in the trench. Fork out their roots and put into your compost bin.



(c) For the first 'bite', start at the beginning of your bed. Take out approximately 1 spade-blade depth (no less, could be more if your soil is not clayish), and 1–2 spade-blade lengths of topsoil and put it into your wheelbarrow. Cart it to the end of the marked out bed and deposit it at the side there for later. If you have taken off weeds, cart them too (separately) and make a pile alongside.

Step 2:



(a) Put your fork into the open soil and rock it back and forth (for aeration).

YOU WILL NEED

- String line
- Spade or shovel
- Fork
- Wheelbarrow
- Some organic matter e.g. animal manure, vegetable scraps, weeds, grass clippings, etc.
- Blood and bone and lime (optional)

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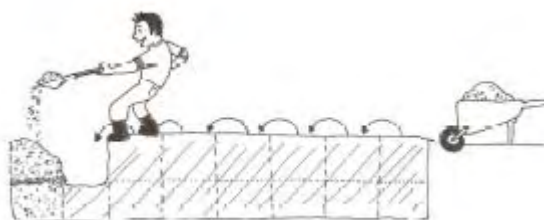
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Step 3:

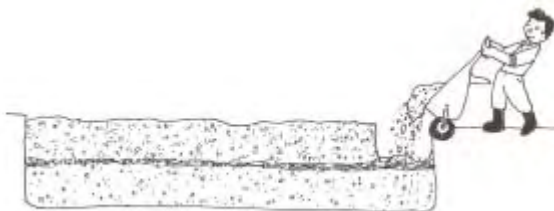
- (a) Put a layer of organic matter into the hole. Scrape off the weeds (first check they are the non-noxious kind!) from the next 'portion' along the bed, and put them into the hole. Beforehand put in some animal manure if you have this. Otherwise you could add 'blood & bone' or other soil nutrients in with the weeds. Add a dusting of lime on top of this. As in (1b), fork out the roots from the area you have just scraped the weeds off.

NB: If you are going to plant a green manure crop straight into the bed when it is finished, adding the extra organic matter (as above) into the middle layer is not essential.



- (b) Dig out the next portion of the bed and put it into the first hole. It will likely create a mound due to the organic matter and the aeration process.

Step 4:



- (a) Repeat Steps 2 and 3, until you come to the end of the last hole at the end of the bed.
- (b) After this is dug, fill it in with any weeds you took from the beginning of the bed, plus any other organic matter as before. Cover this with the mound of soil you took from the first hole.
- (c) Now your bed is complete and you can start planting soon! Ideally, give the bed about a week to 'settle' first.

NB: For the next planting season, simply aerate the soil but putting your fork in and rocking

back and forth on it, then move onto the next section and do again, and again.

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RAISED BED GARDENS

Advantages of a Raised Bed?

1. Soil warms up more quickly, enabling both earlier and later crops.
2. Has a deeper layer of topsoil, with compost concentrated in the growing area.
3. Better drainage and equal moisture (and light) distribution for plant access
4. Less weed germination.
5. Makes crop rotation simple.
6. Standard size makes using a chicken tractor (simple moveable chicken coop) easy.
7. Easy to attach cloche hoops (or strong wire supports) to create a micro-climate, e.g. shade cloth in summer and clear plastic in winter.
8. Easy to manage, including the pathways in between.
9. Beds are never walked on and weeding is done without standing on soil, protecting the soil structure and soil life.

YOU WILL NEED

- String line
- Spade & fork
- Topsoil/compost
- Siding materials
- Stakes
- Seeds/seedlings

Suggestions for Siding Materials

1. ***Sleepers*** – macrocarpa or eucalypt last a long time and can handle soil contact and weather extremes.
2. ***Boards*** – line with plastic if treated timber (preferably don't use treated timber at all).
3. ***Long-necked wine bottles*** (up-ended in the soil) – make whatever outline shape you want!
4. ***Low woven fencing*** with flexible narrow branches e.g. willow, hazel.
5. ***Wood off cuts*** (like tallish firewood) with flat sides, bound together on the flat side with a few lines of fencing wire and fastened to each piece of wood with fencing staples (just like you see commercially)
6. ***Bricks*** (several layers) or ***concrete blocks*** (in layers, or positioned on ends for depth).
7. ***Stakes (metal or wooden)*** –for strengthening/anchoring sides, if using boards.

Dimensions: Width – you need to be able to reach across from either side without standing on the garden e.g. 1 metre across by 2–3 metres long. (Can be any length).

Paths should be wide enough to get a wheelbarrow through and to kneel down comfortably to harvest.



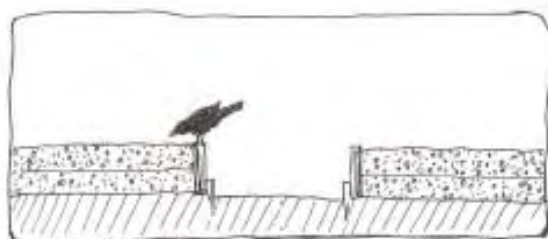
Options for Making Raised Beds

1. You can build your bed up by doing the **no-dig method**, either on open ground then making a structure around it, or by making the structure first and then laying out the sheet mulch layers.
2. A **double-dig bed** can also become a raised bed (especially easy if you have stacked in plenty of organic matter), just by putting sides on it, then adding more topsoil once the organic matter is 'digested' into the soil and the bed sinks a bit.
3. **Standard Method** :

Steps to Making a Standard Raised Bed

1. Prepare the area

- (a) Aerate the soil in the chosen area, by rocking back and forth with a fork.
- (b) Weed the whole area if needed. Add a thin layer of new topsoil (and/or compost if you have this) over the whole area.
- (c) Mark out bed areas accurately with a String line (just like in the Double-Dig handout section 1a).
- (d) Frame up the beds (see materials list above). Anchor the frames with wooden or steel pegs (unless using the 'corner-locking' method for wood sleepers).
- (e) Add in animal manure and other nutrients if the topsoil is thin.



- (f) Remove all topsoil from path areas (new and previous) and put it into the framed beds.

- (g) Replace the path soil with hardy path material e.g. fine woodchip, sawdust or crushed shells. For minimizing weeds, use a cardboard underlay first.

2. Plant directly into your Raised Bed:



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3. Happy harvesting!



4. Then...

Add compost and plant again.

As the soil is really fertile, the interplanting / intercropping approach works well, as there are plenty of nutrients to support all the plants to be healthy and strong.



NELSON PLANTING CALENDAR

VEGETABLE		SOW =												VEGETABLE		SOW =											
		TRANSPLANT –														TRANSPLANT											
		HARVEST =														HARVEST =											
MONTH		J	J	A	S	O	N	D	J	F	M	A	M	MONTH		J	J	A	S	O	N	D	J	F	M	A	M
ARTICHOKE (globe)															LEEK												
ARTICHOKE (jeruselem)															LETTUCE												
ASPARAGUS															MARROW												
BASIL															MELON (water or rock)												
BEANS (broad)															MINERS LETTUCE												
BEANS (dwarf)															MIZUNA												
BEANS (runner)															OKA (yam)												
BEETROOT															OKRA												
BROCCOLI (romanesco-heading)															ONIONS (red or white)												
BROCCOLI (sprouting)															ONIONS (spring)												
BRUSSEL SPROUTS															PARSLEY												
CABBAGE (Chinese)															PARSNIP												
CABBAGE (regular)															PEAS												
CAPSICUM															POTATO (early)												
CARROT															POTATO (main)												
CAULIFLOWER															PUMPKIN												
CELERIAC															RADISH (Japanese)												
CELERY															RADISH (regular)												
CHERVIL															RHUBARB												
CHICORY(whitloof)															SALSIFY												
CHOKO															SEA KALE												
CORN SALAD (lambs lettuce)															SHALLOT												
CRESS (land)															SILVER BEET(Swiss chard)												
CRESS (regular)															SPINACH												
CUCUMBER															SPINACH(NZ)												
EGGPLANT (Japanese aubergine)															SQUASH												
EGGPLANT (regular aubergine)															SWEDE												
ENDIVE															SWEETCORN												
GARLIC															TOMATO												
GHERKIN															TOMATILLO												
KALE (borecole)															TURNIP(white)												
KOHL RABI															ZUCCHINI												
		J	J	A	S	O	N	D	J	F	M	A	M			J	J	A	S	O	N	D	J	F	M	A	M



PLANTING SYSTEMS

Succession Planting, Crop Rotation, Interplanting and Companion Planting

These planting systems all mimic natural ecosystems and provide an abundant harvest of healthy food, soil replenishment and natural pest and disease management.

Succession Planting

Succession planting is sowing or planting a crop a little at a time to ensure a continuous supply to avoid a glut or lean times.

For example, plant a few lettuces every two weeks so they can be gradually harvested when they are ready instead of planting a lot at once and having more lettuces ready than you can eat and then no lettuce.

Tip: the shorter the maturity time, the sooner to harvest and the sooner the space is available for another crop.

Crop Rotation

Crop rotation is a traditional method used to cleanse, protect and replenish the soil. It is a cycle of growing different crops in the same area.

Crop rotation is used for:

Soil fertility and nutrient replacement – the different vegetables have different requirements from the soil e.g. some vegetables are heavy feeders and others are light feeders and they require different soil nutrients. If the same crop is planted again and again in the same area, the nutrients it needs from the soil will become depleted and the harvest will decrease and the plants will be less healthy and more prone to pest and disease attack.

Pest and disease management – to disrupt the life cycles and buildup of insect populations and the increased plant health makes plants more resistant to disease.

Weed control – weed species germinate at different times of the year and the variation of crop depth and surface area covered can prevent weeds taking over.

Tips

- The longer the time frame before a crop is reintroduced into the same garden space, the better
- Plant crops with similar nutritional needs together e.g. heavy feeders together, light feeders together
- Do not plant plants from a plant family in a space where a crop from that same plant family has just finished growing.
- An example of a crop rotation within one year –
 - Spring – leaf e.g. cabbage
 - Summer – fruit e.g. cucumbers
 - Autumn – root e.g. beetroot
 - Winter – flower cover crop e.g. lupin

Interplanting (also called intercropping)

Interplanting is the practice of planting more than one crop together either in blocks, rows or spaces. It uses all of the available space in the garden at all times.

Methods of interplanting:

Stack in space – grow plants that don't like strong sunlight in the shade of taller plants, grow deep-rooted plants next to shallow rooted plants.

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Stack in time – when one plant is harvested, have another plant ready to fill the place.

Create a diverse ecosystem – plant a diverse range of plants that flower at different times, are different heights, a mix of perennials and annuals, different coloured flowers. This provides a habitat and food source for a wide range of creatures - insects, bees and butterflies.

Catch cropping – grow a small, quick maturing crop among a slower maturing crop. The quicker crop will be harvested before the slower larger crops are required e.g. radishes in between the carrot seeds – harvest the radishes and then the space will be used by the carrots as they grow larger, lettuces among cabbages, etc.

Guilds – vegetables that work well when planted together. Some examples are:

- Aztec Triangle (Three Sisters) – corn, beans and squash/pumpkin. Plant the corn first and then plant the beans to grow up the corn and the pumpkin will grow over the ground shading it from the sun and keeping the soil moist.
- Cucumbers, sunflowers and okra. Plant the sunflowers first.
- Tomatoes, lettuce and beans
- Brassica, leeks, shallots
- Silverbeet, celery, parsley
- Radishes and carrots in the same row, beetroot and kohlrabi in the same row.

Companion Planting

This is a particular application of interplanting. The companion can assist the main crop in one or more of the following ways e.g. opening up the soil, supporting growth, improving flavour, protecting it from pest attack because of its fragrance or a substance it exudes.

Many herbs and flowers make good companions to vegetables.

Feed the soil well – this is essential with a quick turnover of vegetables. Compost well at the beginning of each growing season, mulch each crop and use natural foliar feed/liquid manure tea fortnightly to nourish crops.

Frost danger

To avoid frost damage, when planting in spring, find out roughly when the last frost usually occurs and ensure all frost tender plants are planted after that. And if planting frost tender plants towards the end of summer, ensure there will be enough time for them to mature before the first autumn frost is likely to occur.

Frost tender vegetables: beans, corn, lettuce, beetroot, melons, cucumber, pumpkin, tomatoes, peppers, eggplant

Frost tolerant vegetables: Brussels sprouts, kale, turnips, sprouting broccoli, potatoes, carrots, shallots, parsnips, asparagus, chives, garlic, onions, rhubarb, celery, winter spinach

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VEGETABLE PLANTING INFO CHART

VEGETABLE PLANTING INFO CHART

VEGETABLE	Zone ⁴	Feeding Specific	Spacing	Time till Harvest (weeks)	Crop Type	How to Propagate	Seed Lasts	Some Vegetable Interplanting Companions
ARTICHOKE (globe)	2b	HF	180cm		P	Root	5 yrs	(by themselves)
ARTICHOKE (jerusalem)	2b	HF	30cm	17-26	P	Root	5 yrs	(by themselves)
ASPARAGUS	2b	HF	45cm	4 Yrs/seeds 1 Yr/roots	P	Root, Seed	3-5 yrs	Tomatoes, Basil, Parsley (not mixed in - nearby)
BASIL	1b	HF	20cm	6-8	A, P	Raise	5	Cucumber, Tomato
BEANS (broad)	2a	HG	20cm	11-26	A	Seed	3	Spinach, Onion
BEANS (dwarf/bush)	1b	HG	15cm	8	A	Seed	3	Celery, Corn, Cucumber
BEANS (runner/pole)	1b	HG	20cm	8-9	A	Seed	3	Broccoli, Celeriac, Radish
BEETROOT	1a	LF	15cm	8-9	B	Seed, Raise	5	Onion, Kohlrabi, Lettuce
BROCCOLI	2a	HF	45cm	8-9	A, B	Raise	5	Beans, Radish, Lettuce
BRUSSEL SPROUTS	1b	HF	45cm	11-13	B	Raise	4	Beans, Onions, Carrots
CABBAGE	1a	HF	30cm	9-16	B	Raise	4	Celery, Onion, Lettuce
CAPSICUM	1a	HF	30cm	9-12	A	Raise	5	Parsnip, Parsley
CARROT	1b	LF	7.5cm	9-11	B	Seed	3	Leeks, Spinach, Lettuce
CAULIFLOWER	2a	HF	45cm	8-12	B	Raise	4	Beans (bush), Cucumber, Spinach
CELERIAC	1b		25cm		B	Raise	5	Cabbage, Peas, Tomato
CELERY	1b	HF	20cm	15-19	B	Raise	5	Bush Bean, Leek, Turnip
CORN	2b	HF	30cm	9-13	A	Seed	2-10	Pumpkin, Squash, Bean
CRESS (Land)	1a		10cm		A	Seed		(alone/under tall vege)
CUCUMBER/GHERKINS	2a	HF	45cm	7-14	A	Raise	4-10	Corn, Radish, Celery, Bush beans
EGGPLANT	2a	HF	45cm	10-11	P	Raise	5	Beans
ENDIVE	1b		25cm		A	Raise	5	(where lettuce goes)
FENNEL (Florence)					A		4	Basil, Onion (not Beans)
GARLIC	2b	LF	10cm	17-26	A	Seed	-	Parsnip (all, not Beans)
KALE (borecole)	1b	HF	45cm	8-9	B	Raise	4	Radish, Lettuce
KOHLRABI	1b	LF	15cm	7-8	B	Raise	4	Beets, Cucumber
KUMARA	2b	LF	25cm	26-34	P	Root	-	(by themselves)
LEEK	2a	LF	15cm	19	B, P	Raise	3	Onion, Celery, Carrot
LETTUCE	1a	HF	25cm	6-12	A	Raise	5	Carrot, Radish, Cucumber (all veges)
MELON	2b	HF	45cm	12-17	A	Raise, Seed	5	(by themselves)
MINERS LETTUCE	1a		15cm		A	Seed		(all veges)
MIZUNA	1a		15cm		A	Raise	2	Carrots, Beetroot, Onion
NZ SPINACH	2a	HF	30cm	10	P	Root, Raise	6	(at edge of garden only)
OKRA	2a	HF	30cm	7-8	A	Raise	5	(by themselves)
ONIONS	2a	LF	15cm	14-17	B	Raise	2	Beets, Lettuce, Cabbage
PARSLEY	1a	HF	20cm	10-13	B	Raise	3	Tomato, Asparagus
PARSNIP	1b	LF	10cm	15	B	Seed	1	Capsicum, Corn, Garlic
PEAS	1b	HG	10cm	10-11	A	Seed	3	Carrot, Turnip, Corn
POTATO (early/main)	2b	LF	25/35cm	9-17	P	Root, Seed	-	Cabbage, Eggplant
PUMPKIN	2b	HF	60cm	14-16	A	Raise, Seed	3-10	Corn, Beans (NOT Potato)
RADISH	1a	LF	5cm	3-9	A, B	Seed	4	Peas, Lettuce, Cucumber
RHUBARB	2b	HF	60cm	3 Years 1 Yr/roots	P	Root	1	On edge by itself
SHALLOT	1b	HF	15cm	17-26	A, P	Raise	2	(anything except Beans)
SILVER BEET	1b		30cm		B	Raise	10	Beets, Onions
SPINACH	1b	HF	15cm	6-7	A	Raise	5	Strawberries, Broad Bean
SPRING ONION	1a		5cm		A, P	Raise	2	(anything except Beans)
SQUASH	2b	HF	45cm	11-17	A	Raise, Seed	3-10	Corn
SWEDE	2a		30cm		B	Seed	5	Onion, Kohlrabi, Broccoli
TOMATO	1b	HF	45cm	17+	A	Raise	4	BASIL, Onion, Carrots
TOMATILLO	2b		45cm			Raise		(as for Tomato)
TURNIP	2a	LF	15cm	5-10	B	Seed	5	Peas, Tomato
ZUCCHINI	2b	HF	60cm	7-9	A	Raise, Seed	3-10	Corn

KEY:
 Crop Type: A = Annual, B = Biennial, P = Perennial
 Pollination: C = Cross-pollinated, S = Self-pollinated, W = Wind-pollinated,
 I = Insect-pollinated, V = Vegetatively reproduced
 Garden Zoning: 1a = closest to kitchen ... → 2b = furthest away from kitchen
 Propagation: Raise = Raise Seedlings, Root = Root Division, Seed = Direct Seed
 Feeding Specifics: HG = High Giver, LF = Light Feeder, HF = Heavy Feeder



WATERING TIPS AND OPTIONS

Plants suffering from water stress are prone to insect attack and disease. The ability of a soil to hold water and make it available to plants depends on the soil type and structure.

Locating Plants:

Group together, plants with similar water requirements to allow easier garden management.

- (A) **Low water use** - drought tolerant species e.g. silvery leafed herbs e.g. lavender, thyme
- (B) **Med water use** - potatoes, pumpkins, artichokes
- (C) **High water use** - most veggies and soft fruit e.g. citrus

Harvesting Water – some things to consider...

- * Rooftop harvest
- * Simple irrigation kits
- * Mains supply – cost
- * Gravity fed
- * Garden taps
- * Re-using grey water
- * Timers
- * Unglazed pots inserted into soil, or large plastic bottles with small holes - slowly percolate water
- * Bucket in the shower to collect water
- * Drums and tanks
- * Watering cans
- * Pressure and drought restrictions
- * Diverter valves in gravity fed systems
- * Burying hoses
- * Watering times of day, how long to water for
- * Soaker hoses and overhead sprinklers

Equipment

This is a specialist area, so ask for assistance where irrigation supplies are sold. Here is some technical information to assist you:

- * For a small very garden getting regular attention, a **watering can** should be adequate.
- * Many **different types** of sprays and sprinklers are available to fit on the end of a garden hose.
- * **Fixed systems** give greater control over distribution.
- * Use **hand-held or movable** sprays/sprinklers for small or irregularly shaped gardens. They can be relocated quickly and easily.
- * The most commonly available fixed sprinklers are rotation impact or impulse types, operated by **water pressure** energy, where the water jet strikes the head, causing it to move under tension.
- * **Mini sprinklers and micro spinners** supply water over a smaller radius than impact sprinklers. They need **water filters** (50 – 80 microns) generally at the tap, to trap impurities so the sprinkler holes don't get clogged. Most types have a single rotating nozzle mounted on a stem holder. The **distance and amount of water** thrown depends on the nozzle size together with the water pressure.
- * **Microjets and sprays** are small fixed shape sprays which have a small jet opening to define a spray shape and the amount of water emitted.

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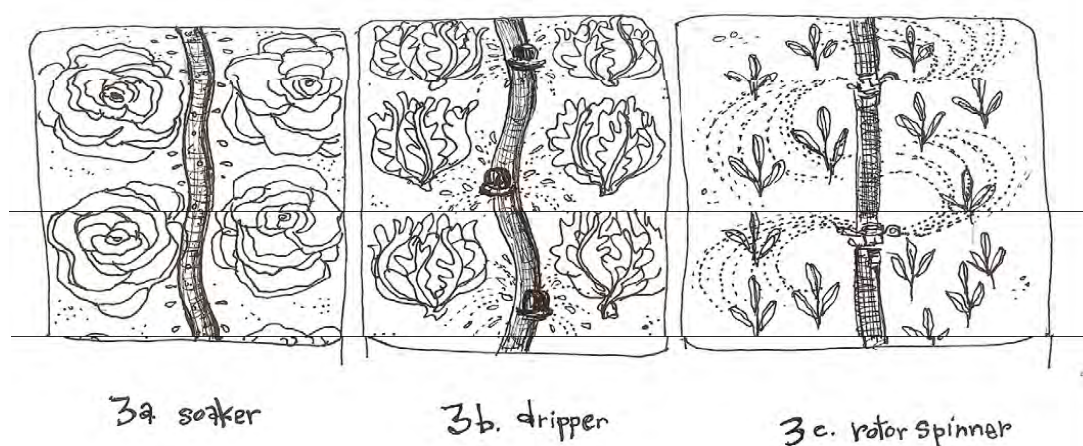
* **Trickle or drip irrigation** systems operate at low water pressures, using small openings in the tubing to restrict the water flow while wetting localised areas in garden beds. They apply water directly to the root zone of the plant at lower output rates and are efficient because water loss from wind drift and evaporation is reduced.

Examples

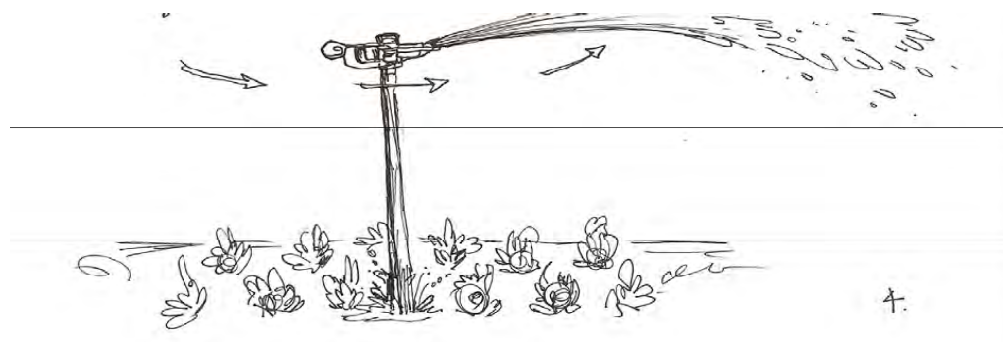
Moveable sprinklers can be relocated quickly and easily



Microsystems can be relocated



Overhead irrigator- Fixed System



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MULCH

Mulch is a layer of organic matter spread directly on to the surface of the soil, ie, it is not dug in. Garden mulch acts the same way as leaf litter in the forest which covers the soil, keeping it cool and moist until it breaks down into the soil.

There are three types of mulch:

1. **Cover mulch** (e.g. bark, wood shavings) is an open coarse textured material which breaks down very slowly and is more suitable for trees and paths, rather than vegetable gardens.
2. **Feeder mulch** (e.g. straw, old hay) is a finer, more compacting type of mulch which breaks down quite quickly. Straw (stalks of grain crops) contains less sproutable seeds than hay, and pea straw is the most common straw.
3. **Living mulch** - companion plants such as nasturtiums, alyssum, heartsease, provides homes for beneficial insects as well as mulching the garden. Sprawling plants, e.g. pumpkins and cucumbers, can provide living mulch under taller plants such as runner beans and corn.

Why mulch?

- Keeps soil moist, and therefore less watering required.
- Keeps soil cooler in summer and warmer in winter.
- Protects the soil from drying out.
- Keeps a balanced environment for earth worms.
- Good for soil life because it increases the humus content of soil as it breaks down.
- Reduces weeds because there isn't any bare soil for weeds to grow in.
- Prevents soil erosion from wind and rain.

Cautions:

- Apply to wet soil – either after rain or watering.
- Important not to have the mulch too dense, or lacking in aeration.
- Don't put on fresh lawn cuttings (apart from a very thin layer) as it goes like silage (slimy).
- Avoid fresh sawdust – uses available nitrogen in breakdown process, robbing this from plants.
- Snails and slugs love mulch! Remove mulch from garden in damp climate times. Use deterrents as path materials, e.g. broken shells, grit, etc.
- Leave a gap between the plant stems/trunks and the mulch to avoid stem rot.
- Allow spring soils to warm up before applying mulch.

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TYPES OF MULCH

Material	Type	Advantages	Disadvantages
Composted bark	Loose Material	<ul style="list-style-type: none"> • Attractive-looks tidy 	<ul style="list-style-type: none"> • Scattered by birds • Expensive for large areas • Should be laid to a depth of about 8cm(3in) to be effective
Sand and Gravel	Loose Material	<ul style="list-style-type: none"> • Attractive • Suitable for plants of Mediterranean-type 	<ul style="list-style-type: none"> • Will not improve soil fertility
Leafmould	Loose Material	<ul style="list-style-type: none"> • Homemade • Use over a sheet mulch 	<ul style="list-style-type: none"> • Better used in potting composts
Paper and cardboard	Sheets	<ul style="list-style-type: none"> • Readily available and free • Good for keeping down weed growth when used under another material 	<ul style="list-style-type: none"> • Too light in open garden unless used with another mulch or weights on top • Rot rapidly
Weedmat - semi-permeable membrane	Sheets	<ul style="list-style-type: none"> • Resistant to weed growth • Porosity allows better soil aeration and less water run-off than plastic 	<ul style="list-style-type: none"> • Expensive over large areas • Environmentally dubious
Prunings(woody)	Loose Material	<ul style="list-style-type: none"> • Free 	<ul style="list-style-type: none"> • Must be composted before use
Straw and hay	Loose Material	<ul style="list-style-type: none"> • Good soil improver 	<ul style="list-style-type: none"> • May include its own seeds
Wood chips	Loose Material	<ul style="list-style-type: none"> • Good semi-formal path 	<ul style="list-style-type: none"> • Must be composted for other uses



WEEDS

A weed is simply a plant growing where it's not wanted by humans, as it competes with chosen plants for space and nutrients.

There are 2 types of weeds:

'Beneficial' Weeds – these weeds give something back to our soil, by 'mining' it for essential minerals and trace elements, storing them in their roots or leaves, and releasing them back into the soil when they break down and die. They are easy to pull out (deep rooted ones need forking out) and will not come back unless there is still seed in the soil. *Examples of 'beneficial' weeds:* chickweed, yarrow, plantain, purslane, dandelion.

This type of weed can be directly incorporated into 'sheet mulch/no dig' and 'double dig' gardens, as well as liquid manure/compost tea brews.

'Noxious' Weeds – a threat to both our garden areas and our native ecosystems because they are invasive, and take over. These weeds are often able to survive under the most difficult conditions, and usually have many ways of reproduction – seed, climbing vines and root runners. *Examples of 'noxious' weeds:* convolvulus (bindweed), banana passion fruit, old mans beard, wild ginger, gorse, wandering Willy, Japanese honeysuckle.

The book '*Plant me Instead*' (available free from your local council) will help in sourcing natives you can plant to occupy the same niche as the invasive one, so that it is hopefully 'out-competed'.

TACKLING WEEDS

1. **Action!** - To minimize their invasiveness, deal to them when they are very young. If they are the 'noxious' type, eradicate them completely as best as you are able to, and if the 'beneficial' type do one of the following:
 - (a) put in your compost
 - (b) make into a 'liquid manure' (put in barrel of water).
 - (c) turn under as part of creating a new 'double dig' garden.
 - (d) leave as groundcover until you want to create a garden in that bed - however, take out or 'behead' before going to seed.

Best conditions for weeding: when the soil is moist (water has penetrated to roots of herbs) so easy to get out, in morning (if want to leave on surface of garden bed to wilt in sun).
2. **Hoeing** - after preparing a new garden bed (i.e. after clearing from last year's crops, forking and raking), don't plant immediately. Wait for the first 'weed flush' to come, and after around a week of the weeds appearing, hoe the ground when the soil is dryish, on a sunny day and leave them to die on the surface. It is worth doing this a second time too. This helps the 'weed seed bank' in your soil to get spent. Keep on top of weeds as they come up, by hoeing between the rows, and just leaving the weeds on the ground where they are.

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3. *Mulching/soil cover*

- (a) Put cardboard or several layers of newspaper down over the growing weeds then cover with mulch material, after slashing them down to ground height (leave roots in). Only use this method with 'beneficial' weeds, and when you don't want to plant in the area for a few months. You could also use the cut weeds as mulch instead of board or paper.
- (b) Alternatively, weed and then cover soil directly with a thick layer of mulch to suppress further weed growth (with or without cardboard). Can be done between rows too.
- (c) Plant in a green manure crop, or put down animal manure and cover with cardboard with mulch on top and leave for a few months
- (d) If you can't beat them – join them! Plant a tougher competitive vegetable crop which takes up all the space, grows faster and/or has bigger leaves which shade out the weeds, e.g. potatoes, corn, pumpkins, kumara. Sow closer together than usual.

- 4. *Use a 'Chicken Tractor'*** – if you have several gardens, its worth considering having a few chickens inside a mobile pen, who will do the weeding for you with their clawy-feet, scratching and pecking at the weeds, and manuring your garden as they go!

GOOD SOLUTIONS FOR SPECIFIC WEEDS:

Couch grass

Fork all around it to loosen the soil, before forking at it, so that you have the best chance of getting out its long roots (looks like a spear!). In summer (or hot days), as you weed, you can throw it onto corrugated iron or black plastic to be killed by the sun. Once dried out and dead it can be put into the compost. Otherwise, do not put into the compost (loves this environment to re-grow!) but put into a dark airtight container e.g. black plastic rubbish bags, make a 'package' out of a black plastic sheet. Once broken down fully (no trace of any life), this provides great a compost material to put back onto your garden.

Oxalis

These have a bulb-like structure, so when weeding, dig deep and wide with your hand-trowel to get right to the bulb/corms underneath (look like little garlic bulbs with lots of cloves), and try not to break off their long white strands of stems – follow them down. Don't let it flower, and also remove its small dense black seeds from the earth. The next stage is challenging, as it will survive in the dark, and without oxygen it seems, as well as withstanding long periods of 'being drowned'. The best way to treat it afterwards is to dry it somewhat on corrugated iron and burn it in an incinerator if possible.

Convolvulus

The roots of this creeper can make their way under black plastic covering the ground, over fences and hedges, and any obstacles in its path. You just need to keep forking it out regularly; at the places it enters the garden. In areas outside the garden, you could 'spot spray' diluted roundup on its stems (this will penetrate down to the roots and kill the plant). Treat similarly to oxalis after weeding.

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GREEN MANURE CROPS

Green manure crops, also known as green crops and cover crops, improve soil structure and provide nutrients to the soil. They are usually planted in autumn, grown over winter and dug into the soil in spring.

It is best to grow a mix of different green manure plants together, eg, a legume, a grain and a mustard.

How to grow a green manure crop:

1. Sow seed thickly.
2. Just before flowering, or a few weeks before the ground is needed for another crop, cut plants off using a sharp spade or other machete-type tool.
3. Chop the plants up a bit and leave on top of the soil for a few days.
4. Dig into the soil and leave to rot down.
5. Three to four weeks later, plant your food crop.



Common Name		Plant Family	Life Cycle	Soil Preferred	In Poor & Clay Soils	<i>When to Sow</i>	When to Cut/ Dig Under	Seeding Rate (gm per M ²)	Seeding Depth (cm)	Seed Viability
<u>Alfalfa/Lucerne</u>		L	P	L		Spring 2nd Year at 1st Blossom	Spring or Early Autumn	2-3	1.3	L
Barley		G	A	L		Spring Autumn	Summer Spring	20-30	2	L
Buckwheat		G	A	All	*	Late Spring or Summer	Summer or Autumn	6-10	2	L
Clover	White	L	P	L		Spring Autumn	Autumn Spring	1	1.3	L
	Red	L	B	L	*	Autumn Spring	Spring Autumn	2-3	1.3	M
Lupin	Blue	L	A	SL	*	Spring Autumn	Summer Spring	10-30	2.5	S
	White	L	A	SL	*	Spring Autumn	Summer Spring	10-30	2.5	S
Mustard		C	A	L		Spring	Summer	3-5	0.6	S
Oats		G	A	All		Spring Autumn	Summer / Autumn Spring	20-30	2.5	L
Pea (Field) eg Greenfest, Maple		L	A	L	*	Early Spring Autumn	Summer Spring	20-30	3.8	S
Radish (Daikon) Japanese		C	A	All	*	Spring	(1 st harvest root) Autumn	1	0.6	M
Rye, Spring		G	A	All		Spring	Summer	16-30	2	L
Rye, Winter		G	A	All		Autumn	Spring	16-30	2	L
Vetch		L	A/B	All	*	Spring or Autumn	Autumn Spring	16-20	2	M

GREEN MANURE PLANTING GUIDE

CODE:

Plant Family

long seed keeps)
L=Legume
G=Grain/Cereal
C=Mustard family

Life Cycle

A=Annual
B=Biennial
P=Perennial

Soil Preferred

SL=Sandy Loam
L=Loam
All=Adaptable

Seed Viability (how

S=Short time
M=Medium time
L=Long time

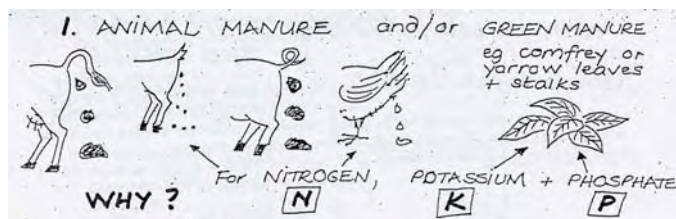
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LIQUID MANURE

This is a convenient way of adding nutrients to plants by foliar (leaf) feeding, to boost plant health on a regular basis.

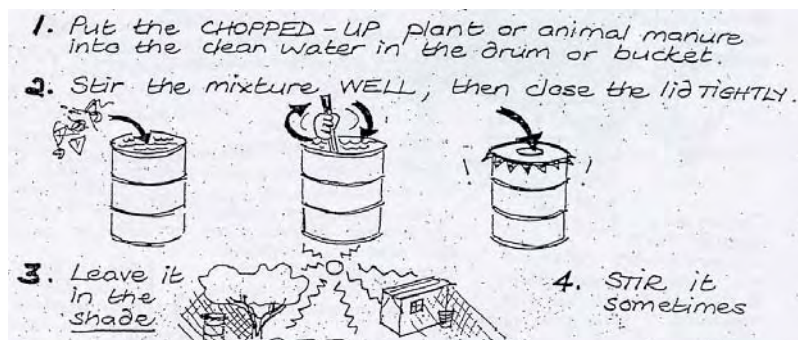


YOU WILL NEED:

- Animal manure or green manure (plant material, seaweed)
- Clean water
- Sealed container e.g. bucket and lid
- Stick
- Shade

How to Make It:

1. Put the chopped up green manure or animal manure into a bucket filled with water
2. Stir it well and place the lid on
3. Leave it in the shade
4. Stir occasionally



Use:

General rule – strain the water off and dilute with water to a consistency of weak coloured tea, e.g. around 10 parts water to 1 part liquid manure.

Apply two-weekly on damp soil, e.g. water the soil first if dry. Remember this is plant food not just water. Think of it like a tonic!

Types of Liquid Manure:

Plant – comfrey, stinging nettle, dock or any of the beneficial weeds.

Provides potassium and phosphorus. Leave **24 hours** then use.

Animal & Fish

Provides nitrogen. Place manure in a sack or similar, tie onto a stick and hang in drum of water. Leave **three weeks** before using.

Seaweed

Provides nitrogen, potassium, phosphorus. Leave for **one month** before using. Can use sack method as above. Dilute 1:3 or 1:5 for use.

When to apply each type of liquid manure:

- Nitrogen (animal) is good for early plant growth.
- Potassium (plant/seaweed) is good once plant is established.
- Phosphorus (seaweed) is good near flowering/fruiting time.

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VEGETABLE PESTS AND DISEASES

Pests and diseases damage and weaken plants, reducing their availability and quality as food for people. If your plants get diseased, or ravaged by pests, your garden ecosystem is out of balance. Organic gardening methods aim to remedy this. Compost-rich soils sustain a diverse, healthy range of micro-organisms and minerals which enhance quality plant growth. Strong healthy plants simply should not attract pests.

Observe, Observe, Observe!!!

Regularly check-over your plants to look for damage before major injury has occurred and it's too late. At the same time, check for the presence of beneficial insects – your 'pest control' support team!

Get to know both beneficial and non-beneficial insects, as well as how to 'read' the likely causes of plant damage.

Become familiar with the life stages of the different insect pests you see around, e.g. egg; nymph; adult, or egg; larvae; pupa; winged adult. Library books can help you identify insects, and Landcare Research has an online bug identification tool at: www.landcareresearch.co.nz/research/biosystematics/invertebrates/invertid.

Play Detective! – Look for Symptoms & Signs:

- **Symptoms** - the plants response to pest invasion e.g. wilting, growth distortions, blights, leaf spots, holes, tunnels. Check for the presence or evidence of past 'visits', such as eggs, cast-off skeletons. Check for signs of fungi.
- **Signs** – honeydew, silvery trails, droppings, fungi, sooty mould.

Use Organic Principles & Management (recommended in this order...)

1. Garden Design:

Design your garden to provide a good environment for plant and insect biodiversity.

2. Build Healthy Soil:

Soil with good structure and fertility breeds healthy plants. Poorly drained soils lead to root rots and other fungal infections, and encourage slugs, snails and wireworms. Soils that have poor moisture retention. Soils that have poor moisture retention (sandy) cause the plants to become stressed from lack of water, making them more prone to insect attack. Build good soil structure by adding organic matter such as well-rotted compost.

3. Grow Healthy Plants:

Select plants adapted to your climate which are hardy yet flavourful, with natural resistance. Grow seeds classified as *heirloom*, *open pollinated* or *organic*. Save seed, or exchange seed locally. Grow vegetables in season and avoid plant stress such as lack of water or plant food.

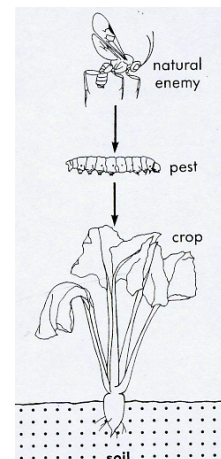
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4. Plant an Insectory Area, Beetle Bank, Beneficial Insect Habitat.

If there are several habitats and food sources for beneficial insects around your garden, pest insects don't stand much of a chance! Plant nectar and intentional food sources around the garden and within nearby hedges. It's a good idea to have such an area in the centre and around the periphery of the garden, as an 'all-purpose' beneficial insect habitat.



5. Trick your Pests – disguise your plants!

Each insect has its own selective way of seeing and smelling its environment. They get confused by too many colours, textures and combinations of plants, and lose their sense of direction amidst a maze of other plants 'protecting' their favourite one.

Some Common Tricks:

- Interplanting with *marigold* or *calendula* (bright colours and insect-deterring smell),
- Mulching with *fresh grass clippings* after thinning *carrots* (their smell is disguised so that the carrot fly is left guessing)!
- Planting *alyssum*, a white flowered bedding plant, underneath your *brassicas* e.g. *cabbages*, *cauliflowers* (the white butterfly mistakes its flowers for another butterfly!).

6. Learn to Read the 'Clock of Nature'

As you observe the cycles and habits of insects, note what else is going on in the garden, e.g. what tree is in flower, which vegetables are at which stage? Keep records. This will help you to know when to look out for that pest the next year.

7. Rotate or Interplant Crops

This is a good insurance against spreading and multiplying plant diseases. Some examples are:

- Interplant carrots with leeks or onions to repel carrot rustfly.
- Rotate crops to prevent the build up of nematodes (eel worms) and clubroot spores in the ground, both of which damage plant roots and are difficult to get rid of once they are present.

8. Keep Weeds under Control

Weeds are often hosts to pests, just waiting to get to the choicest plants in your garden e.g. all weeds in the daisy, potato and pea families are hosts to *green looper caterpillars* and without such weeds, the caterpillar's habitat would be severely limited.

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9. Leave a 'Sacrificial Plant'

Don't pull out all ailing plants which are being damaged by insects. Leave a few for the insects to feast on and then they generally leave the stronger plants alone.

10. 'Barrier Plants'

Plant several rows of tall plants, such as grains e.g. rye, corn, barley, in the flight path of insects as this makes a barrier to slow their access and confuse them.

11. Set up Chicken or Duck 'Tractors'

Clean up your bed after harvest, and re-fertilize it at the same time, by keeping a small number of chickens (or ducks) in a long mobile pen. As the pen is moved along the bed, the birds will eat the insects.

12. Try Mechanical Traps

Since each insect has its own way of perceiving the world (shapes, colours, movement, smell), we can lure them into a trap made just for them. Some examples:

- *Carrot rust fly* (adult 8mm long) tunnels into carrot, parsnip, celery and parsley roots, causing the plants to wilt and roots to become unusable.
- **Trap:** Place sticky yellow traps (12 – 15 cm in size) around the perimeter of the foliage, to monitor the presence of rust fly adults. Check twice weekly and only sow seed when count is zero. If it increases at all, apply diazinon granules to the soil.
- *Slugs and snails* have raspy tongues which damage soft stems and leaves. Active at night, they love warm, damp, humid weather and habitats. Avoid providing them with such a habitat e.g. straw mulch.
- **Trap:** Use *beer* in containers (e.g. saucers), 1–2 mtr apart, with the rims at soil level, as a bait to lure them to their demise – they are attracted to its smell, fall in the container and drown. Clean out every few days.

13. Experiment with Home-made Potions - Natural Insecticides

These are made up for both generic and for specific conditions. See 'Organic Recipes' handout, for some tried and tested recipes, and give them a go.

You can also try taking some specimens of the pest, mixing it in a blender, 'potentising' it by diluting it down 10x in water, and spraying the diluted mix on infected areas.

This approach is very suitable for the *green vegetable bug* (adult: 15 mm long), which feeds on many types of vegetable, (e.g. beans, sweet corn, brassicas, cucurbits, potato, tomato, silver beet) making the infested plant parts deformed and shriveled, resulting in wilting plants.

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14. Use Commercial Organic Sprays

e.g. 'Bt', *Bacillus Thuringiensis* as a biological pesticide which controls caterpillars. This can be purchased from gardening stores. Spray when the larvae are young and small.

Example of Multi-pronged Approach: Managing White Butterfly

All the members of the cabbage family can be affected by white butterfly, usually in the summertime. Caterpillars hatch from eggs laid under the leaves, eating large holes. Some pest management strategies:

- grow caterpillar-tolerant cultivars e.g. *green coronet*, *eureka*
- use companion plants e.g. beetroot, celery, dill, rosemary, sage, hyssop
- grow beneficial insect attractant plants e.g. phacelia, carrot family, which attract lacewings and hoverflies
- cover freshly transplanted seedlings
- remove tiny white eggs, squash green caterpillars
- mulch around plants in summer
- spray smelly rhubarb, garlic, fish fertilizer or Bt bacteria spray
- only lastly, use derris dust, neem soap or Bordeaux mixture



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NATURAL HOMEMADE INSECTICIDES FOR PLANT PESTS & DISEASES

Caution: These sprays can be harmful to beneficial insects, so use only when needed

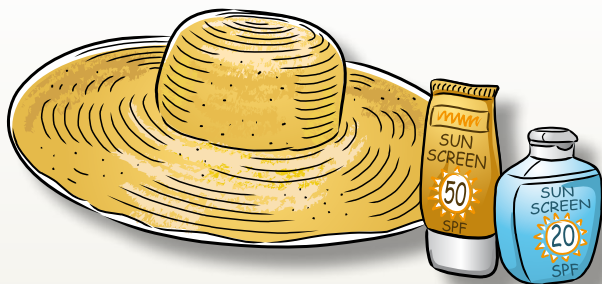
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<p><u>General Purpose Spray</u> An <i>all-purpose pest repellent</i> and <i>fungicide</i>. Spray daily for heavy infestations.</p> <p>Ingredients:</p> <ul style="list-style-type: none"> • 1 onion • 1 hot pepper (or 1 tablespoon cayenne pepper) • 1 garlic bulb <p>Chop or grind ingredients. Steep overnight and strain. Dilute to one part in five of water.</p> <p><u>Soapy Water</u> A spray to chase away or kill: <i>aphids, maggots, leafcutters, mealy bugs, red spider mites and whitefly</i>.</p> <p>Ingredients:</p> <ul style="list-style-type: none"> • 30g grated bar soap • (2 tablespoons laundry soap flakes, not detergent) • 1litre water <p>Mix and leave standing until dissolved. Strain. Add a teaspoon of mineral oil or kerosene for big infestations. Add soap to other sprays to make sure they cling to leaves, especially the undersides.</p> <p><u>Garlic Spray</u> Kills: <i>aphids, cabbage white butterfly, bean fly, caterpillars, mosquitoes, snails and wireworms</i>. Checks: <i>leaf curl, brown rot, downy mildew and leaf spot</i> in cucumbers and <i>bean rust</i> and <i>blight</i> on beans.</p>	<p>Ingredients:</p> <ul style="list-style-type: none"> • 85g-90g chopped garlic bulbs • 2 teaspoons of kerosene (mineral oil/liquid paraffin) • 500-600ml water • 7g-25g pure soap <p>Soak for 24-48hours, and then add water with dissolved soap. Stir and strain through gauze and store in a glass or plastic container (non-metallic container). To spray, dilute to 1 part in 20-100 parts of water.</p> <p><u>Garlic and Chili Spray</u> Treats similar conditions to Garlic Spray, but is more potent.</p> <p>Ingredients:</p> <ul style="list-style-type: none"> • 10 cloves garlic • 4-5 hot chilies • 2-3 onions <p>Boil, store in a glass container, and stand overnight. To use, mix 1 small cup in 10litre water; add a little liquid soap or milk as adherent. For <i>leaf curl</i>, spray every day about 1 week.</p> <p><u>Onion Spray</u> Spray several times for <i>blight on potatoes</i> and <i>tomatoes</i>, for <i>apple scab, curly leaf</i> of peach trees, <i>powdery mildew, aphids</i> and <i>red spider mites</i>.</p> <p>Ingredients: Onions Double the amount of water as onions.</p>	<p>Grind onions alone or with chives and/or onion tops in a blender, then simmer the ingredients in water for two hours.</p> <p><u>Chive Tea</u> For: <i>apple black spot, scab, and mildew</i>.</p> <p>Ingredients: 50ml boiling water 1 tablespoon dried chives Mix, leave for 1 hour and strain. Dilute with 2 parts water.</p> <p><u>Milk Spray</u> Checks <i>virus diseases</i> like <i>tomato mosaic</i> and kills <i>red spider mites, caterpillars</i> and <i>tomato worms</i>.</p> <p>Ingredients: Milk /Sour milk (straight from the bottle or cow) Nine parts of water Dilute milk with water.</p> <p><u>Buttermilk Spray</u> This spray destroys <i>adult spider mites</i> and their eggs, which are enveloped in the sticky mixture and suffocate.</p> <p>Ingredients: 1 tablespoon buttermilk 1/2 cup flour 2 litres of water Mix all together.</p>
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<p><u>Baking soda Spray</u> For <i>rusts</i> and <i>mildew</i>.</p> <p>Ingredients:</p> <ul style="list-style-type: none"> • 100g baking soda • 3 litre water • 50g soap <p>Mix thoroughly.</p> <p><u>Pyrethrum Spray</u> Wide spectrum insecticide -use carefully. Especially good for <i>aphids</i>.</p> <p>Ingredients:</p> <ul style="list-style-type: none"> • 2 tablespoons flower heads • 2 litres of hot water <p>Make tea with flower heads and add a little dissolved soap to improve the consistency. Or grind up flower heads and add to water. Stand 1 hour. Spray in the evening against: <i>aphids, caterpillars, leafhoppers, mites and thrips, mildew and scab</i>.</p> <p><u>Bug Juice</u></p> <ul style="list-style-type: none"> • 1/2 cup insect pest • 2 cups water <p>Mix in a blender, strain and dilute well to use. Can store leftovers in freezer.</p> <p><u>Cabbage Grub Dust</u> Dust plants to kill all kinds of <i>cabbage grubs</i>.</p> <p>Ingredients:</p> <ul style="list-style-type: none"> • 2 handfuls wood ashes • 2 handfuls flour • 1/2 cup salt <p>Mix all.</p>	<p><u>Wormwood Tea</u> Spray to repel: <i>aphids, black flea beetles, flies, cabbage white butterflies and slugs</i>. May be used as a bath to chase <i>fleas</i> from cats and dogs. Wormwood contains a toxic substance called absinthian.</p> <p>Ingredients:</p> <ul style="list-style-type: none"> • 1 litre boiling water • A handful of wormwood <p>Mix all.</p> <p><u>Salt Spray</u> For: <i>cabbage caterpillars</i>.</p> <p>Ingredients:</p> <ul style="list-style-type: none"> • 60g salt • 2 teaspoons soap flakes • 4.5 litre warm water <p>Mix all.</p> <p><u>Epsom Salts</u> For spraying on plants with leaves yellowing as if they have been attacked by a virus. Such plants are deficient in magnesium, which has been "locked up" by overuse of wood ashes, lime, or phosphorus.</p> <p>Ingredients:</p> <ul style="list-style-type: none"> • 50g Epsom salts (magnesium sulphate) • 4 litres water <p>Dissolve salts in water.</p>	<p><u>Fruit Fly Spray</u> Good for <i>aphids, curly leaf and codling moth</i>. It has also cured <i>tomatoes of wilt</i>.</p> <p>Ingredients:</p> <ul style="list-style-type: none"> • 15 litres water, with 1kg sugar dissolved • 1 litre sea water (not water + rock salt) • 1 litre of molasses <p>(Add sufficient diatomaceous earth if you have it). Mix all.</p> <p>Spray several times when fruit fly is bad on fruit trees or tomatoes, also at bud and at flowering.</p> <p><u>Stinging Nettle</u></p> <p>Ingredients:</p> <ul style="list-style-type: none"> • 1 kg nettle (cut) • 1 litre water <p>Mix and leave for 24 hours. Strain and apply generously. Repeat if required about 5 days later.</p> <p><u>Bacillus Thuringiensis</u> For: <i>caterpillars</i>. <i>Bacillus thuringiensis</i> powder is a commercial product. Mix to specifications. For most effective results, repeat by taking 10-15 infected dead caterpillars, mash and add to 1/2 litre lukewarm milk. Leave 3 days, strain, dilute with 4.5litre water and spray.</p>
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Sunsmart

Melanoma is an increasing risk to New Zealanders who spend time in the sun. The critical period is from November to March between 11 am and 4 pm.

- At these times, plan to work in shadier areas and stay out of the sun as much as you can.
- Wear a wide-brimmed hat and a shirt with sleeves. Protect any exposed skin with a broad-spectrum SPF 15+ sunscreen.
- Show your doctor any moles or coloured skin lesions that grow or change in size, shape or colour.

Gardening is a healthy, creative activity that also reflects our concern for the environment. Your common sense and these simple steps will help you to enjoy its pleasures into the future.

This resource is available from www.health.govt.nz or the Authorised Provider at your local DHB.

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New Zealand Government



Safer and Healthier Gardening



Gardening is one of the most popular leisure activities in New Zealand.

It's a relaxing, healthy and creative activity that lets people enjoy nature and grow their own produce.

But despite its quiet, healthy image, there are some risks involved in gardening. This simple safety guide is designed to help you reduce these risks and get even more enjoyment from your garden.

Organisms in garden soil, mulches, compost or potting mix

Wash hands thoroughly after working with soil or handling soil-type products, mulches, compost or potting mix. The soil is rich with many organisms that help the growth of healthy plants. But unwelcome organisms, such as tetanus and legionella, can also be found in garden soils and composted organic material, including commercially prepared products, such as potting mix and soil conditioners. These products can be reinfected even after sterilisation.

Legionella

Legionellosis (or legionnaires' disease) is a form of pneumonia. It's caused by a bacteria called legionella, an environmental organism that lives in moist conditions. You can catch the disease by inhaling airborne droplets or particles containing the bacteria. There has been no reported person-to-person spread of legionellosis.

The illness may be mild or severe and can sometimes be fatal. It is more common in older people, particularly if they smoke, have poor immunity or have a chronic illness. To reduce the risk of exposure to legionella:

- ✂ minimise the amount of dust when working in the garden
- ✂ water your garden and indoor plants using a gentle spray
- ✂ read the warning on bagged, composted potting mixes
- ✂ wear gloves when handling soil, mulches, compost or potting mix
- ✂ wear a dust mask if handling potting mixes indoors or in windy conditions
- ✂ dampen potting mixes before use
- ✂ open bags of soil products or composted potting mixes slowly and away from the face
- ✂ make sure the working area (glasshouse, potting shed) is well-ventilated.



See your doctor immediately if you develop a flu-like illness that is worsening. Antibiotics are effective against legionellosis if given early.



Tetanus

Tetanus is a serious illness at any age. Animal manures may contain this organism and it can be picked up through broken skin and puncture wounds.

- ✂ Keep cuts, scratches and grazes covered while working in the garden. Make sure that any injury is immediately and thoroughly cleaned.
- ✂ Tetanus vaccine has been given to children since 1960. If you have not had a course of three doses of tetanus and diphtheria vaccine as a child or adult, see your doctor or practice nurse. Adults need a booster of tetanus-diphtheria vaccine at ages 45 and 65.

Garden chemicals

Sometimes gardeners use chemicals. These can be hazardous if used, stored or disposed of incorrectly. Insecticides, herbicides and fungicides can help keep your garden looking great, but there are other techniques you can use to help your plants resist pests and diseases.

“Companion planting” works on the theory that certain kinds of plants grow best when planted together. In your garden you should include plants that have a naturally deterrent effect on predators and plants that attract helpful insects. For more information about these techniques, consult gardening books and magazines or contact your local gardening centre.

To reduce the risks from chemicals:

- ✂ Purchase only the quantity you need to do the job and avoid storing large quantities or mixtures of chemicals. Store incompatible chemicals separately.

- ✂ To avoid fires and adverse chemical reactions, keep oxidising agents, such as nitrate fertilisers and chlorine-based swimming pool chemicals, separate from flammable materials, such as methylated spirits and kerosene, and from certain fungicides (EDBC) which, when wet, will generate heat.
- ✂ Make sure that all chemicals are properly labelled and stored in their original containers, preferably with child-proof caps. Keep them well out of the reach of children and away from food.
- ✂ Follow the mixing and application instructions on the label. Wear protective clothing when advised and use any other necessary protective equipment, such as a respirator.
- ✂ Apply the spray when the air is still to avoid the chance of spray damage to other areas of the garden or neighbouring properties.
- ✂ Ask your local authority about the safest way to dispose of unused chemicals. They should not be poured into waste-water or stormwater drains.



Poisonous plants

Some common garden plants are poisonous. They can cause a variety of reactions, from mild skin irritation to a severe or even fatal response, although few people do die as a result of plant poisonings. Current medical treatment is highly successful as long as help is found quickly.

There is no simple way to identify poisonous plants. Some plants are entirely poisonous (or toxic), while other plants concentrate their poison in certain places, such as leaves or flowers. Some plants are toxic to animals but not to people. Small quantities of some plant toxins can have a severe effect, while others only irritate if eaten in very large quantities.

- ✻ Children should be taught not to sample or play with leaves, berries, bulbs or flowers.
- ✻ Store bulbs and seeds out of sight and out of reach of young children.
- ✻ Keep the number of the National Poisons Centre – phone 0800 POISON (0800 764 766 – this is a 24-hour service) in a place you can find in a hurry. It is also listed with Emergency Services in the telephone book.

Insect stings and bites

Bees and wasps

To avoid stings:

- ✻ avoid wearing perfumed products in the garden (eg, aftershave, highly fragrant deodorants, hair and skin products).
- ✻ cover yourself with appropriate clothing, including gloves and footwear.



If you are stung by a bee, try not to squeeze the venom bag at the outer end as you remove the sting. (A wasp does not leave its sting behind.)

For bee and wasp stings:

- ✻ applying an ice pack to the area may help reduce pain and swelling
- ✻ if any pain or irritation does not settle, or if the area is red and swollen, seek medical attention
- ✻ if there is a severe reaction to the sting, such as a rash, extreme swelling or difficulty with breathing, see a doctor immediately or call for an ambulance
- ✻ if you react badly to stings, discuss the problem and possible solutions with your doctor.



Spiders

Some spiders found in New Zealand gardens are poisonous.

- ✻ Disturbing the black garden tunnel-web spider can result in a painful bite and localised swelling. Wear gloves when working around woodpiles and crib walls, where you may see the spider's thick, white, sheet-like webs.
- ✻ The poisonous katipō and redbacked spiders are very rare.

If you are bitten and suspect the spider may have been poisonous, call the National Poisons Centre – phone 0800 POISON (0800 764 766 – this is a 24-hour service).

For more information, see *Spiders in New Zealand*, code HE1424



Garden machinery

While gardening can be a quiet and peaceful time, the equipment used in some gardening activities can damage hearing and cause other injuries. If used incorrectly or poorly maintained, lawnmowers, chainsaws, scrub cutters, trimmers, leaf shredders and wood chippers can all cause physical injury.

- ✔ Keep your machinery in good repair and pay particular attention to engine covers and exhaust systems. Make sure any guards provided for the blade are fitted correctly.
- ✔ When buying new garden equipment, choose machines with a low noise level and check that silencers and covers are fitted properly.
- ✔ Before you start, clear the working area (lawn, fence line, footpaths, and so on.) of stones or other objects that may be thrown by the machinery.
- ✔ Wear protective equipment when using machinery (eg, an adequate grade of ear muffs or plugs, goggles and solid footwear, such as shoes or boots).
- ✔ Follow the operating instructions for any machinery you use. Make sure you have an isolating transformer for electrical garden equipment or machinery.
- ✔ When you hire equipment, the hirer is obliged to provide you with safety information and ensure that you are familiar with this safety information and any precautions that need to be taken.
- ✔ Avoid using noisy equipment at unsociable hours or for extended periods.

For more information, see *Noise around the Home*, code HE1122.



The burning question

Garden fires and incinerators can smoulder for long periods, giving off thick, smelly, unpleasant smoke. Plastics and treated timbers included in the fire can produce toxic fumes.

- ✂ Minimise your need to burn by composting garden waste, recycling as many materials as possible and disposing of other rubbish at a landfill or tip.
- ✂ Check whether your local authority has by-laws or rules in regional or district plans controlling the open burning or incineration of garden rubbish.

Avoiding injuries in the garden

Falls and sprains are common garden injuries. To help prevent these, wear non-slip footwear and keep paths free of moss, algae and fallen leaves.

Regular walking or swimming will usually keep you agile and fit enough to tackle most gardening jobs with little risk of injury or strain. Gardening activities alone can keep you fairly fit, but if you build up slowly to the bigger gardening tasks, you won't have so many aches and pains at the end of the day.



Protecting your back

Many gardening activities require lifting, kneeling or bending. To protect your back when you are working in the garden:

- ✂ place your feet apart for good balance and make sure you have a sound grip and footing
- ✂ bend your knees instead of your back, then lift gradually and smoothly by straightening your knees
- ✂ keep the load as close to you as possible and turn by moving your feet, not twisting
- ✂ use long-handled tools so you don't have to bend
- ✂ work at ground level by resting on both knees and your free hand. Move frequently so that you don't have to stretch or reach.

Most garden centres stock a range of useful gadgets (eg, kneelers, long-handled tools) that make gardening easier for all ages and reduce the chance of injury.



SOURCES OF FREE/CHEAP LOCAL GARDENING MATERIALS

(# = costs something)

Pallets (non tanalised/non toxic) – for compost heaps, raised beds etc:

The Port – entrance near Sealord, Vickerman St

Tile Centre – intersection Rutherford & Examiner St

Enza – Nayland Rd (generally broken pallets)

Copy Machine – corner Collingwood St & New St – good quality small pallets (fit in boot of car) excellent for smaller home compost bins.

Autumn Leaves from deciduous trees, in autumn, especially after winds:

Pioneer Park – Washington Valley, Central School (front of), Botanics (Centre of NZ), Marsden Valley, Plenty of other parks and roadsides!

NB: Get there before council does or call them to find out when their collection is, maybe they will collect in their 'blowers' and give to you? If swept up from street may contain metal residues

Coffee grounds (& sacks)

'The Coffee Factory' – Whakatu Industrial Estate, 'Toxic Coffee' – Saxton Rd

Industrial Estate, Kush Coffee – Bridge St, near Rutherford St

ANIMAL MANURES

* ***Chicken manure*** (make sure you specify from their Free Range chickens, otherwise you will get their battery chicken manure!) – Ewings Poultry #

* ***Horse manure***

- Various signposted places along main Richmond-Brightwater Rd, near 3-Brothers corner. Free if collected, cheap (\$1 – 2) if already bagged.

- Racecourse Stables, Gladstone Rd, Richmond (occasional only).

- Copious horse poo and sawdust mixed. Paul, Ranzau Rd West, 5441662 (phone beforehand). Trailer-load possible.

- Also from Rob at Waimarama Community Gardens (\$2 per bag)

- Check 'Buy Sell Swap' under Free/Give Away. RDA also good source.

* ***Mixed manures*** – Natureland, Tahunanui (Waimarama Community Gardens is their primary recipient, so others would be second priority)

Grass Clippings

If you need a decent quantity, contact Nelmac's parks & landscapes dept, or Peter Grundie at Nelson City Council. NB: Ask for grass from non-sprayed lawns e.g. pensioners flats. Most lawns they mow are sprayed e.g. golf clubs, bowling greens, and schools. Grass clippings need to be used immediately or will heat and go like silage.

Woodchip

Mostly these need to be purchased from landscape & garden suppliers e.g. Sand & Land, Bay Landscapes#. This is graded into 3 categories, from soft woodfibre to 'hammer-bark' used for heavier traffic paths and tree mulching.

Otherwise, look up any arborist in phone book (under 'Tree Services') and ask about dropping off a load as they drive past your place (instead of taking to dump). Or contact department in Nelmac or City Council after strong winds have blown down branches and there is surplus, or autumn/winter pruning time.

Partnership members:

Victory Community Centre, Nelson Marlborough District Health Board, Nelson City Council, Nelson Environment Centre, NZCU South, Waimarama Community Garden



Sawdust - pine, untreated.

Plankville, Beach Rd, Richmond. Bring buckets or sacks, and a shovel (or use hands)

Mulch Materials

Straw – pea straw is most common in Nelson. This is available at most garden centres in bales, cheaper 'seconds' as broken bales in woollsacks#.

Barley & pea straw is available at \$7 per bale, deliver Wednesdays - Dave, Ph 5418239 #

Hay (also sometimes *Straw*) – Waimarama Community Gardens - a fundraiser for a charitable organization # 9 – 3pm weekdays - ask staff for service,

NB: Straw is better to use than hay, as less likely to have viable seeds that sprout and grow in your garden. If grain (straw seeds) does grow, much easier to pull out than grass (hay seeds)! Make sure you ask for 'spray free'.

Fishmeal - Talleys Fisheries #

Seaweed - Further away local beaches e.g. Ruby Bay, after a storm

Sacks (plastic woven) & Woollsacks Ex fertilizer and grain sacks - from micro-breweries and farmers. Woollsacks from recycling centre (maybe).

Newspaper - Nelson Evening Mail old stock

Cardboard (boxes)

Out the back of most supermarkets, in bundles NB: remove tape and staples before using.

Nelson Evening Mail – large cardboard rounds, good for putting around trees (just slit into centre) then mulching on top (has 2 layers, glued together)

Large Heavy Cardboard

Main appliance stores (eg washing machines, fridges come in this), main sports stores, cycle shops. NB: This usually has no tape on it, so swifter to utilize.

Old Carpet – only use wool if for sheet mulch purposes

Nelson Recycling Centre, John's Carpets (poorest carpet only, redundant when replacing old carpet, also sometimes have underfelt).

NB: many old carpets and underfelt were routinely treated with persistent organic pesticides (POPs) – excessive use may leave toxic residues in soil.

Heavy Black Plastic

Farmers, from old silage coverings

Topsoil

Private sources, often from 'Buy, Sell, Swap'- be aware that this may carry weed seeds or be contaminated, so check history first. Often free just for carting away.

NB: Advertise (or look) for whatever you want in weekly '**Buy, Sell, Swap**' – plenty of surprises and bargains!

CONTAINERS

Bathtubs and sinks for worm farms - recycle centre, Tahunanui.

Pots and seedling containers - recycle centre, Tahunanui.

Actually, all sorts of weird and wonderful containers from there!

Compiled by: Robina McCurdy, with additions from Nick Kiddey, Jane Bartlett & Grace Catley.

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