2020

Dirty Diggings

August

Care for the Earth, Care for People, Share the Surplus

Monthly Newsletter of Picket Fence Urban Farm

August in the Garden

Mediterranean

What to sow:
Start to grow your summer crops in trays in a warm, sheltered spot: cherry tomatoes, zucchini, squash, pumpkin, basil and cucumbers. Coriander, lettuce, radish, silverbeet, parsley and edible viola heartsease can be direct sown or planted. Plant out potatoes.

What to do:
Collect the last of any citrus at the end of the season. Freeze lemon and lime juice to use throughout the year, or get creative with jams and preserves. Start to prepare beds for spring crops, adding compost or building up layers no-dig garden style. Be ready for strong winds that often come around August and September; prune back any tall trees and stake any bananas with heavy bunches.

August Plantings

Amarath, Asparagus (seeds) Beans dwarf climb Beetroot, Broccoli, Cabbage, Chicory Carrots, Chinese cabbage, Corn Salad Cress, Endive, Kale, Kohl Rabi, Lettuce Mustard Greens, Onion brown, Parsnip, Peas Potatoes, Radish, Rhubarb Crowns Salsify, Spring Onions, Squash, Tomato

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Veg of the Month

Peas

Herb of the Month

Also in this Issue

Design for Climate Change

By TIM MARSHALL

Feature

In an edited extract from his comprehensive and inspiring new book 'The New Organic Gardener', TIM MARSHALL says building the soil and keeping plants cool are key gardening strategies to counter climate change.

The climate is getting warmer and climate scientists predict that many parts of Australia will become drier. The most commonly agreed prediction is for an escalation of storms and an increase in the intensity of rainfall, even possibly in areas where the total rainfall will decline. Warnings of climate change are too consistent to ignore, so garden planning must take them Understanding climate and the effect it has upon plants will help to reduce failures caused by bad species selection or neglecting to provide the right location to exploit the local microclimate.

Organic practices can both ameliorate against climate change and help us to adapt to it. A key feature of organic gardening is the emphasis on increasing the soil's organic matter, which is principally made up of carbon. The only cheap and easy way to remove carbon from the atmosphere is to grow green plants.

However, green plants do not take carbon out of the atmosphere for a long time. Even trees will usually not live for more than about 100 years, and if they do, their growth is so slow that they will not be taking much additional carbon from the atmosphere.

However, by using appropriate soil biology, we can convert plant carbon into soil carbon. Humus, the end product of the breakdown of organic matter, is very long-lived and therefore an excellent store of carbon. The average age of a piece of humus in Australian soil is probably between 1000 and 2000 years.

Even in a forest, it is likely that more carbon will be found under the ground, in the roots, soil, animals and the organic matter, than in the above-ground biota. We can deepen and strengthen soils much faster with best-practice organic methods than by any other means.
Apart from leading to high levels of carbon storage in the soil, improved organic matter content and continuous soil cover with plants or mulch keeps the soil structure in good condition. This helps the soil to cope better with more intense rainfall, which is predicted for many parts of Australia as the climate changes, because it can absorb moisture faster, thereby reducing run-off and erosion.

Organic strategies that build and preserve the soil's organic matter include the following:

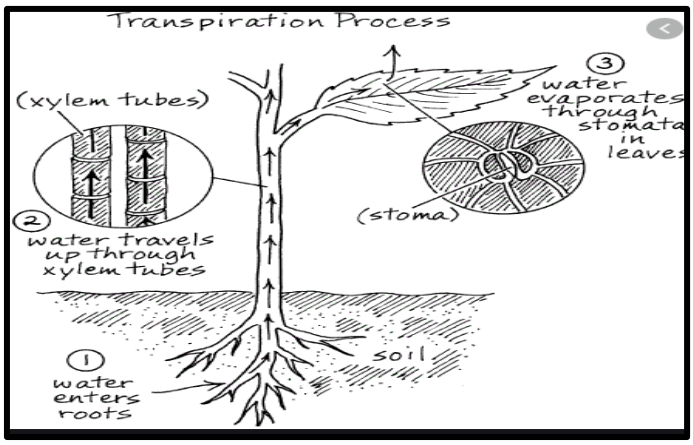
- Recycling of all organic matter by digging-in, mulching and composting;
- Green manures, cover crops, companion planting and polyculture to maintain soil cover for as long as possible;
- Emphasis upon total biology, including the fungal component;
- Careful use of tillage, including use of non-inversion techniques, and using deeper tillage as an opportunity to incorporate organic matter and soil amendments;
- Absence of water-soluble fertilisers – particularly synthetic nitrogen – and herbicides, which harm soil biology and reduce organic matter preservation.

Warmer, drier climates

As climate change is expected to cause longer drier spells, organic methods will help the soil to preserve water for the following reasons:

- Organic matter and humus improve infiltration rates so that water moves into the soil more easily;
- Organic matter and humus can hold a lot of water;
- Roots can explore open, well-structured soils more completely and develop deep and extensive root systems, and therefore become more water self-sufficient; and
- Organic soils sponsor symbiotic bacteria and fungi that help plants find nutrients and reduce their reliance on obtaining nutrients from the soil solution (soil water).

But despite the benefits that organic methods may bring, water availability may be reduced by long dry spells in the future and water prices will rise. This will impact upon the type of gardens we grow in the future, and the way we manage them. The chief adjustments to reduced water use will be improved application methods and timing, use of mulch, and the selection of local indigenous and hardy introduced plants. Despite these adjustments, many gardeners will still want to dedicate part of the garden to their favourite, more water-demanding plants, and to food plants. Climate change is not doomsday for gardeners, but it is a wake-up call to understand how water, soil and plants work.



Cool your plants

Cool plants use less water. During hot spells, plants should be kept as cool as possible. When plants get hot they have to transpire water through their leaves. This internal air-conditioning system is their only way of keeping cool. If plants can't keep up with the transpiration required to stay cool, their leaves will wilt. Some plants can handle significant wilting and recover in the cool of the afternoon or evening, but some species do not recover well.

Shelter from wind reduces transpiration because in still air the atmosphere immediately around the leaf becomes humidified with the vapour emerging from the open stomata (pores) on the underside of the leaf; eventually the atmosphere can't absorb any more vapour droplets from the plant, and thereby transpiration is slowed down. In contrast, moving air blows the moisture away, causing the plant to continue to transpire.

To help plants keep cool during hot spells, position them so they receive shade and wind shelter from taller plants, or construct artificial structures. Physical barriers consisting of 50 per cent white shade-cloth will protect valuable garden plants and vegetables by reducing sunburn to the leaves and fruit and lowering the temperature. Physical screens can be permanent or temporary.

Spray-on sunscreens for plants are available but most contain polymers that are not considered organic. Organic sunscreen products have been trialled on certified organic farms and may be available for home gardeners in the future. A fine suspension of clay sprayed on the leaves does a similar job. Clay powder with a uniform, small particle size can be purchased from mineral, pottery/ceramic or alternative health and beauty suppliers.

Kelp extract provides bio-stimulants that help plants to moderate water loss. By providing the right soil conditions, such as breaking up hardpan (a layer of hard subsoil or clay), and using deep but infrequent watering, plants will send down deep roots which will build up the soil profile and add organic matter at depth, thereby increasing water storage in the soil and the ability of roots to find water.

Building biodiversity

As one of the key principles of organic gardening is diversity, organic gardeners should design their gardens with a wide variety of plants in mind. Biodiversity above and below ground is a key factor in maximising plant cover and will therefore assist in maximising carbon storage in the soil.

To achieve the greatest biodiversity, include some indigenous plants (that is, plants indigenous to your local area) and a continuous sequence of flowering plants. If there are no flowers in your garden, a wide range of useful birds and insects will not spend much time there, and if there is no water, frogs and lizards will only pass through.

It is also useful to provide a range of different habitats, particularly a source of water, and a variety of planting layers (trees, shrubs and under-storey plants). Garden plants should enhance local indigenous biodiversity rather than detract from it. Many garden plants, especially those that produce flowers and fruit, will provide food for useful or entertaining native animals, such as the honeyeaters that visit the japonica outside my kitchen window. But remember to select plants that will not encroach upon local bushland.

Each planting layer provides different opportunities for insects, birds and animals to shelter or hunt. Examples are:

- Trees attract stick insects and praying mantis, as well as larger animals such as owls and kookaburras that will perch on the tree branches looking for rodents, snakes or
- other prey.
- Shrubs provide many useful small insectivorous birds with a place to roost and to retreat to when threatened. These birds will provide a lot of pest control if they can find shelter.
- Flowering plants will encourage some of the most colourful and entertaining birds to visit in search of nectar, berries and seeds. Hunting wasps feed on nectar and pollen, and need a continuous source of open flowers throughout the year, otherwise they will go elsewhere.
- My local thrush is endangered, but is an occasional visitor to my garden because I have a combination of deep shade and deep mulch, exactly the conditions it prefers for feeding.
- Lizards will visit if there is some ground-level water, but birds will hesitate to land on the ground and prefer an elevated bird bath.

https://www.organicgardener.com.au/articles/design-climate-change

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Pea

Veggie Patch

By Penny Ossowski

The pea is thought to have originally been domesticated in the Middle East, spread to the Mediterranean areas, then through Europe as the Roman Empire grew and eventually from Europe to the rest of the world. The pea was valued as it could be dried, making it easy to carry when travelling from place to place, ready to eat or to plant. Peas could be added to many dishes throughout the year. In the 17th and 18th centuries it became popular to eat peas while still green and immature soon after they were harvested. How many families have a traditional *'Pea Soup'* Recipe?

Peas are a legume, part of the Fabaceae or Leguminosae family of vegetables, which extract nitrogen from the air and store it in little nodules along their roots. For this reason, when the plants finish cropping, dig them directly into the soil, where they will slowly decompose and release nitrogen for other plants to use or you could grow masses of peas - not just as vegies, but as a fertiliser and soil conditioner, a green manure crop and dig it in just before they flower.

There are 3 main varieties of peas the *Pisum sativum*, our everyday green pea, *Pisum sativum* var. *macrocarpon*, the snow pea and *Pisum sativum* var. *macrocarpon* ser. cv. the sugar snap pea. All varieties taste better when harvested young and eaten while fresh, often being consumed before they reach the table. The Snow and Sugar Snap peas are most economical as we don't waste the pods of these varieties and they save a lot of preparation time as we don't have to shell them.

Peas are a good cool weather plant, so put some in now. Grow peas in the garden or in pots. Peas will grow in most types of soils but prefer a slightly alkaline soil with a pH 6.0 – 7.5 and well drained, they don't like wet feet. About a month before planting dig in some garden lime or dolomite, blood and bone and rock minerals. Peas can be grouped as bush or climbing varieties. The bush varieties still need some support (twigs are suitable) but only to about 30 – 50 cm while the climbing varieties are best with some form of trellis, teepee or archway up to 2 metres high. These should be erected before planting seeds. Seeds can be planted into seed trays but are best planted directly into the garden where they will grow, about 3 cm deep. Use bush peas in pots or hanging baskets and for climbing peas use a larger pot with poles or wire for them to climb up. Plant seeds into damp soil then don't water again until the seedlings have emerged from the soil. They respond well to a little seaweed or comfrey tea after they start flowering.

Peas are happy to be planted with broccoli, cabbage, cauliflower, potatoes, beans, carrots, corn, and lettuce but don't like chives, garlic, onions or shallots as companions.

The home gardener can harvest pods just as they're needed. It is best to harvest every 2 to 3 days so peas are being picked at their best. This regular picking also encourages the production of more flowers and in turn pods.

Peas should be picked immediately before cooking because their quality can deteriorate quickly the same as sweet corn. Snow peas are best picked when the pods have reached their full length but are still quite flat. The smaller the pods, the sweeter and more tender. Early in their growth pick the peas shoots to eat, delicious. This will also help your plants to bush more.

Allow some of your best pea pods to grow to maturity, dry on the plant and save the seeds for next year.

As peas are susceptible to powdery mildew it is best to water them early in the day and to water the soil near their roots not their leaves. Position your plants in a sunny, airy location, growing on a trellis helps with good air circulation. Milk, bi-carb and sulphur sprays will help with powdery mildew.

To store peas you can dry or freeze them. Peas freeze well and, providing they are processed immediately after picking, lose no more of their nutritional value than in just cooking them.

Some hints

Plant peas now as a winter crop
Peas like slightly alkaline soil
Seaweed spray can help with powdery mildew
For powdery mildew try 1 part whole milk to 10 parts of water in the morning before the sun rises and repeat every 3 days
Ros loves sugar snap peas but her favourite is Pigeon Pea, eat the green pods straight off the bush, succulent and tender if she gets them before the king parrots do.

Nutritional Information

Serving Size: (100 grams raw – **in pods**)

Calories: 42	Kilojoules: 176.4
Total Fat: 0g	Cholesterol: 0mg
Total Carbohydrates 8g	Dietary Fibre 3g
Sugars 4g	Sodium 4mg
Protein 3g	Vitamin A 1087 IU
Folate 42 mcg	Vitamin C 60 mg
Vitamin E 0.39mg	Vitamin K 25 mcg
Thiamin .15 mg	Niacin .6mg
Vitamin B6 .16mg	Riboflavin .08mg
Calcium 43mg	Magnesium 24mg
Phosphorous 53mg	Potassium 200mg
Iron 2.08mg	Zinc .27mg

Nutritional Information

Serving Size: (100 grams raw – **just peas**)

Calories: 81	Kilojoules: 340.2
Total Fat: 0g	Cholesterol: 0mg
Total Carbohydrates 14g	Dietary Fibre 5g
Sugars 6g	Sodium 5mg
Protein 5g	Vitamin A 765 IU
Folate 65 mcg	Vitamin C 40 mg
Vitamin E 0.13mg	Vitamin K 24.8 mcg
Thiamin .266 mg	Niacin 2.09mg
Vitamin B6 0.169mg	Riboflavin 0.132mg
Calcium 25mg	Magnesium 33mg
Phosphorous 108mg	Potassium 244mg
Iron 1.47mg	Zinc 1.24mg

Sugarsnap Sugar Bush - plant to 60 cm high. It has succulent edible pale-green pods, 7.6 cm long. It is the sweetest of the sugarsnaps and very productive

Greenfeast - Popular Australian variety, sweet tasting, widely used podding/shelling pea. Heavy cropping bush 75-100cm, pods 5.5-6.5cm. Wilt resistant -. good for home gardeners

Snowpea Yakumo - a climbing, purple flowered snow pea with large flat, light green pods, 13 cm long, that do not cup.

Snowpea Oregon Giant - Large dark green pods, plant to 1m tall, powdery mildew resistant and some root rot resistance.

Snowpea Oregon Sugar - Flat edible pods to 10cm, in salads or cooked, bush type to 70cm, grown with or without stakes, heavy bearing, disease resistant.

Sugarsnap Climbing- Useful vegetable with no waste as the pods are sweet and crunchy.

Savoury Sage By Penny Woodward

Herbs Spiral

The sages in my garden are coming into their own at present, tolerating the dryness and heat with aplomb, flowering prolifically and providing food for beneficial insects such as bees and a whole range of nectar and seed-eating birds.

Common sage (*Salvia officinalis*) is a native of the northern areas of the Mediterranean, but it has been cultivated for centuries for culinary and medicinal purposes in Europe and other countries with temperate climates.

It was formerly regarded as one of the most precious herbs, and rue was often planted nearby to protect it from evil. Much of this reputation was based on its health-giving properties rather than its use with food. The name salvia comes from 'salvare', to save, and it was believed to give long life to those who used it. An old proverb from the Middle Ages said: "He that would live for aye, Must eat sage in May". In total there are some 1000 sages in the world, but only a handful of these have medicinal or culinary uses.

Sage is a perennial that grows to about 50 cm. It has pebbled grey-green leaves that become more grey as they age, 5–8 cm long with short stalks that grow from woody stems. Sage flowers grow in spikes and have papery calyces, and range in colour from pale to dark blue/ purple, pink and white. There are also cultivars with green-and-yellow leaves and another with burgundy, grey-green and pale-yellow leaves. These cultivars though often don't flower. Sage can be grown from cuttings, and those forms that produce flowers can usually be grown from seed. Although perennial, sages often become too woody in three or four years and such bushes can be split up in spring or autumn, or earthed up during winter, causing individual branches to layer and root, ready for cutting and planting in spring. Sage likes a soil that is rich but well drained, and a sunny sheltered position. It will withstand some frost but does not like cold winds or wet roots.

ingredient of sausages and in stuffings, as well as with rich foods like goose, pork and eel, because of its ability to aid digestion. It can also be combined with cheese as an omelette filling, or in savoury tarts of leek and eggs, and added to the cooking water of vegetables such as spinach, peas and tomatoes. Chopped finely it can be added to cottage cheese and herb butters. Currently my favourite way to eat it is dry fried and then crumbled over a dish, or place two fresh sage leaves in the pan and break an egg over the top. Eggs fried in this way infuse the flavour of the sage.

Sage tea, made by steeping a sprig of sage in just-boiled water is an excellent tonic. You can improve the flavour by adding lemon and honey. It is also drunk to alleviate sore throats and the other symptoms of a cold. If you rub a sage leaf over your teeth it will help to whiten them, a good tip to remember if you've forgotten your toothbrush. A handful of sage leaves added to the bath will help to reduce stress and relieve pre-menstrual symptoms, or infuse it in oil to make a topical massage oil that can be used to improve peripheral circulation and reduce fluid retention.

https://www.organicgardener.com.au/blogs/savoury-sage

Pests & Diseases of Sage

Sage is generally an easy care herb but there are a few problems which can crop up from time to time:

- **Caterpillars** – pick off by hand before they do too much damage.
- Powdery mildew – increase airflow around plants and minimise overhead watering to keep the foliage dry.
- Mealybugs – release Linda (the mealybug-munching ladybeetle).

Permaculture Guilds compiled by Rob Collett

Permaculture

A guild, according to Webster's Dictionary, is an association of people with similar interests or pursuits, also, or more particularly, a guild is a medieval association of merchants or craftsmen. The word guild comes from the Old English and means *Payment* or *Tribute*.

Historically, for example, a carpenter could pay tribute to join a carpenter's guild. He would then be protected by the society of fellow carpenters... protected from price gouging, unfair trade, etc. and protected from others stealing their "secrets", i.e. skills or "tradesecrets". This is where a lot of the secret societies were initially formed (like the Masons... initially, stonemasons). That carpenter could then focus on being the best carpenter he could be while making a good living for himself and his family. But enough of the history...

A Blacksmith Guild

This term has been applied to Permaculture to describe a collection of plants (a **polyculture**) that individually could survive on their own, but perform much better when grouped together.

Permaculture is based on natural systems like those that we see in forests. In a forest system, there are multiple layers of vegetation growing together in a very diverse setting. We see many types of trees, shrubs, plants, insects, animals, and various other things all living together in a system that continually strengthens itself. All of these components of a natural ecosystem serve a function (or several functions) that support each other like the strands of a web. One strand on its own may be weak, but the combination of all the strands together add to the overall strength and usefulness of the web.

In order to mimic these natural systems and to provide for human needs (i.e. food, building supplies, fuel, fibers, clean water and air, etc.) we must learn to identify and work with the various functions of our natural resources. This is where the concept of the “Permaculture Guild” comes from. A guild is usually defined as an association of people working toward a common goal. In Permaculture, a guild is a grouping a plants, trees, animals, insects, and other components that work together to help ensure their health and productivity. Instead of planting gardens or orchards or fields or forests, Permaculture teaches us how to “build guilds”. Instead of teaching about specific species (plants, trees, animals, insects) or components (a wall, fence, building, etc.) we teach about functions. This is why Permaculture can work throughout the whole world. It is a guide for *design* rather than a “how-to” type of agriculture. **A good Permaculture guild generally has 7 components:**

1 – Food for us

Guilds: putting elements together that do well together. Although only plants and trees are shown here, infrastructure and animals can be integral to guilds as well.

When building a guild we need to think about maximizing the health and nutritional benefits that we will be getting from our systems. In order to eat a diversity of foods we need to plant a diversity of foods. This means including Fruits, Vegetables, Staples, Legumes & Nuts, Fats & Oils, and Animals. With good planning, we should be able to receive foods from all of the 6 food groups throughout the entire year. Other needs for us may include medicines, energy, building supplies, fibres etc.

All plants need nutrients to grow, just like we do. One of the main nutrients that plants use for growth is nitrogen. An easy way to get nitrogen into the soil is by planting legumes (i.e. beans, peas, groundnuts, leguminous trees, etc.). All legumes are considered “nitrogen-fixers” and are able to take nitrogen from the air and convert it to a usable form in the soil. Using legumes actually helps to “feed” the plants that they are growing near. The leaves and other organic matter from legumes may also be added to compost to increase the nitrogen content. Other ways to feed the soil is to return all organic matter back to the soil: leaves, trimmings, kitchen scraps, market resources, decaying matter, compost, compost tea, mulch, manure and urine (from any animal/human or insect such as worms), etc.

.3 – Diggers/Miners

Deep rooted plants, such as trees, will reach far into the earth’s soil and bring minerals up to the surface (like a miner). These deep rooted trees are great diggers, breaking open the soil, making it soft, and allowing for air & water to be easily absorbed into the earth. Some diggers also take the form of root crops: cassava, sweet potatoes, yams, Irish potatoes, carrots, beets, etc., each digging at different depths and widths. Diggers can even be insects and animals that burrow through the soil such as: ants, termites, worms, beetles, mice, etc.

4 – Groundcover

Groundcovers protect the soil from the sun, help to hold moisture, and help to keep “weeds” down (there aren’t really any ‘weeds’ – they are just good plants in the wrong place!). There are many types of groundcovers including: sweet potato vines, pumpkin, cucumbers and anything else that will vine or spread across the soil. Mulch is also a form of ground cover and can be made from a wide variety of materials – organic (grass cuttings, leaves, wood chips) or mineral (stones, shells).

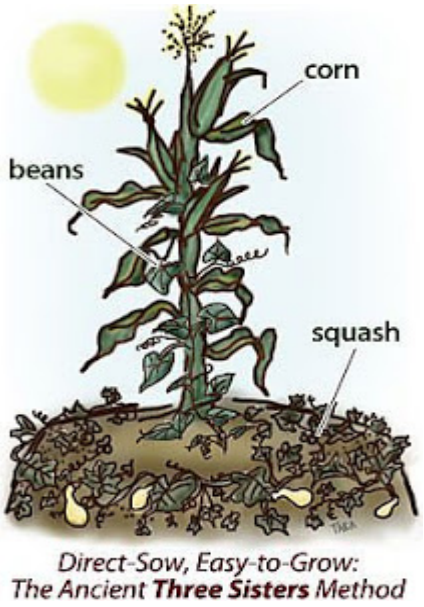
5 – Climbers

Climbers help to maximize food production, and are especially useful in areas where land resources may be scarce or limited. In most forest systems you will generally see examples of climbers, because nature uses all of its layers to their fullest potential. Examples of climbers include: climbing beans, passion fruit (*magalagadeya*), loofa (*chinkupule*), air potatoes, cucumbers, etc.

6 – Supporters

These are stronger items that support the climbers and make the most of our space. Supporters can be living things like trees, bushes, stalks such as a maize or sunflower, or they can be non-living things like houses, walls, fences, etc. The main thing to be careful of is choosing the right supporter for the right climber. Some climbers are very aggressive and can bring down a fence, or take over a tree. If you put a passion fruit vine into a mango tree, you may not end up with any mangoes. This is where thinking ahead and planning become very important.

Anything that helps to protect your guild is a protector. In terms of protecting your guild from damaging insects, strong smelling plants can be very useful. Things like onions, chives, spices, lemon grass, and pungent flowers can help to repel insects and even confuse them making it difficult for them to find their food. Natural predators can also be very helpful in controlling the insect problems in a guild. Beneficial animals and insects such as frogs, birds, lizards, praying mantis, ladybugs, etc should be attracted to the garden with various types of habitat and plants that they prefer. You can even protect from larger animals like goats and people by using things with thorns or sharp ends. Some living fences that we have seen are even more effective than the razor wire that many people put along their fences.



One of the first, and most well known, Permaculture Guilds... the Three Sisters.

The classic **Permaculture Guild** is called the "**three sisters**" named by the Iroquois (native American tribe). The three sisters are corn, beans, and squash. The corn provides support for the beans. The bean is a legume and pulls nitrogen from the air and (fixes) it in the soil with the help of bacteria and fungi. The nitrogen fertilizes the corn and squash. The squash, with its large leaves, shades out weeds and prevents moisture evaporation, and has prickly leaves which deter some animal pests. Finally, squash, beans, and corn are nutritionally complementary.

Permaculture Guilds then are *"groups of species that support each other in beneficial ways, aiding self-maintenance, and reducing the work required to maintain the system." - Martin Crawford (Creating a*

Regenerative Organic Farming and Gardening 3

Regenerative

Biodiversity *Compiled by Rob Collett*

Of critical importance is the faunal biodiversity in one's garden; especially soil biodiversity. Almost all of nature's essential functions are carried out by biodiversity; pollination by bees, butterflies, moths and bats; forest plant propagation by birds, monkeys, civet cats, squirrels and other animals whose dung serves as a repository for seed; insect pest control by frogs, lizards, geckos and spiders.

Further, macro invertebrates like earthworms, termites, ants, beetles, and millipedes, etc play a definite and prominent role in regulating soil fertility while soil micro fauna like bacteria, actinomycetes and fungi, etc aid in humus formation.

The fungi that are probably the most abundant in agricultural soils are Arbuscular Mychorrhizal (AM) fungi. They account for 5-50% of the biomass of soil microbes (Olsson et al., 1999). Mychorrhizal fungi only live in union with plants. Both the fungus and the plant benefit from their relationship. The plant provides sugars to the fungus while the fungus provides a variety of services to the plant. (http://www.agroecology.org/glossary/)

Mychorrhizal fungi play a major role in a plants exchange system. They grow as a vast web of tiny filaments in plant roots and in the surrounding soil thereby exploring a much larger area than the plant roots could alone. When the mycorrhizae encounter limited resources like water, phosphorus or micronutrients, they can pass them on to their associated plant. Mycorrhizae can increase phosphorus uptake and facilitate access to other soil nutrients such as ammonium, potassium, calcium, iron, copper, manganese, zinc and nickel (Jordan, et. al, 2000). Drought resistance and heat tolerance are benefits attributed to mycorrhizae (Henson, 2003). Soils are able to store more carbon when Mycorrhizae are active (Dalpe et. al., 2003) and thereby help to mitigate climate change. In short, the presence of mycorrhizae in soils offers an exciting prospect for organic and low input farmers.

Many crops support mycorrhizae. Legumes like long beans, mung bean, winged bean and horse gram, cereals like finger millet as well as vegetables like cucumber, melon, watermelon, squash, pumpkin, ladies fingers and brinjal are some plants that are prone to mychorrizal associations. Even tree crops like citrus, coffee, tea, rubber and coconut harbor mychorrizal associations. However, plants of the cabbage family, beet, mustard and amaranthus do not respond to mychorrizal associations. Hence the wise farmer must seriously look into promoting mychorrizal associations in his soils if long-term soil fertility is sought.

Light
Another important is the management of light in your garden. Too much light can harm certain crops while too little light can impede the growth of others. Most vegetables and annual crops require sunlight. This is an important feature to remember when designing your garden where tree crops also form part of the design. The area in the garden that will he best suited for vegetable cultivation must be kept as open space with a modicum or shade. Crops like coffee, pepper, ginger, turmeric and taro prefer reduced light conditions and are best cultivated under shade or tree cover.

Wind
It is vital that the direction of wind be identified before planting since otherwise plants could be damaged by wind impact. Climbers like snake, ridge or bitter gourd that grow on trellises must be planted along the direction of the wind since otherwise the trellises could get de-stabilised. This is especially critical during the time of the North-East monsoon when heavy rain and strong winds prevail. Strong gusts of wind can also erode soil especially if there is no mulch or leaf litter on the surface

Principles of Regenerative Gardening and Farming

- Increase soil fertility
- Work with wholes, not parts
- Progressively improve whole agro-ecosystems (soil, water, and biodiversity)
- Connect the farm to its larger agroecosystem and bioregion
- Create context-specific designs and make holistic decisionsthat express the essence of each farm
- Express the unique irreplaceable essence of each person,
- farm and place
- Make holistic decisions aimed at specific systems change
- Ensure and develop just and reciprocal relationships amongst
- all stakeholders
- Design for non-linear, multi-capital reciprocity
- Continually grow and evolve individuals, farms, and communities
- to express their innate potential
- Continually evolve agro-ecological processes and cultures
- Regenerative Farming and Gardening shifts the world

Practices of Regenerative Gardening and farming

Permaculture Design **-** Permaculture is a holistic design system that arranges human habitat and agriculture in a way that regenerates and revitalises the environment. It incorporates practices and processes that mimic the natural world. Permaculture utilises the synergy of relationships that abound in the diversity of species and environmental elements. As a consequence, greater abundance in production is realised as its practice brings together a variety of appropriate eco-technologies, both ancient and modern.

Agroforestry - combines shrubs and trees in agricultural and forestry technologies to create more diverse, productive, profitable, healthy, ecologically sound, and sustainable land-use systems.

Soil Regeneration *– Improve the structure and overall health of soil, starting by enhancing organic matter content*

Properly Managed Livestock, Animal Integration*, Integrating, animal and crop production can reduce* ***nutrient leaching*** *from Fields and Gardens*

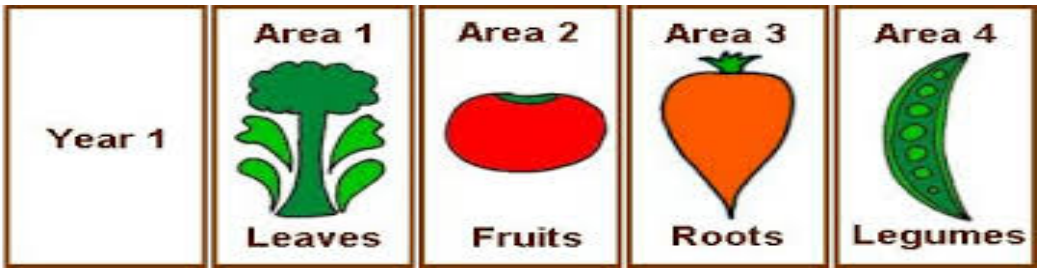
Holistic Management – is a whole farm planning **system** that helps farmers, ranchers and land stewards better manage agricultural resources in order to reap sustainable environmental, economic, and social benefits. This “triple bottom line” of benefits can be achieved by maximizing the **management** of current resources.

Keyline Subsoiling - Keyline plowing is a form of subsoiling. Subsoilers are implements used to loosen and break up soils to double the 6 to 8 inch depths that a traditional disk harrow reaches. The tool used for keyline plowing is the Yeoman’s plow, a subsoiler with very thin shanks. Created in the 1950s by P.A. Yeoman, an Australian mining engineer and farmer, it was designed to lift and aerate the soil while limiting soil disturbance to minimize oxidation of organic matter. Used once on compacted soils

No-Till Farming - Tilling means the damaging of soil. Tilling happens due to the physical disturbance takes place beneath the earth. The effect is so dangerous that it is measured to have more harmful effects than using chemical fertilizers and pesticides etc. No – Till Crop Production will provide efficient and fertile soil which eventually will produce good crops and the process will be more profitable.

Cover crops & multispecies cover crops - A **cover crop** is a **crop** planted primarily to manage soil erosion, soil fertility, soil quality, water, weeds, pests, diseases, biodiversity and wildlife in an agroecosystem, an ecological system managed and largely shaped by humans across a range of intensities to produce food, feed, or fiber.

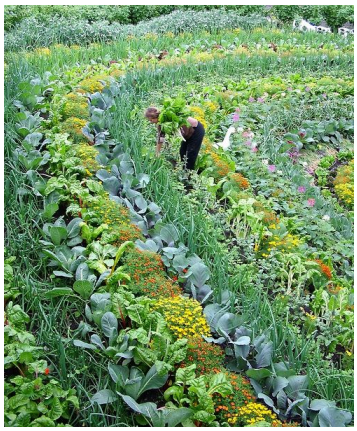
Crop rotation -



Crop rotation is the p
sequenced seasons.
nutrients. It helps in r

Compost, *Compost* is desired to maintain the lives of microbes because the tiny organisms do much for the vast plantation growth. Thermal Composting provides the best way to keep soil nutrients efficient and beneficial. The microorganisms are significant of the fertility of the soil. There is no surprise in knowing that the secret of healthy and enrich soil is the staying of these little microbes.

Polyculture -



Polyculture refers to growing many different species of plants (and animals) in one area. Traditional agriculture employs “monocultures”, which means only one or two plants are grown in a given area and all other species are relentlessly exterminated.

ful insects - see Companion Planting

Biochar & Terra Preta - The technique of using charcoal to improve the fertility of soils originated in the Amazon basin at least 2500 years ago. The native Indians of the region would create charcoal and incorporate it in small plots of land from 1 - 80 hectares in size. Terra Preta, as it is known in this area of Brazil, remains highly fertile until today, even with little or no application of fertilizers. And this is in a region of the world known for its highly infertile soils.

Perennial Crops - Perennial crops ensure that there are living roots in the soil 100% of the time. This prevents soil erosion, reduces compaction, feeds the soil food web, and pushes the soil profile lower (creates soil).
Perennial plant roots can grow very deep over time, allowing the plants to access nutrient and water stores that annual plants never can.

Reduce Inputs - cease the use of chemical fertilisers and bio-cides (herbicides, pesticides, etc.) to support biodiversity and enable healthy biological functioning and nutrient cycling. Save money too!
Permaculture Guilds - in this issue.

Companion Planting – Plant Stacking – Succession Planting – next issues

Feed the Soil Not the Plants

This guide will teach you the fundamentals of living soil to turn your garden into a growing machine. It is the best way to grow organic crops!

In this guide you will learn:

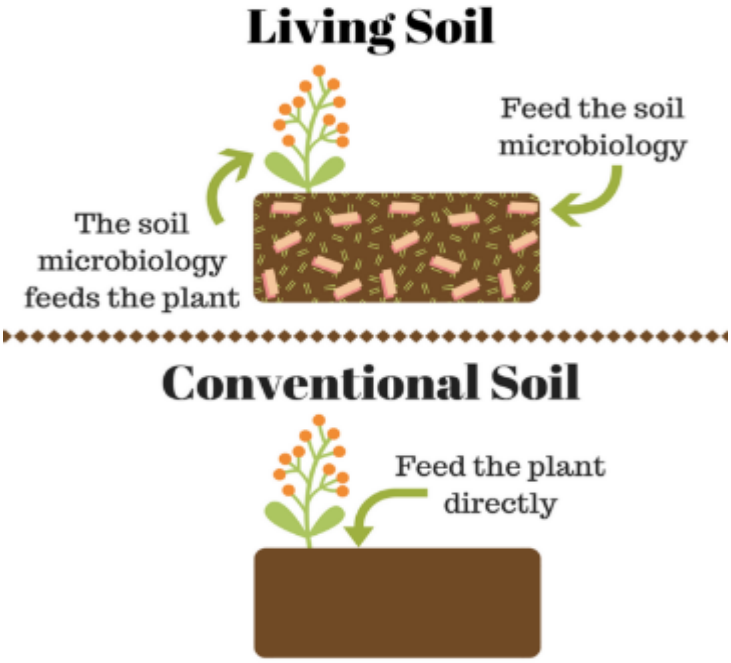
- Living soil terminology and components
- How the soil food web works
- What plants do to control the environment in their favor
- Why working less work will get you more out of your garden
- That organic farming can be cheap and easy

Do you know the adage of “work smarter, not harder”? That’s the underlying benefit of living soil. When you get your soil recipe right, your garden will output the healthiest harvests you have ever seen.

By mastering these strategies, you’ll be able to grow anywhere in the world with soil and a workable climate.

The key is to **be lazy and let the soil microbiology do your work**. Let’s begin.

What is living organic soil?



Living soil is a productive organic system that produces healthy harvests with minimal inputs. Sounds nice, right? It’s the counter method to modern agriculture where we toss chemical compounds in the soil to produce lackluster results.

As it turns out, living soil naturally produces better results than conventional agriculture if we just allow it to do its thing.
The term “chemical” often gets a bad rep – but chemicals aren’t the problem here. After all, plants need chemical compounds to survive. Those are the plant nutrients. The distinguishing factor between modern agriculture and living soil is how those chemicals get to the plant.

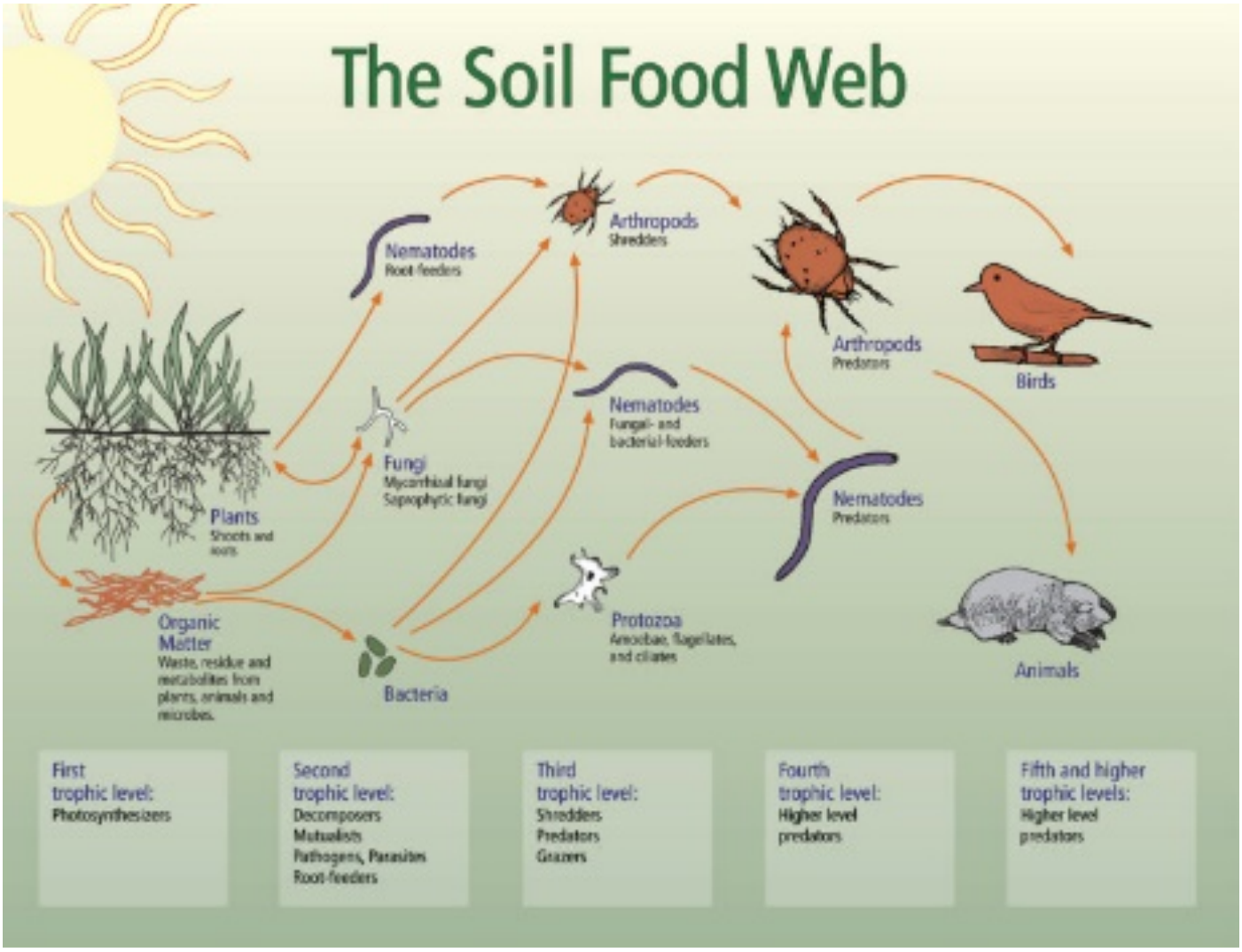
This sort of agriculture is also called true living organics, no till, ROLS, and other terms that the cannabis community uses on a regular basis to describe similar techniques. The core concept shared by all the agricultural methods is that we use organic amendments and let the soil microbiology do the work.

Now, depending on who you ask, there are between 15 and 42 essential nutrients for optimal plant growth. The organic matter in your soil is a treasure trove of these nutrients, and there is rarely need to add in supplemental nutrients.
But…

Due to their chemical structures, natural nutrients in the soil can’t be directly used by plants. The nutrients first need to convert into their plant available forms through a decomposition process.

As a solution to this puzzle, plants have masterminded a genius strategy. The plants “farm” microbes which use enzymes to break down nutrients in the soil for the plants.

Enter the soil food web, where plants maintain beneficial relationships with bacteria and fungi for access to locked up nutrients in the soil.



The key to succeeding with organic living soil is in understanding the soil microbiology. Instead of feeding plants directly, you farm the microscopic life in the soil, which in turn provides for your plants. Though it may sound like an inefficient and round-about method, if you focus on building your soil you will truly end up with higher yielding crops, and way less legwork.

Does that sound crazy? That's because it is.

Let's dig in deeper.

The benefits of growing in living soil

If your soil is alive, there are so many direct and indirect benefits. If your soil is dead, well, we call that dirt. But don't worry! Soil is a resilient system that can quickly recover.

Let's take a quick look at a chart comparing the features of dead dirt and living soil.

Dead Dirt vs. Living Soil

Soil Type	Dead Dirt	Living Soil
Soil Structure		*
Nutrient Retention		*
Water Retention		*
Root Depth		*
Crop Yield		*
Plant Disease		*
Crop Taste		*
Soil Restoration		*

Soil Restoration *

Fertilizer Use *

Pesticide Use *

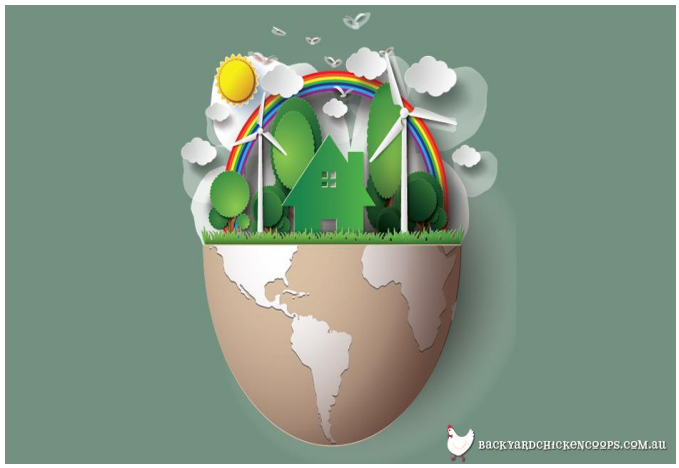
Plant Disease *

Plant Disease *

There's a clear winner here. Living organic soil provides the perfect environment for your plants!

Eco Living

What Is Sustainable Living? By Kassandra Smith



With concerns steadily increasing about the current state and quality of our environment and the ongoing issue of climate change, many people are seeking to live a more sustainable lifestyle. But what does sustainable living actually mean? Many people have heard of it, **discussed** it, and may even practice some elements of it, but are still confused by what it really is.
By keeping chickens you are contributing to living a sustainable lifestyle- go you! But what else does sustainable living entail.

What is Sustainable Living?
In short, sustainable living means practising a lifestyle that uses as few of Earth's natural resources as possible, in an attempt to create the least amount of environmental damage for future generations.

Those who are committed to living a sustainable lifestyle will often try to reduce their carbon footprint by changing their means of transport, energy consumption and their diet- living in a way that is consistent with sustainability, and in balance with, and respectful of humanity's symbiotic relationship with the Earth's natural ecology and cycles.

Basically, sustainable living involves living on the Earth as lightly as possible- meeting one's needs in the present without compromising the needs of future generations, so they too can enjoy the same high quality of life that people do today.

Why Should we Live Sustainably?
Sustainable living isn't just a buzzword or a phase, it's a continuing way of life, and one that is important if we are wanting to preserve the environment for our grandchildren and their grandchildren. If we continue to use all of our natural resources at the rate we are currently, and continue to cause ongoing damage to the environment from unsustainable practices, we are putting future generations in a situation where they will not have enough resources available to sustain life on earth.

How to Live Sustainably
Sustainable Energy
Those who choose to live a sustainable lifestyle will often rely on renewable energy sources- those that do not harm the environment, as a source of power. This can include water, solar, wind or geothermal energy.

There are also a number of small changes that can be made in regards to power consumption that will help make a home more energy efficient. Simple things such as changing to energy efficient light bulbs, adjusting temperatures by a few degrees, or simply turning it off, will all contribute to reducing your carbon footprint.

Sustainable Homes
Sustainable homes are built in a way that they use very few non-renewable resources and are run using the renewable energy sources noted above. Resources that are often used to build a sustainable house include; adobe, bamboo, composite wood, reclaimed stone or brick, recycled metal and concrete, wood and straw bale- all materials that have been produced in an environmentally friendly manner.

Sustainable Transportation Methods
The automobile industry is is not at all feasible to sustainable living, with carbon emissions and high energy prices contributing to our climates warming. Choosing small, fuel-efficient or hybrid cars, over gas guzzling

four wheel drives, are a more sustainable choice for those wanting to contribute to this lifestyle. When possible, choosing public transport or walking or riding to your destination are even more environmentally friendly options.

Sustainable Food Choices
Making sustainable food choices includes choosing seasonal and locally grown food, as this reduces carbon footprint caused by long distance food transport, reduces the effects of pollution and will help to stimulate the local economy. It is also best to choose organic food where possible, to help minimise the risk of pollution to the environment caused by chemicals such as pesticides, or herbicides that are used on non-organic foods.

Many wanting to live a self-sustainable lifestyle will opt for a vegetarian lifestyle, as it causes less resources to produce, and causes the least amount of damage to the environment. Reducing meat consumption, and choosing to buy only organically raised, free range or grass-fed meat, is another alternative towards having a more sustainable diet.

Growing your own fruit and vegetables at home defines what it means to be truly self- sustainable- especially if they are also organic! **Urban farming** has surged in popularity recently, with communities banding together to help contribute to a self sustainable lifestyle- growing and trading their homegrown wares with one another, or contributing to public urban gardens.

Keeping backyard chickens is indispensable to sustainable living practices, providing fresh eggs to pair with your homegrown fruit and vegetables. Raising chickens is easy with the right setup and advice, all which can be found on The Backyard Chicken Coops website- chicken coops for every sized flock, and everything you wanted and needed to know about raising chickens!

Recycling & Reuse
Recycling plays a big role in living a sustainable lifestyle- reusing products to help minimise the addition of waste to landfill. Some materials that can be recycled include; glass, paper, plastic, metals and wood- these can also be up cycled which converts a material into something of similar or greater value in it's second life.

Small adjustments to your lifestyle can also help to reduce waste- go electronic where possible to reduce paper waste, and turn food scraps into a compost. Before throwing things away, think about how they could possibly be reused- worn shirts can become cleaning cloths, empty glass jars make great tealight holders- simple, yet effective!

Although it has taken quite some time, people are starting to learn that environmental resources are not infinite, and so we need to do our best to preserve what we can, ensuring future generations can live harmoniously. It is our responsibility to contribute to this preservation by following sustainable living practices- every little bit counts.

https://www.backyardchickencoops.com.au/blogs/learning-centre/what-is-sustainable-living

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History

History of Botany 4 *Continued*

During the 18th century botany was one of the few sciences considered appropriate for genteel educated women. Around 1760, with the popularization of the Linnaean system, botany became much more widespread among educated women who painted plants, attended classes on plant classification, and collected herbarium specimens although emphasis was on the healing properties of plants rather than plant reproduction which had overtones of sexuality. Women began publishing on botanical topics and children's books on botany appeared by authors like Charlotte Turner Smith. Cultural authorities argued that education through botany created culturally and scientifically aware citizens, part of the thrust for 'improvement' that characterised the Enlightenment. However, in the early 19th century with the recognition of botany as an official science, women were again excluded from the discipline.[46]

Botanical gardens and herbaria[edit]
Further information: Botanical garden, List of botanical gardens, and Herbarium

Public and private gardens have always been strongly associated with the historical unfolding of botanical science.[47] Early botanical gardens were physic gardens, repositories for the medicinal plants described in the herbals. As they were generally associated with universities or other academic institutions the plants were also used for study. The directors of these gardens were eminent physicians with an educational role as "scientific gardeners" and it was staff of these institutions that produced many of the published herbals.

A 16th century print of the Botanical Garden of Padova (*Garden of the Simples*) — the oldest academic botanic garden that is still in its original location

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Preparing a herbarium specimen

The botanical gardens of the modern tradition were established in northern Italy, the first being at Pisa (1544), founded by Luca Ghini (1490–1556). Although part of a medical faculty, the first chair of *materia medica*, essentially a chair in botany, was established in Padua in 1533. Then in 1534, Ghini became Reader in *materia medica* at Bologna University, where Aldrovandi established a similar garden in 1568 (see below).[48] Collections of pressed and dried specimens were called a *hortus siccus* (garden of dry plants) and the first accumulation of plants in this way (including the use of a plant press) is attributed to Ghini.[49][50] Buildings called herbaria housed these specimens mounted on card with descriptive labels. Stored in cupboards in systematic order they could be preserved in perpetuity and easily transferred or exchanged with other institutions, a taxonomic procedure that is still used today.

By the 18th century the physic gardens had been transformed into "order beds" that demonstrated the classification systems that were being devised by botanists of the day — but they also had to accommodate the influx of curious, beautiful and new plants pouring in from voyages of exploration that were associated with European colonial expansion.

From Herbal to Flora[edit]
Main article: Flora

https://en.wikipedia.org/wiki/History_of_botany

Dirty Diggings September 2020

Feature: ***Cities, Climate Change and Gardening***
Veggie Patch : ***Cherry Tomatoes***
Herb Spiral: ***Garlic***
Permaculture: ***3 sisters stacking***

Regenerative Farming and Gardening: ***Building a Model for Regen. Farm & Garden***
Eco Living:
Beginner Gardening: **Living Soil 2**
Plant History: ***The history of Botany 4***