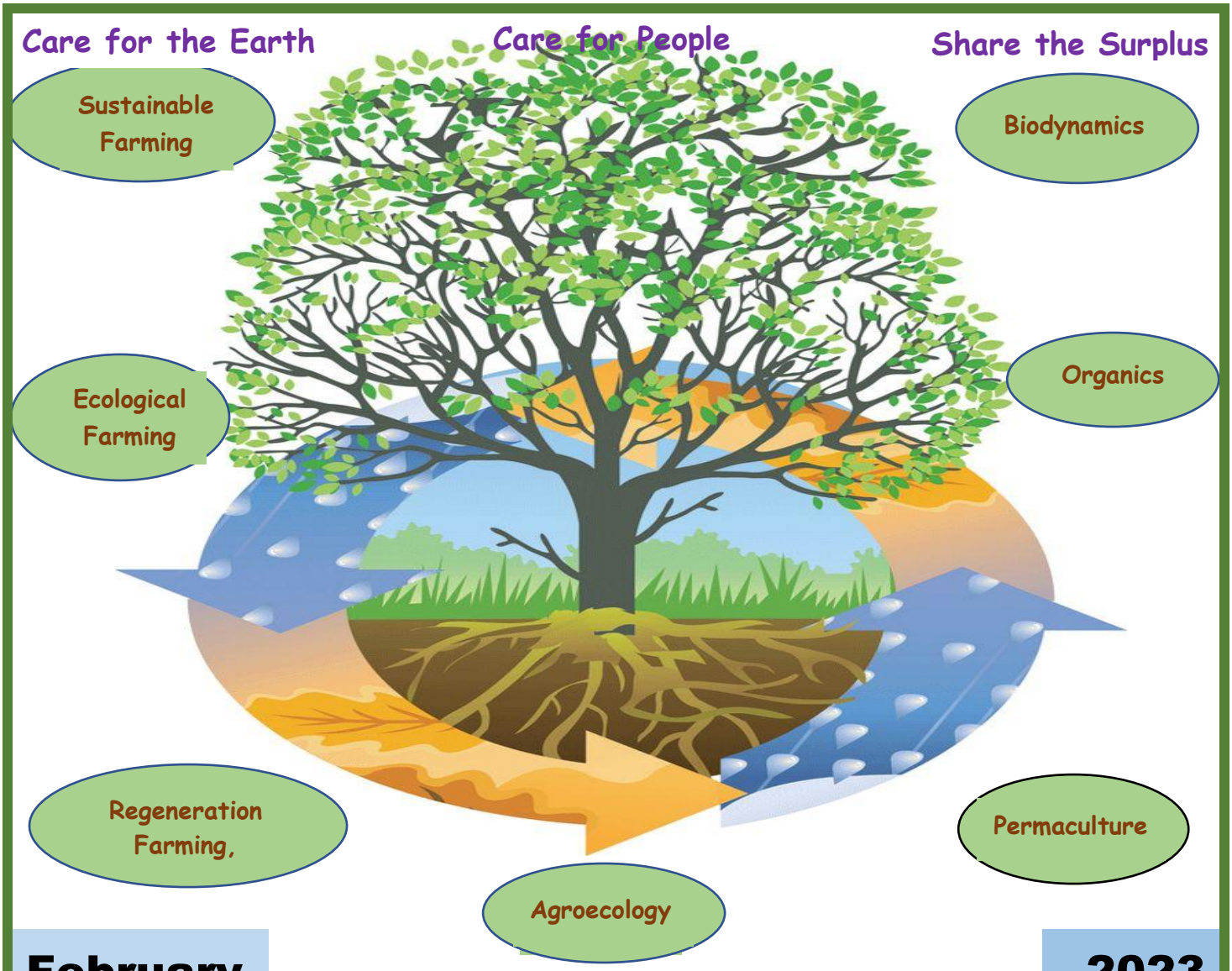

February **2023**

Dirty Diggings

February in the garden

What to Sow: You can still plant out fast growing summer crops now to make the most of the warm early autumn, like zucchini, squash, basil and cherry tomatoes. Lettuce, rocket, parsley, radish and beetroot can be sown or planted. Plant out potatoes.

What to do: Keep plants and vegie beds well-watered. Watch out for forecasts for extreme heat, and prepare by picking all the fruit off plants you can, watering morning and night, and shading plants where possible. Keep staking tomatoes and remove any leaves looking poorly. Watch out for fruit fly attack. Bag any infected fruit and freeze or solarise them in sealed bags in the sun to kill any larvae. Cut your losses and take out any severely affected plants. Check if your olives are ready for harvesting and pick them before the birds do.

February Plantings

Amarath, Globe Artichoke, Beans (dwarf) Beetroot, Broccoli, Cabbage, Carrots Cauliflower, Celery, Chicory, Collards, Cress, Cucumber, Endive, Kale, Kohl Rabi, Leeks, Lettuce, Parsnip, Potatoes, Radish, Rhubarb Seed, Salsify, Shallots, Silverbeet, Spinach, Spring Onions, Sunflower, Swede, Turnip

Magazine of Picket Fence Urban Farm
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Permaculture is all about the design of an agroecology system, a highly promising alternative to industrial agriculture that has the potential to avoid the adverse ecological and social impacts of input-intensive production.

PERMACULTURE FOR THE TRANSITION TO AGROECOLOGY

Permaculture has undergone parallel growth with agroecology, displaying overlapping concerns while developing different constituencies in the past three decades.

Agroecology and permaculture share a focus on agricultural production and the intersection of ecology, a normative orientation towards agroecological transition, and an association with popular movements consisting largely of land users.

Additionally, permaculture shares with agroecology a complex stratified definition.

Recent scholarship has clarified that agroecology simultaneously refers to a scientific discipline, a social movement, and a set of agricultural practices.

Similarly, some of the confusions surrounding Permaculture can be attributed to the use of the word to refer to:

- an international movement;
- a design system;
- the worldview disseminated by the movement, and
- the set of associated practices.

Permaculture is defined as the conscious design and maintenance of agriculturally productive ecosystems which have the diversity, stability, and resilience of natural ecosystems.

It was founded by Bill Mollison and David Holgrem in the 1970s and is now present in all the continents in the world.

Agroecology is defined as the application of ecological concepts and principles to the design and management of sustainable agroecosystems; it provides a framework to assess the complexity of agroecosystems" (Miguel A. Altieri, 1995).

Today, the question of agricultural production has evolved from a purely technical one to a more complex one characterized by social, cultural, political and economic dimensions.

Agroecology has emerged as the discipline that provides the basic ecological principles for how to study, design and manage agroecosystems that are both productive and natural resource conserving, and that are also culturally sensitive, socially just and economically viable (Altieri 1995).

TO TRANSITION TO AGROECOLOGY THROUGH THE PERMACULTURE DESIGN SYSTEM

Published definitions of Permaculture emphasize on its status as ***a system for the design for human settlements, with an emphasis on productive landscapes.***

The Permaculture design system utilizes spatial reasoning strategies, and ecological and systems thinking principles, which are used to select practices, analyse site conditions, and integrate them with site conditions and land use goals.

The most distinguishing aspects of the Permaculture orientation towards agroecosystem design are *its emphases on site specificity* (including attention to microclimate), *the interaction between components* at multiple scales, from field-scale polycultures to agroecosystem scale land use diversity, and *spatial configuration* as a key driver of multiple functions.

From the perspective of Permaculture design, crops and land use should be carefully selected and placed to demonstrate a fine-grained analysis of in-site heterogeneity including microclimate, topography, and existing vegetation.

Microclimate effects, driven by both regional and local topography and vegetation, can be leveraged to identify sites for otherwise marginal crops and maximize energy efficiency.
Structures, ponds and equatorially oriented slopes, and woody vegetation are identified as the main sites at which extremely cold temperatures are moderated by thermal mass and heat-trapping effects which may accommodate less hardy species.

In Permaculture, land use diversity appears in forms that include animal and plant production, tightly integrated terrestrial and aquatic system, and annual and perennial plants.
This emphasis is consonant with the scientific literature, in which the benefits to productivity generated by synergies between multiple enterprises has been demonstrated.
Integration of multiple has shown to increase labour efficiency and to enhance all dimensions of multifunctionality, including environmental, economic, and social functions as well as food security.

Polyculture

Permaculture's emphasis on configuration is expressed in the Principle of Relative Location and the design tools Zones of Use and Sectors.

Relative location, according to Hemenway, *is the art of placing the elements of your design in ways that create valuable relationships and time-saving connections among all parts.*
Sectors refer to directional forces that impinge on the site from the outside including the sun, wind, water, and wildfire.
Landscape components can be arranged to manage these forces through:

- exclusion (fire breaks);
- channelling (windbreaks and water control features), and
- inclusion (maximizing isolation/minimizing shading for crops and structures).

Zones of Use is a concentric model of land use planning **intended to maximize farm labour productivity**, by sitting land uses that require frequent management or use closer to the home or other centres of activity.
These principles of agroecosystem configuration, although lacking an explicit parallel discussion in the scientific literature, appear reasonably well supported by existing science.

Configuration is, nevertheless, an explicit issue for land use function that depends on spatial and topographic relationships, including runoff filtration, windbreaks, habitat provision, nitrogen fixation in poly-cropping, contour cultivation, and soil and water conservation.
At large scales, the configuration is regarded as a driver of ecosystem functions and to a lesser extent cultural functions.

PERMACULTURE DESIGN AND AGROECOLOGY PRACTICES: ONE FEED THE OTHER
Permaculture practices are often inspired by traditional agro-ecological systems, as in the case of tropical home gardens and the permaculture "food forest."

As demonstrated by the guild concept, natural systems are another source of inspiration in which polycultures are specifically designed as analogues to natural functional assemblages.
Alternative agricultural techniques such as the original adoption of Keyline's system of landscape planning may also be adopted by permaculturists.

Contemporary examples include the increasing enthusiasm in the permaculture community for aerobic compost tea and biochar. The "herb spiral", a mound garden design that was proposed by Mollison for the production of culinary herbs, is, probably the only practice to have emerged from the permaculture movement itself.
In this light, the practical spectrum of permaculture might be more productively regarded as a conceptual framework for the assessment and adoption of practices rather than a bundle of techniques.

Insects and diseases are the symptoms of a failing crop, not the cause of it. Dr William Albrecht.

Criteria for the evaluation of practice are not articulated explicitly in Permaculture principles, but consideration of principles and favoured practices suggest two broad conceptual criteria: **Ecosystem mimicry and system optimization.**

The criterion of ecosystem mimicry regards the structure and function of the unmanaged ecosystems as models attempt to create highly reproductive systems with analogous structure and function using species that produce yields for human use.
The criterion of systems optimization doesn't refer to a model ecosystem but seeks to identify strategic positions of leverage where minimal intervention may enhance the performance of the desired function beyond that of naturally occurring systems.

Collectively, these criteria outline a conceptual framework for the assessment of practices in the Permaculture movement and may also inform future investigation of these issues.
The design and use of perennial polycultures is a major theme of the Permaculture experience and literature and reflects the criterion of ecosystem mimicry.

The plant/animal design or other multi-kingdom polycultures, however, receive less attention.
Diverse polycultures are valued for resistance to pests and pathogens, resistance to climate variability, diversification of production, and as a prerequisite for a facilitative interaction between plants that can reduce the need for material and labour inputs.

Perennially in cropping species is treasured for soil conservation functions and labour efficiency.
This view is largely consonant with the emerging scientific perspective on perennial polycultures as well as the more extensive discussions of field-scale diversity and perennially.
Permaculture is exceptional in emphasizing the potential perennial polycultures to replace some portion of annual vegetable crops and staple crops.
Perennial Alley Cropping

Dense and complex plantings can have various effects including the reduction of productivity through above and below-ground competition for resources, increased harvest labour, and increased pathogen pressure due to lack of air circulation.

Redundancy in water storage system is emphasized with the priority placed first in soil storage, then surface water impoundments, followed by tank storage.
The utilization of earthworks for water harvesting and control is a global idea in traditional agriculture systems.
The productivity of such systems has been demonstrated across multiple contexts including arid land agriculture, hillside agriculture in humid zones, and in aquaculture/ irrigation systems in a wide range of contexts.
Despite the rate at which water harvesting earthworks are addressed in the permaculture literature, discussions of the quantitative planning tools is rare.

Discussion of the risk posed by dispersive soils, which are highly vulnerable to the tunnel erosion and thereby to catastrophic failure, is absent.

Permaculture literature supports attention to new and underutilized crops, consideration of wild relatives of domesticated species, and on-farm breeding of new cultivars.

The multifunctionality of the cropping species is valued over the place of origin, and the introduction of non-local species is regarded as desirable.

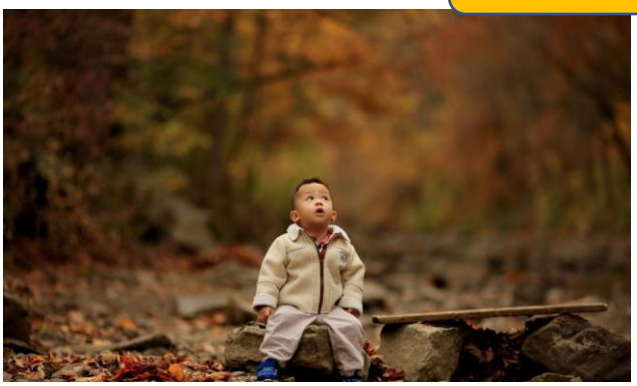
Permaculture And Agroecology - World Permaculture Association

Biosphere and Technosphere

Herbert Girardet| 28th November 2022 Continued

Feature

The technosphere



For most of our existence we lived as hunter-gatherers and subsistence farmers, small in number. While we were utilising a very limited range of hand and hunting tools, our impact on the biosphere was very limited. The solar-powered human economy was essentially circular, with organic wastes key to ensuring future harvests.
By contrast, the technosphere, a product of the Industrial Revolution, is primarily powered by fossil energy sources, or stored ancient sunshine, with 'progress' enabled by relentless advances in technology and innovative production systems.

The term 'technosphere' was first coined in 1968 by the Vancouver-based control engineer John Milsum. It comprises all the structures and processes that modern humans have imposed on the planet, such as factory production, building technology, transport and communication systems, mechanised farming, cities and megacities.

The technosphere, of course, has enabled a life of abundance for a minority of the world's population, whilst a majority is still waiting to benefit. But there is another profoundly systemic problem: today the vastly expanded human economy is essentially linear: materials are extracted and turned into consumer products, and wastes are discharged into Nature as pollutants. In our accountancy systems, these environmental externalities are largely unaccounted for, with dire consequences for future life.

The technosphere may be an offshoot of the biosphere, but by contrast it is inanimate and profoundly lifeless. As a linear system, it operates according to its own entropy-driven dynamics. Its products do not grow in some organic process, but rather are assembled on conveyor belts. It has no sense of 'future'. Crucially, our industrial economies are subject to the second law of thermodynamics: their use of fossil energy, their key characteristic, is an irreversible process, with materials degraded and usable energy irretrievably turned into unusable, dispersed waste. Recycling is often avoided because of costs that both producers and consumers are unwilling to pay.

Anthropomass

Another study from the Weizmann Institute of Science, by Emily Elhacham et al., published in Nature in December 2020, reveals the following:
The stuff we make, called anthropogenic mass or 'anthropomass', added up to some 35 billion tonnes in 1900, doubling by 1950. It increased again, to about half a trillion tonnes, by 2000. By 2020 it had doubled again, to be equivalent to the mass of all living things.
In 1900, anthropomass equalled about three per cent of the total biomass. By 2000, this number had grown to 100 per cent, with the number of humans quadrupling in this time frame. Today, for every person alive, a quantity of anthropomass greater than their body weight is produced every week.

Under current trends, the products of the technosphere will outweigh the living world by as much as threefold by 2040. The number of new 'technospecies' coming out of our factories and laboratories now far exceeds the Earth's estimated nine million living species. Concrete and aggregates make up four-fifths of the total, followed by bricks, asphalt and metals, not counting rock used in building construction or generated in mining. In total we use and discard some 30 trillion tonnes of Earth's resources every year. Whilst plastics are a minor ingredient, their mass is greater now than that of all animals on Earth.

Since the 1950s, the Earth has been on a new, human-driven trajectory – leaving behind the stable conditions of the Holocene epoch and entering the uncertain new world of the Anthropocene.
Urbanisation, now on an unprecedented scale, is a major contributor to the systemic clash between biosphere and technosphere. As cities expand geographically, they encroach on the realms of the biosphere, usurping ever-larger living landscapes and paving them over with tarmac and concrete. This has robbed vast areas of land of the capacity to photosynthesise.

Well over half the world's population now lives in cities and megacities, mostly located on the world's coastlines and river valleys, on former forest and farmland soil. Our urban lifestyles increasingly draw on resources brought in from long distances – water, food, energy, metals, and aggregates – the global ecological footprints of cities, often extending to hundreds of times their actual built-up surface area. Order, imposed on landscapes in geometric urban settlement patterns, causes disorder elsewhere in Nature as products are imported, utilised, and discarded.
Cities are also giant heat engines – but there is the catch: the fossil fuel energy they utilise for their many vital functions can be used only once, as fuels combust into low-grade heat and waste gases. And as urban factories process materials into products, quality inevitably starts to deteriorate. High-energy modern cities will therefore tend to contribute to disorder, waste and pollution.

Thus modern cities, and their technology-driven economies, could be described as 'entropy accelerators' – continuously downgrading the resources they require in the process of using them. A key question that needs an

urgent answer: how can we rapidly replace high-entropy urban energy and production systems with low-entropy, renewable energy and (re)production systems?

Cities are places where human creativity reigns supreme and now the task is to use eco-literacy as a tool for change. To assure our future viability, our education systems need to address the gap between the prevailing linearity of technical systems and Nature's circular ecological systems.

Circular technical systems?

To try and align technosphere and biosphere, then, is a historic challenge in this age of the Anthropocene. To take stock of what it could mean for education it might be useful to summarise the profound systemic difference between biosphere and technosphere:

- The biosphere, driven by solar energy and photosynthesis, is an essentially circular system, which is all about reproduction: organic growth, regeneration, species interdependence and communication. All wastes are recycled into new growth, assuring the continuity of life.
- The technosphere, largely powered by fossil fuel combustion, is an essentially linear system. It is defined by production: resource extraction, mechanical assembly, chemical manipulation, and linear waste disposal, with pollution systemically undermining the continuity of life.

E.F. Schumacher put it succinctly: "The system of Nature, of which man is a part, tends to be self-balancing, self-adjusting, self-cleansing. Not so with technology." *What makes up the Biosphere*

We need to get to grips with the fact that the technosphere, in its current form, clashes with the functional principles of the biosphere, an organic, ecologically defined system. The second law of thermodynamics tells us that the processes at work in the technosphere are defined by entropy – erosion of quality. By contrast, in the biosphere negentropy – or sustained order – prevails.

As regards energy, dramatic change is inevitable: every year we currently burn at least one million years' worth of fossil fuel deposits, accumulated in the Earth's crust over some 300 million years. In this climate-challenged world, how can this possibly remain the energy basis of human civilisation?
Burning the world's remaining fossil fuel reserves would unleash 3.5 trillion tonnes of greenhouse gas emissions – seven times the remaining carbon budget to cap global heating at 1.5 degrees Celsius – according to the first public inventory of hydrocarbons, published in September 2022. The UN's annual Production Gap assessment in 2021 found that governments plan to burn more than twice the fossil fuels by 2030 that would be consistent with a 1.5-degree Celsius world.

It seems only too evident that modern fossil-fuel-powered technical systems face redundancy. Switching rapidly to efficient use of renewable energy is the logical, inevitable next step, despite resistance from entrenched interests. But as the costs of renewable energy have been coming down dramatically in recent years, this is becoming more plausible all the time.

To have any long-term viability, our civilisation needs to learn to live within the capacity of natural systems to renew themselves. Food production can only be viable in the long term as a circular system. Across the world, there are now many permaculture, agroforestry and biodynamic farming systems that practise these methods, and conveying this knowledge to students should be an important part of school curricula.

Moving production and consumption practices towards circularity is vitally important, but systems change in that direction is a hard nut to crack, since the technosphere does not have the inherent capacity to continually renew itself in the same way as the biosphere.

That is where human inventiveness needs to come into play. There is much talk now about creating circular 'cradle to cradle' economies. This concept goes beyond the waste management mantra of refusing, reducing, recycling and remanufacturing, which has long been on the green agenda. We need to be clear that much recycling, as currently practised, is actually down-cycling.

The redesign of the 'technical metabolism' is a vital task. Circular systems for technical materials – particularly plastics and clothes fabrics – are crucial for future viability. Most of us are only too aware now of the horrendous scale of plastics pollution in rivers, lakes and oceans, and its impacts on Nature. The main challenge is to reinvent industrial production systems that mimic Nature's metabolism.

This is where the work of pioneering eco-industrial designers Michael Braungart and Bill McDonough is particularly important: "There are three basic principles of Cradle to Cradle Design: waste equals food, use current solar income, respect diversity. These principles allow Cradle to Cradle Design to conceive industrial systems that emulate the healthy abundance of Nature."
Plenty of literature is now available for students at all levels to explore these options and to study examples of real-life practices.

The noosphere and the internet

Back to Vladimir Vernadsky and his book *The Biosphere*: jointly with French theologian and philosopher Teilhard de Chardin, Vernadsky pioneered, in 1922, the concept of the noosphere, described as the "planetary sphere of reason". In summary: "The noosphere represents the highest stage of biospheric development, its defining factor being the development of humankind's rational activities."

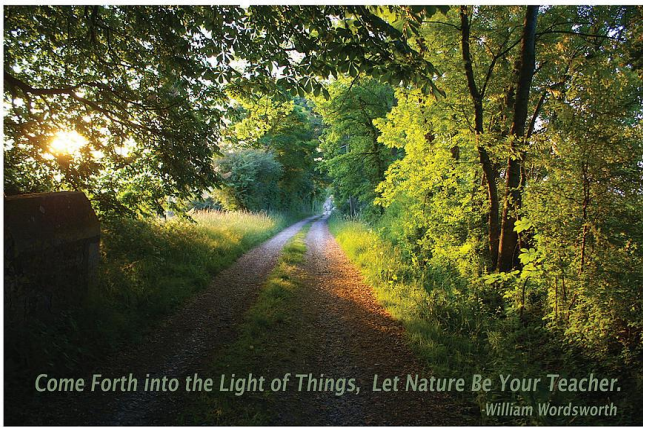
In ancient Greek, *noos* is a word for 'mind' or 'reason'. The idea of a knowledge-dispersing noosphere is barely known 100 years after it was first publicised. But the recent rapid growth of cyberspace – the realm of the internet – could be said to resemble or even represent this noosphere, disseminating Earth consciousness/eco-literacy. At best, the internet and global communications can be key educational tools for overcoming the evident mismatch between biosphere and technosphere.

It is certainly true that the internet enables unprecedented access to information, to knowledge, and even to sources of wisdom. So far, so good. But it is also being increasingly usurped by commercial interests as a tool of a new global 'surveillance economy'. In the face of this, every possible effort should be made to build up distinct sections of the internet as vital tools for disseminating knowledge of the workings of our home planet.

In a time of planetary emergency, education cannot be focused only on young people. With little time left to prevent the Earth from overheating and disastrous biodiversity loss, rapid decisions are needed to overcome the systemic conflicts between biosphere and technosphere. All of us, including decision makers of every description, have to undergo crash courses in Earth systems science.

Concepts and practices for enabling the regeneration of the Earth's living, organic economy should be at the heart of education, focused single-mindedly on long-term wellbeing of people and planet. The need to reinvigorate the vital organs of our home planet must be closely linked to exploring ways and means to lead less demanding, simpler lives. The growth of the eco-technical revolution and the green new deal now under way might be a significant step in the right direction, but, in the rush towards mainstreaming renewable energy and electric transportation, can we avoid systemic dependence on metals such as lithium, as well as cobalt, coltan and copper, which are mostly mined by slave labour in places previously covered in forest ecosystems?

Nature as teacher



As we face an unprecedented emergency on planet Earth, Nature, as a vast, multifaceted, interactive living system, needs to be our revered teacher: it is all about give and take, in an exuberant dance of life, powered by sunlight and wetted by rain. Until we learn to adopt Nature's 'circular' ways, always giving back what we have borrowed, we will deplete her resources to a point where human life itself is in question. Our education system needs to convey plausible ways and means of restoring the Earth's living, organic economy. Wherever possible this should not be book learning but experience-based, hands-on learning – in gardens and orchards near people's homes, and in wide-open landscapes. There are many studies that show that spending time out and about in Nature is good for our wellbeing.

Back in the classroom and at home, a plethora of documentaries about the wonders of life on Earth are there for us to view and enjoy. Animations are particularly well suited to portraying the complex interconnections of the Earth's systems and cycles.

Beyond this, we have other amazing new tools available to us to glean new, global perspectives. Using satellite technology (also a product of the technosphere), we can see the Earth from space, in all its astonishing variety, and scrutinise the changes that are occurring on the landscapes and seascapes of our home planet. And we can now see the world for ourselves as never before: at night, much of the Earth is now illuminated by billions of lights from households, public buildings, and vehicles. The lights of cities and the flares of oil and gas fields are turning night into artificial day. These images vividly illustrate the unprecedented human presence on Earth.

Then, during daylight hours, we can see straight lines and right angles stretching across vast landscapes. Cities with their angular building blocks and multi-lane highways are much in evidence in many places, mostly located in coastal areas and along rivers.

In other areas we see vast fields used for large-scale mechanised agriculture, often sprawling across former forest landscapes. In some places there are feedlots with tens of thousands of cattle crammed together behind impenetrable fences. Elsewhere, large numbers of green circles are densely clustered together – the patterns of irrigated crops imposed on otherwise barren landscapes. These are the ecological footprints of an urbanising world.

Cities in one part of the planet are umbilically linked to distant farmland, forests and mines to slake their insatiable appetite for resources. To convey an understanding of these global 'teleconnections' is an important task for education at all levels, junior education and university tuition, as well as further education and lifelong learning.

The total extent of the Earth's surface is listed in atlases as 51 billion hectares, of which 71 per cent is ocean and 29 per cent land surfaces. Agriculture utilises half that land, with forests now covering 30 per cent. There are

approximately three trillion trees in the world. Over 15 billion are cut down each year, and the global number of trees has fallen by almost half since the start of human civilisation.
But these figures do not convey the full picture. Importantly, they do not account for the fact that the planet's three-dimensional living surfaces – tree canopies and scrub vegetation – extend to a vastly larger area than its registered surface area.

Walking in a rainforest, and looking up at its multi-layered canopy, it is obvious that its leaf surface is many times larger than the surface area of the forest floor. Precise estimates are still not available.
The Gaia theory states that the composition of the Earth's atmosphere is kept in a dynamically steady state by the presence of life, assuring its continuity. Large-scale deforestation, as has been occurring across the tropics, in South America, Africa and Asia, ominously interferes with this capacity.

With rapid loss of tropical forest cover and marine vegetation in many places, the Earth's bioactive surfaces are being continuously reduced. This is particularly troubling at a time when biological carbon sequestration is more important than ever, with only half of our CO_2 emissions currently being absorbed by photosynthesis. Most alarmingly, rainforests, vital organs of planet Earth, are well on their way to becoming net emitters of CO_2.

The degree to which deforestation has caused the loss of vast layers of living vegetation has barely been estimated. The ever-growing demands of the technosphere as it currently operates undermine the very capacity of the biosphere to absorb our discharges, whilst also interfering with the Earth's water, nutrient and carbon cycles.

It is becoming increasingly apparent that much of economic growth across the world, based on depleting the integrity of the biosphere, has effectively become uneconomic growth: deforestation, resource depletion, pollution and climate breakdown inevitably damage the relationship between people and planet. Prevailing economic theory and practices are clearly failing much of humanity. It is vital for our education system to convey this reality and to envisage alternatives.

It is crystal clear that the systemic principles underpinning the Industrial Revolution, which gave rise to the technosphere, are now redundant: we need to address the fact that our industrially empowered economic system puts economy before ecology, largely ignoring critical environmental externalities.
Education at all levels – schools, universities and further education – needs to focus on these existential challenges and to assure that biosphere and technosphere are aligned, both theoretically and practically. Across the world we can build a vibrant new green economy, with new livelihoods for billions of people. Let's get on with it.
Biosphere and technosphere (theecologist.org)

Insects

Insects and Extinctions BY SHARRON P.

What is happening to insects? Do you see the same number of insects in your garden as you did a few years ago? Research in the northern hemisphere shows that there are significant declines in insect numbers. A **review of scientific data in 2019** shows that rapid rates of decline in insect numbers threatens 40% of insect species with extinction over the next decades possibly leading to "insectageddon ".

In Australia, there is not enough scientific data yet to say if the same conclusions apply here. However, it is known that some insect populations are declining e.g. the green carpenter bee.

Should We be Concerned?
To many people, insects are just a nuisance, but they actually play a pivotal role in nature. They are important in maintaining ecological balance. They provide food for many birds, reptiles, other small animals and fish. They clean up/recycle waste and decaying plant and animal material and some also feed on or parasitise larvae of pest insects. One of their most important roles in the world's ecology is that of pollinators of plants. This function is vital for production of food crops and is a reason that we are so concerned to prevent reduction in bee populations.

Since insects comprise the largest animal group on the earth and represent about two thirds of land-based species, we need to be very concerned about major changes in their populations.

When you enter a garden you are elevated to a calming, relaxed state. In this sanctuary your mood transforms as you become part of this special place of beauty. A garden possesses elegance and the magic of nature – a wonderful mixture of art and life sciences embraced by spiritual realms. The gardener enhances life as it flourishes unbridled, leading you down the path of the natural world.

Frank Holzman

Many aspects of our modern world are responsible for loss of insects:
Pesticide use – in agriculture, gardens and inside dwellings. Many such as the commonly used group of chemicals, neonicatinoids are not specific for pests and kill many other insect species as well.
Agriculture's dependence on large scale monocultures. These support only a small number of insect species displacing other species which do not thrive or reproduce in the absence of a natural diversity of plants species.
Loss of habitat due to agricultural monocultures and urbanization. Both have led to removal of wetlands and naturally diverse vegetation which provide food, shelter and breeding grounds for insects.

What You can do to Help Insects

Each of us can do something to help prevent insect decline continuing:

- Reduce or stop use of insecticides. There are many alternatives that protect plants from insect attack. In other articles on SGA's website there are suggestions for particular pests. Some examples are hosing them off or covering target plants with fine netting.
- Reduce (or get rid of) your lawn area which provides little food or shelter for insects
- Plant your garden with a wide variety of insect-attracting plants to provide them with food and shelter e.g. Marigolds, perennials with composite flowers like Sweet Alice and Yarrow, herbs with perfumed flowers or leaves, sunflowers.
- Create some "messy" spaces in the garden to provide shelter and breeding locations – pieces of timber, old bricks, stones, dense shrubs and ground covers. In particular, plant ground covers and mid-storey plants that are indigenous to your area – they are best at attracting indigenous insects.[1]
- Make or buy an insect hotel which will give insects a home and look attractive too.
- When you buy food, choose that which hasn't been grown using pesticides. These would be labelled "organic", pesticide-free", "chemical-free" or "biodynamic". Boosting sales of such food leads to growers changing their growing practices.
- Turn off out-door lighting. Many insects will be drawn towards the lights e.g. moths. Insect navigation systems are disturbed by lights, consequently affecting their ability to feed.
- Get engaged in observing and counting insects through citizen science – you can help monitor insects to add to our scientific knowledge about population numbers by joining in initiatives which record insects e.g. the Wild Pollinator Count or Butterflies Australia.

Declining Insect populations | Sustainable Gardening Australia (sgaonline.org.au)

Veggie Patch

Turnips & Parsnips By: Peter Cundall

PETER CUNDALL says easy-to-grow 'old-fashioned' turnips and parsnips are back in vogue with their distinctive flavours and textures.

Parsnips and turnips are among the easiest of root crops to grow. With planning, these valuable vegetables can be harvested in temperate gardens through much of the year, thriving and maturing even through the coldest winters. They are also a remarkably cheap source of nourishment, with just a couple of packets of seeds producing enough to feed most families and plenty left over to give away.

Most root vegetables are nothing more than bulky fuel reserves. They allow plants to survive months of winter or dry-season dormancy in order to form seeds and reproduce. These roots become filled with complex carbohydrates, minerals and other nutrients. For thousands of years humans have harvested these storage organs as a vital source of food for survival.

Turnip Treats

For a couple of thousand years, enormous and rather coarse turnips – which perhaps gave this flavoursome food a bad name – were a significant part of the food eaten by humans and farm animals. Turnips were eventually replaced by potatoes as a staple and for many years their popularity waned, although nutritious 'turnip tops' were often eaten as spring greens.
Today, there are numerous varieties of turnips of all sizes, shapes and colours, and they are very much back in fashion. They are delicious eaten raw, baked, steamed, stir-fried with the leaves, or cooked in stews and casseroles. The Chinese value them so much they cut them into large, extra-thin slices and hang them up to dry.

Not only are turnips easily grown, but some varieties, such as the outstanding Japanese ‘Hakurei’ and ‘Tokyo Cross’, are ready to be eaten whole when the size of a ping-pong ball. In short, they are ready to begin harvesting within a few weeks of the seed germinating and can be allowed to continue to grow larger.

Turnips are undoubtedly the quickest maturing of all fast crops – apart from radishes – and grow to perfection in almost any soil and climate, including the coldest and even northern Australia.

In the subtropics, turnips do better and are more productive than parsnips, producing heavy crops – 100-150kg per 10 square metres. Sow in March for maturity in June, although plants can be left in the ground until November.

In cool temperate climates plant between August and March, while in warm temperate areas plant in late summer/early autumn and spring.

Soil preparation
Turnips are brassicas, so should never be grown in soil in which any of the cabbage tribe have recently been harvested. They are an excellent follow-on crop after sweetcorn, yam, peas, beans and pumpkins.

Sprinkle a good fistful of blood and bone fertiliser over each square metre of surface. Add a 20mm layer of matured cow or sheep manure and use a garden fork to turn the lot deeply into the soil. Rake level, water deeply then leave to settle overnight. (Avoid high-nitrogen fertilisers such as chook manure unless turnips are mainly grown for the tops.)

Sowing seed
Turnip seeds are small, round and hard. To sow, make a 10cm-wide, shallow drill with a hoe and sprinkle the seeds very sparsely along the entire width. Cover with a thin layer of potting soil and water.

The seeds germinate rapidly and the bright green seedlings are up and moving in less than a week. Competition caused by overcrowding encourages leaf production at the expense of root size. So be prepared to thin the seedlings weekly either by hand or by using a light hoe. Keep the bed well-watered and growth will be extremely fast, especially if pushed along with heavily diluted fish emulsion (1 part emulsion to 100 parts water) every week.

Harvest and storage
When small, the entire plants can be eaten raw. The Japanese white turnips are remarkably tender, sweet and delicious. Successive sowings can be made every month right through the year in cool and temperate districts to provide a continuous supply of tasty globes. In temperate climates, other varieties such as ‘Purple Top White Globe’ can be left in the ground during winter and are best eaten when the size of a tennis ball. However, once they start producing a flowering stem, they become fibrous and hollow-centred.

Why Parsnips?
These vegetables may look like white carrots but, although related, they have a totally different flavour and are much closer to parsley or celery. Some people describe the sweet, aromatic taste of cooked parsnips as similar to celery-flavoured butterscotch. Unlike carrots they lack beta-carotene, but are a good source of B vitamins, folic acid and fibre. Long before cane sugar arrived in Europe, parsnips were made into popular sweet dishes, drinks and syrups. This tradition was resurrected in the UK as a result of sugar rationing during the First and Second World Wars. Generally though, they are used like carrots in soups and stews, steamed and baked.

Growing parsnips
Parsnips can only be successfully grown by directly sowing the seed where the plants are to be raised. Even small seedlings resent disturbance and attempts at transplanting causes the plants to bolt uselessly into flower to form tough, tasteless roots.

Above all, parsnip seed must be completely fresh as it loses viability – the ability to germinate – faster than any other vegetable. When buying seeds, carefully check expiry dates on packets. Should seed racks be exposed to heat or direct sunlight at any time, make your parsnip purchases elsewhere.

The most common cause of failure after sowing parsnip seed is erratic, poor or non-existent germination. This is almost always due to old or badly stored seed. Place sealed packets of newly purchased seeds in a refrigerator if they are not to be opened immediately. The most viable of all parsnip seeds are those we harvest ourselves.

Sowing times depend on location and climate: in cool districts from October until early autumn; in warm, temperate districts from August until mid-March. In the subtropics, parsnips can be challenging because the cool season is brief. Get your seed in no later than April to avoid plants bolting in spring.

Soil preparation

Parsnips grow best in deep, well-drained conditions, preferring a sweet, loamy, deeply dug, cool soil and full sun. The roots will not properly form in hot, stony ground, heavy clay or acidic conditions. The plants have a low need for fertilisers and resent over-rich, heavily fertilised soil which is the main cause of deformed, badly forked roots of little value.

Ideal beds are those that have been manured or fertilised to grow greedy vegetables such as brassicas or sweetcorn the previous season. Don’t bother adding fertilisers or organic matter, but apply lime where needed

The soil should be broken up and raked to a fine tilth, especially the surface. It helps if the bed is then given a soaking down to the sub-soil the day before and left to settle.

Sowing seed
The oddly shaped, lightweight, flattish seeds are difficult to handle when sowing. To avoid overcrowding the seedlings, mix the contents of a typical packet into about half a cup of fine, very dry sand, which will space them apart more evenly. (If necessary buy a small bag of horticultural sand, spread it over a sheet of black plastic in the sun to dry off, then shake it through a kitchen sieve, discarding the large particles).

Put the sand into a screw-top jar with a finger-sized hole in the lid and mix thoroughly. This can then be poured through the hole, directly into a drill (impression in the soil) no more than 10mm deep. A good straight drill can be made by pressing a garden stake or rake handle into
the soft surface.

Then give the seed-bed a deep soaking using a fine sprinkler-head so as not to wash out the seeds. This will gently wash them in, making backfilling unnecessary. However, during extra-hot conditions pulverised coco-peat may be sprinkled along the drill line to help retain moisture around the swollen seeds.

Germination and harvest
The most hazardous stage with parsnips is during the 10 to 15-day period between seed sowing and germination. It is vitally important that the soil does not dry out during this crucial period. If it does, even for a few hours, the seeds will die. This means watering several times a day if necessary, especially during hot, dry and breezy weather. The most important times to water are in the evening and again early in the morning. This ensures the seeds remain fully engorged with moisture during germination.

When the seedlings emerge, thin as soon as possible, spacing those left in the ground about 5cm apart. About six weeks later, every second plant can be harvested as tasty, extra-tender, finger-sized roots for immediate eating either raw or steamed. Those left in the ground should be no closer than 10cm apart.

The most delicious parsnips are those which are left in the ground to be heavily frosted in winter. The extreme cold converts much of the starch into sugars to make them even more delicious. In cool temperate regions, the roots are best stored in the ground during winter to be pulled as required.
Turnips & Parsnips | Organic Gardener Magazine Australia

Herb Spiral

How To Grow, Harvest And Use Agrimony For Digestive Problems

BY SUSAN ELIZABETH

There are many different species of Agrimony, but the one grown and used most often for its health benefits is *Agrimonia eupatoria* or common agrimony.

These plants bloom from June to September and both the leaves and flowers have been used for centuries to treat or ease a range of medical conditions and symptoms.

Growing Agrimony
Agrimony is common in the wild in many areas, so you could pick or forage the leaves, flowers, etc. if you wanted to. However, growing agrimony in your garden is not difficult.

In terms of position, you need to ensure the plants have full or at least partial sun and well-drained soil. Plants are unlikely to produce flowers without regular watering.

Agrimony can be grown from seed in winter or from root cuttings. If you live in a cold area, it's best to start the plants off indoors until it's warm enough outside and the seedlings have reached a height of about 4 inches or 10 centimeters.

Seeds germinate within three weeks, and after 90 to 130 days you will have mature plants you can harvest leaves, flowers, and seeds from. A word of warning, though: agrimony is considered an invasive perennial. If you don't stay in control, it will take over your garden!

How To Harvest And Process Agrimony

If you are harvesting in the wild, it's important to make sure that you have, first and foremost, correctly identified the plant. Remember not to pick too much from any one area as this protects the plant and means that foragers that arrive after you will also be able to harvest.

Harvesting should be done in midsummer and when the flowers are blooming and when the leaves are at their best. Be patient as leaves harvested too soon will be more astringent and will have lost some sweetness.

The steps to harvesting and processing agrimony are simple:

Harvesting:

You can either pick the whole plant or only the parts you want to use. For example, you might opt to only pick leaves as you need them. Other people also pick the flowers and thin stems or stalks.

If you want seeds for propagation purposes you will need the flowers but only harvest them once they have opened fully.

Drying:

The drying process takes approximately a week. You'll know the leaves are dry when they become a little flaky. If you only pick the leaves you can air dry them by laying them out on a sheet of brown paper, a wire rack, or paper towel. If this is not practical for you, you can also use brown paper bags.

If, on the other hand, you have cut whole branches or plants, tie the stems together with string or twine to form a small bunch. The bunch should then be suspended from a hook or beam in an area that is dry, away from direct sunlight, and where the airflow is good.

Preparation:

Depending on what you want to use the agrimony for, the dry leaves can then be crumbled up into pieces or ground into a powder. Seeds that you want to use for propagation the following season can be stored in the freezer.

Storage:

If you are storing leaves or powder, it's best to do so in thin paper bags or in airtight jars. Store them in a cool, dry place. However, many experts recommend that you don't store agrimony for too long as it loses taste and – in some cases – its effectiveness.

How To Make Agrimony Tea

The most popular Agrimony preparation is tea. You can use the leaves, flowers, and even the thin stems. Although dried leaves are more often used, you could use fresh ones too. How strong you make the tea will depend on what you are drinking it for.

For instance, strong tea is best as a gargle for a cough or sore throat, but very weak tea should be made if you are using it to treat diarrhea or a digestive system issue. The ratio is 1 to 2 teaspoons per one litre of boiling water.

Making the tea is as easy as one-two-three:

1. Put the leaves in a container, pour boiling water over the leaves, and cover the container.
2. Leave the tea to steep or draw for 5 to 15 minutes depending on the required strength.
3. Pour the tea through a strainer to remove any plant matter.

Agrimony tea can be drunk hot or cold and you can add honey if you enjoy the taste more that way. We don't recommend adding milk!

Of Caution About Agrimony
Just because something is natural does not guarantee that it is safe for all individuals and in all circumstances:

- Women who are pregnant, breastfeeding, or trying to fall pregnant shouldn't use Agrimony
- Given this plant may lower blood sugar levels, it's not recommended for diabetics unless they have had guidance about strength and dosage from a professional.
- In most cases, drinking too much tea can lead to constipation or even vomiting. It is thought that a safe and beneficial dose is one cup of Agrimony tea a day.

How to Grow, Harvest and Use Agrimony for Digestive Problems - The Lost Herbs

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Top 10 things to consider when greening your new home

Eco Living

TUESDAY 13 DECEMBER 2022

From retaining existing trees to considering the orientation of your home, there's lots to think about when you're planning your new garden on a small block. We've got you covered with 10 key things to consider.

It's exciting planning for your new home or big renovation. Your garden is a key part of that place where the heart is – regardless of how big or small it is. Getting the first steps right can make sure the result is perfect for you.

We all know the benefits of trees and green spaces at home. Using trees and green spaces to shade your home can help you save on energy costs, and even boost the value of your home. More importantly, it's great for health and wellbeing.

Garden featuring a green wall and roof. Design: Landskap.

Here are the top 10 things to consider so that you can make your garden the best fit for you – all while meeting the minimum green space requirements for new homes in South Australia's Planning and Design Code:

1. Get the right advice at the right time
Planning might seem time-consuming, but it saves a lot of time and work down the track.

In the early stages, seeking help from professionals such as your local council, landscape architect or builder can help you make choices that increase the value of your home, and more importantly, ensure you have the garden you always wanted.

State Flora can help you choose beautiful native plants to suit your needs including flowering ground covers, interesting grasses, climbing violets, and flowering shrubs and trees. Native plants are suited to local growing conditions, and important to support native butterflies and birds.

2. Retain existing trees and green space (where possible)
As we covered in our earlier blog, retaining trees – especially mature trees – can help shade your home and give an impressive street view, as well as provide habitat for wildlife.

Remember, mature trees can't just be replaced. If you're lucky enough to have one at home, give it the right conditions to thrive and it will keep giving back.

3. Consider the orientation of your home and the best spots for your green space

Utilising the best spots to provide sunlight and shade can boost the energy efficiency of your home.

Consider where you plant new trees and if you're building your new home, position windows to get the best advantage from existing trees.

Avoid impervious (completely solid) surfaces and instead opt for soft landscaping (the living growing stuff) and permeable paving. This will reduce run off and ensure valuable rain soaks into your garden where it's most needed.

Garden featuring a mature tree

4. Understand the growing conditions for your plants

Placing the right plant species in the right place and conditions plays a big role in the long-term success of a garden.

When choosing plants for your garden, consider the type of soil and drainage, amount of sunlight, and complementary plants that will grow well together.

5. Check the location of underground and overhead infrastructure

Avoiding clashes with services such as sewerage, power and water will reduce costly maintenance, repairs, and safety risks.

It will also help you save time if you want to set up irrigation to water your plants.

If you're installing any new services, it's important to coordinate with your builder and providers on where is best to locate them within your yard.

6. Leave room for trees to develop and grow

Allowing space for trunks, roots and branches to grow will ensure your trees and plants can mature and avoid damage to neighbouring properties, walls and fences.

Make sure to leave enough soil volume away from hard surfaces, like concrete, so that trees aren't confined and have access to enough water.

7. Design your garden to suit your lifestyle

It's best to choose the right trees and plants to suit your lifestyle and garden space.

Do you want a place to entertain and impress your friends? Or to start an edible garden and get your family involved? (If you do, don't forget to check out Green Adelaide's gardening hub).

You'll see more on this in our upcoming blog on 8 garden designs for a small backyard!

You can make your garden suit your goals, and your schedule. That brings us to number 8.

Garden with stone stairs and paths.

8. Consider the watering requirements of your garden

Don't just plan for what's in your garden, but what it will take to maintain it.

Native plants are a great choice to reduce watering needs as these plants have evolved to cope with our hot and dry conditions.

If a lush green space feels like too much commitment (eek!), installing irrigation systems will help ensure your garden can be managed in the time you can put in.

9. Prepare your garden area prior to planting

Buying healthy plants and preparing your soil will help your garden thrive.

Consider how much sunlight and shade they'll get, which plants complement them best, and the soil and care they need.

10. Maintain your garden regularly

Caring for your trees and plants will ensure a healthy garden you can enjoy year-round.

You can also get your family involved to help you stay connected with nature and each other.

These tips are from the summary of the Adelaide Garden Guide for New Homes, which has everything you need to know to help you meet the green space requirements of the state's Planning and Design Code. The guide was developed by Green Adelaide, the State Planning Commission and Clover Green Space.

See the full guide for more information to get you started and get inspiration from a range of garden ideas.

Top 10 things to consider when greening your new home | Green Adelaide

AGROECOLOGY FARMING FOR A BETTER FUTURE?

Next issue

With a global pandemic tightening its grip around the world and photos of empty supermarket shelves flooding social media, there's never been a better time to consider where our food comes from.
Asger Mindegaard explores how 'agroecology' can make our food production more resilient, rebuild healthy ecosystems and perhaps even prevent future outbreaks like COVID-19.

Zero Waste Living 3: The Final Steps EMMA GIBBS NOVEMBER 2022

Eco Living

In the third part of our zero waste living series, we look at the final steps you can take towards adopting a waste free lifestyle.

Before you proceed, we recommend catching up on the first two instalments of our zero waste living series if you haven't already done so. Part one is here and part two is here.

Secondly, a disclaimer – it may only be venerated zero waster Bea Johnston or *Pip* friends Lauren and Oberon Carter, (authors of the fabulous book, *'A Family Guide to Waste-Free Living'*), who can truly claim to have completed the "final steps" to zero waste living.

Being truly zero waste takes enormous commitment, and given the society in which we live in is set up to thwart our efforts at every turn (here's looking at you junk mail), being able to say you've "completed" your zero waste journey will be nigh on impossible until there is systematic change.

What we mean by "final steps" in your zero waste living journey is tackling those remaining areas in your life that are still big waste generators.

They're the things that you may not have wanted to focus on finding alternatives for in the early days of going zero waste, and may not be as easy as replacing your daily takeaway coffee cup with a reusable one.

Are you ready to take the final steps in your zero waste living journey?

Zero waste your celebrations

Parties are a huge generator of waste – invites, wrapping paper, decorations, party favours, all that leftover food – and can be a zero waste convert's worst nightmare.

While it may be easy to adjust your own behaviour around the waste you produce, getting your friends or family onboard is often the trickiest part to hosting a zero waste celebration.

Firstly, deal with the items you'll need to host the party. Send out invites via email or via Paperless Post.

Source second-hand decorations from eBay or your local op shop, or buy items like fabric bunting from Etsy, which you'll be able to use for future events. Better yet, make your own festive décor like this recycled bunting or this native Christmas wreath.

On the day, set up a buffet table so people can help themselves and control their portion size, which means any leftovers you can freeze to later consume yourself, or send home with guests.

It should go without saying that opting for regular cutlery and tableware over plastic options, and cloth napkins over paper ones is a must!

Now for the tricky part… convincing family and friends to get onboard your zero waste living practices. As awkward as it can be initially, simply explain to your loved ones why you're trying to live a zero waste lifestyle in simple terms.

"I'm trying to cut back on my plastic use as so much of our plastic ends up in our oceans" can be enough. The plastic pollution problem has reached widespread recognition now, so a lot of the groundwork has been done for you.

Next, make it easy for them. If you're hosting a birthday party for your child, and you know your friends and family will want to buy your little one a gift, assure them that you're very happy to receive second-hand gifts.

Point them in the direction of eBay or a second-hand clothing store like this one. If a gift must be brand new, send them the link to an online store that sells environmentally friendly toys or sustainable clothing, or ask that they buy books, as at least these can be recycled later on.

State that there is no need for gifts to be wrapped – ask your guests to "save a tree instead"! Or suggest wrapping gifts in scrap fabric or old scarves.

People will generally be respectful of your wishes if you're upfront and friendly about it.

Zero waste your inbox

Is your inbox often flooded with marketing emails from companies trying to sell you their wares?

Those 30% off/buy 2 for 1/everything-must-go deals drain your time, energy and bank account

Furthermore, according to carbon footprint expert Mike Berners-Lee's 2010 book *'How Bad are Bananas: The Carbon Footprint of Everything',* the average spam email generators a footprint equivalent to 0.3 grams of carbon dioxide emissions (CO2e). It all adds up.

Unsubscribe from all but your beloved sustainable brands (we recommend keeping *Pip* on your newsletter list!) so your inbox isn't clogged up with all those potentially tempting offers.

Zero waste your Achilles' heel

What do we mean by "Achilles' heel"? We mean that one area of your life that's letting you down in the zero waste stakes.

It maybe you haven't been brave enough to try cloth nappies over disposables ones if you have a baby. It could be the pet food you buy for your dog or cat that comes in plastic pouches. Or it could be your addiction to packaged treats.

Whatever it is, it's the one area you need to identify as your zero waste "weakness" and then figure out what steps you need to take to reduce the waste it produces.

Zero Waste Living: The Final Steps | Pip Magazine

Fungi

The electrical language of fungi

Yasmin Dahnoun November 2022

Decoding the language of fungi could do a lot to help us understand changes in the environment.

Do mushrooms talk to each other? A new study suggests that they do, through the use of electrical signals. And their language is complex.

In observing the spikes of electrical activity in particular species of fungi, computer scientist Andrew Adamatzky at the University of the West of England found patterns that were strikingly similar to human language.

Through experiments, he translated the spikes into a lexicon of 50 'words' based on patterns typically associated with human speech.

Bioluminscent Ghost Fungus - Omphalotus nidiformis.

Decoding
The electrical signals responded to changes in the environment such as food and injury, according to the paper published in the journal *Royal Society Open Science.*

To record this activity, Adamatzky attached electrodes to four species of fungus – ghost, Enoki, split gill and caterpillar – and monitored it every second over 24 hours. The findings revealed that each species had its own way of communicating.

For example, while Enoki fungi used a rich spectrum of diverse patterns of electrical activity, exhibiting low-frequency irregular oscillations, the split gill fungus transitioned from low to high amplitude spikes, and was one of the fastest-spiking species Adamatzky recorded in all his experiments.

The research also found that electrical currents were involved in the interaction between mycelium and plant roots during the formation of mycorrhizal fungus.

Decoding the language of fungi could do a lot to help us understand changes in the environment.

Syntax
"If we could plug into mycelial networks and interpret the signals they use to process information, we could learn more about what was happening in an ecosystem," Merlin Sheldrake points out in his book *Entangled Life*.

"Fungi could report changes in soil quality, water purity, pollution, or any other features of the environment that they are sensitive to."

As Sheldrake also mentions, however, limited research has been conducted in the field of electrical fungal activity.

Whilst Adamatzky's study provides the stepping stones for future research, it is limited to what Adamatzky identifies as "primitive classification".

Further research is needed to understand the possibility of fungal language in more detail, such as syntax and grammar – if, of course, such things exist in the fungal world.

The electrical language of fungi (theecologist.org)

Gardening

Getting Started with Gardening

The basics Why plant?

There are so many reasons why it's good to green up your home – outside and inside.
Some top reasons are:

- You will breathe cleaner air as plants create oxygen.
- It's pleasing to the eye. Plants look good, really good!
- Plants create relaxing or calming environment and your home will become a sanctuary.
- Plants can cool your home.
- Plants grow homes and food for little creatures like butterflies and birds (outside).
- Plants can provide food for your family (depending on what you plant).
- To help tackle climate change and Adelaide's rising temperatures.

Gardening has so many benefits.

When to plant
In Adelaide, it is best to plant outdoors in the cooler months through autumn and early winter.

This is because after planting the winter rains can take care of the watering for you. Also, your plant's roots get a chance to establish before the weather heats up, giving the plant a better chance of survival.

Get planting
Help your new native plants start their life right and give them the best chance of survival. Here's 6 steps to planting.
The best time for planting native seedlings in Adelaide is autumn, winter or early spring. This is because it gives them time to get established with the help of natural rainfall.
Knowing how to plant your new plant is the first step in a long, thriving life in your garden. Read on to find out how to do it right.
Planting a native seedling.

Smooth edges can be avoided by using a garden fork to loosen the soil around the walls and base of the hole – basically, you want the hole to look a bit rough. If your soil is really hard and compact, you can fill the hole with water and allow it to soak into the ground before breaking it up with a garden fork.

Step 1: Dig a suitable hole
The perfect hole for your plant is one that is twice as deep and twice as wide as the plant container. Keep the soil you dig out in a pile next to your hole as you will need this to fill it back in again.

If your soil is really hard or has a high clay content, you'll need to avoid creating a hole with smooth sides that look almost polished – this is called 'glazing'. A hole like this will restrict the root's growth in the same way a pot does, causing the plant to become root bound and stopping it from growing healthily and happily.

***Step 2:** Soak the plant's roots*

Giving your plant a good water while it's still in the pot will make it easier to get the plant out of the container.

To do this, place the whole container in water but be careful not to submerge the whole plant. Then, wait until the water stops bubbling. Once that happens, remove it from the water.

Top tip: Add a small amount of seaweed extract to the water to stimulate root growth – you can find this at your local gardening store.

***Step 3**: Remove the plant from the container*

Hold the plant with one hand; place one finger either side of the plant's stem and tip the pot upside down. Use your other hand to gently squeeze the pot and the soil and root ball (the mass of roots) should fall out easily.

If the roots are coiled tightly, tease them out gently. Otherwise, try not to disturb the roots more than is necessary.

Top tip: If the plant doesn't come out of the container easily, tap lightly on the edges of the container with a small garden tool like a garden trowel and try the process again.

***Step 4:** Place the plant in the ground*

While supporting the base of the seedling (which is now out of the pot), use your other hand to hold the roots and soil together as you place it in the hole in the ground.

***Step 5:** Backfill soil*

First, check how far up the stem the soil goes. The aim is to plant the seedling so that same amount of the plant that was covered by soil in the pot is also covered when the plant is in the ground.

You will need to hold the seedling in place with one hand, while you scoop the soil back into the hole, filling in under the plant and in around the sides. It's best to leave a small dip around the plant – this will act as a water bowl to capture water and help keep the plant stay moist.

Once the hole is full, press down firmly but avoid over-compacting, as this will stop water soaking in.

***Step** 6: Water immediately*

Always water new plants straight away. This will reduce the chance of the plant going into transplant shock.

Newly planted seedlings need a good soaking – not just a light sprinkle. It takes a lot of water to reach the roots under the soil so we suggest using about half a bucket or half a watering can's worth. Deep watering reduces water evaporation and encourages the roots to become stronger, by growing deeper and looking for moisture.

Top tip: Add a layer of mulch around your plants to reduce water evaporation and weeds, and, over time, improve your soil.

Once you've settled in your new plant babies, you'll want to make sure you know when to water them, how often to prune and if fertiliser is required. Head to our native plant after care page for more plant care tips.

Just beginning your gardening journey? Head to our gardening hub for facts and tricks.

Dirty Diggings March 2023

Agroecology Farming for a Better Future?
Controlling Mosquitoes Sustainably
Getting Started with Gardening
Five Neat Carnivorous Plants by **Jesse Singer**
Thinking Outside The Flower Box: Five Strange Plants

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