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Sustainable
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Biodynamics

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Regeneration
Farming,

Permaculture

Agroecology

May

2023

Dirty Diggings

May in the garden

What to Sow: Plant out brassicas like kohlrabi, cabbage, cauliflower and broccoli. Sow Red Russian kale—it has less issues with white fly than other varieties. Direct sow broad beans, snow peas, podded peas and sweet peas.

What to do: Cut back spent perennial sages and Echinacea. Mound up soil around potatoes. Clear out any out summer crops and prepare the beds for winter crops by spreading compost or building up the beds, no-dig gardening style. Sow or plant some alyssum and sweet peas for winter colour.

May Plantings

Broad Beans, Beetroot, Broccoli, Cabbage,
Carrots, Cauliflower, Celery, Chinese cabbage
Collards, Corn Salad, Cress, Endive, Kale,
Kohl Rabi, Lettuce, Mustard Greens, Onion
white, Orach. Peas, Radish Rhubarb Crowns,
Shallots, Spinach, Spring Onions

Magazine of Picket Fence Urban Farm
1167 South Road St Marys
Ph: 0434 354 539

In this issue

What is Gene Editing?

Permaculture Principle 3

Principles of Agroecology Pt 2

**What does it cost to save an heirloom
variety from extinction?**

Biodiversity and Mankind

Pattern and Repetition

What is Gene Editing? By Matt McIntosh

Feature

How gene editing works, and why it's so revolutionary.

Gene editing is a big deal in more ways than one. But while the technology has already had a significant impact in our food and healthcare system, understanding how gene editing differs from other tools in genetic science is, for many, less clear.

Let's run through it – what gene editing is, what it isn't, and how it works.



A more precise method

The traditional way of making new and improved varieties of plants and animals is through breeding – that is, crossing two different types of the same or related organisms to try and emphasize desirable traits.

In plants, this could mean selecting for higher food production capability, drought tolerance, resistance to pests and disease, and many other factors. It's much the same for animals. Livestock, for example, can be selectively bred for lower disease risk, more meat or dairy production, desirable physical characteristics, and so on. Most plants, animals – and even pets – which are familiar to us today are a result of this human-directed evolutionary process.

The trouble with traditional breeding? It can be a slow process, and results are not guaranteed.

New organisms developed through traditional breeding methods are a result of combining two full sets of DNA, meaning it's possible to transfer both desirable and undesirable traits. Combining two plants might, for example, successfully create a variety which produces more food, but that also turns out to be more susceptible to drought. Breeding two different dairy goats could result in a goat that produces more milk, but which is also more susceptible to specific diseases.



Breeders used gene editing to increase disease tolerance in the Cavendish banana. This same result could have happened by crossing commercial bananas with a wild banana variety with the sought-after disease tolerance, but it would have taken much longer and likely brought some of the unwanted traits from the wild banana as well (such as a smaller size or big seeds).

These are simplified examples, but they illustrate how challenging (and time-consuming) plant and animal science can be. Indeed, it can take years or decades for plant and animal breeders to achieve their goals through traditional breeding techniques.

Gene editing can – and is – solving many of these challenges.

How it works

Different genes within a DNA sequence are responsible for different traits. Gene editing refers to our ability to precisely target and change specific parts of an organism's DNA sequence by turning the gene off, removing, adding, or replicating it. Doing so means scientists can achieve the desired change in the organism right away, using the genes already present in the organism's DNA sequence – and minimizing the risks associated with traditional breeding methods.

One of the revolutionary technologies allowing scientists to change plant and animal DNA directly is called CRISPR (or clustered regularly interspaced short palindromic repeats, if written in full). CRISPR is comprised of an enzyme which does the work of changing the targeted gene, as well as a sequence of nucleic acid (called RNA) which guides the enzyme to the target gene. It is the most efficient and precise way we have for making changes to DNA.

It's important to note here that the ability to use [gene editing](#) also required knowledge of the specific edits that were needed. Extensive research is conducted in advance of gene editing a plant to confirm what a gene does and which genes should be edited to get the desired result. These capabilities have been significantly enhanced in the last few decades as a result of important breakthroughs in genome sequencing.

It's tough to overstate the significance of CRISPR as a technology. Indeed, it has already had an enormous impact in everything from food and agriculture to industrial materials and health care – that includes many of the vaccines we now have for Covid-19. The development of CRISPR has been so revolutionary, its creators were awarded a [Nobel Peace Prize in 2020](#).

Gene editing and GMOs – related, but different

If this description of gene editing sounds like we're discussing GMOs, you're right – sort of.

GMO (genetically engineered organism) is the term commonly applied to plants and animals created through “transgenic” engineering. That is, introducing one or more genes into an organism from another organism, whether a related or unrelated species. This technology has been in use for many decades and has been employed by both public researchers and private companies to create many crop varieties which have benefited farmers, consumers, and the environment.

Gene editing is another form of [genetic engineering](#). While it can be used to introduce new genes and create GMOs, it is focused on making precise edits that already exist or could have arisen through conventional [plant breeding](#). The distinction can sometimes be lost, in part because the way terms like GMO and genetic engineering are used by the general public is often different from their overarching scientific meaning.

There are regulatory differences, too. Products developed using the transgenic method must meet additional safety verification requirements set by the federal government. For products developed through gene editing, regulatory policies are still under development, but many countries have developed separate processes for products of gene editing that are similar/indistinguishable from products of conventional [plant breeding](#) and don't require lengthy pre-market assessments.

[What is Gene Editing? - Canadian Food Focus](#)

Veggie Patch

Growing Orach

Have you heard of orach? This awesome annual vegetable is relatively unknown, but it's an easy replacement for spinach that can handle the heat, and it isn't bothered by pests. Interested in growing orach in your garden? Keep reading to find out all about this fantastic vegetable.

Growing orach is really easy, and I'm surprised this vegetable isn't more well-known. This post will cover what orach is and the reasons why you should grow it. It'll also cover the basics of planting orach and how to add it to your garden.

By the end of this post, you'll be ready to plant orach in your garden. But don't forget to grab your free, easy-to-print cheat-sheet that gives you the rundown on orach, plus a bonus list of other self-seeding vegetables that, along with orach, would make a great addition to any property or garden.



What is Orach? (And Why You Should Grow It)



This is some green and dark red orach growing in one of my hedgerows in 2018. The hedgerow was new and the orach made a great year 1 privacy screen and wind block while the shrubs and trees were still small. Plus, it was tasty! Orach is an annual vegetable also known as mountain spinach. It lives up to its nickname. It tastes a lot like spinach, and it cooks up like spinach, too. But it's much hardier and more resilient to heat than its celebrated counterpart, making it a lot easier to grow.

Orach grows straight and tall, with stalks towering up to 10 feet (3 meters)! But usually it only reaches about 4-6 feet (1.2-1.8 meters).

Orach is sometimes described as having a slightly salty taste. (Some people notice it more than others—I've never noticed it.) But otherwise, it's an excellent alternative to spinach.

Native to Europe and Asia, orach was widely cultivated around the Mediterranean region until the spinach came onto the scene and became more popular.

I like spinach as much as the next person, but orach has some major advantages. It handles heat much better than spinach, and unlike spinach, it retains its flavour even after it bolts. You can keep harvesting orach all summer long. (After a while, the older, larger leaves do get a bit tough for raw eating. But they're still great in soups, curries, pastas, and other cooked meals.)

I love the colours of orach. It comes in a variety of colours. Dark red is most common, but it also comes in green, yellowish green, and a mix of all 3 colours.

I really like the look of orach in the garden. It adds a great splash of colour.

In my own garden in western Washington, slugs and pill bugs can be an issue. But I've found that orach is rarely ever bothered by these pests. This makes it a great “green” to grow if you have wet springs that result in slug issues.

Benefits of Orach

Try growing orach in your garden! Here's a summary of the great reasons to grow orach.

- Heat tolerant alternative to spinach.

- Relatively pest free (at least in western Washington).
- Can be harvested all summer long even after bolting.
- Can be eaten raw or cooked. Use it in any dish that calls for spinach.
- Adds a splash of colour to your garden.

Basics of Planting Orach

This was a volunteer orach that came up in my gravel parking lot mixed with grass. I transplanted it into my garden and it has been doing great! But I was very impressed how well it was doing in the hard compacted soil in the parking lot!

The best way to grow orach is from seed. In my own garden, orach seeds germinate very easily and quickly. Just follow the instructions on the seed packet, and you should be good to go.

The main thing you need to be careful about when growing orach is how big it gets. Orach doesn't tend to fall over, since its central stem will get thick. It can easily shade out other vegetables, so make sure to plant it where its height won't cause problems for your other plants.



Wild Tip:



You can use the fact that orach grows so tall to your advantage. If you grow orach in small clusters, you can create semi-shady micro-climates where you can grow lettuce and other plants that don't like the heat. A row of orach can also be used to provide late afternoon shade and block summer winds. Basically, a mini-hedgerow for your garden!

Orach also self-seeds very easily, and it may come up the next year in areas you don't expect. (Its seeds have a small, paper-like disk that helps them blow in the wind.)

This is a dry orach seed stalk that I collected. The seeds are in the small papery disks. Each plant produces a ton of seeds!

I've found that a layer of mulch will easily suppress any volunteer orach. Though if you plan for it, like you would with other self-seeding vegetables you could plant orach once and then never have to replant it! Just let the volunteers do the work.

If orach comes up in an area you don't want it, you can let it grow for a bit and then harvest the whole plant.

If you harvest it while it's still young, the central stem won't be tough yet, and you can eat it along with the leaves.

You can also collect seeds at the end of the summer and plant them in the spring, like normal. If you buy seeds from the store, the paper like disk will be removed from the seeds. But I haven't noticed this disk hindering germination, so don't worry about removing it from the seeds you collect.

Harvesting and Using Orach

Orach is a great vegetable for salad and other raw dishes but it is also good as a cooked green.

Harvesting orach is very simple. Just wait for the plant to get about 6 inches tall, and then you can start harvesting the leaves. Move from plant to plant so you don't take off too many leaves from any one plant.

Your orach will continue to grow, and soon they'll have dozens of large, colourful leaves coming off the central stem. New leaves will grow as you harvest the old ones.

As with any vegetable, it's best to harvest in the morning or evening, and not in the heat of the day.



You can throw orach leaves in a salad to add a nice splash of colour, or you can cook with them. Orach can be used for any recipe that calls for spinach, and it also works as an alternative to other greens like chard.

Get started With Orach

Orach is a great vegetable to grow in your garden or really anywhere on your property. Here it is growing in a hedgerow, and it would be great in a food forest!

So, are you ready to start growing orach in your garden? Orach is an excellent, time-honored vegetable that would make a great addition to any property. Orach stands up to pests, handles the heat, and produces a bountiful harvest. When you grow low-maintenance vegetables like this, you're not only saving yourself time and energy—you're making your property more resilient by working with nature. Plus, since it's a self-seeding vegetable, once you start growing orach, you'll be set for years to come. Have you grown orach? Let me know in the comments below!
<https://www.growingwithnature.org/growing-orach/>

Herb Spiral

Java Tea

Botanical Name: *Orthosiphon aristatus*

Also Called Cat's Whiskers

Life cycle: Perennial

Height: 1.5m

Position: Sun / part shade

Soil preference: Well drained



Cat's Whiskers is a tall, slender evergreen perennial growing up to 1.5 meters including the flower stalks. The spread is variable at 30 to 90cm per plant depending on home garden conditions. The dark green leaves are 5-10cm long, slightly glossy, narrowly ovate and deeply veined. They are held in pairs, end in points at each end and have coarsely toothed margins. The stems have a purple tone which seems to deepen closer to the flower whorls.

The Cat's whisker plant flowers range from white through to light mauve or pink with the slender tube shaped corolla being 2.5 cm. It is almost 3 times the size of the bell-shaped calyces. The 'whiskers' or stamens extend outwards up to twice as long as the flower itself, giving the impression of cat's whiskers. Cat's Whiskers flowers from late summer to autumn and is considered to be a bee, bird and butterfly attractant. Some gardeners have commented that the white flower is quite striking under moonlight. This uncommon plant is highly recommended and is very attractive planted in groups.

Cat's Whiskers has many scientific synonyms and alternative common names, especially in the South East Asian region. Commonly used names around the world include Java Tea, Kidney Tea, Kumis Kucing, Kumis Kutjing and Kitty Whiskers. You may see the same plant referred to as *Orthosiphon spiralis*, *Orthosiphon stamineus* or *Ocimum aristatum*. The scientific name 'orthosiphon' refers to the upright tube shape of the flower and 'aristatus' means 'with ears'. This plant is native to some tropical regions of Australia and South East Asia, spreading to East India, Indo China and Indonesia. It is cultivated for Java Tea on the islands of Sumatra and Java. It grows naturally in forest edges but is commonly seen along roadsides and wastelands.

Growing Conditions

Cat's Whiskers is a fast-growing plant that should do well in most gardens. It comes from a tropical climate, so replicating this environment with rich soil and good water supply will result in a healthy plant. *Orthosiphon aristatus* requires moist soil and it is best not to let the soil dry out too much. Many people find this plant does well in a damp garden corner with water loving plants.

Most recommendations say it requires full sun, but this is not with the heat of Australian sunshine in mind. The plant will often wilt simply from the heat, so it is worth trying part shade or a few different places to see where it grows best. Some shelter from the extremes of winter is also recommended in cooler regions.

This plant is quite hardy and grows well in temperate conditions, but letting the ground dry out may result in the plant dying even when watering resumes. It may be semi-deciduous in cold winters with the leaves turning yellow and becoming sparse. Frost may kill the plant unless it is well protected. It is also reported to only grow 60cm to 90cm high in the northern hemisphere, so this may be a guide for cold winter areas.

Many home gardeners report that cutting back flower stalks leads to improved performance the following year. It is easily propagated and may root in water or soil if left lying on the ground. Propagation is by soft wood cuttings or seed pods can be collected and dried in a paper bag for planting later. In areas where the plant dies down completely it should grow back if allowed to self-seed and grow as an annual.

Medicinal Uses

Many people will have heard of Java Tea which is how *O. aristatus* is usually marketed to the public. It is very popular in SE Asia and is called Kidney Tea in Europe and India. Java Tea is used to treat mild kidney symptoms in conjunction with drinking lots of fluids to flush out the bladder. To make your own tea simply place 2-3 grams of finely chopped leaves into a cup and pour over 150 mls of boiling water. Let it steep for 10-15 minutes and then strain. Java Tea or Cat's Whiskers is often used in conjunction with other herbs recommended for kidney health.

This plant has a long history of medicinal use and is considered to be anti-hypertensive, diuretic, anti-fungal, anti-bacterial, and anti-inflammatory. It has been used for urinary tract infections, nephritis, kidney stones, gout, rheumatism, jaundice and diabetes. Most of its recommended uses relate to kidney and bladder function however studies regarding the effectiveness are not yet conclusive.

O. aristatus contains the diterpenes orthosiphon and orthosiphon, as well as saponins, rosmarinic acid and lipophilic flavonoids. Only the above ground parts of the plant are used as other parts as potentially toxic. Leaves should be harvested when the plant is in bloom. Please use herbs with diuretic action in consultation with your doctor if you are on prescription medication. For example, lithium may not be excreted properly when using diuretics and a higher concentration may remain in the body affecting the dosage level.

[Organic Cats Whiskers Plant \(*Orthosiphon aristatus*\) – Mudbrick Herb Cottage](#)

Permaculture Principle 3

Permaculture

Permaculture Principle 3: Obtain a yield, with good permaculture design.

February 23, 2020 By Tracy Wandling



This is the most exciting part of the whole permaculture design process for me: obtaining that yield. Whether it's harvesting vegetables from your permaculture garden, picking apples from your food forest, or storing the energy from solar panels, obtaining a yield is pure excitement.

I'm not in the position to pick my own apples or light my home with solar power yet, but time spent harvesting food from my garden is one of the most gratifying things I do. Food yield is the main area I'm concentrating on here on this rental property.

There is a long list of yields that can be obtained on a permaculture property, big or small. Vegetables are just one of them. Energy, in all its forms, is another. Meat, eggs and milk can come from your animals, along with hides and fur, feathers and manure. A food forest can supply fruit, berries, vegetables, fire wood, building materials, medicine, craft supplies, and more.

The tastiest grapes are the ones you grow yourself.

Herbs and flowers can be harvested for food and medicine. And then there is the wild stuff to be harvested from your property or the surrounding area.

Food yield potential on this property

Besides the vegetable garden, with its array of tasty vegetables, we have herbs – rosemary, sage, oregano, thyme – growing here and there; and many edible flowers growing throughout the summer.

As for wild things, we have LOTS of blackberries (of course, this is the Pacific Northwest after all), as well as Oregon Grape (edible berries). I plan on planting berries this year, as well as some lesser known edibles for the shady areas, such as hostas.

Last year was the first year for this garden, and it did very well. But there really isn't a lot of growing space on this property as it is VERY shaded, and there is little to be done about it.

This year we are expanding our growing space by utilizing the shop roof, which gets great sun. This is where the tomatoes and peppers will be residing this year, and I have high hopes for them. I expect to obtain an impressive a yield of canning and drying tomatoes, and I'm pretty excited about that.

Harvesting turnips.



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Vegetables, plants, Compost, Worm or chicken poo liquid Garden Beds and more.

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Pots and tubs, and whatever other receptacles we can scabble together, will be used to grow food. Obtaining a food yield is my main priority, and I hope to really maximize the limited space here. I'll keep you updated!

And I'm hoping to get some mushroom logs going this year! How cool would THAT be? I do love mushrooms.

The yields of your permaculture system have multiple roles. They can feed you, feed your animals, and feed the other systems. But they can also support you in other ways.

Your yields can be sold in various ways and forms, and can be used as trade for items you need. Some people think that 'income' is a dirty word in the permaculture world (more on that some other time). But if you can make a living doing what you love, how cool would THAT be?

Taking advantage of all the sunny spots on the property.

The important yields

The most important yield that you will obtain as you work within your permaculture system is knowledge. We always have something to learn from our permaculture adventures, and this knowledge will lead us on to greater heights. My permaculture garden has given me so much knowledge already, just by observing and interacting, and obtaining a yield; and I look forward to learning more this year.

The main idea of this principle is to use good permaculture design to set up systems that put out more energy than they take, and give you yields for yourself – food, energy, medicine, etc. – as well as yields to put back into the system. This creates self-supporting, stable systems. Cool stuff.

So, go take a walk around your system, and see how long a list of yields you can make. You might be surprised.

Health, Hope & Happiness

[Permaculture Principle #3: Obtain a yield, with good permaculture design | Living Permaculture \(livingpermaculturepnw.com\)](http://livingpermaculturepnw.com)

Principles of Agroecology Pt 2

Agroecology

Co-creation and sharing of knowledge:

agricultural innovations respond better to local challenges when they are co-created through participatory processes.

Agroecology depends on context-specific knowledge. It does not offer fixed prescriptions – rather, agroecological practices are tailored to fit the environmental, social, economic, cultural and political context. The co-creation and sharing of knowledge play a central role in the process of developing and implementing agroecological innovations to address challenges across food systems including adaptation to climate change.

Through the co-creation process, agroecology blends traditional and indigenous knowledge, producers' and traders' practical knowledge, and global scientific knowledge. Producer's knowledge of agricultural biodiversity and management experience for specific contexts as well as their knowledge related to markets and institutions are absolutely central in this process.

Education – both formal and non-formal – plays a fundamental role in sharing agroecological innovations resulting from co-creation processes. For example, for more than 30 years, the horizontal campesino a campesino movement has played a pivotal role in sharing agroecological knowledge, connecting hundreds of thousands of producers in Latin America. In contrast, top-down models of technology transfer have had limited success.

Promoting participatory processes and institutional innovations that build mutual trust enables the co-creation and sharing of knowledge, contributing to relevant and inclusive agroecology transition processes.

[The 10 elements of agroecology \(fao.org\)](http://fao.org)



What does it cost to save an heirloom variety from extinction?

Become a seed sponsor and help Diggers preserve heirloom seeds for gardeners of the future, so they can enjoy the best of the past.

To save seeds is to preserve the very essence of culture. Heirloom crops wouldn't exist if not for the gardeners and farmers who meticulously grew seeds and saved them to pass down from generation to generation.

At Diggers we have helped preserve and revitalise many varieties over the years, including 'Uncle Tony's La Stupenda' tomato, 'Franks' pea and 'Moon & Stars' watermelon, holding them in our seed bank and passing them on to future generations.



Why is it important to preserve heirloom seeds?

This unbroken chain of observation, selection and cultivation is under constant threat with the increasing power and influence of agricultural and chemical companies that operate the world seed trade. Frighteningly, just four companies control over 60% of global proprietary seed sales and these mega-businesses are not interested in preserving cultural and biological diversity.

There is no government or institutional body in Australia that supports the preservation of heirloom vegetable and flower seeds. It is now and always has been, the community of gardeners and small-scale farmers who are the stewards of this valuable and precarious diversity. This has created a situation where it is left to individuals and not-for-profit organisations like Diggers to undertake this vital task, but it comes at a cost.

Our seed trial, production and preservation team maintain our four-acre seed farm in Dromana, Victoria. It is an intensive and technical operation that requires specialist skill and knowledge to ensure varieties are maintained with optimal diversity whilst maintaining stability and are true-to-type, and each year we welcome the generous donations of heirloom seeds from gardeners across the country, adding to our seed bank.

What does it cost to preserve an heirloom?

Each accession that we add to our seed bank goes through a process of growing, assessment and recording to establish that the variety is unique and stable and that it is as described by the donor. This process involves all the technical elements of cultivation, including germination, transplanting, crop management, harvesting and tasting.

Then there are the 'back room' aspects of seed saving, including digital record keeping, dry-conditioned storage and the specialist equipment required, including seed germination incubators and seed cleaning tools. We have calculated that it costs an average of \$1,000 to keep a variety safe for future generations.

Sometimes the seed varieties we receive as donations make it into our magazine or online offer, and we can generate sales to support the work required to keep them going. But there are far too many varieties to list them all so we are seeking your support to help us maintain our living collection of Australian heirlooms – to catalogue, record, preserve and, most importantly, grow these wonders of yesteryear.

You can also help grow a seed preservation crop by donating:

- \$75 for netting and seed harvesting equipment
- \$100 for water and irrigation components
- \$350 for compost and field materials
- \$12,000 for racking and storage for the Diggers seed bank
- \$20,000 for a seed germination incubator

The benefits of seed sponsorship:

- Tax-deductible receipt
- Certificate of sponsorship



- Acknowledgement on the Diggers website for your sponsored variety
- Updates on grow-outs and seed collection
- Opportunities to join seed harvesting days
- Free seed samples of your sponsored variety
- Access to Diggers Foundation donor events



We are very excited to open up this program so that our members and gardeners across Australia can participate in the preservation of heirloom seeds. With our mission to preserve genetic and cultural diversity through seed, we welcome donations of seed from gardeners across the country to add to our seed bank, contact us at seeds@diggers.com.au

[What does it cost to save an heirloom variety from extinction? - The Diggers Club](#)

Biodiversity and Mankind

Biodiversity

Conservation in the wild can serve humanity and allow speciation into the future, for those species not driven to extinction. Destruction and fragmentation of habitat could drive speciation by creating disjunct populations with no gene flow!

The importance of plants and biodiversity

Mankind uses plants for fibre, food, medicine, and environmental services, such as storing carbon and cleaning water systems. Plants protect against dry land salinity, and coastal inundation. Because humans continue to use plants for survival diversity may hold valuable genetic material as we enter rapid climate change. In antiquity, hydraulic civilisations in the Middle East, (irrigation 5,500 B.P., led to dry land salinity over 2-3,000 years), the Indian subcontinent and Northern Asia displaced native ecosystems. Australia is unique, as an island/continent because changes, to hydrology and natural communities, due to irrigation agriculture only commenced 230 years ago, with the arrival of Europeans. Australia separated from Antarctica approximately 45 million years B.P



This geographic isolation has driven allopatric speciation. Accordingly, 92 % of Australian endemic plants are unique to Australia. Moreover, since European settlement 83 higher plant species have become extinct, while 6.8% of Australian vascular plants are currently in danger of extinction.

Challenges to conservation of endangered communities So, why act now? We have reached a crossroads, and whether we do anything about it or not; our world is changing. One of the key challenges, at this time, is the conservation of endangered ecological communities. Coastal ecosystems are particularly under pressure by human development, containing a large proportion of endangered ecological communities. The Ocean Shores development is an example of the clearing of littoral rainforest for housing development. Clearing was so rapid and comprehensive that, for example, eight of nine *Acronychia littoralis* trees were bulldozed (Floyd Australian rainforests), before they had been described. Inland communities are also under threat. Due to the fragile landscape the activities of pastoralists, and to a lesser extent indigenous peoples, have greatly impacted the landscape. Now, mining threatens inland spring-fed waterways. Doongmabulla Springs, nationally protected wetlands, contain grasses and sedges endemic only to these areas. Elsewhere in Queensland aquifer-fed springs have been heavily impacted by development. In native grasslands at Moray Downs, a population of the endangered black-throated finches, *Poephila cincta*, was recorded (2013) at Adani's proposed mine-site in the Galilee basin. **Resilience in rainforest communities** The research of Rossetto from populations to communities (2008) indicates that while some Australian rainforest species have become extinct, others have survived in refugia, providing seed banks for future recolonisation. Rossetto found that species, similar to those of mid- Eocene, have persisted through long-term climate change, as well as through the rapid climate changes of the Pleistocene ice ages. The range of the rainforest communities has gone through periods of expansion and contraction. The most recent examples of the rapid recolonisation, 8,000 years ago, of rainforest species, has occurred in the Eastern Qld, NSW border areas and in the wet tropics. Rossetto and Kooyman maintain that in rainforest communities there is a tension between dispersal and persistence as a survival mechanism. Dispersal refers to the ability of rainforest trees to spread their seed widely. In fragmented forests where there are few dispersal mechanisms for large-fruited trees, plants can persist mainly by

vegetative reproduction. For example, Rosetto and Kooyman suggest, it is the lack of long-range dispersal mechanisms, coupled with resprouting potential, which limit the spatial distribution of *Eidothea hardeniana*, Nightcap Oak. It may be limited by the ability of the dispersers, terrestrial mammals, to carry the large seeds long-distances to other suitable available niches, rather than a reduction of alleles as would be caused by genetic drift. However, genetic tests have shown that in this species, where there are more closely spaced individuals, there is less variation. **Multi-species recovery programs** Saving our species technical report (Department of Environment and Heritage, NSW 2013) identifies five priority levels for threatened species management. The third asks if there is sufficient knowledge of the species ecology, distribution and management requirements? This can identify data-deficient threatened species, requiring further research into life history, threats and distribution. Meaningful patterns in evolutionary ecology recognise:

- biogeographical barriers driving allopatric speciation
- trait-based species groupings
- potential and realised niche modelling.

The most successful approach will combine these into the development and implementation of multi-species recovery plans. Functional trait-based flora groups may be used as a guide to model appropriate placement of plants whose life histories have not yet been studied, by comparing with species allocated to the same trait-based flora group. **What options for the future?** Human activity can assist speciation into the future by conserving ecological communities and by linking communities with stepping-stones; Coastal connectors, a system of public reserves connecting small wetlands, semi-cleared ridges and riparian strips. By selecting plants, using functional trait-based flora groups, suites of species can be used to connect and extend the existing corridors. The successful project will identify geographical barriers and utilise existing niches, planting species from the appropriate flora group and biogeographic region.

Biodiversity and Mankind – Permaculture College Australia

Permaculture

Pattern and Repetition

Michael McCoy's Woodend Garden features designed plant communities inspired by the new perennial movement.

Nestled in a small valley, down a winding unmade road in Woodend, Victoria, Michael McCoy experiments with planting combinations in the only garden he feels comfortable investing this level of unique expression and garden experimentation – his own.

A plantsman, Michael McCoy studied botany before realising that his passion for plants could only ever be fulfilled by physical engagement in gardens. After an apprenticeship learning from some of the best gardeners in the world, Michael's knowledge, experience and love of plants and their associations has since seen him carve out an impressive career in print, television and design.



A shift in gardening

After decades engaged in a world of gardens, plants and design, Michael admits there has never been a more exciting time for gardening than now.

“There has been a real shift away from staged presentation. We are no longer observers, but participants immersed in the planting,” says Michael. “The new perennial movement (which incidentally has been 50 years in the making) no longer relies on old knowledge and ideas, but rather an innovative and exciting approach to planting design championed by Dutch master gardener Piet Oudolf.”

This shift has not only seen a change in the way we use plants in our gardens but also an enormous change in what was the accepted plant palette, which is opening up a whole new world of planting possibilities, combinations and garden aesthetics.

“In the past, only the most glamorous plants would be incorporated into a design, but now the glamour factor is less critical. It is more about designed plant communities and the association of different plants, rather than pure cultivated aesthetic,” says Michael. “We have removed the ‘human’ focus and are more directed towards a cultivated replication

of something natural. We are now part of the landscape and planting, which has resurrected the value of the term 'to garden'."

Experimentation at home

Drawing on his own vast knowledge and experience, Michael enjoys experimenting with designed plant communities in his garden in the ranges north of Melbourne. Exploring the rich aesthetic of dry gardening, the steppe, a terraced area in Michael's garden that receives no irrigation and endures monthly frosts, showcases seasonal beauty via an unusual combination of low-mounding perennials and bulbs, using strong repeated vertical focal points to bring continuity and rhythm to the landscape. "The challenge is to embrace the climate and ambient conditions, then showcase the most suitable plants to perfection," says Michael.

A seasonal matrix of mounding evergreens and perennials, utilising various euphorbias combined with lavender, *Stipa* and *Verbena*, create the framework for the planting, while Californian poppies and bulbs such as *Triteleia*, species tulips, *Colchicum*, *Allium* and bearded iris add to the procession of colour and seasonal spectacle.

Bulbs are equally important to the overall garden aesthetic as evergreen perennials, even though each has only a short peak period. Michael demonstrates that bulbs don't need to be staged in a separate part of the garden, but rather integrated throughout. He plants them where their seasonality shines through to create a garden event among the plants that support them. This interaction of different plant forms and types is what's so exciting about this new approach to gardening.

Michael adds that pattern and repetition are pivotal to the success of the planting, and that the garden does require a certain degree of order to cover and offset the disorder that arises through seed dispersal and plant spread.

"Gardening is now all about the planting, and the possibilities are endless."

Pattern and repetition - The Diggers Club

Getting Started With Gardening

5 plants for your garden in the Adelaide 'burbs

Want to spruce up your yard with colour and diversity? With the winter rains on their way, now is the perfect time for planting. Discover 5 plants that will love life in an Adelaide garden.

Native plants can be underrated as the perfect plant.

They're perfect because:

- They generally need less water than introduced plants.
- Are cheaper than introduced plants (when bought as seedlings).
- They need minimal maintenance.

Are you ready to get native with your yard? Read on for your dose of 5 native plant inspo:

Pale fanflower



1. A large shrub: Sweet bursaria aka Christmas bush

Named accordingly for the time of year it flowers, Christmas bush (*Bursaria spinosa*) is an excellent choice if you're looking for something that's going to take up a bit of space. This shrub grows upright to 4 metres.

Its fragrant, creamy-white flowers when many other plants aren't flowering (in summer) make up for its prickles, and you could even use it as an informal screen or barrier that no one would be keen to go through...

It's happy with most soil types but does not love life on the coast – so if you live within 5 km of the beach, we suggest checking our blog [5 plants for your coastal garden](#) for coastal-loving native plants.

Christmas Bush.

2. A medium shrub: Paper flower

This butterfly-attracting shrub grows to about a metre tall and a metre wide. Its crinkly green leaves and small sprays of pink, papery flowers make it an eye-catching choice.

Paper flower (*Thomasia petalocalyx*) also provides long-lasting cut flowers, so you can enjoy them outside and in a vase inside.

A stunning paper flower.



The daisy-like flowers of a common everlasting.

3. A herb: Common everlasting

Common everlasting (*Chrysocephalum apiculatum*) is not a season-your-food-with-it-type herb like basil or rosemary. While lots of plants are considered herbs, not all of them are actually edible.

Common everlasting grows to knee-height and has silver-grey leaves, with clusters of bright yellow daisy-like flowers. In the garden it attracts birds and butterflies but it can make a lovely cut or dried plant feature in the house as well.

If you live in a rental or apartment, you'll be pleased to know that this species is happy in a pot. Check out [our pot plant care information](#).

4. A groundcover: Pale fanflower

While the idea of a 'groundcover' may conjure up images of a plant that's flat to the ground, this is not the case for pale fanflower (*Scaevola albida*), which grows to around 40 centimetres high.

It has lovely and rather delicate white and purple flowers during summer, and it is another great choice for a pot plant. It's also a great addition to a [butterfly-friendly garden](#) because it attracts them.

Pale fanflower has tiny, white-purple flowers.



5. A grass: Kangaroo grass

Unlikely to attract kangaroos to your suburban backyard, kangaroo grass (*Themeda triandra*) is likely to entice birds and butterflies.

This dense grass is a perennial (meaning it doesn't die after one season and can last for years) and grows to 1.5 m high. It has red-purple tinged leaves and pink flowers in summer.

Kangaroo grass can handle being cut back a couple of times a year but despite having 'grass' in its name, may not be the best option to replace your lawn unless you're not fussed about it being low or green. If you're looking for a native lawn substitute, consider [weeping rice-grass](#) (*Microleana stipoides*).

Kangaroo grass doesn't just look like any old grass



Where can I purchase these plants?

Around Adelaide, there are some [nurseries that specialise in native plants](#).

Hot tip: Give the nursery a buzz beforehand to double check that they have what you want in stock.

Where to next?

Just beginning your gardening journey? Head to [our gardening hub](#) for tips and tricks to help, including a downloadable copy of our Adelaide Planting Guide.

[Gardening | Green Adelaide](#)

Mason Bees 5 reasons you want them in your garden

You've heard about the bee... but have you heard about the mason bee? There are approximately 20,000 known species of bee on this planet, and 139 of those species are mason bees. If you've never heard of them, let me fill you in a bit because these little critters are amazing! I think they are amazing... can you tell? Lol! I get excited about animals sometimes. Let me share a little and then let's see if you are a little excited too.

Here are some of the reasons I love mason bees:

Mason Bees are a solitary species, meaning they don't live in a hive. Most people think of a hive when they think of a bee, but that's because the honeybee lives in a hive. The honeybee is the most well-known, but it is definitely not the only bee. Mason bees are beneficial to us as gardeners because we don't need to become beekeepers to enlist their help in our garden.

Mason Bees are non-aggressive and don't sting. Whaaat? A bee that doesn't sting? Yep, that's correct. They can sting, but it's incredibly rare. Honeybees have a queen and a hive to protect, and they will give their life to do so. Did you know that when a bee stings you they die? It's true.. And sad! If they feel threatened, they will sting to protect their hive. Mason bees, however, don't have a queen and a hive to protect... so they are nice and carefree. They are the safest bee around pets and children for this reason.



Solitary bees make up a little over 90% of the total bee populations. It's true! The poor solitary bees... they don't get any credit, yet they make up almost all the bees on the planet. Those honeybees get all the attention! You've almost certainly seen a mason bee and didn't even know it.

Mason Bees get their name because of their use of mud, like a mason. This is so cool! Since they don't have a hive to lay their eggs in, the females find natural holes or cracks in trees, logs, or any man-made structure they can. After they breed, the female starts laying her eggs in the back of the hole or crack. Then she packs in pollen and nectar for food and puts a layer of mud to section off that egg. Once the hole or crack is full, she then seals it with more mud to keep the eggs safe.

Mason bees have a 95% pollination rate vs. the honeybee's 5%. Mason bees are the superheroes of the bee world. Honeybees collect pollen and nectar for their hive. Everything the honeybee gathers is literally for the hive. The mason bee, however, doesn't have a hive to give the pollen and nectar to. For this reason, the mason bee carries more pollen on its body when it is traveling from flower to flower. Also, the mason bee is a very furry bee, meaning that it has more hair that the pollen sticks to. The combination of having a furry body and not needing to give the pollen to a hive sends their pollination rate through the roof!

OK... I'm checking in with you?... Are you at least a little excited about these critters? They are kinda cool, right? There are so many amazing animals on this planet. I truly believe that we can do a better job of living in balance with nature. The first step is learning about them! YAY! If you are reading this, it means you now know a little about the mason bees. The next step is to adjust what you are doing to help them thrive. It doesn't always take huge effort to help many of the animals that live around us. Encouraging the mason bees to live in your yard and garden is a perfect example of that. To learn more about how to encourage mason bees to live in your garden, keep an eye out for our Friends In Your Garden micro-course coming soon.

Carrie Sylvester – Wildlife and Eco Educator

Carrie has lived and worked with animals her entire life. She is driven by a passion to help the animals and planet through her teaching. She began her professional career as a Registered Veterinary Technician. After spending a total of 10 years in veterinary hospitals, she returned to school to study Animal Training, Zoo Keeping, and Wildlife Education. In these three categories, she has had the privilege of working at the Los Angeles Zoo with the California Condors, training dogs and many exotic animals (including a Wolf and Mountain Lion), and providing hands-on live animal education programs to thousands of children. Following her dream of providing impactful education, she has been the director of a Zoo Day Camp for children and founded a non-profit organization. This passion has now met the world of gardening as she fulfills another dream... having a big, healthy, organic garden!

[Mason Bees: 5 reasons you want them in your garden - Grow Your Own Vegetables](#)

June Dirty Diggings 2023

Restoring The Water Cycle Understanding The Basics And Taking Action
Farming's umbilical dependency on glyphosate
Reducing reoffending through growing cooking and eating good food
Ground Covers and Weed Management for Regenerative Farming and Ranching
How To Propagate Hardwood Edibles
Growing Fruit and Nut Trees From Seed



Getting Started with Green Manures How to Grow and Use for Your Best Ever Soil & Veggies

Kirsten Bradley, March 12, 2021

Soil

The power of green!

Whether you have a small veggie patch or an expansive forest garden, adding green manures is a great way to replenish or build soils with minimal input.

Thanks to nature and photosynthesis, sowing a 'green manure' mix of seeds will give your garden a crop of specialty plants that convert sunlight into biomass for your soils and add maximum nutrients, too – and all for free.

The 'manure' part is a touch confusing though – there's actually no animal poo involved.

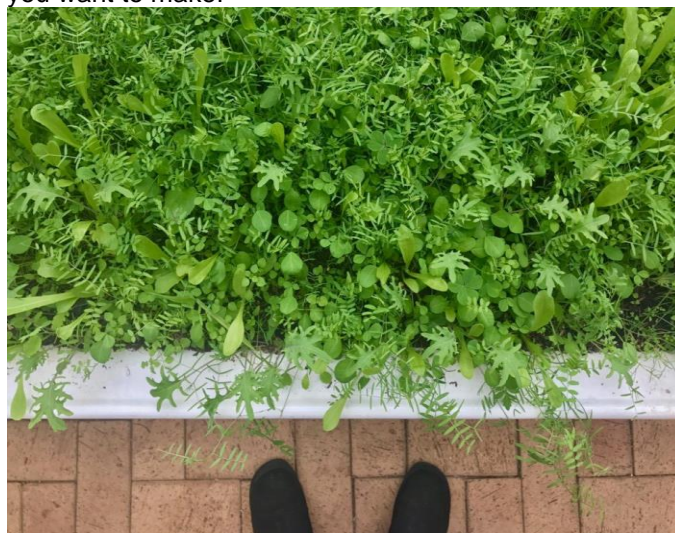
Instead, green manuring is all about sowing fast-growing, specific plants for a few weeks or months, then purposefully cutting down their juicy foliage and digging all that green matter back into the soil, where it decomposes – enhancing your garden's soil balance, and eventually coming back around as food for us all.

What is green manure and why it's a Very Good Thing

Green manures are grown from the seeds of fast-growing, specific, usually annual plants – often a legume combined with a specific grass (e.g. oats). And there's different combinations of green manure seed mixes that suit different soils and climates.

The effect of using green manures is a bit of magic for your garden – as the legumes (clover, lucerne, peas or beans) provide nitrogen, while the plants from the grass family provide plenty of organic matter.

But a note of caution here – when I say 'grass', I'm referring to cereal grains such as barley, oats or sorghum, *not* problematic running grasses such as couch or kikuyu, like you find in your lawn. That is not a mistake you want to make!



Green manures can be used in raised beds, too!

- Provide habitat, nectar and pollen for beneficial insects and reduce populations of pests.
- Improve water, root and air penetration in the soil.
- Smother persistent weeds; good choices for weed suppression include lablab, cowpea, lucerne and buckwheat.

A greenhouse veggie bed at Melliodora having its soil 'refreshed' with a green manure crop

When and how to plant and a green manure crop

If you have access to appropriate seeds, you can plant a green manure crop at any time of year (depending on your climate, obviously).

But, as a starting point, summer or winter is the best time to plant a green manure crop – for digging in the following autumn or spring.

Benefits of green manures

Planting green manures as part of your yearly rotation in parts of your veggie garden is an outstanding way to improve your veggie harvest and, as a bonus, break diseases cycles in your soil.

Check out the list below of green manure benefits, compiled by Green Harvest, an ace Australian seed company:

- Increase organic matter, earthworms and beneficial microorganisms.
- Increase the soil's available nitrogen and moisture retention.
- Stabilise the soil to prevent erosion.
- Bring deep minerals to the surface and break up hardpans.



In general, it's a process that helps ensure you're moving your soil forwards, not backwards. Regeneration is the name of the game here.

You might decide to plant a green manure crop to:

- Rest your land, improve the soil and create a bit of balance.
- Fix nitrogen and generate lush biomass in preparation for planting heavy-feeding veggies next, such as brassicas or tomatoes.
- 'Hold the space' back from opportunistic weeds until you have time or the right weather to plant the crop you really want.
- Provide a living understorey for growing vegetables – green manures help protect the soil, retain water and provide a host of nutrients while they grow.
- Help correct acidic soil – if your soil is less than 7, it has a low pH (this applies to most Australian soils). Adding green manure crops into your rotation with more frequency can help.
- Cultivate and loosen compacted soil in the early stages of forest establishment – green manures and other transitional ground covers can be sown between the pioneer trees and shrubs.

Our favourite way to plant a green manure crop is by broadcasting a good-quality seed mix over the patch we want to use it on, and then raking it all in so the birds can't eat all the seeds. Sometimes we put a layer of shade cloth over the area to help with this, until everything's germinated well. Shade cloth is also super useful to help contain soil moisture while your green manure crop germinates.

You'll then need to keep this bed moist, to ensure the seeds germinate.

For a winter green manure, you'll hopefully be blessed with rain – check the weather and aim to broadcast your seeds just before a rainy spell and rake them in well. For drier weather, you may need to rig up a sprinkler, irrigation or remember to water daily, to keep the soil moist at least until germination happens.

And then watch as a lush green carpet develops...

[Green Manure: How to Grow and Use for your Best-Ever Soil & Veggies - Milkwood](#)

How regenerative agriculture can enable sustainable nutrition

Bea Stevenson 09 Feb 23

To achieve sustainable nutrition and global food security we must evolve our current agri-food system into one that is more resilient, productive and climate-positive

At COP27 in November 2022, the food sector was recognised in all its complexity: a formidable producer of emissions, which is uniquely vulnerable to the extreme weather events caused by climate change. As global weather patterns become increasingly erratic, and population rises steadily, our current agri-food system is proving unviable world-over. There is a growing consensus that we cannot continue with farming practices that degrade soil while not sequestering carbon at scale.

Industrial farming techniques, which have largely prioritised yield over resilience, and the climate change impacts they contribute towards, have already left around [a third of the world's soils degraded](#). This puts our global food supply at serious risk. A recent [FAO report](#) found that up to 828 million people already face chronic hunger globally. With hunger comes malnutrition, and a host of dangerous deficiencies and health impacts. For the food system to provide nutrition and food security in a warming world with a ten billion-plus human population, agricultural transformation through regenerative and sustainable approaches is crucial.



Reger
ative
Agricu
lture

Planetary wellbeing

Two terms stand out as foundational pillars of this future food system: “regenerative agriculture” and “sustainable nutrition”. Both take an equitable approach that supports environmental and human wellbeing simultaneously.

Regenerative agriculture refers to farming outcomes that improve water and air quality, enhance ecosystem biodiversity, store carbon, and produce nutritious food. Sustainable nutrition encompasses accessible, affordable,

safe, and equitable diets, which support the earth and its resources.

With the overlapping challenges we face, a large-scale transition to regenerative agriculture is our best chance at securing sustainable nutrition, and socio-economic stability, for the planet.

Industrial farming methods have compromised the nutrient density of our food. [Studies have shown](#) that crops grown today contain reduced levels of nutrients such as calcium, iron and vitamin C, and less protein, compared to historic levels. The pursuit of maximum yield has ensured that farmers are paid for mass of crops above all else and, consequently, the existing nutrients in soil are stretched across too many crops. Livestock feed on these nutritionally “diluted” crops, so the nutritional quality of plants and meat alike has been compromised.

Regenerative farming practices conserve and rebuild nutrient stores in the soil, which should then filter into food crops. A [University of Washington study](#) has produced preliminary results which confirm this in practice. Tracking eight pairs of regenerative and conventional farms across the US over five years, the study found that crops from regenerative farms had 34% more vitamin K, and 15% more vitamin E, B1 and B2, than conventional farms. The regeneratively-grown crops also had 11% more calcium, 16% more phosphorus and 27% more copper. These nutrients are central to a healthy human diet.

Crop – and genetic – diversity

People and planet can benefit from an agricultural system that incorporates a wide variety of crops. In contrast to the diversity of plants and crops growing in natural ecosystems, the industrial farming system that has developed over the past [50-or-so years](#) relies on the sowing of single crops into fields, for maximum yield and convenience. This has caused a dangerous global reliance on very few crops. And within these, diversity of species has also been dramatically lowered as we have relied increasingly on genetically identical seeds.

These factors have left crops vulnerable to pests and diseases, such as [Panama disease](#), which poses a threat to multiple banana varieties, including the most widely eaten Cavendish banana. On the other hand, species diversity boosts the overall resilience of food systems.

And while genetic diversity can enhance food security, crop diversity can provide a more varied and sustainable diet. One opportunity that comes with adopting largescale regenerative agriculture is [trading monocultures for “heirloom” crops](#), which have naturally adapted to grow in specific climates, over thousands of years.

Co-cropping or planting a variety of crops in the same field, is actually inherent to regenerative farming. A common form is intercropping, when two cash crops are grown simultaneously. This can increase soil nutrients such as nitrogen, while also suppressing weeds and pests. As farmers grow and sell multiple crops from the same land, they are also able to diversify income. This is crucial in providing greater financial security against unpredictable variables such as market price volatility, pests, and diseases impacting specific crops. Financial benefits of this sort bolster the short-term economic case for regenerative agriculture, at farm-level.

On a wider scale, increasing crop diversity enhances and protects biodiversity, by supporting a whole ecosystem. For instance, intercropping a pea crop with barley can support bee populations, which then boost the ecosystem around them through pollination. This contributes to a healthier and more varied environment for crops to grow in.

Climate change mitigation

To protect our food systems from the disastrous implications of a planet warming more than 1.5C or even 2C, we must mitigate greenhouse gas emissions as quickly as possible. Regenerative agriculture can cut food sector emissions – which currently [make up one-third of all GHGs](#) – and simultaneously, sequester carbon. [The Rodale Institute](#) estimates, based on recent data from farming systems and pasture trials around the globe, that we could sequester more than 100% of current annual carbon dioxide emissions with a switch to the practices constituting regenerative agriculture.

The conventional farming system is a net producer of greenhouse gas emissions. These are produced directly when farming practices deplete soil carbon stocks, and also emit nitrous oxide, a greenhouse gas 300 times more potent than carbon dioxide. Deforestation for agricultural land releases further carbon.

In contrast, regenerative practices, such as using innovative fertilisers, compost, mulch and biochar (a high-carbon form of charcoal), can increase carbon sequestration in soil. As can reducing ploughing and tillage.

Ploughing leads to soil erosion and degradation, and removes topsoil, releasing carbon into the atmosphere. Tillage is [used in organic farming](#) to clear the soil for planting, in lieu of the use of any pesticides or herbicides. By [scrapping the practice](#) altogether, farmers can cultivate healthier soil and keep carbon locked in. Mitigating present and future emissions through a regenerative approach allows farmers to protect their food crops, and our food system, from the impacts of climate change.

Land-use efficiency

Already, approximately [half of the world’s habitable land](#) is used for agriculture. This [cannot continue to increase](#), if we

are to avoid further deforestation and stay within global carbon budgets. However, agricultural output must still contend with a rising global population. This presents the challenge of increasing food production without expanding agricultural land.

No-tillage and preserving crop residues, building up organic matter, also increases water retention and fertiliser responsiveness, enhancing productivity.

One experiment from 1968 to 2008 on [clay soil in Australia](#) found higher soil organic carbon, and higher average grain yield when crop residues were retained. A similar study on [silty soil in China](#) found that wheat yield rose by 16% under no-tillage with straw cover, compared to conventional tillage with straw removed.

With a careful selection of [tree species and planting arrangements](#), agroforestry has also proven successful in increasing productivity per unit of land, and enhancing food security in areas that deploy it. To scale this solution further, farmers require access to agroforestry extension services and finance, and value chains must be developed for agroforestry. Smallholder farmers – especially women – [require access to capital, credit and clearer land or tree tenure rights](#).

Soil health

By improving soil health through methods such as no-till, cover-cropping and biochar, farmers can improve land use by restoring degraded land. Perennial cropping systems – which incorporate crops that automatically grow back after harvest – could also help to place a large amount of degraded or abandoned [agricultural land back to use](#), whilst providing additional ecosystem services. Restoring degraded croplands in this way will enhance future food security and promote sustainable nutrition.

Cover crops can protect soil from rain, sun and frost; sown in between cash crops, they act as a blanket for the ground soil. There is substantial evidence to suggest that they will also be able to stabilise yields and improve moisture levels as weather becomes more volatile. One [30-year study](#) found that crops farmed using regenerative techniques outperformed conventionally-farmed crops in the same area. Through climate shocks and periods of extreme weather, regenerative agriculture helps farmers to do their job, even in more challenging conditions.

Long-term security

Ultimately, sustainable nutrition relies on food security. As temperatures and weather patterns become more extreme, we need farming systems which can withstand climate change impacts and maintain crop yields.

The 2nd [Sustainable Development Goal](#) on zero hunger states an aim to “end hunger, achieve food security and improved nutrition and promote sustainable agriculture”. With climate change and geopolitical challenges exerting more pressure than ever on each piece of this puzzle, it is crucial that we act now to protect our food systems.

Whilst it is by no means an exact science, and much innovation is going to be required, it is clear that regenerative agriculture will be a big part of the solution.

This briefing is part one of a two-part series, exploring the role of regenerative agriculture in enabling sustainable nutrition and food security. Part two will investigate how it can work at scale for farmers and businesses.

[How regenerative agriculture can enable sustainable nutrition \(innovationforum.co.uk\)](https://www.innovationforum.co.uk)

The garden as refuge The restorative power of green spaces and nature ALICE FROST 05.04.2023

Sustainability

“People talk about losing themselves in their gardens and that’s made possible by this sense of being ‘held’ by the garden... you can come out of a session of gardening and feel in a very different place in yourself.” These are the words of author and psychiatrist, Sue Stuart-Smith, during a [session at ORFC](#) earlier this year, where she told the story of her grandfather, traumatised by war but healed by the restorative power of the garden, as part of her book, [The Well-Gardened Mind: Rediscovering Nature in the Modern World](#).

Beyond the idea of specifically viewing the garden as a place of sanctuary and means of escape from the rest of the world, Stuart-Smith also discussed, in a much broader sense, the power of the natural world as a whole: “...we overvalue verbal communication; there are so many other levels on which the natural world communicates with us, and if we tune into it, we can respond to that”.



Green social prescribing

There's now an overwhelming collection of evidence which advocates for the benefits of utilising green spaces and interacting with nature to aid poor mental and physical health, otherwise known as **green social prescribing**. Research reveals that benefits can include, but aren't limited to, **improved concentration**, **reduced risk of developing cardiovascular diseases**, **better social connections** and **feelings of being connected to nature**. It also reduces the overprescribing of medicines and associated adverse drug reactions, which have been linked to **1,708 deaths a year**.

Dr Michael Dixon, Chair of The College of Medicine, described the advantages and potential of social prescription as "limitless". The College of Medicine launched the **Beyond Pills Campaign** in response to the Chief Pharmaceutical Officer's **National Overprescribing Review**, published in 2021, which revealed the extent to which medicine was being prescribed to patients in the UK, subsequently creating a culture of "**a pill for every ill**". The review found that 10% of drugs being prescribed to patients were unnecessary and may cause harm, and that at least 15% of the population were taking at least five drugs per day, often using one drug to treat the side effects of another. The review concluded that tackling overprescribing could achieve benefits "comparable to a new blockbuster medicine".

The impact of COVID-19 on our relationship with green spaces

The benefits of green spaces and nature were perhaps most notable when access to them **became severely limited** at the beginning of 2020, as a direct result of the COVID-19 pandemic and subsequent lockdowns. During this already trying time, it felt as though we'd been shut off from the outside world, told to stay at home, with outdoor exercise restricted to just once a day, and the formidable 'rule of six' that meant only six people were permitted to meet outdoors at a time – concepts which, thankfully, now feel rather alien to us.

Even when it was illegal, it perhaps came as no surprise when hundreds of people broke COVID-19 restrictions to gather in their local parks and green spaces, all desperate for the same taste of freedom and respite that came with these kind of environments: "At this time of chaos in the world of people, **nature was a constant**." People wanted to connect with nature by any means necessary: page views from the webcams of 47 wildlife trusts across the UK – offering just a glimpse of wildlife, such as a nest or burrow – saw an increase of 2,024% from 20,407 to 433,632 in 2020, from 23 March to 31 March, compared to the same period in 2019.

Green social prescribing in practice

In July 2020, just months after the first COVID-19 lockdown in the UK, then environment secretary, George Eustice, proposed a plan for environmental recovery. In his speech, the former secretary announced that £4 million would be invested into a two-year green social prescribing pilot scheme, later in the year. Activities under the realm of green social prescribing include nature-based activities such as walking, community gardening and food-growing projects. The scheme would launch in urban and rural areas that had been most affected by the pandemic, with the intention to increase the scale of the project in the future. **More money has since been invested** into the scheme and seven 'test and learn' sites have been set up across England to assess how communities connecting with nature, through green social prescribing, can improve mental health, with a full evaluation of the project expected at some point this year. Recent **research completed by the department of health and social care**, exploring perceptions of green social prescribing among clinicians and the public found that "nearly all clinicians would refer patients to social prescribers in the future" and the majority of patients were open to discussing opportunities for spending time in nature to support their mental health.

Access to these spaces where nature-based activities can take place to tackle health issues is just as important however, with research revealing that **equitable access to green spaces in England could save the NHS £2.1 billion every year**. Inequalities in access to green space became particularly prevalent during the pandemic, when, for some, their daily outdoor exercise meant a walk around their local park or time to unwind in their own gardens, whilst others were restricted to a small balcony, with no local green spaces available within a walkable distance. Yet, this problem persists beyond the pandemic; as of May 2022, according to the Fields in Trust Green Space Index, **2.8 million people in the UK live more than a 10-minute walk from a public park**.



In an attempt to tackle this problem, DEFRA announced earlier this year as part of their **five year roadmap** for a cleaner, greener country, and building on the vision of the **25 Year Environment Plan**, published in 2018, that they were committed to ensuring that every household would be within a 15-minute walk of green space, such as woodlands, parks and rivers.

Another avenue for green social prescribing: farms

With awareness growing and clear evidence supporting green social prescribing, it's no wonder that other avenues for green rehabilitation are being explored. Working alongside The College of Medicine and researchers from the University of Bristol, we've been launching **our own green social prescribing pilot**, working with two regenerative farms and a number of local GP practices to assess what kind of impact farms and involvement in farm-based activities can have on people's mental health.

Having been recognised as a possible solution to overprescribing of medicines, the importance of social prescribing initiatives, green or otherwise, cannot be overestimated. It could alleviate pressure on our already severely under resourced and undervalued NHS, and has already proven in other countries to be one of the **most cost-effective health measures**. Could the answer to our ever burgeoning physical and mental health crises be, quite literally, all around us?

[The garden as refuge: The restorative power of green spaces and nature - Sustainable Food Trust](#)

