

Permaculture Cairns Newsletter

EMPOWERING COMMUNITIES WITH SUSTAINABLE SOLUTIONS FOR 10 YEARS



Care for the Earth, Care for people, Fair share the excess

Permaculture Cairns Incorporated Web Site: www.permaculturecairns.org.au

PERMACULTURE CAIRNS FEBRUARY MEETING

Tuesday 18th February 6pm for a 6.30pm start

Venue: Endeavour Learning and Lifestyle Building
4 Warner Street Manunda

Members free, please bring some nibbles for cuppa break, non-members \$5

AGENDA

Welcome to all and Info on upcoming local events.

Guest Speaker:

Cathy Earle on Greenwashing

Member talk-

Bruce Zell on his recent visit to a permaculture community

**Meeting close 8.30pm now time for a chat, a cuppa and a snack with
like-minded people**

The Tropical Veggie Patch

Gardening in the hot, wet, humid Tropics

Tropical Perennial Food Plants. Tropical perennials can give you all the greens you need, try growing some ground covers under fruit trees, Samburg, Brazillian, Okinawa and Kang kong, are all good plants to grow all year round. Plants for shaded areas, Rungis, Lebanese cress and water caress. Taller plants are Sweet leaf grown for the new tips which taste like peas, Tree lettuce, Timor lettuce. The Moringa tree and three variety of Aibika a shrub with edible leaves. ***Root crops***, taro, cocoyam and sweet potatoes.

Composting - Compost all kitchen scraps, but be sure to have some hay, dried leaves or sugar cane mulch to cover the wet scraps each time you add to the compost bin. Turning is possible inside the bin with a Gardenmate or a garden fork. Insert into compost and lift and shake the contents to incorporate air for the microbes. Worm farms are good for small households.

Wet season soil improvements. - Now is time to plant a green manure crop. This is as simple as planting bird seed which has a variety of plants for cut and drop or cut and incorporating into the soil after about 6 to 8 weeks, before they set seed. Leave to decompose two weeks before planting out.

What to plant now -try direct seeding amaranth, corn, snake beans, bok choy, gai choy, Asian greens, Green Gem cucumbers, radish, melons, mustards. Herbs to plant all the basil, Mexican tarragon, mints, garlic chives, chives, lemon thyme, thyme, oregano and some spices turmeric, ginger, galangal, cardamom, Vanilla, Pandan and five in one herb. The greens will need some shade.

Grow some flowers for the birds and bees, salvia, marigold, coleus, allysum, sunflowers, basil all sorts, dianthus, sun jewels, five in one herb, bees also love flowering native plants, flowers on palm, bananas, shrubs and trees.

It is a difficult time to plant seedlings now, as heavy rain can just smash the seedlings into pieces. Advanced plants of Egg plant, Kale and Rosella will survive the heavy falls. But softer leaves could be at risk. Give it a try its only a few seeds and you will learn as you go.

Grow & eat fresh pesticide free, nutrient rich food all year to keep healthy.
Best wishes and good gardening for 2020 Cheers Carol

Composting and worm farming workshop

Which is right for you.

This workshop will provide practical methods, ideas and information on both methods of recycling your kitchen and garden waste. This waste, once decomposed can then be used to improve your soil for growing fresh fruits, flowers, ornamentals and vegetables

*Saturday 4th March 2020 9.30 to 12.30 Venue will be in the Cairns City area
More information on will be supplied when you make a booking.*

Please email your booking request to info@permaculturecairns.org.au

Cost \$30 for members, \$35 for non members.

Workshop Presenter: Carol Laing

Marina brought a lot of water kefir to the last meeting for us to taste and now has kindly sent us these instructions on making and storing

Water Kefir

Sweet but somewhat bland without a second ferment, flavored water kefir is reminiscent in taste and effervescence of a natural soda pop. Similar to Kombucha and dairy kefir, water kefir “grains” (named for their appearance only) are a SCOBY that digests sugar to create beneficial probiotics. Unlike Kombucha, the water kefir recipe does not call for tea, so there is no caffeine. This also means there are not as many powerful enzymes and acids in water kefir. But water kefir does contain a higher number of beneficial bacteria, around 400. The water kefir grain is a mixture of bacteria and yeasts in a polysaccharide biofilm that act in symbiosis, creating a culture that is stable.

What are Water Kefir Grains?

Water kefir is a name of convenience. Due to the similarity of the appearance of the “grains”, these two distinct fermented beverages now share a common name. The traditional names for water kefir grains perhaps explain a bit more about their origins and usage. Since a rose would still smell as sweet, we also assume that kefir water has much of the same benefit that led to its cultivation and sharing since ancient times. Or has it changed over time?

The kefir grain is not actually a grain but rather, a symbiotic polysaccharide containing both yeast and bacteria that ferment sucrose into a lightly sweet and bubbly brew that repopulates the gut with healthy organisms to balance the digestive and immune system. Plus, it is super easy to flavor in a myriad of ways providing infinite variety. They can also be utilized with other substrates to create unique beverages with additional benefits. These include fruit juices and coconut water.

Fruity Water Kefir Recipe Flavors

- **Strawberry Mint**
 - 2 whole strawberries, diced
 - 2 mint leaves, chiffonade
- **Blueberry Thyme**
 - 1 TB of blueberries, lightly mashed to release juices
 - 1-2 springs of fresh thyme
- **Peach Spice**
 - 1/4 peach, diced, skin removed (optional)
 - 1/4 tsp chai spice
- **Grapefruit Refresher**
 - 1-2 TB fresh grapefruit juice
 - 1-2 slices ginger root

“Soda” Water Kefir Recipe Flavors

- **Orange Pop**
 - 1/4 cup fresh squeezed OJ
 - 1/2 tsp fresh squeezed lemon juice
- **Ginger Ale**
 - 2 slices of ginger root, diced
 - 1/4 lemon, juiced
 - 1/2 tsp honey or sugar (optional – for extra fizz)
- **Lemon Lime Soda**
 - 1/4 lemon, juiced
 - 1/4 lime juiced
 - 1/8 tsp lemon zest
 - 1/8 tsp lime zest

• **How will I know if I've successfully made water kefir or if I shouldn't drink it?**

- Water Kefir has a pleasantly sweet taste but is not cloying. As a lactic acid ferment with a higher pH than Kombucha, it does not have the same type of acid profile. Many newbies to fermentation appreciate the lighter flavor. Those used to Kombucha may find it too sweet, but bottle aging will lead to a nice, dry flavor. Do not drink water kefir if it tastes like fermentation is not occurring (i.e. like straight sugar water) or if it has obvious signs of mold. A few white bubbles on the surface is fine.
- I add 3 sultanas to the first ferment. If they float, the Kefir is working. (I also add sultanas to the 2nd ferment as sugar)
- If you prefer more fizz, add ¼ teaspoon of sugar to the 2nd ferment and ensure the cap is tight. Screw cap or flip cap.
- I add some lemon juice and minced or finely chopped ginger to the 2nd ferment. You could try powdered ginger but I haven't.

Easy Water Kefir Recipe and Instructions

The following water kefir recipe is for a ratio of 2 tablespoons of grains per 4 cups of water. Scale up or down as needed.

Ingredients

- **2 Tablespoons hydrated Water Kefir Grains**
- **¼ cup sugar – organic preferred***
- **4 cups of chlorine free water ***

**Using a sugar with higher mineral content, such as rapadura, piloncillo or turbinado will help the grains reproduce.*

You can also use molasses but avoid raw honey.

If using purified water through a filtration system, then you may also add **one of the optional additions to re-mineralize it.*

To dechlorinate water, allow to sit for 24 hours or boil for 10 minutes then cool to needed temp.

Optional Additions

- **3-5 raisins**
- **1 dried fig**
- **1/2 teaspoon molasses**
- **Pinch of Himalayan salt**
-

Directions

1. **Add ¼ cup of sugar to the jar.**
2. **Add water to the jar.**
3. **Stir thoroughly to dissolve the sugar.**
4. **Add 2 TBs of kefir grains to the sweetened water.**
5. **Cover with a plastic lid, cloth cover or Fermentation Cap.**
6. **Let sit for 24-48 hours – no longer than 72 hours or the grains will begin to disintegrate.**

The water kefir recipe will produce a slightly fizzy beverage with a pleasantly sweet taste. Once it has the flavor you prefer best, then strain the kefir through a strainer or cheesecloth to recapture the grains. After you remove the grains, add flavors for a second fermentation or drink straight. (If you prefer a tangier brew or a fizzy one, do a second ferment of the water kefir in the bottle to yield a deeper flavor.) Develop your own favorite water kefir recipe based on experimentation. Repeat & enjoy. Kefir doesn't like metal utensils.

Water Kefir Troubleshooting Tips

- Grains do not need to be rinsed between uses. If rinsing is desired, do so in filtered water.
- Grains do not always reproduce every batch but may be used again and again.
- If left longer than 72 hours, grains are at risk for starvation and may disappear.
- The correct temperature range for fermenting water kefir is 20-26°C with the ideal temperature being 24°C.
- Warmer temps result in faster fermentation whereas cooler temps will slow it down.
- If you notice the kefir is ready before 24 hours, add more sugar solution to the next batch, shorten the fermentation cycle or reduce the amount of grains to 1 1/2 Tablespoons per litre.
- If grains fail to reproduce, they may need additional nutrition – add one of the optional additions listed in the water kefir recipe above.
- Grains can get slimy or change shape if too many minerals are used. If you notice this, use white sugar or remove any additions to prevent them from dissolving.

For more information including coconut kefir www.kombuchakamp.com/water-kefir-recipe

Long Term Storage & Re-nutrition of Water Kefir Grains

Living Water Kefir grains are more sensitive to adverse elements and are not prone to keeping as well as Kombucha SCOBYs do in a hotel. If you need to take a break from making Water Kefir, here is what to do.

Long Term Storage

1-7 days: Place the grains in a glass and cover with water. Store in the refrigerator.

7-14 days: Place the grains in a glass. Leave them dry (no liquid) with 1/8 tsp molasses. Store in the refrigerator.

14+ days: Simply spread the grains on a dehydrator sheet, set the temp to 38°C and the timer for 24-36 hours. If you don't have a dehydrator, use the lowest possible oven setting with the door cracked slightly to try and maintain as close to 38°C as possible (bacteria death starts around 42°C). It may also be possible to air dry the grains successfully. Store dehydrated grains in freezer safe bag in the freezer or in a dry, cool location out of direct sunlight.

The longer the grains starve or sleep, the longer it may take to revive them. The revived grains will also not have the same bacteria diversity but it will regain diversity as they are woken up and used again. As such, they may need to be re-nutriented prior to fermenting the first batch. If you notice slow fermentation or if you have been using them with another substrate, follow these steps to reactivate the grains and make them more lively.

Renutrient Kefir Grains Recipe:

- Place the grains into a dish.
- Add just enough water so the grains are completely covered.
- Sprinkle 1 Tablespoon of sugar into the water and add a raisin or two.
- Cover with a cloth and set in a warm spot (24-30°C).
- Check on them after 12 hours to see if you observe any signs of fermentation – this will be manifested in the appearance of small bubbles around the edges and a change in turbidity. If you see bobbing raisins, that is a good sign. You may now use the grains to brew your first half batch of 2 cups and 1/8 cup of sugar – keeping the vessel in a warm location will speed up the fermentation process. **Continue checking every 12 hours for up to 3 days.**
- Once that is successful, then scale recipe based on quantity of grains.

***If no fermentation is observed, add a 1/4 cup of water and 1/2 teaspoon of molasses and gently stir. Check again in 12-24 hours. If no signs of fermentation such as those listed above are exhibited after a week or so, fresh grains may be required*

- **How much kefir I should be drinking each day?**
- Trust YOUR gut! Humans evolved consuming fermented drinks on a daily basis. Listen to how your body responds. If you experience any adverse symptoms, start with ¼ glass daily and build up to 1-2 glasses daily.

Mareeba Seed Savers and Gardening Group

Meeting Notice

Our meetings are friendly and informal. It is a time when we meet to share / exchange seeds and plant materials, to swap ideas and gather knowledge from other gardeners

Our next meeting will be held on Sunday 8th March 2020

Come along from 10am to 4pm. We will clean, pack and register seeds, share lunch and then wander through the garden, followed by afternoon tea

Venue ~ Michael and Lindy Alba 17 Middlemiss Street, MAREEBA

for further information contact Maria Gillies on 0421 210 136

**** PLEASE** bring a chair, and if staying for lunch, bring your own cutlery, mug and plate and lunch / afternoon tea to share, any seeds or plant material you have to share and a gold coin donation. Also, remember your hat and sensible shoes for the garden walk ******

**~ Special Guest Speaker at 1pm ~
Ulla Melchiorson**

**Topic: *How to be a Successful Seed Saver
and Gardener***

*Ulla will share invaluable information for both seasoned and amateur gardeners
Come join us for yet another great day*



Pandanus amaryllifolius growing in a revegetation project, Bangkok.

Pandan (Pandanus amaryllifolius) has long been a staple in tropical food gardens in South and South East Asia. Its leaves impart a unique aroma and flavour to drinks, rice, cakes and desserts. As with all garden produce, the quality of freshly picked pandan surpasses that of the dried or the frozen equivalent. Fortunately, pandan is easy to grow in a subtropical or tropical climate, they make an attractive display, it is easy to propagate and to maintain in a kitchen garden.

Fresh pandan leaves are as aromatic as they are flavoursome. The easiest way to try your first pandan is putting a few leaves into rice. Pandan rice usually found in Indonesian restaurants. The first tip to using home grown pandan is the most flavoursome leaves for cooking are not the youngest, but the fully mature ones. The base of each leaf is a creamy colour. These taste bitter, so snip them off with scissors. Now all you need do it cut the leaves into lengths that fit in your saucepan. Leaves are often folded and tied into bundles to make them easy to remove before serving.

Many recipes require either fresh pandan juice or pandan paste. Since pandan juice is mostly water, it's convenient for flavouring drinks and puddings. Pandan paste is much thicker, it's a puree, so it's mostly leaf with little water. Pandan paste is best for ice-cream, baking and recipes that require small amounts of added liquids.



Pandan paste (bottom) falls out of suspension from pandan juice.

Make pandan juice

You will need water, pandan leaves, a blender, a sieve (or muslin cloth), a pair of scissors, and a tall glass or jar.

Method

- * Pick twenty leaves;
- * Remove the creamy white bases;
- * Wash leaves the leaves;
- * Snip leaves into sections 1-2cm long and put into a blender;
- * Add 400ml water and blend very thoroughly (about a minute);
- * Pour liquid through a sieve or muslin cloth, pressing the liquid out of the puree using the back of a spoon;
- * The filtered liquid is pandan juice.

Make pandan paste

- * Pour freshly made pandan juice into a tall glass or bottle;
- * Seal, and place somewhere inside the fridge where the juice won't be disturbed (eg not inside the door);
- * Store for three or four days, during which time the pandan paste settles out of suspension to rest on the bottom of the glass, leaving pandan juice as the liquid above;
- * To separate the two, gradually and gently pour off the pandan juice;

This leaves pandan paste which, if not used immediately, should be returned to the fridge and used within a week. From twenty leaves and 400ml water, expect to produce around 50ml richly flavoured pandan paste.

Some cooks prefer to use coconut milk in recipes instead of water, just don't try to turn this into a shortcut: blending pandan leaves with coconut milk makes filtering almost impossible. Make the paste first, then add it to the coconut milk.

Avoid freezing pandan juice or paste; this discolours the product and they lose the all important aroma.

Apart from flavouring drinks and rice, another dead easy use for pandan juice is to flavour sago pudding or a steamed sponge pudding.

The easiest use for pandan paste is in combination with finely chopped lemongrass, kaffir lime leaves and tamarind juice for making chicken or fish curry.

In the garden

[Pandan \(*Pandanus amaryllifolius*\)](#) is a bit of a mystery. Just like corn on the cob, what we grow has been shaped by cultivation to suit human needs. You won't find wild corn producing cobs, nor will you find wild pandan producing seed. Pandan has been cultivated since antiquity and in the process it has lost the capacity to reproduce by seed. Whenever someone locates a rare 'wild' population they usually turn out to be garden escapes so where it originated from is still uncertain, although the Royal Botanic Gardens, Kew, indicate the point of origin may be the Maluku Islands of Indonesia.

Pandan forms low, wide clumps and plants have shallow root systems. If you intend to grow them in containers, a bowl is preferable to a conventional pot;

Repot each spring and feed once with a slow release fertiliser in late spring to early summer;

Pandan is not drought tolerant. Stand pots in a saucer or tray and keep this topped up with water – a depth of 1cm is sufficient;

Take stem cuttings in summer. Pandan side shoots often produce stilt roots, so cuttings are ready to grow in a new location;

Position pandan somewhere sunny and sheltered, and protect them from western sunshine which can burn the leaves. Often, you will see pandan planted in soil in tropical shadehouses where irrigation water drips down and runoff is channelled around them to keep the soil wet;

This article is one of Jerry Colby Williams from 2019, thanks Jerry.



Reforestation, drone technology & biochar seed balls.

AirSeed Technologies is an innovative environmental restoration company created to increase carbon sequestration through global scale reforestation.

Their mission is to plant 100 Million trees per year by 2023 using Drone Technology, Artificial and Data Driven Intelligence. They are achieving 80% germination rate with mixed species in trial projects to date using biochar in their seed balls.



[Non-Members Registration URL](#)



ANZBI to own ANZBC

January Membership Drive

ANZBI has now raised 80% towards our target to own [ANZ Biochar Conference](#). Visit our membership page to view our new fee schedules and membership levels. Let's put the foundations in place and watch us grow!

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HERE'S CHEERS TO A NEW USE FOR CO₂ FROM THE ATMOSPHERE

It won't tackle global carbon emissions yet, but a new technology from Australia's national science agency, CSIRO, has found a way to pull carbon dioxide (CO₂) out of the atmosphere and put it into beer and other beverages.

At a time when CO₂ levels in the atmosphere are increasing, there have been shortages in industrial supplies of the gas over the past decade, impacting on fizzy beverage supply and food production.

CO₂ is in global demand for purposes ranging from making fizzy beverages to food packaging and controlling the atmosphere in agricultural greenhouses

The new technology is called Airthena, and was developed in partnership with Monash University, Energy Infrastructure and Resources and H2H Energy.

It draws on recent breakthroughs in advanced filtration methods to solve challenges around the water-food-energy nexus including sustainable resources, and environmental value and resilience.

Airthena captures CO₂ directly from the air using tiny sponges known as metal-organic frameworks (MOFs), and can be scaled up for commercial production.

CSIRO project lead, Aaron Thornton, said the solution had broad applications across a wide range of industries.

"As it requires just air and electricity to work, Airthena offers a cost-effective, efficient, and environmentally-friendly option to recycle CO₂ for use on-site, on-demand," Dr Thornton said.

"It also provides a more reliable source of CO₂ for use in small-scale applications ranging from beverage carbonation to controlling pH in swimming pools, and industrial cleaning."

A common method companies currently use to generate CO₂ onsite relies on burning natural gas, which is subject to market price and supply fluctuations.

CO₂ can also be bought from a supplier, which can involve expensive long-distance transportation and be prone to shortages.

Airthena only needs about two kilowatt-hours of electricity per kilogram of CO₂, equal to around 20 cents per kilogram at minimum solar energy prices of \$0.1 per kilowatt-hour at its current scale.

Jon Murphy is General Manager of Murphyfresh Hydroponics, which uses CO₂ in their greenhouses to grow tomatoes and other produce.

"We spend a lot of money on buying in carbon dioxide, so we're eager to see a new technology that can deliver CO₂ on-site, on-demand," Mr Murphy said.

Airthena is capable of capturing two tonnes of CO₂ from the atmosphere a year, making it suitable for small-scale applications right now, but Dr Thornton says it is scalable.

While Airthena won't make any immediate impact on cutting global CO₂ emissions due to its scale, it will help businesses with a more reliable source of the gas for their everyday operations, while reducing their carbon footprint.

"We are now exploring options for taking Airthena to market, which include reducing the cost of the unit for small scale applications and having it tested to ensure it meets food quality standards, or working with the food production industry to scale up the technology for larger applications," Dr Thornton said.

Airthena could also be valuable for the chemicals industry which use CO₂ as a feedstock for making other compounds and materials such as methanol and methane.

The collaboration and development of Airthena was supported by \$725,000 from the Science and Industry Endowment Fund.

If you're a business interested in working with us to further develop this technology, visit [CSIRO's Marketplace](#).

SUPPLYING NITROGEN: TAP INTO NATURE

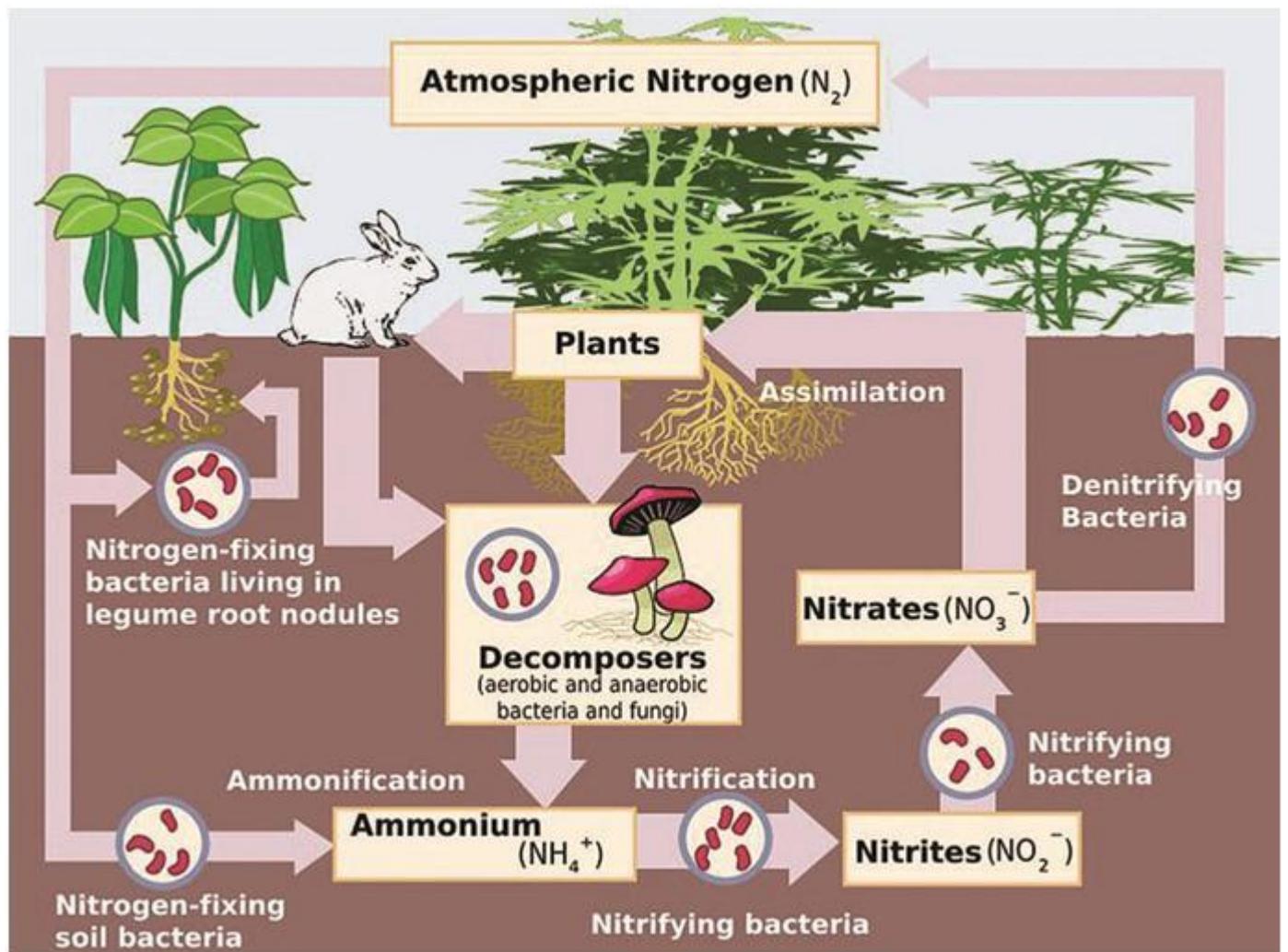
By Dr. Phil Wheeler.

Human activity is affecting planet Earth to such an extent that natural scientists are naming this time the beginning of a new geological age/epoch called Anthropocene (the recent age of man) and ending what was the Holocene epoch (about 17,000 years ago to present).

We are no longer observers of nature, but significant influencers of what is happening to nature. The sheer weight of humans and their livestock is now bigger than the Earth's wild animal population. Our activities are rapidly increasing the amount of CO₂ in the air. That is an established fact, the effect of which is the only thing in dispute, i.e. will it get warmer or cooler and will we be wetter or dryer?

The temporary warmth is obvious in the Arctic. Although growers usually help to absorb CO₂ by growing crops, their improper handling of crop residue or improper feeding of livestock can add the CO₂ back into the air. However, farming's bigger polluting effect concerns nitrogen. Plants have always used N from the air by a variety of natural methods. Now the rate we are taking N out of the air is 50 percent higher than what nature has done for millions of years. Most of this industrially created N is now used for fertilizer. This industrial process was originally used to make munitions prior to World War I.

Taking N out isn't really the problem; it is the later consequences that matter. Chemical N leaches into the aquifer. We are all familiar with ocean "dead zones" where the oxidized N and P have fed algae blooms that starve aquatic life for oxygen and the concept of "blue babies" that occurs when excess nitrate in the water causes babies to turn blue from lack of oxygen in their blood. Even though people don't turn blue, they may have, and not be aware of, a reduced amount of oxygen in their blood, which can affect their energy levels.



As growers, we must do our part in mitigating our impact on natural systems by taking every opportunity to use naturally occurring N and cease the use of industrially created N. There are five main ways we can get the nitrogen we need to grow our crops without resorting to man-made N. The good news is that you will be raising healthier, more valuable crops in the process of using nature's supply of N and can achieve comparable yields (or even greater yields).

LEGUMES

One of nature's original methods of building available N is with N-fixing plants called legumes. Legumes range from small white clover to large shrubs and trees. They all have the ability to take N₂ gas out of the air that is circulating in the soil and use a biological/chemical process to fix the N₂ into ammonium ions and/or more complex amino acid molecules. There is a microorganism called rhizobia that establishes itself inside the root nodule to complete the process.

Since each legume may have need of a different rhizobium it is best to buy the inoculant that matches it the first time you use that particular legume. If you are not farming conventionally/chemically, the organisms will usually survive, and you will not have to keep buying new inoculum for the repeated crop. The amount of N fixed by a given legume varies widely, but 30-60 pounds per acre is common.

The legumes usually need the trace mineral molybdenum to make the process happen efficiently. Hopefully, you all remember to dig up your legume of choice, carefully cut open the visible nodule on the root and check its size and color. The larger the nodule, the more the fixation potential. The darker the pink, purple or maroon, the more molybdenum you have in your soils to make the process work. If you have dull grey nodules, you need to add some molybdenum. The easiest, least costly way is to use fish, seaweed and ocean liquid or dry products that contain traces of "Molly B" on a regular basis.

AZOBACTER

Nature's second process of supplying N involves freestanding microorganisms called azobacter or azotobacter.

These organisms don't have to use a root nodule to change the N₂ gas to ammonias and other important compounds. They basically absorb the N₂ gas and release ammonias and the other compounds. The other compounds are very significant, including amino acids (the building blocks of protein): glutamic, methionine, tryptophane, lysine, and arginine. This means your plants are receiving N in a form that they can use without expenditure of valuable internal energy that can be used for increased production.

Azobacter also produce vitamins B1, 2, 3, 5, 6 and 12 and vitamins C and E. In addition, the phytohormones indoleacetic acid, gibberellic acid and cytokines are produced. If you add up the cost of buying all the compounds separately, modern azobacter products are a real bargain. Conventional farming kills off these organisms and robs the grower of what amounts to free N and a whole slew of growth factors.

Thanks to a technology breakthrough, cyst forms of azobacter that can operate on a leaf surface to produce ammonias and all the other compounds for uptake by the plant are available in the marketplace. The amount of N produced in the soil and on the leaf is conservatively listed at 40-50 units per pound per acre per application. The azobacter can also deny surface space to disease pathogens. (Believe it or not, "good" nematodes are also great ammonia and amino acid factories.)

MANURE

The next major natural source of N is from the waste products of livestock. Stable manure will also contain urine, so now you have ammonias, nitrates, urea and some protein N. Much of this can be wasted if manure is not handled properly.

Manure pits are the most common treatment/process that seeks to save/stabilize the N. However, without peroxide, biology and carbohydrates added to aerate and fix the N, much of it is lost, and odor is a problem.

Composting is the best way for sustainable growers to handle manure as the composting process, when done properly, kills pathogens, stabilizes the N and other nutrients, increases microbial activity, and creates other valuable enzymes, hormones and growth factors. Generally compost is used at 1-2 tons per acre providing 14-28 lb N (cow) and/or 60-120 lb N (poultry) the first year. There are several ways to preserve more N from your manure when composting. Adding clay improves moisture retention and increases aggregation. Adding KS+, a natural mined acidic mineral, at the beginning of composting (or better yet, at the source of the manure) stops N volatilization, kills pathogens and reduces odors very quickly, and creates better amino acids for easier uptake by plants.

PROTEIN BY-PRODUCTS

The fourth way to get N for your crops is to use a protein by-product: blood, feather meal, cottonseed meal or fish products. Protein nitrogen is composed of amino acids which are available for direct use by a plant without the use of internal plant energy to process them. Comparing protein N to industrially produced N is complex.

First, usually about 80 percent of the applied chemical N is lost either up (volatilizing) or down (leaching). Second, research shows that the protein N in fish is equivalent to about five times the amount of remaining chemical N. Simply put, 100 units of chemical N winds up being 20 units used by the plant and that 20 units of chemical N has the equivalent effect of only 4 units of fish

protein N. The added efficiency of protein N from fish comes from the additional microbial stimulation of “good guys” like azobacter. Five gallons of a 4-1-1 fish product can get you the same result or better than 400 pounds or 40 gallons of 28 percent.

HUMUS

The fifth natural source of N for your crops is from recycling previous years' plants into humus. Humus is the product of plant residue broken down by microorganisms. You can build your humus levels through cover cropping and proper handling of crop residue. The humus-building process is greatly enhanced in biologically active soil.

Humus is produced as either active or passive factions from the plant residue. The active faction feeds your next crop, while the passive faction builds long-term humus levels. The usual figure for the amount of N released by humus is 40 pounds per percent of humus per year.

To be on the safe side, I use a figure of 30 pounds per percent of humus. Research shows that large amounts of chemical nitrogen stimulate microbes to eat plant residue, but the carbon volatilizes instead of forming humus.

Another vital and positive side effect of microbial N versus chemical N is that mycorrhizae have a much better chance to do their job of producing glomalin (long lasting carbon compounds) which is the true soil “glue” that gives soil structure through flocculation and enables plants to increase the access of N from the air.

Keeping in mind the usual rule that says it takes a pound of N to produce a bushel of corn, let's see how much N we can come up with using sustainable methods. We will assume you properly incorporated your crop residue in the fall with carbohydrates and bacteria and added protein N if the residue was brown. You have also planted a mixed legume, grain cover crop to take down next spring. Your current humus reading is only 2.5 percent.

Let's delineate and calculate N sources and amounts for next year's corn: Humus (30 lb x 2.5 = 75 lb N); Crop Residue (30-40 lb N); Legume plow down (30-60 lb N); 5 gal of a 4-1-1 fish product (22 lb equivalent N); 250 ml nitrogen-fixing azobacter in the row (40-50 lb N); sidedress fish and azobacter and/or foliar feed azobacter (20 lb N); “A few good nematodes” (10 lb N). And it all adds up to (75 + 30 + 40 + 22 + 40 + 20 + 10 = 236 lb N [low end] or 277 lb N [high end]). Add more to that number if you spread raw manure or compost this fall or next spring.

See? You have enough N to grow at least 200 bushels of corn without one pound of manufactured N! Meanwhile, you haven't added nitrates to the groundwater, killed off any of your beneficial microbes or burned out your humus with artificial, costly processed N. Please break your high N addiction now! Make sure you handle this year's crop residue correctly, plant a cover crop and get ready.

the AUSTRALASIAN PERMACULTURE CONVERGENCE

CELEBRATING NATURE'S ABUNDANCE

20th - 23rd APRIL 2020 REDLAND BAY, QLD



+ APC FESTIVAL @ NORTHEY ST
19th APRIL 8AM - MIDDAY

FOR MORE INFO HEAD TO apc.nscf.org.au

AROUND THE FARM

AUSTRALASIAN PERMACULTURE CONVERGENCE 2020

The program has been announced for the Australasian Permaculture Convergence at Redland Bay in April. This is a great opportunity for people living in our region to meet and learn from the wider Australasian permaculture community. We'll be holding talks and workshops covering topics relevant to the three ethics of permaculture, Earth Care, People Care and Fair Share. Each evening will be filled with entertainment and music, including one night with Charlie Mgee from Formidable Vegetable!

Tickets are now on sale and are great value for money. Full price tickets for adults, including all workshops and activities, shared accommodation for four nights and all meals, are just \$630. We also have special rates for children (aged 11 and under) and members of Permaculture Australia. Single day tickets including meals are \$130. See the APC website for full ticket details and pricing.

Please PRINT – SIGN – SCAN and RETURN by email to
info@permaculturecairns.org.au.



Permaculture Cairns

Membership Form 2020

One year's membership fee - 1 Jan – 31 Dec:

- Household membership \$30 Renewing Member
 Individual membership \$20 New Member

Name(s) of all applicant(s) & DOB if under 18yrs:

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Postal Address:

..... Postcode:

Phone(s):

Email:

Signature:

Payment may be made at Meetings, at Cairns Penny or Online Direct Deposit to Permaculture Cairns A/c at Cairns Penny in Grafton Street. BSB704-966 A/c No. 100009440 please include your Surname as reference.

If you have a Permaculture Design Certificate could you please complete the following survey.

YOUR NAME:.....

Who was the Course Presenter:.....

When did you do the Course:.....

Where did you do the Course:.....

Enquiries

President:	Craig Phillipson	info@permaculturecairns.org.au
Secretary:	Carolyn Holland	info@permaculturecairns.org.au
Treasurer:	Jenny McGrath	info@permaculturecairns.org.au
Newsletter	Carol Laing	newsletter@permaculturecairns.org.au
Website:		www.permaculturecairns.org.au

You can join online and pay into our account or join at our meetings, third Tuesday of the month.