

# Permaculture Cairns Newsletter

EMPOWERING COMMUNITIES WITH SUSTAINABLE SOLUTIONS



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

Permaculture Cairns Incorporated

Web Site: [www.permaculturecairns.org.au](http://www.permaculturecairns.org.au)

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## JUNE NEWSLETTER

### PERMACULTURE CAIRNS MEETING

Tuesday 20<sup>TH</sup> JUNE 6pm for a 6.30 start

**ARC Disability Centre 92 Little Street Manunda**

Members free, but bring some nibbles for the cuppa break  
and a dollar for the raffle, which helps pay for the venue.

Non members \$5

#### AGENDA

Welcome to new members and visitors

Upcoming workshops and events

Permaculture Principle Number 6, a practical explanation.

### Guest Speakers:

*Christian Cluver from 'grow your own home' will talk to us about building a cob home and his workshops coming up*

*A presentation on growing Microgreens, Baby greens and Sprouts by Carol Laing*

*What's happening at Northey Street Farm by Jenny McGrath*

Plant of the Month, and if anyone has something to add please bring it up on the night before we break for a cuppa and nibbles.

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

**All finished by 8.30pm.**

## Permaculture Principle 6:

### Produce no waste

“A stitch in time saves nine.” “Waste not, want not.”



By valuing and making use of all the resources that are available to us, nothing goes to waste.

The icon of the worm represents one of the most effective recyclers of organic materials, consuming plant and animal ‘waste’ into valuable plant food. The proverb “a stitch in time saves nine” reminds us that timely maintenance prevents waste, while “waste not, want not” reminds us that it’s easy to be wasteful in times of abundance, but this waste can be a cause of hardship later.

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## Growing Food in the Tropics in June

AhH, cool at last. And the veggies are loving it, the new crop of a smaller version of the Chinese cabbage called Wombok are growing fast and without bugs. The Tuscan kale is recovering from being harvested back to growing point, the Red Russian Kale and the Celery are loving the cooler weather. Cucumbers are running up the trellis, Coriander growing everywhere, lettuce, bok choy, eggplant, tomatoes, peanuts, capsicum, rocket, tatsoi, chilli, potatoes, pepino, Blue lake climbing beans and a new variety of pea, Pea Novelle are now producing

Keep on seeding the beans, corn, lettuce, coriander directly into the garden or planting seedlings so there is food coming along all the time.

Not forgetting the tropical perennial greens, they are all still there to be enjoyed in the winter as well as the summer, Okinawa, Sambung, Brazilian, Kang Kong, Lebanese Cress, Leaf Genseng, Ceylon spinach, Amaranth red and green. And the root crops Cocoyam, Taro, ginger, turmeric bunching shallots, and all the herbs.

### IMPORTANT MESSAGE

I read an article online from a ABC gardening show where a Microbiologist explained how mycorrhizal fungi were beneficial to have in the garden. She said

*the best way to keep the fungi in the soil was to grow TRAP CROPS such as plants in the Onion and Marigold families.*

*I recently seeded some of my Bok choy seeds into a garden where I had removed a crop of bunching shallots.*

*The result was startling, the bok choy plants are large and really healthy, with no insect damage and have been producing for months. I am allowing some to go to seed for collection.*

*Why does this make a difference? Because, to put it simply, Mycorrhizal Fungi take up home in the root zone and roots of plants and mycelium move grows through the soil to find nutrients for the plant, it's called a symbiotic relationship, where one helps the other, because the plant feeds the fungi.*

*The plants in the onion family, such as bunching shallots, garlic chives, chives and rakkio onion are all Trap Crops. They don't take up much space so be sure to have them growing in your garden all year round.*

### ***Try this at home***

*Grow some marigold plants in pots and when fully grown and beautiful, stop watering them. The mycorrhizal fungi will take this as life threatening and will produce more fungi to search for water and nutrients.*

*Once the plant is dead, harvest the soil and roots in the pot. Then spread the soil and roots containing the mycorrhizal fungi around your plants by gently adding to your soil and covering with mulch and watering.*

*The mycorrhizal fungi will attach themselves to the roots and help the plants become more productive by searching for nutrients that the plant requires. Compare the growth of those plants with the fungi to those without the fungi. Then come to our meeting and tell us about it.*

*Feed the soil not the plant and the microbes and fungi will do the work for you. Good gardening with biology.*

*Cheers Carol*

***Do you have anything to add please contact me***

***Editor, Carol Laing - [newsletter@permaculturecairns.org.au](mailto:newsletter@permaculturecairns.org.au)***

## Workshops and Events

### Cairns Seed Savers Meeting – 25<sup>TH</sup> June 2017

Cairns Seed Savers is an informal group of individuals with a passion for saving seeds and growing fruit, vegetable and other useful plants that have been passed down through generations and are adapted to our local conditions.

WHEN: Sunday 25th June 2017

WHERE: Robert and Rheana's: Synergy Studio, 66 Johanna St, Trinity Beach.  
(The first road to the left as you exit the Reed Rd roundabout to Trinity Park).

PHONE: Jo 40553053

WHAT TO BRING: • Organically grown, non-hybrid seeds for our Seed Bank • A plate of food to share for lunch • Your own chair, plate and cutlery • Your spare seedlings, cuttings, plants and produce for the Share Table

AGENDA: 10 – 11:00AM Meet'n'greet, general housekeeping, seed sorting and access to Seed Bank

11:00 – 12 Robert will talk about propagating, planting, growing and caring for tropical fruit trees suitable for our local conditions, and tie that in to his area of expertise on human health and the role of diet as it pertains to tropical tree crops.

12 - 12:30 Enjoy a shared lunch

12:30 – 1PM "Show and tell" of any other great ideas/inventions.

Tour of the property – please wear closed shoes.

See you there!



#### Welcome to our winter newsletter.

Community Foods continues its 20<sup>th</sup> Anniversary celebrations with a Film and Friends night at Wharf One Café on Saturday 24 June from 6pm. The feature film is SEED: The Untold Story, which follows passionate seed keepers protecting the planet's 12,000 year-old food legacy. In the last century, 94% of our seed varieties have disappeared. Tickets here: [www.trybooking.com/QJTZ](http://www.trybooking.com/QJTZ) Read more [here](#).

Volunteering at Community Foods is a fantastic way to get involved. Things are changing, old faces have moved on and new ones are popping up. So come and add your positive energy to our community in our 20th year. Volunteering provides a great opportunity to connect with the Cairns community, learn more about Co-op products and decrease your organic food spending. Our training gives you up-to-date information about healthy food products within a supportive team environment. You are guaranteed to get that warm inner glow from being one of the gang. [More Information](#).

Winter in Cairns is here because we're wearing long sleeves and have turned off the fans. So - time for some warming winter food. We often get asked what to do with spelt grain, so [here's a recipe](#) for a brilliant spelt and veggie soup.

Enjoy the cooler weather and hope to see you in the shop very soon :)



## The Team at Community Foods Co-op

**Address:** 74 Shields St, Cairns QLD 4870

**Phone:** 07 4041 5335

**Email:** [shop@comfoods.org.au](mailto:shop@comfoods.org.au)

**Website:** <http://www.comfoods.org.au>



### Spelt and Vegetable Soup



*Winter in Cairns is here because we're wearing long sleeves and we've turned off the fans. So time for some warming winter food.*

*We often get asked what to do with spelt grain, so here's a recipe:*

*Soak a cup of spelt grain overnight. Next day, drain the water, gather the ingredients below, fry the onion and garlic until brown, then add the other ingredients, including the spelt grain.*

*You will need:*

- 1 cup spelt grain*
- 1 tablespoon olive oil*
- 2 cups peeled and cubed butternut pumpkin (cut into 1-inch pieces)*
- 1 1/2 cups peeled and sliced carrots (cut into 1-inch pieces)*
- 1 1/2 cups peeled and sliced parsnips (cut into 1-inch pieces)*
- 1 large onion, diced*
- 3 cloves garlic, chopped*
- 1 tablespoon chopped fresh parsley*
- 4 cups miso to taste or vegetable stock*
- 1/2 teaspoon black pepper*

*Add the other ingredients and cook on a low heat until everything is super soft. Blend or leave chunky - your choice.*

*Garnish with extra parsley and serve with warmed buttered sourdough bread.*

# FNQ COMMUNITY EXCHANGE

## *Relocalising Far North Queensland*

FNQ Community Exchange – LETS Local Energy Trading System

### JUNE CALENDAR 2017

KOAH Saturday 3rd 9am – 1pm Monthly Market and Trade at Koah Community Hall. You are invited to be part of the local Koah Monthly Market, an excellent family friendly venue. This is a traditional cash market, however LETS members are welcome to participate and trade \$5 or 5B per stall, set up from 8am. Event Host: Tonielle – 0422058995

Mount Molloy Saturday 3rd 8 – 12 noon Mt Molloy Markets – Look out for the LETS stall holders for info about LETS and trading in that area.

YUNGABURRA Saturday 3rd from 12 noon Alliance Francaise at that retro cafe, 20 Eacham Road. This is not a LETS event! Want to learn, speak, practice or just listen to others speaking French? The Tablelands group meets on the first Saturday each month. French music, and some French specials on the menu for lunch. Come along – everyone welcome. Event Host: Ingrid - 0459793313

CASSOWARY COAST Sunday 4th Johnstone River Community Garden Celebrating Eco Picnic and 7th Birthday for JRCG. For more details please contact Event Host: Bernie - 0403523244

ATHERTON Saturday 10th 6 – 9pm Atherton Dinner & Trade Evening, 17 Evans Street. Please bring along something to trade, a table or blanket to display your wares and a plate of a gluten free delicious to share for dinner. Event Host: Irene 0439914876

**MALANDA** Saturday 17th 2 – 4pm Mary & Mathieu's Trade Day 7 Cleminson Close Malanda – Bring a plate to share for afternoon tea and something to trade in a lovely garden setting. Event Host: Mary - 0456021026

**CASSOWARY COAST** Sunday 18th from 11am Trade Day at Rebecca's 239 Warrubullen Rd, Moresby – Bring a plate to share for lunch, a friend and a table or blanket to display your wares. For directions please call Event Host: Rebecca Fisher - 0427668804

**RAVENSHOE** Tuesday 20th from 2pm Octopi Garden Sanctuary 78 Grigg Street. Afternoon tea and Trade, bring along something to trade, a friend or two and enjoy an afternoon of trading. Event Host: Hayley - 0456663965

**MALANDA** Friday 23rd 6pm – 9pm Trade Evening @ Katrin's 33 Park Avenue- opposite the caravan park. Bring a plate of German theme dinner to share, a table or blanket to display your wares. Family friendly event - Come along enjoy the fun! Event Host: Katrin – 40966755

**YUNGABURRA** Saturday 24th 12 - 2pm that retro cafe Trade Afternoon. The RED SHEDS SHOPS 20 Eacham Road, Yungaburra. This event is the directly after the Yungaburra Markets. Bring along something to trade a rug to display your wares. That retro cafe is offering 100% Bartles for drinks from the menu; you will need cash for lunch and drinks from the display fridge. On the Verandah is offering preloved clothing for 100% Bartles. We are now setting up at the back of the Red Sheds in and around the courtyard. Event Host: Melitta - 40952340

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CAIRNS CITY Sunday 12 - 2pm - Lafew Teahouse, 33 Sheridan Street. LETS relies on member initiative and participation to make events happen. Lafew Teahouse & Kombucha bar is available any Sunday between 12-2pm for trade days, I however will not be there to organise it, I invite anyone in Cairns to create with the space a place to trade - shaded garden area out the back is also great. Contact Lorna for more info: 0475762838

JUNE 15th - DEADLINE FOR JULY CALENDAR details to Melitta - [fnqces@gmail.com](mailto:fnqces@gmail.com) or 40952340 to be included in All Calendar, Website, Facebook and other Promotions

What to bring to Trade Events where not specified above: food & drinks for yourself or to share, or money and/or Bartles at some venues, friends, Trading Record Sheet and pen, any goods you wish to trade, table/rug to display them upon is often useful, your own chair at some venues, promotional material of any services you are offering if applicable, \$20 to join LETS if you are not yet a member.

[fnqces@gmail.com](mailto:fnqces@gmail.com) - 4096 6972 - [www.fnqces.org](http://www.fnqces.org) - [www.communityexchange.net.au](http://www.communityexchange.net.au)

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## ***JULY EVENTS***

### **Biodynamics FNQ Event JULY 2017**

**Biodynamic Cattle and Pasture Management**

**Sunday 9<sup>th</sup> July 2017 10am to 3.30pm**

**Julatten to be confirmed**

**Bring food to share for lunch.**

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### Create your own Marine Monstrosity

- Using only recycled & recyclable materials design a giant sea creature. representing any (existing) species,
- Open to all school aged kids
- Register your school, your group or have a go individually
- Bigger is better
- Awards to be won
- Points received for percentage of recycled material used, ease of recycling after event, size, creativity, education and wow factor.
- All Marine Monstrosities will be presented at the Gimuy Fish Festival 2016 (16th July 2017) in an interactive display.
- All artwork needs to be completed by 13th July so they can be collected and delivered to site.





Dr Wendy Seabrook, Director

### GETTING TO THE HEART OF PERMACULTURE DESIGN

Four-day course - 15th – 18th July 2017 at Hill Top Farm, Cooktown Queensland

At this 4-day course, we'll take you on a journey to the heart of Permaculture Design.

As Bill Mollison said – at its heart Permaculture mimics nature. He understood that by learning from nature we can make our gardens, farms, and communities sustainable. In ways that are also productive, easier to manage, and better able to bounce back from extreme weather and other unchosen change.

In this course, you'll develop ways to bridge the gap between how your project operates and natural ecosystems perform using our Toolkit of Ecological Practices and Permaculture Design



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Permaculture  
Convergence**  
[ipcindia2017.org](http://ipcindia2017.org)  
Hyderabad, Telangana, India

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**CONFERENCE**  
25 - 26 Nov 2017  
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*For more info on the Convergence check out the website” -  
[ipcindia2017@permacultureindia.org](mailto:ipcindia2017@permacultureindia.org)*

*Website for Permaculture videos info and blogs*

*Permaculturenews.org/category/how to*

**AND**

*Geofflawtononline.com*

*Check out the Friday Fives, join up for insights and benefits*

# *News from Home and around The World*

## CSIRO News Release - Roadmap to low emissions future

### NEWSRELEASE

2 June 2017



[Pictures-Audio-Video](#)

#### ROADMAP TO LOW EMISSIONS FUTURE

CSIRO today released its Low Emissions Technology Roadmap outlining the technology options to meet emission reduction goals and steer Australia towards a secure energy future.

The roadmap analyses how changes in the electricity, industrial energy and transport sectors could help Australia meet or exceed its emissions reduction target for 2030 and contribute to further decarbonisation to 2050.

The roadmap also explores the potential economic opportunities that exist for Australian industry through deployment of relevant technologies or by participating in growing low emission fuel and technology supply chains.

It takes a 'technology neutral' approach and presents four options or 'pathways' to decarbonisation of the energy sector, which currently accounts for 79 per cent of Australia's emissions.

Based on nine months' research, modelling and consultation, the report found that:

- Australia is endowed with energy-rich resources and is well positioned to benefit from innovation in low emission technologies.
- Energy productivity will remain important in reducing energy costs and emission levels throughout the transition.
- Modelling conducted as part of the report suggests that new energy generation is likely to be mainly in wind, solar PV, storage and gas to meet our 2030 emissions reduction targets.
- While the technology pathways are comparable in terms of cost, they carry different levels of commercial, technical, social and stakeholder risks.

"In the midst of disruptive change within the energy sector, we must address the 'energy trilemma' of security, affordability and sustainability," CSIRO Chief Executive Dr Larry Marshall said.

"We can't navigate the bumpy road of change without this Roadmap, using science to reinvent roadblocks into freeways.

"We think of coal as the past, but what if we could reinvent it into the feedstock for hydrogen?

"We think of lithium-ion batteries as the storage solution, but what if we could use chemical storage like ammonia which also offers safe transport and distribution using existing liquid infrastructure?

"CSIRO's Strategy 2020 is dedicated to using science to navigate Australia's industries, both traditional and emerging, into a brighter economic future enlightened by innovation."

CSIRO Energy Chief Economist Paul Graham noted that improvements in technology are often hard to predict, but Australia's diverse energy resources mean we can exploit new opportunities as they arise.

"History shows we are poor predictors of technological innovation – for example, at the start of this century no one thought solar photovoltaics would be a cost effective source of low emission electricity – but if we keep our options open, we have the opportunity to position Australia to achieve its emission targets and contribute to new global low emission energy supply chains," Mr Graham said.

The Low Emissions Technology Roadmap was prepared for the Australian Department of the Environment and Energy to provide input to the Government's 2017 Climate Policy Review.

View the report at [www.csiro.au/letr](http://www.csiro.au/letr)

## Double your fruit and vegetable intake for much-improved health



**Katherine Martinko** (@feistyredhair)

**Living / Health**

February 23, 2017 Treehugger



CC BY 2.0 *cristina.sanvito* -- ***Eat up! They'll only make you stronger and healthier, and you'll live longer, too.***

**New research from the UK shows that doubling the daily recommended amount of produce from 5 to 10 servings a day has significant health benefits.**

If you thought eating five portions of fruit and vegetables a day was challenging, it's going to seem easy in comparison to the latest findings from the world's nutritional experts. Researchers are now saying that *doubling* the current recommended amount – upping your daily intake to ten servings – could significantly reduce risk of heart disease, cancer, and stroke, and prevent 7.8 million premature deaths annually.

Scientists at Imperial College London **analyzed nutritional data** from 95 different studies involving two million participants. They assessed 43,000 cases of heart disease, 47,000 cases of stroke, 81,000 cases of cardiovascular disease, 112,000 cancer cases and 94,000 deaths, publishing the results in the *International Journal of Epidemiology*.

**Not surprisingly, they found that the more vegetables and fruits a person eats, the healthier he or she is. **The Guardian reports:****

“Eating up to 800g [approximately 1.5 lbs] of fruit and vegetables – equivalent to 10 portions and double the recommended amount in the UK – was associated with a 24% reduced risk of heart disease, a 33% reduced risk of stroke, a 28% reduced risk of cardiovascular disease, a 13% reduced risk of total cancer, and a 31% reduction in premature deaths.”

One portion is roughly equivalent to a banana, a pear, an apple, a large Mandarin orange, or 3 heaping tablespoons of cooked vegetables, such as spinach, peas, broccoli, or cauliflower. So you can imagine that multiplying those items by 10 each day would mean a whole lot more vegetable- and fruit-eating than is currently being done by most individuals. In fact, fewer than one in three UK residents is thought to reach the official target of five portions per day.

The researchers found no difference between raw and cooked produce, although certain vegetables and fruits appear to reduce risk of specific diseases:

**To prevent heart disease, stroke, cardiovascular disease, and early death**, eat apples and pears, citrus fruits, salads and green leafy vegetables such as spinach, lettuce and chicory, and cruciferous vegetables such as broccoli, cabbage and cauliflower.

**To combat cancer risk**, eat green vegetables, such as spinach or green beans, yellow vegetables, such as peppers and carrots, and cruciferous vegetables. The latter contain glucosinolates, which activate enzymes that could prevent cancer.

Lead author Dr. Dagfinn Aune advises eating whole vegetables and fruits, which are also beneficial for gut health:

“Most likely it is the whole package of beneficial nutrients you obtain by eating fruits and vegetables that is crucial to health. This is why it is important to eat whole plant foods to get the benefit, instead of taking antioxidant or vitamin supplements (which have not been shown to reduce disease risk).”

Upping one's intake of fruits and vegetables for health reasons has the added bonus of reducing one's environmental impact, for when meals are rounded out with vegetables, it often translates to less meat and dairy on the plate. Focusing on vegetable-centric eating is something that many people are trying to do as a **climate change mitigation strategy**, so it's a win-win situation for all.

~ ~ ~

# **The Hon. Josh Frydenberg MP**

Minister for the Environment and Energy

## **Turning waste into fuel**

Media release  
4 May 2017

The Turnbull Government through the Clean Energy Finance Corporation (CEFC) will lend \$30 million to ResourceCo to transform non-recyclable waste into solid fuel, known as Processed Engineered Fuel (PEF).

The project is being financed through the \$1 billion Sustainable Cities Investment program, established to boost the use of renewable energy and clean technology in cities.

PEF can be used as a fuel substitute for coal and gas in high-combustion facilities such as cement kilns.

Production will initially be used locally and eventually will also be exported to Asia.

The CEFC will help fund a plant at Wetherill Park in Sydney and a second at another location to be announced.

The Wetherill Park plant will process around 150,000 tonnes of waste a year to produce PEF and recover other commodities such as metal, clean timber and inert materials.

Conversion of non-recyclable waste into PEF is a win for the environment as it has the potential to reduce Australia's need for new landfill.

The project is expected to reduce the equivalent of at least 8 million tonnes of carbon dioxide emissions during the expected life of the equipment.

ResourceCo is one of Australia's largest recycling businesses, accepting and processing more than two million tonnes of waste per year.

The CEFC invests with co-financiers to develop new sources of capital for the clean energy sector, including climate bonds, equity funds, aggregation facilities and other financial solutions.



# Injured plants warn neighbours of danger



**Melissa Breyer** (@MelissaBreyer)

**Science / Natural Sciences**

May 17, 2017 From Treehugger newsletter



© Jeff Chase/University of Delaware

## **Another study adds to the growing body of research on how plants can communicate with each other.**

In a perfect world – or perfectly, wonderfully weird world, at least – plants and all the animals would speak the same language. Can you imagine? Though it would certainly make being on top of the food chain emotionally challenging, it sure would be enlightening.

As it stands, most humans don't give much credence to the communication talents of other kingdoms – but just because they don't speak a language we understand, it doesn't mean plants are not getting messages to one another.

The latest in a string of studies looking at how plants and trees communicate comes to similar conclusions as its predecessors. This time around, a young high school science student and his botanist mentor spent two years studying plants. They discovered that when a leaf of *Arabidopsis thaliana*, also known as mustard weed, was injured, the hurt plant sent out an emergency alert to neighboring plants, which began shoring up their defenses.

"A wounded plant will warn its neighbors of danger," says Harsh Bais, the botanist from the University of Delaware, who is an associate professor of plant and soil sciences in UD's College of Agriculture and Natural Resources. "It doesn't shout or text, but it gets the message across. The communication signals are in the form of airborne chemicals released mainly from the leaves."

Connor Sweeney, now a senior at Charter School of Wilmington, is the first author of the research, which was published in the scientific journal *Frontiers in Plant Science*.

The discovery came about after Sweeney had placed two of the many plants they were working with a few centimeters apart on the same petri plate – and then made two small nicks on one's leaf to mimic an insect's attack.

What happened next, as Sweeney says, was "an unexpected surprise," notes the **University of Delaware**: The next day, the roots on the uninjured neighbor plant had grown noticeably longer and more robust – with more lateral roots poking out from the primary root.

"It was crazy – I didn't believe it at first," Bais says.

The team repeated the experiment numerous times in different arrays to rule out communication between the root systems, a method that has been observed before.

"The reason why the uninjured plant is putting out more roots is to forage and acquire more nutrients to strengthen its defenses," Bais says. "So we began looking for compounds that trigger root growth."

They found that the injured plant was releasing volatile organic compounds (VOCs) as its warning alarm. As described in the study: "The emission of VOCs induces a response in the neighboring plant communities and can improve plant fitness by alerting nearby plants of an impending threat and prompting them to alter their physiology for defensive purposes."

"So the injured plant is sending signals through the air. It's not releasing these chemicals to help itself, but to alert its plant neighbors," Bais says.

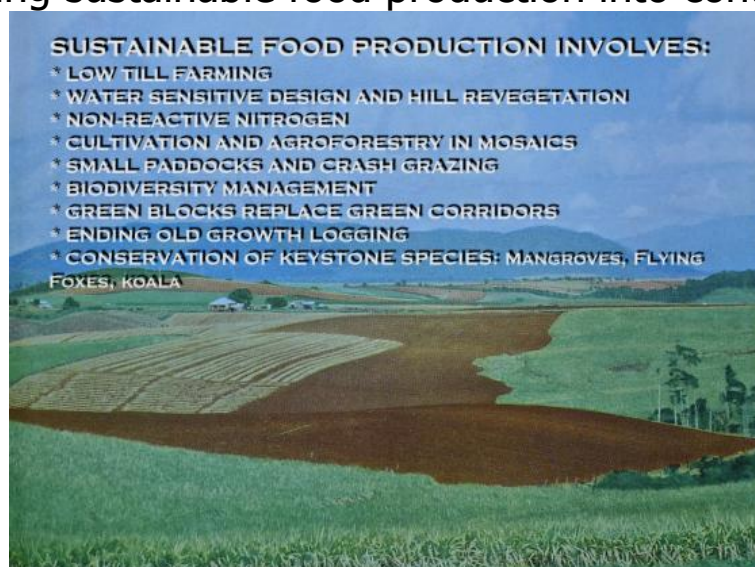
Admittedly there are many questions that remain unanswered, but it's nonetheless an exciting time for rethinking what we think we know about plants and how they're talking. While they may not be whispering, "psst, buddy, caterpillar approaching," they're still clearly getting their messages across

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**Patron, National Toxic Network Inc**

**New Post by Jerry Coleby-Willians, Patron, National Toxic Network Inc**

Putting sustainable food production into context "



At the [Meetings of the conferences of the parties to the Basel, Rotterdam and Stockholm conventions, Geneva, Switzerland, 24th April to 6th May 2017.](#)

"There is no economy without food.

I am here to tell you that [industrial chemicals - pesticides and fertilisers - are unnecessary for food production.](#)

The food growers I mix with are interested in reducing the cost of operating a farm. They are not interested in spending money unnecessarily on industrial chemicals or fossil fuels.

The growers I work with are the opposite of industrial monocultures, they create productive, resilient landscape mosaics.

Such growers are interested in increasing productivity and profitability of their business by reducing the operating costs of food production.

No farming system is more productive than a mixed, one hectare family run farm. This is the best and most productive system our species has invented.

What matters most to sustainable food production is context.

What is occurring in the Arctic will reshape global food production.

Methane gas, released by a rapidly warming Arctic, heralds the end of industrial food production because [this greenhouse gas will warm our climate so much and so fast it will end definitive seasons.](#)

[Within ten years of the first ice-free month in the Arctic we can expect 6-8C of warming, and this will mean the end of clearly defined seasonality.](#) As seasons become 'greyed', seasonal food production will end.



**Great Barrier Reef 60% bleached and ecologically dysfunctional in 5 years**

Natural systems tend to accommodate environmental stresses up to a tipping point, beyond which systems rapidly collapse. Australia's Great Barrier Reef is a prime example. Sixty percent of this reef bleached in a five year period. Most of this reef is now ecologically dysfunctional.

[This methane positive feedback loop](#) is not acknowledged by the Paris Treaty. It is one of twenty positive feedback loops currently in operation, none of which are recognised by that treaty. The consequences of feedback loops for food security are not recognised by a single national food security policy.

These environmental changes will not occur evenly. [They will impact faster and harder on the Northern Hemisphere](#) because that is where most of the land occurs and land warms faster than oceans. These changes herald the twilight of industrial monocultures.

As one farmer in Central Queensland recently said about rain following drought in an article published by the [Australian Broadcasting Corporation: "It's too late for a summer crop and it's too early for a winter crop..."](#)

\_ Monocultures will not end with a bang, they will end with a whimper.

The future of food security will depend on family run farms, market gardeners (like me) and domestic food growers, because this kind of grower is more flexible, more responsive and very unlike the monolithic, ecologically impoverished, industrial monocultures. Monocultures are productive and food is cheap when nature is benign. Unlike monocultures, we are the nimble, the quick and the resilient.

**We ignore the following key aspects of sustainable food production at our peril:**

- \* **A culture of forgetting - we forget our horticultural history;**
- \* **Declining crop diversity, both in the range of species grown and in the genetic diversity within each crop;**
- \* **The oversimplification and impoverishment of systems of food production;**
- \* **A reluctance to apply the precautionary principle where using the least toxic solution in crop protection comes first;**

**A culture of forgetting** horticultural history occurs as the spotlight focusses on progress and moves forward with it. How did our species manage to produce food before the invention of bee-killing and bird-killing neonicotinoid pesticides thirty or so years ago\*?

We have forgotten lessons already learned and forgetting is a form of uninvention.



Rare and threatened plants display, Sydney Botanic Gardens (1998)

**Declining crop diversity is a risk.** It is risky for humanity to depend on just twenty different crop species. It increases the risk when crops, especially hybrids, lack genetic diversity. It is even more risky to rely on a narrow range of crops when countries are, in effect, changing their climates.

I am a cropping systems engineer. I have a sound working knowledge - not just book knowledge - of 15,000 plants of economic value, and I have cultivated plants in four different climate zones (cool temperate, dry temperate, warm temperate and subtropical).

**Declining genetic diversity within crops is very risky,** because this reduces their resilience to pests and diseases and reduces their reliability in different soils and less hospitable, less predictable weather.

The rediversification of systems of food production to cope with accelerating climate change implies we need research, however this is not true. Much of it has already been done. The Australian National University (ANU) has completed research into 300 family farms across the states of Victoria, New South Wales and Queensland. Professor David Lindenmayer at ANU is a first point of reference.



**The precautionary principle in chemical use is vital.** The Royal Botanic Gardens, Sydney, which I managed between 1992 and 2003, is Australia's oldest scientific organisation. The garden occupies the first site in the country to experience European farming methods and runoff - silt, chemicals and other pollutants - drain directly into world famous Sydney Harbour. Now Australia's most heavily visited public open space, the gardens have accumulated many of Australia's most complex pest and disease problems. In every sense, this land is 'ground zero' for the impact of western industrial horticulture since settlement in 1788.

Yet it only took five years for scientific and horticultural staff to convert this 30 hectare open space to biological (organic) management. This achievement was never publicly announced because the Hon. Bob Debus, then the NSW Minister for the Environment, privately likened biological farming as being a 'religion' and declared in conversation 'there is no place for 'religion' in the NSW public service'.

Despite the botanic gardens never officially declaring it had become organic, all the systems were in place and practised to a large degree by staff. Integrated pest management eventually became official policy, continual improvement was endorsed, and the use of least toxic chemical first was advocated.

My message to this conference is this. If Australia's oldest, most heavily used, and most complex horticultural landscape can be prepared for conversion to biological systems of management so too can any horticultural landscape anywhere.



**In 200, Australia's oldest scientific organisation almost became organic**

The United Nations recognises that [access to a healthy diet is a human right](#). Since climate change is altering the biochemistry (nutritional value) of the crops we grow, the health value of the food in our diet has, and is, altering.

I put it to you that if a healthy diet is a human right, it is also a human, animal and environmental right to provide access to the safest methods of crop protection, animal husbandry, and prioritising solutions which are both the least expensive and safest.

I come from four generations of English farmers and market gardeners. I can reach back through 150 years of family horticultural tradition. I know that botanical pesticides, like nicotine soap, were effective long before multinationals ended their use so they could claim a global monopoly on their synthetic, bee-killing and bird-killing neonicotinoid alternatives.



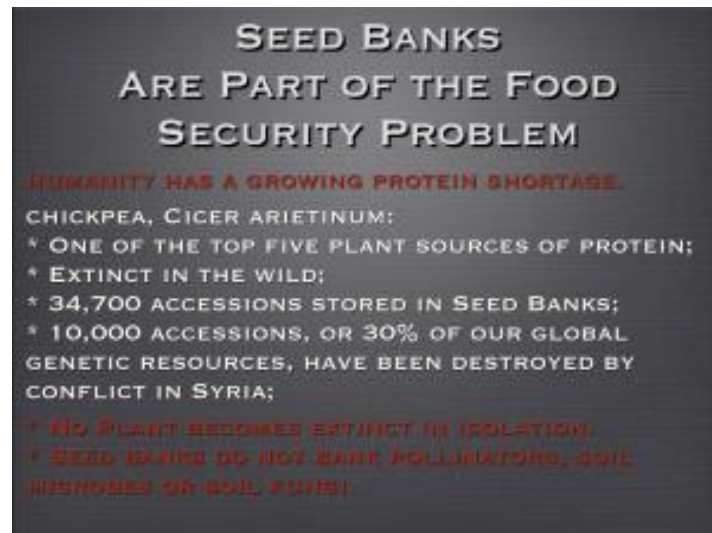


**Milk, coffee, bicarbonate of soda, vegetable oil,. Vinegar are safe and effective for crop protection**

It is a human right to be able to use human foodstuffs to manage pests and diseases. Foodstuffs such as caffeine (in coffee, used to control slugs and snails and weeds), bicarbonate of soda (used in cakes and for controlling foliar fungi and for altering soil pH), cow's milk (horticultural fungicide), vegetable oil (spraying oils, like sunflower oil, for suffocating pests) as well as traditional botanical pesticides. We know how effective neem oil is, but why was nicotine soap, a botanical extract from the tobacco plant, *Nicotiana tabacum*, and used against chewing and sap sucking pests, discontinued in favour of synthetic neonicotinoids? Traditional horticultural solutions must be front and centre in national food security policy, national agriculture policy. Growers and the public must be aware of and educated in their use, not just exposed to the consequences of applying the latest, most fashionable toxic industrial poisons.

My affordable, sustainable market garden and home - 'Bellis' - in subtropical Brisbane is an example of how powerful small, intensive food production can be. In tropical Indonesia, with its young, fertile soils, my 813 square metre property could feed a family of five and earn a cash income.

I have a 300 square metre food garden and, on average, I have 100 different fruit, vegetables, herbs, spices and medicinal plants available for use. I garden with Australia's fossil soils. I have proven that 100 square metres of good soil can feed one person all year round if it can be supplied with a minimum of 7,000 litres of irrigation water a year. This garden supplies a surplus of food to three and earns me a cash income



**Seed banks are not as safe, democratic or reliable as we are led to believe**

My property produces three times as much renewable electricity as it uses. My roof is my power station and it collects my drinking water supply. My sewage system uses ultra-violet light and bacteria to convert washing and sewage water into liquid fertiliser for toilet flushing and irrigating my crops. I am the only person in Queensland that uses wastewater for food production.

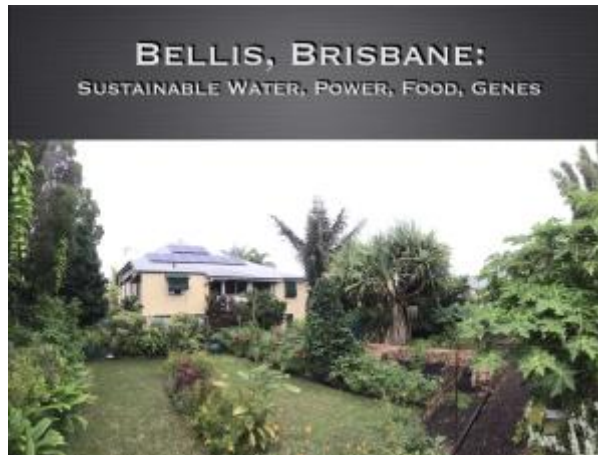
My property uses well composted, freely draining soil, contouring, raised beds, sub-surface drainage and porous paths to slow stormwater down so it soaks in and moves vertically through the soil profile. Hardly a drop of stormwater, nutrients or sediment escape my land.

In extended drought I can sustain food production using one litre of recycled sewage water per square metre per day, plus natural rainfall. In 2009, I won a national Save Water Award (Built Environment category) for demonstrating this.

By demonstrating to the Queensland State government how many plants can be successfully grown with recycled waste water, the government modified and expanded its advice to growers.

During dramatic summer floods in SE Queensland in 2011, 2012, 2013, my property soaked up rainfall. Not a strawberry fruit was lost.

In March 2017, over twelve hours, ex-Cyclone Debbie dropped 219mm rain on my property. Every drop soaked in.



## Bellis: an affordable, versatile model of sustainable power, water and food production

The key infrastructure that makes my property work are solar panels, a wastewater system, a rainwater harvesting system, a nursery, water sensitive landscape design. The key crops are diverse, non-hybrid landraces which are being acclimatised.

In wealthy, first world Australia, my property is regarded as a domestic food garden, however the model is very flexible. It could be up scaled to suit a housing division, a town or a city. It is a template for a living gene bank, a production nursery, it can supply the local community or local farmers with planting stock. The model is affordable and can be adapted to suit a variety of purposes and extreme weather events.

As we enter the world of methane-driven climate change - the Age of Climate Consequences - I want you to know that small growers and traditional methods are powerful, nimble, quick. When the weather is unfavourable, they are more adaptable and dependable than the monolithic monocultures would like you to believe.



Triple your harvest with NSW-bred 19th century non-hybrid corn

Jerry Coleby-Williams RHS, Dip. Hort. (Kew), NEBSM  
 Patron, National Toxics Network Inc. (Australia)  
 Director, Seed Saver's Network Inc. (Australia)  
 'Bellis', Brisbane's affordable, sustainable house and garden

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## Small farms need protection to safeguard nutrients and diversity

BY KATE LANGFORD



Farming in Vietnam. Image: Neil Palmer/CIAT

New research shows that a diverse landscape made up of a patchwork of small to medium-sized farms produces the vast majority of the world's nutrients.

As farm size increases this diversity decreases, authors of the study are keen to emphasise, in light of the United Nations Sustainable Development Goals.

Lead author CSIRO's Mario Herrero says the findings published in the first issue of *The Lancet Planetary Health* demonstrate that addressing global food needs is not just about quantity – it's also about the quality of global food supplies.

"The findings open up a whole policy agenda for farming and what kind of world we want to see," Dr Herrero says.

### **Transdisciplinary research**

The study involved more than 400 scientists from 19 different institutions, including geographers, livestock, agricultural and marine scientists, economists, public health and nutrition specialists, epidemiologists, and environmental scientists.

Dr Herrero says the transdisciplinary team, for the first time, quantified the contribution of agriculture, livestock and fisheries, and its wide array of farms to global nutrient production, diversity and food security.

The researchers mapped how much calcium, folate, iron, protein, vitamin A, vitamin B12 and zinc is produced in farms of different sizes from 41 crops, 7 livestock products and 14 fish groups.

### **Diversity decreases as farm size increases**

The Lancet study found that, globally, farms smaller than 50 hectares, particularly in Africa and Asia, produce 51-77 per cent of nearly all commodities and nutrients, including cereals, livestock, fruits, pulses, roots and tubers and vegetables.

Farms larger than 50 hectares and that dominate production in North America, South America, and Australia and New Zealand, contribute between 75 and 100 per cent of all cereal, livestock and fruit production.

The researchers found that it is the landscapes with more diversity that produce more nutrients and that the diversity of agricultural and nutrient production diminishes as farm size increases.

### **Quality versus quantity**

Herrero says the study provides evidence to support broadening discussions on food security from simply focusing on increasing the quantity of food, for example through increasing yields, to feed a growing global population, to ensuring we have quality in our food production systems.

Around 2 billion people in the world suffer from micronutrient deficiency, meaning they don't get adequate vitamins or minerals in their diets, often called "hidden hunger". This can lead to stunting and difficulty in learning among children and poor health in adults.

A [recent CSIRO study](#) that found one in two (51 per cent) adults are not eating the recommended intake of fruit, while two out of three adults (66 per cent) are not eating enough vegetables.

The economic cost of malnutrition, including hunger, micronutrient deficiency and obesity, is estimated as [equivalent to 10 percent of world GDP](#) each year; more than the global value lost during the 2008 financial crisis.

### **Greater resilience in diversity**

Dr Herrero says larger farms are also necessarily more vulnerable.

He uses the example of the recent Cyclone Debbie which swept across in southern Queensland and northern NSW in late March / early April 2017 and hit cane growers as well as tomato, capsicum and eggplant producers.

Consumers will feel the pinch when prices for these commodities increase in coming months due to a shortage of supply.

"We need to be careful about putting all our eggs in one basket," Dr Herrero says.

"What if there were a major wheat disease that devastated farms across Australia? Having diverse farming systems builds resilience."

### **Weighing up the big and small**

On a global scale, he explains, the understanding gained from this study will be crucial for meeting the United Nation's [Sustainable Development Goals](#), the second of which aims to end hunger and all forms of malnutrition by 2030.

Dr Herrera says the research findings prompt the question: "Do we want to continue the trend towards expanding the production of cereals such as wheat, rice and corn, or do we want more diverse farms, such as in Europe or South East Asia?"

"If we decide that we want large farms producing our food then this could come at a cost." "We need both big and small farms to achieve food and nutrition security but we must ensure we protect and support small farms and more diverse agriculture so as to ensure sustainable and nutritional food production."

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Read the full article in [The Lancet Planetary Health](#). See a [visual summary of the results](#) by Environment Reports. See also this [story map by Food Matters](#).



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treasurer@permaculturecairns.org.au.

## Permaculture Cairns

### Membership Form 2017

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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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. 10009440 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:.....

Permaculture Cairns Public Meetings - All Welcome Every month on the Third Tuesday of month Jan to Nov (Second Tuesday in Dec). Doors open 6pm, meeting starts at 6.30pm at: ARC Disability Centre, 92 Little Street, Manunda

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