Permaculture Cairns Newsletter

EMPOWERING COMMUNITIES WITH SUSTAINABLE SOLUTIONS

Care for the Earth, Care for people, Share the excess

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

DECEMBER NEWSLETTER

PERMACULTURE CAIRNS ANNUAL GENERAL MEETING

and

Information Exchange Night

Tuesday 13th December 2016 - 6pm for a 6.30pm start

ARC Disability Centre 92 Little Street Manunda

Members free, but bring a plate of finger food for the ***Festive Supper***
and a dollar or two for the **Xmas Raffles (valued at over $200 in prizes)**

AGENDA

Welcome to new members and visitors
Upcoming workshops and events
Permaculture Principle Number 12, a practical explanation.

Tips and tricks for surviving the Christmas Season

Time to Renew your membership: $20 for single or $30 for Household
Every renewal will also get an additional ticket in the Raffles

Report on November Backyard event - Building a Food Forest Workshop

How to build a tropical food forest in your backyard: **Saturday 19th November**

It was a lovely hot morning, fortunately our hosts Jason and Ben had a great undercover area. Jye Dawes delivered an enlightening presentation and explained all the advantages of a food forest. Then Jye led a walk-about and talked about the plants and useful weeds growing in the yard. We gathered our tools and dug holes and planted out the food forest. With the hard work done, morning tea was definitely earnt. Thank you Jason and Ben, look forward to watching this food forest grow.

PS: Jye Dawes has written an e-book on food forest systems $15, if you would like a copy email him on ecoholiperm@gmail.com

Permaculture Principle no. 12

Creatively use and respond to change

"Vision is not seeing things as they are but as they will be"

We can have a positive impact on inevitable change by carefully observing, and then intervening at the right time.

The butterfly is a positive symbol of transformative change in nature, from its previous life as a caterpillar. The proverb "vision is not seeing things as they are but as they will be" reminds us that understanding change is much more than a linear projection.

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Growing Food in the Wet Tropics in Summer

Let's have a look at growing, Sprouts, Microgreens and Baby Greens

Sprouts are the fastest food crop to grow, Microgreens and Baby Greens are the next. If you have limited time, space or gardening skills let me introduce you to this fantastic way to grow fresh, crunchy, tasty, nutrient rich, healthy food.

Sprouts are the first stage of the life of a seed after germination, and the seeds are usually eaten along with the sprouts. Sprouts are grown inside and do not need light to grow.

Seeds for Sprouting - Adzuki bean, Alfalfa, Amaranth, Broccoli, Buckwheat, Chickpea, Coriander, Dill, Fenugreek, Kale, Lentils and Mung bean, Mustard, Onion, Quinoa, Radish, Red Cabbage, Sun flower, Wheat

- To start sprouting, soak seeds a few hours, then drain and rinse.
- Place seeds in a bottle with a large neck and cover with an open mesh material (mosquito netting is good) a rubber band will hold the mesh in place.
- Place bottle on an angle so that it drains any moisture left in the bottle, if left inside the sprouts will go mouldy. If this happens you will know this by the smell.
- They will need thorough rinsing several times a day, especially in hot humid weather.
- Use when the seeds have germinated and are just showing a little green.
- Use in salads, on sandwiches or as a garnish on meals.

In the hot humid weather of the Tropics we have problems with moulds forming on the sprouts, especially if they have not been rinsed and drain enough. So it is best to grow Microgreens or Baby Greens during the summer months, and Sprouts in the cooler months. Some seeds are better for sprouts than for microgreens so check out what is recommended.

Microgreens are the second stage in the life of a seed after germination
Microgreens take a few more days to put the first two leaves out and are usually harvested then.

Baby Greens are the third stage when the true leaf forms and are harvested at the 4th leaf stage.
These will take from 1 to 3 weeks to grow.

- **Benefits of growing Sprouts, Microgreens and Baby greens**
- Fast growing,
- Can be grown indoors, on a sunny windowsill, kitchen bench, outdoors on balcony, covered porch or shade house.
- Little cost, time and effort required for a fresh healthy harvest of organic greens.
- They contain digestible vitamins, minerals that provide nutritional health benefits, flavour, colour, texture, living enzymes and nutrients.
- Ability to harvest your microgreens just before serving maximizes nutrients.
- Have a lightly crunchy texture and can be used as garnishes to add flavour and colour.
- Many varieties will regrow and produce several harvests – fantastic value!
- Kids like growing and eating microgreens.

How to Grow Microgreens and Baby Greens

Microgreens and baby Greens grow where there is good light but not in full sun. They like good moisture, water at least once a day, but check to see if they will need more, especially on very hot dry days. The container must have holes in the base, it could be a recycled takeaway container or other small container depending on your needs.

- I use a mix of 80% coconut coir and 20% worm castings for both microgreens and baby greens. Moisten the mixture before filling the containers. The coir keeps the mixture moist but not wet and the worm castings supply nutrients.

- **For Microgreens**
- Fill the container to ¾ full with the moist coir and casting mix and lightly press down.
- Sow seed evenly over the mix and lightly cover with more mix and very lightly press down.
- Use a spray bottle to moisten the seeds and the added planting mix.
- Larger seed such as Mung beans, wheat and peas may be soaked in water a few hours before seeding, this will shorten the time to germination. Within a week to 10 days you should he harvesting your first Microgreen crop.
- Some seeds may not germinate with the first lot so look to see if more seeds are germinating before discarding your container.
- **For Baby Greens**
- Follow the steps as above but let your crop grow until they have four leaves and then snip off at soil level and use in a salad. Sometimes you will get a second crop from the slow to germinate seeds, as with the microgreens so keep looking after them.

- **What to do with the used planting mix**
- The mix can be used again but after that it is best to start a fresh batch.
- The old mix can be added to the compost or the worms will just love it.
- If you use the same mix again, moisten the mix with half strength organic liquid fertilizer before seeding the second crop.

Seeds for Microgreens and Baby Greens

Amaranth, Barley grass, Basil, Beets, Bok Choy, Broccoli, Buckwheat, Cress, Cabbage, Dill, Kale, Mung beans, Mustard, Peas, Radish, Rocket, Sunflower and Wheatgrass

Be sure the seeds you use have not been treated with a fungicide. Buy only certified organic seeds for sprouting or if you save your own seeds then any of those would be ok.

For microgreens and baby greens a lesser amount of seed is required than for growing sprouts. They need more space especially the Baby greens as they will grow larger.

Places to buy Organic Seeds in Cairns – Enviromart Australia on cnr Scott and Aumuller Street, Bungalow, have a good selection, health food shops, supermarkets and Asian stores, check to see if seeds have been grown in Australia as imported seeds may have been irradiated and may not germinate.

Happy gardening and a Merry Christmas from Carol

USEFUL INFO: **All the seed packets in the supermarkets and hardware stores have more seeds in them than is usually required by the home gardener, so have a look at.**

The Seed Collection web site, they have seeds for $1 a packet with 25 – 150 seeds depending on variety. They also have seeds for sprouting and bulk seeds for the serious gardener.

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WHATS'ON AND WHAT'S COMING UP

FNQ Community Exchange – LETS Local Energy Trading System
DECEMBER/JANUARY Calendar of Events

KEWARRA – Friday 2nd December 5.30pm 7.30pm I have got tables, please come and load them up and share a slice of homemade pizza and a chat. PLUS its Sponsorship month, join our community of about 900 members in the area!!!! Event Host: Ilona Heindl

KOAH – Saturday 3rd December 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

ATHERTON – Saturday 3rd December 6pm-9pm Shared dinner and Trade Evening,
17 Evens Street. Bring a plate to share, Irene will provide Kombucha and other drinks Event Host: Irene 0439914876

WONGABEL – Sunday 4th December WORKING BEE - 7am Early start! Sanding 2 old fridges in the shade, painting them, and moving them into the Tree House. If anyone wants to gather rocks for their garden or for building, a really early start would be good. There will be shade for this too. Many hands make light works.
Contact Sheila Taite - 40912070

YUNGABURRA – Sunday 11th December LETS CHRISTMAS TRADE! The RED SHEDS – This annual no $pend Christmas Trade has had years of success! Bring along your wares with Christmas theme in mind. This is a Bartle only affair so no cash is needed. BYO table or something to display your wares. We are opening The RED Shed, where Ian Reece had a studio, there is some outdoor space around the side as well. You can park at the Community Hall parking behind the pub. Event Hosts: Melitta & Katrin 40966755

ATHERTON – Saturday 7th January 6pm-9pm Shared dinner and Trade Evening 17 Evens Street. Bring a plate to share, Irene will provide Kombucha and other drinks Event Host: Irene 0439914876

KOAH – Saturday 7th January 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

CASSOWAY COAST – Sunday 15th January 11am – 3pm LETS Trade. Bring Lunch to share (BBQ available), items to trade, information on services offered and some good conversation as well. Please consider BYO plate & cutlery to save our host excessive dish duties. Car pooling recommended when making the trip from the Tablelands. (Weather permitting). Event Host: Bernie - 0403523244

YUNGABURRA Sunday 29th January 12noon – 2pm Retro Trade is now on Sunday at the rear of The Reds Sheds behind the cafe. Bring along a table or something else to display your wares, shared lunch and drinks will be available from the Cafe menu. Child friendly event Event Host: Melitta 40952340

CAIRNS CITY – Sunday 29th January 12- 2pm Lafew Teahouse, 33 Sheridan Street. At Lafew we provide a prime position opposite Rusty's Market. We offer: Kombucha, tea and coffee. Available 50/50 Bartles/$. Bring your trading sheets and goodies. For new members, please drop by and chat to the LETS traders, you can sign up on the day.
Event Host: Lorna – 0475762838

JANUARY 15th - DEADLINE FOR FEBRUARY CALENDAR
All details to Melitta - fnqces@gmail.com or 40952340 to be included in
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 - 4096 6972 - www.fnqces.org - www.communityexchange.net.au

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INFORMATION – SERIOUS AND USEFUL STUFF
A MUST READ!!!!!!

World's horticultural scientists hear growing vegetables not rice is key to ending hunger and poverty

"If you want to grow your way out of poverty, don't plant rice or wheat. Grow vegetables."

Dr Dyno Keatinge's blunt message was delivered to the world's top horticultural scientists gathered in Cairns, in far north Queensland, to tackle the challenge of poverty and hidden hunger as part of the Global Horticulture Initiative.

The Belfast-educated global expert in crop agronomy made a compelling case for a greater role of horticulture in the fight against micronutrient deficiencies in the world's poorest nations.

He told delegates from 23 countries at the International Symposia for Tropical and Temperate Horticulture: "It is no longer good enough to aim to feed the world. We must nourish it."
The outgoing director-general of the World Vegetable Centre said the pendulum of the allocation of finite resources for agricultural research and development may finally be shifting toward fruit and vegetables.

The week's best stories in your inbox?

"If you have just a small landholding — as most people do in the developing world — then you can make good money out of horticulture but if you grow rice, or you grow wheat, you're likely to remain poor forever," Dr Keatinge said.

"I believe if people can be taught to farm effectively, can have a proper distribution of crops within their farming enterprises, they can end up to be more sustainable, more resilient, more profitable."

Dr Keatinge's remarks reflect a growing frustration in the horticultural science community at the focus of major donor agencies in developed countries on the bio-fortification of rice, wheat and maize.

A better balance was required if more appropriate and diverse diets were to be promoted. "At the moment the lion share of all funding goes to staple cereals, it has done for the past 50 years," he said.

"But I believe the time has come for that to change and that more effort should be given to these more nutritious, indigenous vegetables, for example, which are already nutrient dense and not a huge amount of work is required."

Dr Keatinge said the impact of international vegetable research and development had already shown the benefits of breeding improved lines of niche vegetables with an emphasis on open and self-pollinated crops, such as tomatoes, peppers and pumpkins, as well as some indigenous species with high nutrient density, such as nightshade or African eggplant.

Photo: Chilli trials in Taiwan where the World Vegetable Centre's genebank holds 442 species from 156 countries (Supplied: Dr Dyno Keatinge)

He said the genebank in the World Vegetable Centre in Taiwan was able to offer a great diversity of germplasm to plant breeders working on solutions to threats to tropical vegetable production.

"We don't know yet enough about how to grow vegetables properly," he said.

"Insects and diseases are the major problems for farmers today, they were yesterday and probably will be tomorrow.

"But we have to have research to be able to keep pace with being able to cope with these things."

Hidden hunger causes real pain

The availability and affordability of fresh fruits and vegetables remain major obstacles to improving health in the world's poorest countries, with many diseases attributed to a lack of vitamins and vital micronutrients.

Vitamin A deficiency remains the main cause of preventable blindness in children and a higher risk of death in pregnant women.

"Unfortunately many, many children remain malnourished and many teenage girls and young woman who are about to become pregnant are in a malnourished state and as a result of that, tend to have malnourished foetuses as well.

"It's likely that when they become pregnant and become mothers, then they also will have malnourished foetuses.

"It's a very difficult, vicious cycle to break into and the only way to do that is to make sure that really well-balanced diets are given to young women and young men before they start reproducing."

In poor, developing countries, close to one billion people do not have enough to meet their most basic nutritional needs; while in the first world, more than two billion people suffer the debilitating effects of consuming too much of the wrong types of food.

Dr Keatinge said growing and eating a minimum of 400 grams of vegetables — equivalent to the weight of a standard, soccer ball — would go a long way to resolving these complex and contrasting health problems.

"If people understood the consequences of poor diets and the economic cost to governments, they would radically rearrange their thinking."

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Amazing Moringa: Medicinal, Edible & Easy to Grow

Ansel Oommen
Friday, 23rd January 2015

The Moringa Tree, also known as the Drumstick tree is nearly entirely edible. It can grow with little water, has multiple times the amount of nutrients as oranges, carrots and milk, plus grows very well in regions of malnutrition. Could this tree solve the world's food crisis?

In the foothills of the Himalayas in northern India, a certain tree has long graced the region with its miraculous fruit. Hanging from its wiry branches are clusters of ribbed pods, each a foot in length. These pods, or drumsticks, have attracted the attention of mankind for millennia, and for good reason.

While the aptly named Drumstick tree has a rather slender appearance, it is anything but frail. A tropical native, this prolific powerhouse has spread its roots across Africa, Asia, the Middle East, and the Caribbean. And now, it seems to have anchored itself in American soil.

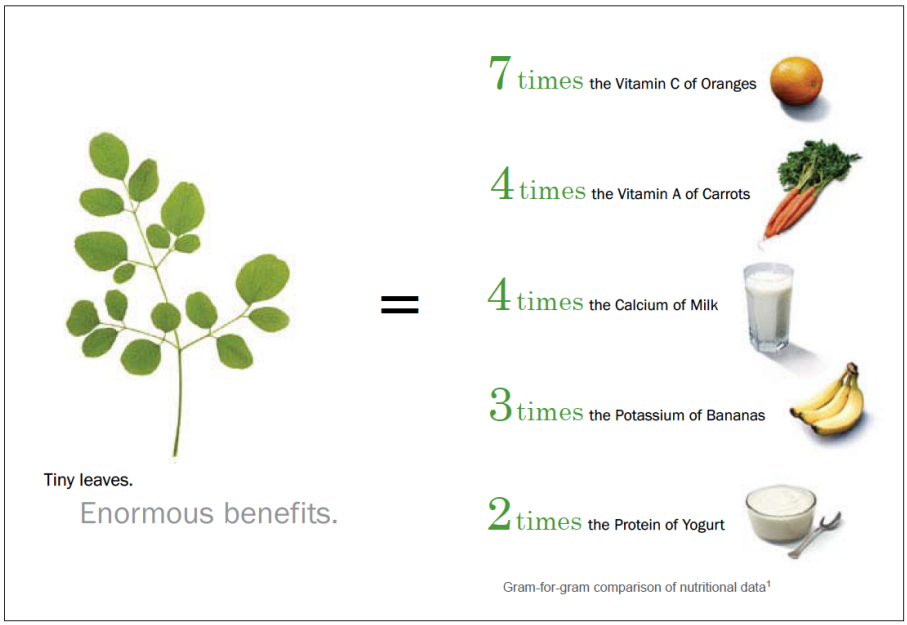
Part of a new wave of exotic vegetables, *Moringa oleifera* (MO) is a botanical platypus. A member of the order Brassicales, it’s a distant relative of both the cabbage and papaya. Its roots taste so much like its cousin horseradish, that it’s earned the title 'horseradish tree'. Its fruit, a popular Indian vegetable, looks like a cross between an okra and a pole bean with the flavor of asparagus. Its cooked flowers mimic mushrooms in taste, while its leaves hint at spinach and lettuce. Its immature seeds are used like peas and if fried when mature, resemble peanuts.

Moringa root.

In fact, it's hard to find a part of Moringa that isn't edible. Even the bark is sometimes taken internally for diarrhea. But that doesn't come as a surprise to the locals, who consider it a living pharmacy. Moringa has proven to be a multipurpose arsenal that dispenses some of the best secrets nature has to offer. For centuries, it has been used in Ayurvedic medicine to treat a host of ailments including anemia, bronchitis, tumors, scurvy, and skin infections.

Drought hardy and disease resistant, MO is a godsend during the dry season, when little food is available. The fresh leaves and branches serve as an excellent source of forage. Indeed, a Nicaraguan study confirms MO's ability to boost milk production in cows without affecting its taste, smell, or color.

The leaves offer a spectrum of nutrition, rich in vitamins A, B, and C, as well as protein, calcium, and iron. They are so nutritious in fact, that they contain more vitamin A than carrots, more vitamin C than oranges, more calcium than milk, more iron than spinach, more potassium than bananas, and more protein than either milk or eggs! A traditional item in pickles and curries, the raw leaves are also perfect for salads.



As a result, Moringa could play a key role as a wholesome food source in impoverished nations, where malnutrition is often rampant. The World Health Organization has stressed the importance of amino acids and protein for growing children. Luckily, Moringa leaves are rich in these nutrients, with the added benefit of omega-3 fatty acids and a host of protective phytochemicals.

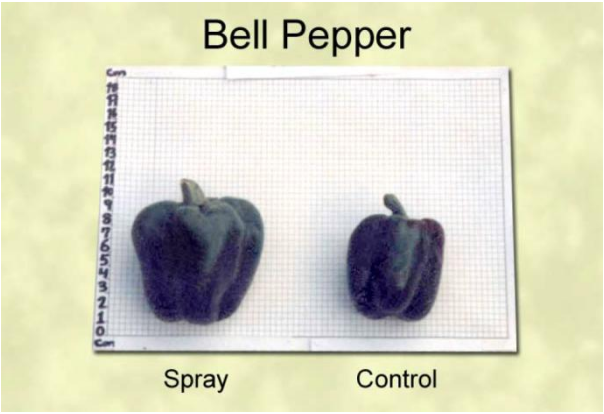
When mixed in with different cereals, children regained normal weight and health status in 30-40 days, while the United Nations Industrial Development Organization (UNIDO) recipe for malnourished children took 80 days, double the difference.

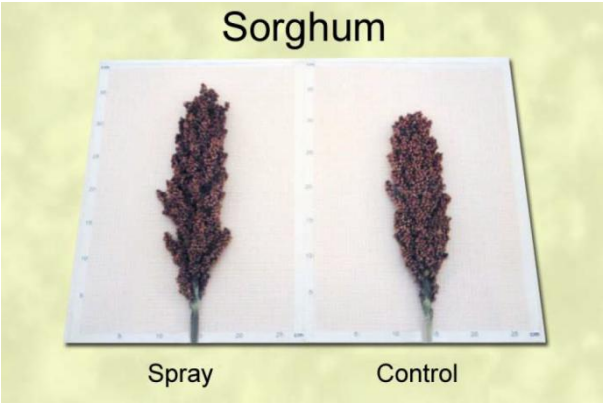
“[It] is a very healthy satisfying food that meets all nutritive needs. It is cheap to produce, can be cooked or eaten raw, sold in the market, or dried as a powder to be sold over long distances,” added Nikolaus Foidl, a world leading agricultural researcher on Moringa.

Foidl has been studying the tree for over a decade in conjunction with the University of Hohenheim in Stuttgart, Germany. He has traveled to many countries, including Senegal, Honduras, Guinea Bissau, and Argentina, promoting the miracle tree’s cultivation by working with the locals.

In Nicaragua, he helped farmers utilize the leaf extract as a growth spray for other crops.

“Moringa leaves contain the growth factors gibberellin, kinetin, and some lower levels of auxin. We got up to a 25% increase in sugarcane and turnips, onions and radish.”





Such a bountiful increase should not be ignored, especially in areas where food shortage is an issue. Foidl, who has the financial support of the Austrian government, first came across the tree by accident.

He recounted, “By chance, I had a *Jatropha* plantation with rows of Moringa as windbreaks and the damn cows were always breaking down my fences to get to them. So I wondered, what is so special about this tree that the cows are willing to risk injury?”

That question has now led to a new understanding of MO's multifaceted potential. As a vigorous hardy grower, it surprisingly does not require much water or soil nutrients once established. This makes it one of the most valuable tropical trees in terms of overall utility.

Like the leaves, the flowers too are edible when cooked, packed with calcium and potassium. As a bonus, they are not only incredibly fragrant, but also support native bee populations.

MO roots and bark, on the other hand, are used with caution. The bark contains the toxic chemicals moringinine and spirochin which can alter heart rate and blood pressure. However, they do show promise in the medical field. The inner flesh of the root is less toxic, and those of young plants are picked for a hot sauce base while the resin is added as a thickener. Interestingly, blue dye can be obtained from the wood, which is also used in paper production.

But if Moringa were a magician, it has certainly saved its best trick for last. The famed drumsticks contain all nine essential amino acids that humans must obtain exclusively from their diet. Often, they're chopped into logs, boiled, and split into thirds lengthwise. The fibrous rind is inedible - rather it's the soft jellied pulp and seeds that are sought after. These can be scooped out or scraped away by the teeth.

Hidden within the drumsticks are even more remarkable seeds. Loaded with protein, they also contain special non-toxic polypeptides that act as natural Brita filters. When ground into powder and mixed with water, they cause sediments to clump together and settle out. Then when strained through a cloth, they provide cheap access to clean water. Amazingly, just two seeds are enough to purify a dirty liter.

"It has been widely used at the village level in Africa to transform river water into drinking water," shared Foidl. "I had a project working with the seeds in a wastewater treatment plant in Nicaragua (wastewater from 4,000 people). It was very effective - about 99.5% separation of turbidity in 30 minutes."

In turn, the seeds themselves yield a valuable yellow oil called ben oil. Sweet, clear, and odorless, it doesn't spoil easily - perfect for perfumes, cosmetics, and lubrication. It has also found use in cooking due to its high levels of healthy unsaturated fats.

For such a versatile tree, it's almost hard to believe that Moringa is easily grown via seeds or cuttings. Foidl remarked, "It grows virtually better than willow."

As agriculture becomes more expensive, managing the long-term productivity of the land is essential. Moringa solves this issue through a practice called high-density planting. The trees are grown closely together to increase the yield per given area, while at the same time reducing the need for herbicides. Because MO grows rapidly, it crowds out and suppresses neighboring weeds.

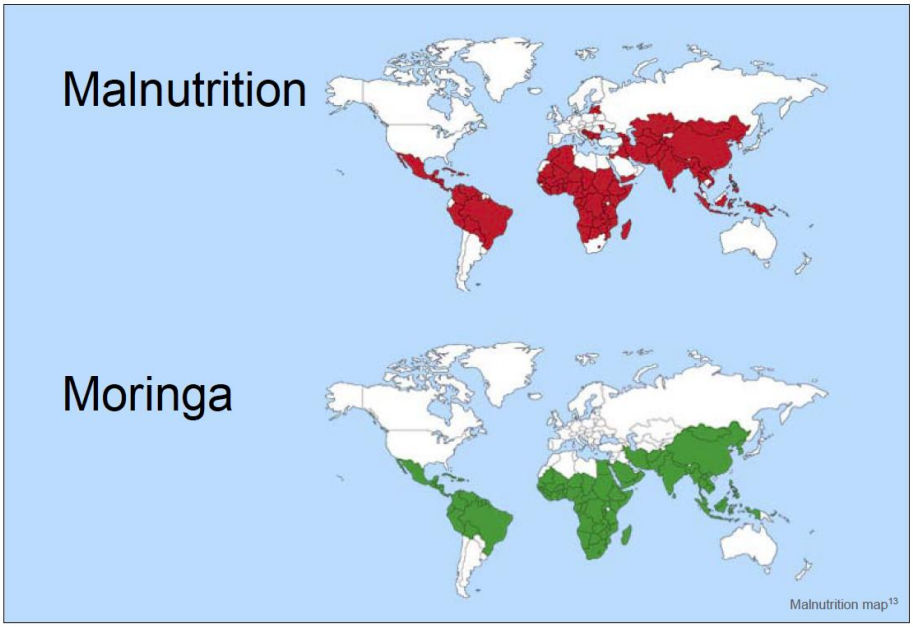
"The optimal density is 1 million plants per hectare (10 x 10cm spacing), where the losses of plants per cut are around 1% and the losses are compensated through vigorous sprouting," explained Foidl. "Moringa is cut at a height of 15 to 25cm for vigorous regrowth."

Moringa just before harvest. Foidl either harvest at 35 days of growth or 75.

Moringa harvested on rotation.

This practice allows for cutting every 35 days, totaling 10 harvests per year. In fact, 120 tons of dry matter can be harvested per hectare a year, 10 times more than corn and several times more than soy. As a result, there is a constant supply of fresh food, with little need for storage.

Moringa is in a unique position to address the issues of hunger, malnutrition, poverty, and lack of clean water all at once, something no other plant can boast. It is even more valuable considering it is found widely throughout the tropics, in the regions where it is needed most, making this ancient tree a true modern day miracle.



Moringa's growing regions and regions of malnutrition.

*About the Author: Ansel Oommen is a garden writer, citizen scientist, and medical transcriptionist whose works have been published in magazines such as Atlas Obscura, Well Being Journal, and Entomology Today, among others. Discover more at **www.behance.net/Ansel**.*

*All images thanks to Nikolaus Foidl apart from Moringa root, thanks to **Crops for the Future**.*

STATE OF THE CLIMATE 2016 DELIVERS THE LATEST SCIENCE ON OUR CHANGING CLIMATE

Australia is experiencing more extremely hot days and severe fire seasons according to the findings of a new climate report released today.

The biennial CSIRO and Bureau of Meteorology *State of the Climate* report draws on the latest climate monitoring and science to show how our climate is changing

CSIRO Senior Scientist and leader of the NESP Earth Systems and Climate Change Hub, Dr Helen Cleugh said the changes were due to an increase in greenhouse gases such as carbon dioxide (CO_2) in the atmosphere, which act like a blanket by keeping heat in the Earth's lower atmosphere.

Image: The State of the Climate 2016 report presents the latest in climate science and monitoring for Australia.

"Carbon dioxide is measured in parts per million," Dr Cleugh said.

"Before around 1750, the level of CO_2 was 278ppm. This year the Earth will record a global annual average of over 400ppm, the highest level in the past two million years."

"Australian temperatures will almost certainly continue to increase over the coming decades. Temperature projections suggest more extremely hot days and fewer extremely cool days.

"As land temperatures increase, so do ocean temperatures and the report shows that the deep ocean is also impacted, with warming now recorded at least 2000 meters below the sea surface."

The Bureau of Meteorology's Manager of Climate Monitoring, Dr Karl Braganza said Australia was already experiencing the effects of climate change with record-breaking heat now becoming commonplace across the country.

"Australia experienced its three warmest springs on record in 2013, 14 and 15," Dr Braganza said.

"Temperature and rainfall during this period is critical to southern Australia's fire season.

"We've already seen an increase in fire weather and a longer fire season across southern and eastern Australia since the 1970s. In these regions the number of days with weather conducive to fire is likely to increase.

"Whilst the observations show us increased rainfall in some parts of Australia, we have also seen significant seasonal decline, such as in the April-October growing season where an 11 per cent decline in rainfall has been experienced in the continental southeast since the mid-1990s.

The changing climate significantly affects all Australians through increased heatwaves, more significant wet weather events and more severe fire weather conditions.

"Some of the record-breaking extreme heat we have been seeing recently will be considered normal in thirty years' time."

State of the Climate 2016 is the fourth report in a series published biennially by CSIRO and the Bureau of Meteorology, which together play an integral role in monitoring, measuring and reporting on weather and climate.

The State of the Climate 2016 report can be found on the Bureau of Meteorology or CSIRO websites.

Fast facts:

- Australia has warmed by around 1 °C since 1910.
- The number of days per year over 35 °C has increased in recent decades, except in parts of northern Australia.
- There has been an increase in extreme fire weather, and a longer fire season, across large parts of Australia since the 1970s.
- May-July rainfall has reduced by around 19 per cent since 1970 in the southwest of Australia.
- April-October growing season rainfall has reduced by around 11 per cent since the mid-1990s in the continental southeast of Australia.
- Rainfall has increased across parts of northern Australia since the 1970s.
- Global sea level has risen over 20 cm since the late 19th Century with about one third of this rise due to ocean warming.
- The 2016 global annual average CO_2 level will almost certainly exceed 400 ppm.
- The overwhelming contribution to the additional CO2 in the atmosphere is from human activities, mainly the burning of fossil fuels.
- The atmospheric CO_2 increases in 2015 were the highest ever observed.

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Scientists discover another cause of bee deaths, and it's really bad news

Jaymi Heimbuch (@JaymiHeimbuch)

Science / **Natural Sciences**

July 26, 2013

So what is with all the dying bees? Scientists have been trying to discover this for years. Meanwhile, bees keep dropping like... well, you know.

Is it mites? Pesticides? Cell phone towers? What is really at the root? Turns out the real issue really scary, because it is more complex and pervasive than thought.

Quartz reports:

> Scientists had struggled to find the trigger for so-called Colony Collapse Disorder (CCD) that has wiped out an estimated 10 million beehives, worth $2 billion, over the past six years. Suspects have included pesticides, disease-bearing parasites and poor nutrition. But in a first-of-its-kind study published today in the journal PLOS ONE, scientists at the University of Maryland and the US Department of Agriculture have identified a witch's brew of pesticides and fungicides contaminating pollen that bees collect to feed their hives. The findings break new ground on why large numbers of bees are dying though they do not identify the specific cause of CCD, where an entire beehive dies at once.

The researchers behind **that study in PLOS ONE** -- Jeffery S. Pettis, Elinor M. Lichtenberg, Michael Andree, Jennie Stitzinger, Robyn Rose, Dennis vanEngelsdorp -- collected pollen from hives on the east coast, including cranberry and watermelon crops, and fed it to healthy bees. Those bees had a serious decline in their ability to resist a parasite that causes Colony Collapse Disorder. The pollen they were fed had an average of nine different pesticides and fungicides, though one sample of pollen contained a deadly brew of 21 different chemicals. Further, the researchers discovered that bees that ate pollen with fungicides were three times more likely to

be infected by the parasite.

The discovery means that fungicides, thought harmless to bees, is actually a significant part of Colony Collapse Disorder. And that likely means farmers need a whole new set of regulations about how to use fungicides. While neonicotinoids have been linked to mass bee deaths -- the same type of chemical at the heart of the **massive bumble bee die off in Oregon** -- this study opens up an entirely new finding that it is more than one group of pesticides, but a combination of many chemicals, which makes the problem far more complex.

And it is not just the types of chemicals used that need to be considered, but also spraying practices. The bees sampled by the authors foraged not from crops, but almost exclusively from weeds and wildflowers, which means bees are more widely exposed to pesticides than thought.

The authors write, "[M]ore attention must be paid to how honey bees are exposed to pesticides outside of the field in which they are placed. We detected 35 different pesticides in the sampled pollen, and found high fungicide loads. The insecticides esfenvalerate and phosmet were at a concentration higher than their median lethal dose in at least one pollen sample. While fungicides are typically seen as fairly safe for honey bees, we found an increased probability of Nosema infection in bees that consumed pollen with a higher fungicide load. Our results highlight a need for research on sub-lethal effects of fungicides and other chemicals that bees placed in an agricultural setting are exposed to."

While the overarching issue is simple -- chemicals used on crops kill bees -- the details of the problem are increasingly more complex, including what can be sprayed, where, how, and when to minimize the negative effects on bees and other pollinators while still assisting in crop production. Right now, scientists are still working on discovering the degree to which bees are affected and by what. It will still likely be a long time before solutions are uncovered and put into place. When economics come into play, an outright halt in spraying anything at all anywhere is simply impossible.

Quartz notes, "Bee populations are so low in the US that it now takes 60% of the country's surviving colonies just to pollinate one California crop, almonds. And that's not just a west coast problem—California supplies 80% of the world's almonds, a market worth $4 billion."

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Oil, Rust and Global Crisis. Ten Years On…

26/11/2016

Ten years ago British Petroleum closed Prudhoe Bay, the largest oilfield in the USA. Rusted, leaking oil pipes heavily polluted a region already suffering from accelerating global warming. At the same time, melting permafrost had started to cause forests, roads and homes to start sinking into mud. Methane gas, once frozen under the ice, started fuelling a potent global warming feedback loop. When I wrote an article '*All Hands in the Soil*' about the importance of sustainable home food production, most Australians were more worried about the cost of food and petrol than the environmental consequences of fossil fuel use. What happened after the shutdown?

Back in August 2006, I wrote:

"On the 8th of August 2006, British Petroleum (BP) closed Prudhoe Bay, the largest oilfield in the USA.

BP's public relations claimed this was due to 'corroding pipelines'. They hadn't checked them for over a decade, but no one gets nervous when you hear about a bit of rust in a refinery.

The future for petrol… A Morningside petrol station, Brisbane

Environmentalists know the arctic tundra is warming and melting at an alarming rate and warming is faster and more extreme towards the poles than the equator.

Those rusted pipelines are also buckling – sinking in the squelchy morass left as the tundra warms. Houses are sinking in mire and across the whole of the circumboreal conifer forests – forest as significant in scale as the Amazon rainforest – trees are literally falling down and looking more like a drunken forest. Warming winters and longer summers allow timber pests to breed explosively, decimating trees. Forest, once firmly supported on top a bed of permafrost, are now unsupported and sliding into ooze. And that ooze has pockets of ancient trapped methane in vast – climate shifting – quantities.

So as Prudhoe oil field slips slowly into the mire of its own creation is the next great Tipping Point of climate change being unleashed into the world's atmosphere? If you're worried about carbon dioxide trapping heat, methane is twenty times more dangerous and once it's in the atmosphere it traps much more heat.

The loss of Prudhoe Bay oil production meant a loss of 8% of US daily use and the 'repairs', including installing pontoons and using summertime tankers for squelchy, buckled roads could take quite some time to get things working again. Then there's the leakage which is polluting Prudhoe Bay.

The economic shock caused the New York Mercantile Exchange to register an immediate US$2 a barrel rise in crude oil prices, which had knock on effects for the rest of the world.

Refineries in California and Washington had trouble finding additional short term sources of oil to process, bringing a negative impact on their respective state economies. At the time, other sources of crude oil were affected by political problems involving Iran, Nigeria and Venezuela. As a consequence, the US government released oil from its emergency stockpiles*.

The US federal government and the State of Alaska sued BP for the environmental damage to Prudhoe Bay.

On 9th August 2006, Australia's National Roads and Motorists' Association (NRMA) predicted retail petrol prices would rise to A$1.80 a litre**. Around the same time, Queensland's Courier Mail reported on the continuing decline in petrol station numbers as multinationals used cost-cutting as a way to kill off competition from local independent petrol stations. Every environmentalist who runs a car should consider buying petrol from a local, independent petrol station.

Other sources predict that petrol will rise to A$3 a litre during 2007. Since the cost of supermarket food is directly linked to the cost of oil, the price of food, artificial fertilisers and pesticides will rise significantly.

After the 1973 Arab-Israeli War, Britain experienced 25% inflation, so maybe it's time to pay off the

credit card, support local, Australian-owned businesses, and learn how to sow dinner".

* Ref: ABC AM Show, 8.8.06 reporter Andrew Geoghegan

** Ref: ABC News Online, 9.8.06

Ten years later, what happened?
November 2016

At the time of writing the magnitude of the spike in oil prices was, in some ways, hard to predict.

The unfolding crisis ended up being known as the 2007-08 Oil Price Spikes, which caused the 2007-08 World Food Price Crisis for industrial agriculture – which cascaded into the Global Economic Crisis (GFC).

Consequences of rising fuel prices included the setting aside of food growing land to instead grow biofuel. Less grain was grown, so food harvests and strategic food storage fell as biofuel production rose.

The cost of petrochemical pesticide production, the operation of farm machinery, food refrigeration and food transport costs all rose.

The cost of petrochemical fertilisers tripled: urea, diammonium phosphate, muriate of potash and superphosphate – the chemical fertilisers that industrial food production leans on – their prices rose by 300%. This impacted heavily on many Australian family-owned farms, most of which were already suffering hardship from the low farm gate prices they get paid by supermarket contracts.

The affordability of food impacted on working families in the developed world. See The 2007/08 Agricultural Price Spikes: Causes and Policy Implications', by the British Government.

In developing countries an extra 200 million people experienced malnutrition for the first time. Social and economic crises occurred in many countries.

Prudhoe Bay oil field re-opened in July 2007. About 2 billion barrels of recoverable oil remain but by 2013 Prudhoe Bay had slipped from the USA's biggest oil producer to third place. It's peaked.

For the past two years, world oil production has suffered from a price collapse, this time due to an oversupply of fossil fuels, a consequence of rapidly rising gas production by fracking.

"Alaska's problems go deeper than the current oil price collapse though. Simply put, the state is getting long in the tooth – at least as far as its productive assets go. The Prudhoe Bay Oil field, once the largest such field in North America, is starting to reach the end of its life. In 1985, the Prudhoe Bay field was pumping 2 million barrels per day – roughly a quarter of the total U.S. output. Today it is pumping 500,000 barrels a day. That's leaving the 800 mile Trans-Alaska pipeline seriously under-utilized" – see: "Is the end in sight for Alaska's Oil Based Economy?".

"If you're younger than 30, you've never experienced a month in which the average surface temperature of the Earth was below average", says the World Economic Forum (February 2015).

Ten years ago, I wrote an article *'All Hands in the Soil'*, for 'The Organic Gardener' magazine. I argued how home food production can help ordinary households reduce their cost of living and secure their health. And how seed saving is a way to adapt annual crops to changing growing conditions.

Warming weather in Brisbane now means three or four chilly weekends instead of eight cool weeks. Cold-loving crops, like potatoes, watercress, cauliflower and broad beans, are pretty unreliable and unproductive. In their place I have kaffir limes and eggplant all year round, I can ripen bananas in mid-winter, and chillies almost escape winter cold damage.

An orchard planted ten years ago – as mine was – should now be yielding a decent harvest. I'm getting six

crops a year from my Tahitian lime and others, like jackfruit, jaboticaba and pawpaw just get better each year. See what 300 square metres of good soil can produce in the subcoastal subtropics at Bellis.

Since that article was published, we've had ten years to rehearse home food production. **Now 2017 looks like being the first Arctic summer to see no continuous ice cover for a time – another climate Tipping Point.** I reckon we have another ten years to perfect sustainable home food production before runway global warming means that supermarkets will have less food to sell, irrespective of the price of fuel – or your willingness to pay the price.

This is not a drill.

Jerry Coleby-Williams
25th November 2016

Eliminate Dengue – Our challenge

AUSTRALIAN FIELD TRIAL UPDATE OCTOBER 2016

Cairns • Cairns project expansion is underway in November 2016 • Wolbachia at high levels in 2010-2015 trial sites • Releases currently underway in Edmonton and Bentley Park • Central suburbs of Cairns (Edmonton to Stratford) to be completed by June 2017 • Wolbachia Warriors Program underway at Bentley Park College

Douglas Shire • With strong community support, releases began in October 2016 • Wolbachia level continues to increase across Douglas Shire • Douglas Shire Council and Rotary Club of

Mossman are directly assisting the project • Mosquito releases to finish December 2016, with mosquito monitoring to continue into 2017

Cassowary Coast • Initial investigation is underway to see if Cassowary Coast could host releases of mosquitoes with Wolbachia in 2017

Aussie science continues to show strong signs of success

We have significantly increased our activity in northern Queensland this year, including starting projects in Charters Towers and Douglas Shire, plus expanding our Cairns project. Our largest site, Townsville, has continued to grow with the help of the local community, who have taken the lead by growing and releasing mosquitoes with Wolbachia in their own backyards.

Wolbachia are natural bacteria that reduce the ability of Aedes aegypti mosquitoes to pass viruses including dengue and Zika, between people. With the support of communities, we release mosquitoes that carry Wolbachia, which breed with local mosquitoes and pass Wolbachia on to future generations. Overtime, Wolbachia levels increase until almost all mosquitoes carry the bacteria, reducing the risk of these diseases being spread.

There have been very few locally acquired dengue cases across North and Far North Queensland this year, despite the high number of imported cases being brought in by overseas travellers. And there has been no significant local transmission of dengue in areas where Wolbachia is at high levels in the local mosquito population.

These results give us confidence to implement our Wolbachia method in other communities around the world, where dengue and Zika are a much greater burden.

We expect to complete mosquito releases in our Townsville, Charters Towers and Douglas Shire projects at the end of 2016, but we will continue to monitor the Wolbachia levels in these areas. Releases in additional parts of Cairns will continue into 2017, and we are currently investigating project options in the Cassowary Coast region.

Eliminate Dengue's Wolbachia method has also been shown to reduce transmission of other viruses including Zika.
Over the next three years the proposed South American Projects will reach millions of people. Join the conversation @eliminatedengue

Eliminating zika This year, the Eliminate Dengue team in Brazil found evidence that Wolbachia can reduce the ability of mosquitoes to pass Zika between people, similar to its effect on dengue. The World Health Organization has endorsed trials of our method in South America, where Zika is a large concern. We are now planning the expansion of our work in South America to combat dengue, Zika and chikungunya in some of the world's hardest hit communities

Going global In addition to our project sites in Australia, Brazil and Colombia, we also have teams in Indonesia and Vietnam, who are planning impact studies to scientifically test dengue reduction in areas where Wolbachia is present in the local mosquito population. We hope to commence work on a number of possible new pilot sites in 2017.

Wolbachia warriors program It has been an exciting year for the Eliminate Dengue Wolbachia Warriors Program, with a significant increase in the number of students participating. Over 600 students, across five Townsville primary schools have taken part in this fun and educational program, which see students directly contribute to our project by growing and releasing mosquitoes with Wolbachia at home.

We would like to congratulate students and their families from Hermit Park, Kirwan, Heatley, Kelso and Grammar primary schools on their achievements!

Bentley Park College, in Cairns, and Richmond Hill State School, in Charters Towers, are

currently taking part in the free, extracurricular science program.

These remarkable Aussie schools and their students are inspiring similar programs at our international project sites around the world.
Find out more about how Wolbachia method works: eliminatedengue.com/australia

If anyone has information they think should be included in this newsletter, especially about workshops and events, please send me the information in a way that I can copy and paste into the newsletter.

Editor, Carol Laing – newsletter@permaculturecairns.org.au

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

Permaculture Cairns

Membership Form 2017

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

- **Household membership $30 O** **Renewing Member O**

Individual membership $20 O **New Member O**

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

……

……

……

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:……

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

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