



## Go Organic and help prevent climate change

Imagine if we could quickly reduce the threat of climate change and grow healthier crops at the same time, without the sacrifice the coal and oil industry tells us are inevitable! Turns out we can, and the solution is literally right under our feet.

As we know now, too much carbon dioxide (CO<sub>2</sub>) in our atmosphere is disastrous for our planet. CO<sub>2</sub> traps heat and results in the ice caps melting, more extreme weather, sea levels rising and a variety of consequences that will disrupt life as we know it.

As much as 30 percent of the CO<sub>2</sub> in the atmosphere is leaked by chemical industrial farming. Climate scientists tell us there should be no more than 350 parts per million (ppm) of CO<sub>2</sub> in the atmosphere and we are already at 400 ppm. What does this mean? We are racing against the carbon clock to combat climate change.

However, CO<sub>2</sub> in the ground, where it naturally occurs, is in fact necessary for fertile soil, and results in healthier and more drought-resistant cropland. We can keep CO<sub>2</sub> in the ground through a natural process that traps it in a "carbon sink." That process is organic or "carbon farming."

We all remember learning about photosynthesis in school. Plants manufacture much of their food from

sunlight, water and CO<sub>2</sub>, turning those molecules into food. The CO<sub>2</sub> is exchanged with fungi and bacteria making richer soil and, in turn, healthier plants. In the process, CO<sub>2</sub> is captured in the ground. In this natural ecological barter system, carbon is sequestered, helping plants grow while keeping the soil healthy. Industrial farming literally prevents this underground transaction from happening because fertilisers, pesticides and herbicides destroy the balance of CO<sub>2</sub> and micro-organism exchange, and results in CO<sub>2</sub> being released into the atmosphere.

Organic farms showed that building up soil carbon has other benefits too. It helps soils act like a water sponge and helps maintain crop yields when conventionally grown crops are dying during droughts. Unfortunately, extreme droughts may become the norm as climate change alters our weather patterns, giving us yet another reason to implement organic farming on a large scale. If enough farmland and grassland are converted back from industrial to natural farming, we can put huge amounts of carbon back where it belongs, maintain yields in times of drought, eat healthier food and reduce healthcare costs.

While more research continues, we already know enough to begin the transformation today. What you can do is spread the word. Shop at your local farmer's market and buy organic products when you can. The sooner we have support for carbon sinks and organic farming, the sooner we can start to combat climate change.

Source: *The Huffington Post*

## YOU CAN SAVE THE BEES SUPPORT ORGANICS



### Bringing Back the Buzz

As you read this, thousands of bees are dying. It is a global predicament with consequences more serious than we understand. A multitude of factors such as the use of chemical pesticides in industrial agriculture, monoculture food crops and the effects of climate change have all contributed to the rapid decline of the honey bee population, resulting in what has been described as the 'Colony Collapse Disorder.'

Recent scientific evidence points to the role of a systemic class of insecticides, called neonicotinoids, which when sprayed, enter the

plant's vascular system, contaminating pollen, nectar and the environment. They are lethal to honey bees and other wild pollinators, resulting in our food systems being threatened. The seven most harmful insecticides used by gardeners and the agricultural industry include imidacloprid, thiamethoxam, clothianidin, fipronil, chlorpyrifos, cypermethrin and deltamethrin. These insecticides cause impaired navigation and orientation abilities, increased mortality and dysfunctional development of bees.

Bees play a vital role in pollinating our food crops. Without them, approximately one third of what we eat would not make it to the table. According to "The Food and Agriculture Organisation of the United Nations (FAO), research

estimates that out of some 100 crop species, which provide 90% of food worldwide, 71 of these are bee-pollinated." – UNEP, 2010.

#### WHAT NEXT?

The future of agriculture requires a radical shift to ecologically sound farming practice. Organic farming is pesticide free, promotes biodiversity and provides greater habitat heterogeneity for pollinators through companion and mixed cropping systems. Supporting bee farming can pave the way for socio economic development, conserve biological diversity and is an invaluable resource of medicinal honey and bees wax.

Bee keeping has become an art form that can be practiced in one's own

backyard. The basic equipment necessary are the components of the hive, protective gear, smoker and hive tool, the equipment you need for handling the honey crop and the help of an experienced bee keeper. Urban bee keeping is becoming a fast growing global trend, where bees are proven to produce higher yields further away from crops sprayed with pesticides.

Namibia's well known bee keeper is Roland Graf zu Bentheim, the "go to" person for removing wild hives and relocating them. He produces different honey products and supplies bee equipment.

Look out for the Bentheim Honig label in stores or contact Roland at: 081 635 7323.



Tired of worrying about what's really in your food?

There is an answer:

**GO ORGANIC !**

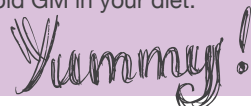
### Why buy organic?

#### 1 Food you can trust

You can be safe in the knowledge that harmful pesticides, hydrogenated fats and controversial additives like aspartame, tartrazine and MSG are banned under organic standards.

#### 2 A diet free from genetically modified food

Genetically Modified (GM) crops, animal feed and processing ingredients are banned in organic production and processing. Choosing organic is an effective way to avoid GM in your diet.



#### 3 Better for the environment

Organic farming reduces pollution and greenhouse gases being released during food production by banning the use of artificial chemical fertilisers and pesticides.

#### 4 Wildlife protection

Organic farms are havens for wildlife and provide homes

for birds, butterflies, bees and other pollinators.

#### 5 High animal welfare

Organic standards insist that animals are given plenty of space and fresh air to thrive and grow – guaranteeing a truly free-range life. Organic animals are not fed any growth hormones, routine antibiotics or Genetically Modified feed.

#### 6 Organically certified

Organic farms in Namibia produce food according to NOA's strict organic standards and are inspected annually to ensure that those standards are upheld. For peace of mind that your food is indeed organic, look out for the NOA Organic Mark!



#### 7 Help prevent climate change

Organic agricultural methods are regenerative. It helps store carbon in the soil as organic matter and reduces Greenhouse Gas emissions. In contrast, chemical industrial agriculture releases carbon into the air, depleting soil quality and negatively affecting the environment.

# ORGANIC LIVING



## Where to buy Organic

### Organic Box

Order your weekly selection of organic and natural products online. You can either collect it or ask for it to be delivered. Windhoek only.  
 Contact Silvia Steinbrück  
 081 284 6446.  
[www.organic-box.com](http://www.organic-box.com)

### Maerua Superspar

'The Health Nut' section at Maerua Superspar stocks a large variety of local and imported organic products, as well as special dietary needs products.

Maerua Lifestyle Centre,  
 Centaurus Road, Windhoek  
 Tel: 061 383 000

### Saturday Green Market / Bio Markt

Selected stalls at the Windhoek Green Market offer NOA Organically Assessed products and a wide range of other produce directly from

farmers and crafters.  
 3 Uhland Str, Klein Windhoek  
 Tel: 061 223 959

### Food Lovers Market

Selected local and imported organic food products available at Food Lovers Market.  
 Metro Centre, Olympia  
 Windhoek  
 Tel: 061 414 700

### Komnik & Franck

Organic coffee, tea and wine.  
 48 Cobalt Str, Prosperity  
 Windhoek  
 Tel: 061 222 411

### Root to Health

Organic and natural skin and body care products.  
 35 Chateau Str, Windhoek  
 Tel: 061 245 677  
 E-mail: [elga.drews@iway.na](mailto:elga.drews@iway.na)

### FARMERS

#### Farm Rogers - Ina & Ernst-Ludwig Cramer

NOA Organically Approved dairy products, ice cream and

frozen yoghurt.  
[cramer@iway.na](mailto:cramer@iway.na)  
[www.cramer.com.na](http://www.cramer.com.na)  
 Cell: 062 561 424

#### Farm Krumhuk & Farm Eichenbach - Ulf-Dieter Voigts; Ralph and Christiane Ahlenstorf

NOA Organically Approved beef, chickens (eggs and meat), milk, vegetables, herbs, fruit, maize and animal feed products as well as other non-organic farm products.  
[krumhuk@iway.na](mailto:krumhuk@iway.na)  
 Tel: 061 233 645

#### Farm Springbockvley - Judith Isele

NOA Organically Approved beef & lamb.  
[iselkuel@iway.na](mailto:iselkuel@iway.na)  
 Tel: 062 581 606

#### Greenspot Organics

NOA Organically Approved vegetables, herbs and fruit.  
[greenspot@greenspot.com.na](mailto:greenspot@greenspot.com.na)  
 Tel: 062 502 410

#### Bellissima Farming - Thys & Suzette van Vuuren

NOA Organically Approved herbs and vegetables.  
[suzette@organicnamibia.com](mailto:suzette@organicnamibia.com)  
 Cell: 081 127 0681

#### Farm Pfeffelbach & Farm Altona - Gernot & Steffi Eggert

NOA Organically Approved maize, sunflowers, sorghum, cowpeas, herbs, vegetables and fruit.  
[gheggert@gmail.com](mailto:gheggert@gmail.com)  
 Cell: 081 124 2720

#### Green Sheep Namibia - Anne & Wolfgang Ramdohr

Vegetables, fruit and herbs are produced under the 1st year of "organic-in-conversion" status.  
[veggie@greensheep-namibia.com](mailto:veggie@greensheep-namibia.com)  
 Tel: 062 573 524

## How do you know it is truly organic? How do you know organically labeled products are really organic?

The only way to be sure if a product is truly organic, is to look for the Organic Mark. Organic certification is the process where a farmer or processor applies for verification that their production is in compliance with a given set of organic standards, and which provides the end consumer with the guarantee that production has been in compliance with those standards.

Third party, ISO accredited certification is a method of organic assurance for export markets. Typical third party certification marks include the Afrisco, EU, Soil Association, Demeter, Naturland, USDA, Ecocert organic marks etc.

For local markets, alternative systems such as NOA's Participatory Guarantee System (PGS) can be used which provides a credible, relevant and cost effective mechanism through which producers can provide an organic guarantee to consumers.

In Namibia, look out for the "NOA Organic Mark" which means that the farm is fully compliant with the NOA Standards, or "NOA Organic in Conversion Mark" which means that the farm is managed according to the Standards, but is still in the 2-3 year conversion phase.

Each Organically Assessed Farm receives a certificate indicating all products which are assessed according to the NOA Standards. If the products are not listed on the NOA certificate, it may not be organic. If in doubt, ask the farmer for his/her certificate.

### NOA members can participate in farm assessments

NOA members are welcome to attend the various annual farm assessments as

observers. This is a farm visit where the assessment team visit the farm, do a farm tour, check if the production complies with the NOA standards and go through documentation. This is a great opportunity for consumers to visit the farm, get to know the farmer, see how they produce your food etc. It is an open session where participation is encouraged. Discussions are always lively and questions are addressed along the way.

## Internationally recognised

NOA's Participatory Guarantee System (PGS) has received official recognition by the International Federation of Organic Agricultural Movements (IFOAM). This means that NOA's PGS has passed a thorough quality review carried out by the IFOAM PGS Committee. Through IFOAM's recognition of NOA's PGS system, Namibian consumers can

be assured that products carrying the NOA Organic Mark is assessed according to internationally recognised procedures.



## Show your support for sustainable farming

*At Fruit & Veg City and Food Lover's Market we're serious about conserving the environment, which is why we support sustainable farming practices in Namibia.*



### One of the ways in which we show our support is by stocking organic herbs and vegetables, grown by our local farmers, on our shelves.

In a country like Namibia, that is more susceptible to the effects of climate change than most other regions in the world, it is especially important to make sure that farming is done in a responsible manner. Research has shown that organic agriculture improves soil structures, helps to conserve water, lessens the effects of climate change, and guarantees sustained biodiversity. Thus, our organic farmers are helping to ensure the future of our country's environment through their holistic farming methods. We ask you to help us support their efforts by buying locally produced organic herbs and vegetables the next time you visit your nearest Fruit & Veg City or Food Lover's Market store. It's the right thing to do, and it's good for you too!

**FOOD LOVER'S MARKET**



# Our Pioneer Namibian Organic Farmers

Namibia's pioneer organic farmers use the latest innovative and scientific methods to produce food you can trust, in an environmentally friendly manner.

**Steinhausen - Farm Rogers**  
Ina and Ernst-Ludwig Cramer  
ina@cramer.com.na  
Tel 062 561 424  
Dairy, ice-cream, beef

**Grootfontein - Farm Eichenbach**  
Ulf-Dieter Voigts,  
Ralph & Christiane Ahlenstorf  
ralph.ahlenstorf@krumhuk.com.na  
Tel. 061 233 645  
White and yellow maize,  
sunflowers, sorghum, cowpeas,  
lucerne, various cereals, beef

**Windhoek - Farm Krumhuk**  
Ulf-Dieter Voigts, Ralph  
& Christiane Ahlenstorf  
info@krumhuk.com.nam  
Tel 061 233 645  
Chicken (eggs and meat), beef,  
milk, vegetables, herbs and fruit

**Kombat - Farm Pfeffelbach  
and Farm Altona**  
Steffi & Gernot Eggert  
gheggert@gmail.com  
Tel 081 1242720  
Maize, sunflowers, sorghum,  
cowpeas, vegetables, fruit

**Dordabis  
Green Sheep Namibia**  
Anne & Wolfgang Ramdohr  
Organic status: 1st year of conversion  
veggie@greensheep-namibia.com  
Tel 062 573 524  
Vegetables, fruit, herbs

**Okahandja  
Greenspot Organics**  
Manjo & Francois Smith  
info@greenspot.com.na  
Tel 081 1295575  
Vegetables, herbs and fruit

**Blumfelde  
Farm Springbockvley**  
Judith Isele  
iselkuel@iway.na  
Tel 062 581 606  
Beef & lamb

**Okahandja - Bellissima Farming**  
Suzette & Thys van Vuuren  
suzette@organicnamibia.com  
Tel 081 1270681  
Vegetables and herbs

## Look for the NOA Organic Mark!

Organic farms in Namibia produce food according to NOA's strict organic standards and are inspected annually to ensure that those standards are kept.

Visit [www.noa.org.na](http://www.noa.org.na) for more information



After 2-3 years of organic farming and assessments against the NOA standards, approved farmers can use the "Organic Mark"



After 1 year of organic farming and an assessment against the NOA standards, approved farmers can use the "organic in conversion" mark

# ORGANIC LIVING

## The impact of chemicals in skincare, beauty and household products on our health and the environment



by Elga Drews

Over the last century there has been a dramatic increase in the number of chemicals that we come into contact with in our everyday lives.

Chemicals are present in our homes, our food, in the water we drink, the toiletries and cosmetics we use and in the air that we breathe.

It may come as a shock to discover over 85% - some claim 90% - of the

commonly used chemicals that we encounter regularly have not even been subjected to minimum safety standards testing and that there is no obligation on the chemical industry to properly assess the chemicals they sell or to use safer alternatives.

Occurrences of cancer are now more common than ever before and there has been an increase in asthma, heart disease, allergies, infertility and chemical and pesticide poisonings over the past fifty years.

### Our Daily Exposure to Chemicals in Personal Care Products

More than 300-500 man-made chemicals have been found contaminating our bodies and links have been found between man-made chemicals and illnesses such as testicular and prostate cancer. Medical research has proven that synthetic fragrances trigger asthma (Curtis 2004), that the detergents in shampoos can damage eye tissue (Scaife 1985; Neppelberg 2007) and that hair dye chemicals can cause bladder cancer and lymphoma (Zhang et al. 2008). Once absorbed into the body, toxic chemicals can be stored in fatty tissue or organs such as the liver, kidneys, breasts, ovaries and the brain.

If we consider our daily morning routine, we most likely take a shower with a shower gel, we shampoo and condition our hair, wash and scrub our face with a cleanser, and men probably shave with a well-lathering shaving foam. We follow with a toner or an astringent and top it with a moisturiser with added sunscreen and possibly some make-up. We apply some anti-perspirant under our arms, and finish off with a spritz of fragrance. Within just a few minutes we have exposed ourselves to an overwhelming amount of chemicals before we've even left home.

After a quick count of ingredients contained in a typical cleanser, toner, moisturizer, eye cream, facial scrub, body wash, body lotion, and sunscreen one could add up more than two hundred different chemicals that are diligently applied to our skin daily, thanks to excellent marketing and advertising ploys.

We do all this without thinking. But this routine might be more damaging than we could ever have imagined. A survey carried out by the US National Institute of Occupational Safety and Health found that 884 chemicals used in personal care products

and cosmetics were toxic and estimate that women absorb up to 2 kilograms of chemicals through their toiletries and cosmetics over the course of a year.

In 2006, the Environmental Working Group, a consumer advocacy group together with the Breast Cancer Fund, Breast Cancer Action and the National Environmental Trust, released a study of the listed ingredients for 7 500 bestselling beauty products. The findings were surprising:

- About 90% of cosmetic ingredients were never analysed by the Cosmetic Ingredient Review Board, a panel that oversees cosmetic safety;
- More than 70 popular hair dye products contain ingredients derived from coal tar, a known carcinogen; and,
- Nearly 55% of products contain "penetration enhancers" that increase the ability of the chemicals to enter the blood stream.

With this knowledge, we can choose to buy products that contain toxic chemicals, or we can choose to buy organic or environmentally friendly products.



## Read labels and avoid the following:

1. **1,4 Dioxane** is a cancer-causing petrochemical found in high levels in dozens of babies' and adults' personal care products. Look out for ingredients that contain "eth" in their names, such as sodium laureth sulphate, polyethylene glycol oleth, myreth, and cetareth.
2. **Sodium Laureth Sulphate (SLS)**, is found in any product that lathers. This ingredient is a strong skin irritant and causes hair loss, eye tissue damage and increases the risk of developing cataracts. This substance remains in liver, heart and lung tissue, and causes possible suppression of the immune system.
3. **Phthalates** are hormone disruptors and known reproductive toxins. They are used as smell confiners to mask the smell of plastics, paraffins and the like.
4. **Aluminium** is a known potent neurotoxin and is present in all antiperspirants in some form. It dries out sweat by injecting aluminium ions into the cells that line the sweat ducts preventing the natural process of toxin elimination. Evidence suggests that aluminium and antacids found in hygiene products contribute to breast cancer and Alzheimer's disease.
5. **Petrolatum** is a petroleum derivative and a major component in mineral oil jelly, liquid vaseline, paraffinum liquidum and baby oil. The substance can cause photosensitivity and strips the skin of its natural oils resulting in chapping, dryness and premature ageing. It prevents elimination of toxins and can cause acne and other disorders.
6. **Alcohol, or isopropyl**, is a poisonous solvent and denaturant. Denaturants alter the structure of other chemicals and are found in hair-colour rinses, body rubs, hand lotions, after-shave lotions, and fragrances. It causes nausea, vomiting, headaches and/or depression.
7. **Parabens** is a synthetic preservative found in most cosmetics, is easily absorbed and accumulates in body tissues. The substance mimics our own hormones, especially oestrogen and is a hormone disruptor.
8. **Formaldehyde** is a potent allergen and considered by the World Health Organisation as carcinogenic. Urea, allantoin, and DMDM-hydantoin, imidazolidinyl, diazolidinyl urea, quaternium-15 are all formaldehyde-forming preservatives, known to cause skin irritations, joint pain, allergies, depression, headaches, chest pain, chronic fatigue, dizziness, insomnia, asthma and a weakened immune system. Their ability to increase the risk of cancer is well-documented. They are present in skin, body and hair products, anti-perspirants and nail polish.
9. **Paradichlorobenzene** in air fresheners and insecticides are readily absorbed by the body, causing headaches, liver and lung problems and disrupted central nervous system.
10. **Synthetic fragrances are usually petroleum based** and can cause headaches, dizziness, rashes, respiratory problems, vomiting, skin irritation and multiple chemical sensitivity.
11. **Synthetic colours: coal-tar dyes are generally labelled -FD&C or D&C followed by a number.** Hair dyes have been found to be carcinogenic, linked to leukaemia and non-Hodgkin's lymphoma.



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## Probiotics

Probiotics are live microorganisms that, when applied in sufficient amounts, deliver a health benefit to the "host". The "host" can be the human gut, a waste-water treatment plant, livestock, a maize field, vegetable lands or your flower bed. This is based on the principles of effective microorganism (EM) technology developed in Japan over thirty years ago.

While the traditional meaning of the word "probiotic" is applied to human and animal digestive microorganisms, Probio has transferred the technology to a whole range of different applications. The products are all-natural, biodegradable, not chemically engineered or genetically modified, and can be used in the following sectors:

### Human health

Your digestive system is home to up to 100 trillion microbes, many of which keep you from getting sick. Unlike anti-bacterial products that kill all bacteria (healthy and harmful) indiscriminately, probiotics are good bacteria that help maintain the natural balance of microbes and reduce the growth of harmful bacteria.

### Companion animals

Probio Pet Odour Away neutralises pet odours and

breaks down grime and dirt caused by playful pets – including soiled paws and bathroom accidents. Probio Coat Care restores a healthy balance to your dog's skin and fur.

### Kitchen, restaurants, bathrooms

Probio products contain powerful microbes and their metabolites break down grease, grime and dirt, neutralises and inhibits bad odours. It removes mould without the need of hazardous chemicals.

### Crop Agriculture

Probio enhances plant growth, increases soil health, decreases fungal and bacterial diseases and assists with stubble management after ploughing, or in no – or reduced tillage farming.

### Animal Husbandry

Probio neutralises odours, controls pathogens and flies in livestock operations and associated processing plants. It is used to make silage and preserve the quality of animal feed. It is given as a probiotic feed supplement to aid digestion, improve animal health, improve production and assist with manure management.

### Septic tanks

It helps eliminate odour, sludge, scum and grease build up in septic pipes and tanks.

## Bioremediation

Probio products contribute to the rehabilitation of polluted environments such as lakes, rivers, dams, canals and soils through the natural breakdown of toxins.

## Waste Water Treatment

Probio products create a clean environment by populating the area with healthy microorganisms so they dominate the toxic, disease-causing bacteria. When applied consistently and following the proper usage guidelines, this powerful green technology can help improve water quality at wastewater treatment facilities in rendering plants, reduce sludge in livestock lagoons and control pathogens in public and/or private lakes.

All these products have been designed to be a direct replacement to many manmade toxic chemicals currently being used in homes, commercial businesses and agriculture operations within Southern Africa. Support your health, animal health and the environment by going non-toxic.

The Probio range is distributed by Greenspot Organics, info@greenspot.com.na, or visit www.probio.co.za for more product information.

*Let's do it!*

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**Bokashi & Garden range**

**All Seasons Bokashi & Indoor Composter**

All Seasons Bokashi is wheat bran inoculated with SCD Probiotics that when used with the Bokashi Indoor Composter conveniently composts ALL food waste indoors.

The Indoor Composter makes composting easy by turning all your food waste into organic soil conditioner.

**Bokashi can also be used:**

- As a soil conditioner
- To control odours
- As a compost activator

**compost activator**

Probio compost activator serves as a cost-effective way of producing high quality compost. The beneficial bacteria in Probio compost activator speed up the composting process and reduce the loss of important nutrients.

Enhanced levels of phototropic non-sulphur bacteria (PNSB) have powerful detoxifying anti-oxidant properties that help speed up the composting process and reduce the loss of important nutrients through oxidation.

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# ORGANIC LIVING

## Glyphosate and GM food - a toxic combination

### Gut-wrenching new studies reveal the effects of glyphosate

Firstly what is glyphosate? It is the active ingredient in numerous chemically based herbicides used in diverse situations that require weed control, from household gardens to the management of public facilities and industrial crop and timber plantations.

Its market dominance has been entrenched with the introduction of crops that are genetically modified (GM) to tolerate applications of glyphosate. On the shelves you may recognise glyphosate in Round Up, produced by Monsanto. Despite the manufacturers' assurances that glyphosate does not accumulate in the

human body, tests conducted on behalf of Moms Across America on human breast milk, urine and drinking water have shown the presence of glyphosate residues. Glyphosate has been implicated in chronic kidney disease in adults, neural tube defects in babies, spontaneous human abortions and birth defects in animals.

These findings have ramifications for virtually every man, woman and child in Namibia, as this pesticide is widely used on both conventional and particularly on genetically modified (GM) crops that are produced by our main trading partner, South Africa.

### How does it affect Namibians?

Glyphosate has become synonymous with genetically modified (GM) crops as certain crops are engineered to withstand applications of glyphosate. This means, for example, that a farmer can plant GM maize, and use glyphosate without harming the crop.

South Africa is the first - and only - country in the world to cultivate a genetically modified staple food - white maize.

Although Namibian law does not yet allow our farmers to plant GM crops, we import 50% of our maize requirement from South Africa, as well as all of our soya requirements.

So when you eat imported maize from South Africa, or processed foods such as bread containing GM soya, you're consuming glyphosate residues.

### What is GMO?

Broadly speaking, today there are three different classes of genetically modified organisms (GMOs), of which two are already commercialised.

### GMO for insect resistance

In this major class of GMO, genes are transferred to plants to make them produce toxins against certain insects. These toxins mostly come from soil bacteria (e.g. Bacillus

thuringiensis) and are thus natural products which are already used in nature's pest management. Today, these traits are especially common in maize and cotton crops. However, a downside is that the toxins also kill beneficial insects.

### GMO for the production of chemicals

Although not commercialised, various companies try to develop plants through GE that can produce chemical substances for industry and medicine.

### Uncontrollable consequences

Although lobbyists claim that their methods only affect specific parts of the genetic code of an organism, they cannot fully control their impacts which means there is no proper technical control of genetic engineering.

When genetic engineering is applied, transgenic sequences enter the seed supply of traditional crop varieties, either by direct contamination (mixing of seeds in production /

distribution) or by indirect contamination (via pollen / soils). They will perpetuate and accumulate over time, which makes it impossible to control the effects.

### This contamination has various effects

**Food safety:** The effects (especially long term) are still not sufficiently examined.

**Weeds:** GMO can become weeds directly or via cross-contamination.

**Trade:** Contamination can undermine export to Non-GMO countries (e.g. Europe).

### Organic agriculture:

Contamination ultimately undermines the production and principles of organic farming.

### Intellectual property right:

Because infringement does not require intent, farmers may violate property rights unintentionally. This could create major problems for contaminated farms.

### Food system:

Contamination of harmful substances (e.g. BT toxins) could cause large-scale disruptions, recalls and waste.

Resistance against pesticides can cause major problems for farmers.

**Seed repositories:** Ongoing contamination of the commercial seed supply could gradually undermine the quality of our communal genetic storehouse for agricultural crops. Nothing is more fundamental to the future of our agriculture and food system than a continued supply of safe, high-quality seeds.

### GMO for industry or drug production:

Substances (drugs) end up in food chains, soils, and animals through contamination by vehicles such as antibodies, hormones, proteins, vaccines and chemicals for industry.

### Where can you find more information?

African Centre for Biosafety: [www.acbio.org.za](http://www.acbio.org.za)

Moms Across America: [www.momsacrossamerica.com](http://www.momsacrossamerica.com)

Non-GMO Project: [www.nongmoproject.org](http://www.nongmoproject.org)

## What can YOU do to avoid eating glyphosate and GMOs?



### Tip 1 Buy Organic

Organic producers cannot intentionally use GMOs.



### Tip 2 Avoid At-Risk Ingredients

#### Imported Maize

- Maize meal, corn flakes, corn flour, starch, gluten and syrups
- Sweeteners such as fructose, dextrose and glucose
- Modified food starch

#### Soy

Soy flour (used commonly in bread flours), lecithin, protein, isolate and isoflavone vegetable oil and vegetable protein

#### Canola

Canola oil (also called rapeseed oil)

#### Cotton

Cottonseed oil



### Tip 3 Read food labels and insist on labeling if the ingredient list is not clear



### Tip 4 Organically certified



### Tip 5 Request that Namibian food importers AVOID importing GM maize and soya



### Tip 6 Inform your friends and family about good food choices



### Tip 7 Join NOA and stay informed



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# ECOSO DYNAMICS

You can find our products at:

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- Swavet, Veterinary Supplies, Windhoek
- Most health shops & pharmacies in Windhoek

The effects of Devil's Claw are anti-inflammatory and may reduce pain, making it commonly used during the treatment of joint inflammation, arthritis, rheumatism, and stiffness.

By buying our products, you are supporting organic production, sustainable harvesting, and fair trade.



EcoSo Dynamic's Devil's Claw tablets are made mainly of the original Certified Organic raw material. We take a holistic approach to assure all necessary natural components work together to bring out the efficacy of the products. There are about 2.7 million hectares that house the Devil's Claw resource, and EcoSo Dynamics purchases from 1,300 harvesters in these areas.

Devil's Claw has been used in Africa for hundreds of years. It was around the 20<sup>th</sup> century that its healing properties were discovered by western medicine. Today, Devil's Claw is one of the most researched plants and is widely used to support the treatment against joint inflammation, stiffness, arthritis, and rheumatism.

Along with human finished products, we offer tablets for dogs (50 or 100) and powder (1kg) for horses. Dogs and horses can benefit equally as much as humans do, easing joint inflammation, arthritis, stiffness, and more.

Fun Fact:

The San Bushmen used to throw the prickly seed pods behind them in order to ward off followers.



[www.ecoso.net](http://www.ecoso.net) | 061 256115  
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# ORGANIC FARMING



## Pest and disease control

### Improve soil and plant health using mushrooms together with other biological products

The perception exists that organic farmers use traditional farming methods and do "nothing" to control pests / pest and diseases. Nothing could be further from the truth. Organic or agro-ecological crop and vegetable farmers use the latest science and innovation to improve soil health and control pests and diseases. Using micro-organisms, mushrooms and releasing beneficial insects into the production area are just some of the important methods being used to produce healthy organic crops. These beneficial organisms act in different ways, such as parasitising pest organisms to inhibit growth. Following these methods also helps restore balance in nature, helping organism populations increase to the advantage of the organic or agro-ecological farmer.

Namibian organic farmers benefit from the latest research, development and production of a natural range crop of protection products to improve soil and plant health. Dagut Science, a company in Pretoria, South Africa, explains the usage of their product range:

### Controlling Bacterial and Fungal Soil-borne Diseases

Farmers can use different products in the Dagut Science range namely Bismarck, Antares and Lucius, as a seed treatment or plant row application for dry land maize. Bismarck (*Microbacterium maryltypicum*) is a beneficial bacteria that protects plants against bacterial infections.

*Erwinia chrysanthemi* is a bacterial disease on maize and many other crops like potatoes, onions and tomatoes. It causes major maize yield losses and is compounded by lodging often taking place making harvesting difficult and expensive. Bismarck is very effective in controlling bacterial diseases like *Erwinia chrysanthemi* and was developed by Dagut Science to control different bacterial diseases on tomatoes. Dagut Science is the only company that uses *Microbacterium maryltypicum* as a biological crop protection method.

The combination of *Erwinia chrysanthemi* and *Fusarium* on maize is detrimental as both these diseases break down the vascular tissue

causing many different symptoms. One of the symptoms is a stem with a straw-like appearance when the maize stem is cut open, (photo 6a) instead of a solid white sponge appearance (photo 6b). This is a result of vascular tissue that has been enzymatically broken down causing the straw-like effect (photo 6a).

This is the reason for lodging. The plant becomes top heavy when cobs form because the cell structure of the plant is no longer strong enough to support the developing cobs. Photo 7 shows lodging with *Erwinia* and *Fusarium* infection present. Photo 6a was taken from this maize land.

As the vascular tissue is not functioning optimally, poor uptake of water and nutrients cause different symptoms including wilting, as can be seen in photo 8 taken in Grootfontein. The maize plant on the right wilted because of physiological water stress. Often the cobs don't fill and seed is loose resulting in poor yield as well as poor quality grades. (Photo 9)

### Mushrooms improve soil fertility

This maize farmer does no-till and as you can see in the photo on the left (1), the soil is very fertile with evidence of earthworms gathered in one hand of soil. In photo 2 however, the control maize crop does not show vigorous growth compared with the Dagut Science maize crop that included a mushroom treatment. Photo 3 shows the Antares (*Pleurotus pulmonarius*) mushroom pinning applied in this no-till maize land. We have found that our mushroom products even improve pinning of other natural mushrooms present like puff balls (photo 4) and the bird's nest mushroom (photo 5). The Dagut Science product range, including mushrooms, improved the crop even in this fertile no-till soil. Together with Bismarck, the edible mushroom Lucius (*Lentinula edodes*) is applied to maize controlling both *Erwinia* and *Fusarium*.

Lucius not only controls these diseases but also improves plant growth and soil fertility. Another edible mushroom used by Dagut Science is Antares (*Pleurotus pulmonarius*) (photo 10). It protects plant roots against damage from plant parasitic nematodes. Photo 10 shows Antares that has pinned in a green bean land and the white mycelium growth is evident in the soil area of the mushroom. Photo 11 is Antares and photo 12 Lucius as grown in the laboratory in the mycelium form.

### Controlling Nematodes

The impact of plant parasitic nematodes and their

economic impact on yield is underestimated by many farmers. Damage caused by plant parasitic nematodes increases the infection rate of *Erwinia* and *Fusarium* and the combination of these three, *Erwinia*, *Fusarium* and nematodes is costing the farmer optimal yields. Antares attack the nematode by first luring it, then sedating the nematode with the metabolites it produces, after which it penetrates an opening of the nematode and consumes it as a food source. The other Dagut Science nematocide, *Spartacus* (*Beauveria bassiana*) also penetrates the nematode shown in photo 13, where white arrows show the *Spartacus* mycelium penetration of the ring nematode (*Criconemoides xenoplax*). This natural cycle taking place in soil is also an effective barometer of soil fertility. The ratio of beneficial nematodes to plant parasitic nematodes is an important indicator of how healthy soil is. The Dagut Science natural nematocides Antares and *Spartacus*, do not affect beneficial nematodes.

Farmers using Antares and *Spartacus* continuously increase the beneficial nematode count resulting in higher yields. It is important to send soil samples to a nematology laboratory that count both the beneficial and plant parasitic nematodes. Photo 7 with the lodged dry land maize, had a very high *Erwinia* infection and the nematode count on this land stood at 6560 plant parasitic nematodes / 250cm<sup>3</sup> soil with root knot nematode (*Meloidogyne*) and lesion nematode (*Pratylenchus*) being the highest count. This same dry land maize has been treated with the Dagut Science products as a plant row application with optimal yields and no lodging as can be seen in Photo 14a. Photo 14b shows the same power station (arrow) as can be seen in photo 7 showing it is the same land. This Dagut Science treated land in photo 14a had a total plant parasitic nematode count of 115 / 250cm<sup>3</sup> soil and the beneficial nematode count has increased showing that Antares nematode control was effective.

The combination of the two edible mushrooms Lucius and Antares together with the beneficial bacteria Bismarck for maize treatment, gives optimal maize yields in a natural way. Photo 15a shows the white spongy stem of the Dagut Science treatment while the control is starting to be straw-like and showing the pink *Fusarium* infection. The control cob gave a seed yield of 356g while the Dagut cob gave 407g, 51g more. Dagut Science products protecting the vascular tissue is the reason for higher yields (Photo 15b).

Dagut Science focus on other crops as well ranging from all vegetable, greenhouse crops to long



term crops like vineyards and citrus trees. Potatoes and carrots have been a challenge as the crop grows beneath the soil, leaving no room for mistakes, especially when the focus is on bacterial diseases like Erwinia and nematodes. The Dagut Science product range is very effective on crop protection for crops like potatoes and carrots as can be seen in photo 16a and 16b harvested in the Tsumeb area. Two other important products included in this program are T-Gro (Trichoderma harzianum) for the control of Rhizoctonia and root stimulation and Artemis (Bacillus subtilis) that assists in the control of both Erwinia and Rhizoctonia. For more intensive crops like potatoes, Dagut Science uses a combination of different beneficial organisms to control Erwinia which include Bismarck, Lucius and Artemis. For nematode control, both Antares and Spartacus are applied through the irrigation system on a regular basis.

### Controlling Foliar Diseases

Dagut Science also have products that can control foliar diseases. Triarii (Bacillus pumilus) can control both Alternaria and Late Blight with success. Photo 17a shows Alternaria control growing in the laboratory in a petri dish. However when Alternaria (arrow) is placed together with Triarii (yellowish light circle) it won't grow or sporulate, indicating optimal biological control (photo 17b).

### Controlling Powdery Mildew

Dagut Science searched for a long time for an organism that can control powdery mildew (Leveillula taurica) in peppers (photo 18a). The edible mushroom Agaricus bisporus - commercially called Palladius - was found to be very effective in controlling powdery mildew on peppers. Photo 18b shows the success in controlling powdery mildew on greenhouse peppers.

### Controlling Lepidoptera Worms

Three different products in combination is very effective against worms. Arrow (Beauveria bassiana), Boudica (Isaria fumosorosea) and Blade (Bacillus thuringiensis var kurstaki) gave optimal results on loopers in an organic carrot land in Tsumeb. Even though the looper was already mature, the results were very effective. While Blade must be ingested by the worm, both Arrow and Boudica only have to make contact with the worm, after which the fungi penetrate the worm and consume it as a food source. Photo 19 shows the the looper changing color and later hanging down after infection takes place.

### Important points to remember when using biological crop protection products

1. Water and soil pH must be 6 – 7.5 pH (H2O) for optimal micro-organism growth.
2. Apply micro-organism products during cooler times of the day, either early morning or late afternoon as the high soil surface temperature may kill the micro-organisms.
3. Store these products in a cool dry area away from direct sunlight.
4. Exposure to UV for long periods may also kill the micro-organisms. This is very important to remember when maize seed is treated with micro-organisms during the planting period.
5. If a farmer intends to apply biological products from different companies, the farmer must contact these companies to ensure that these different products do not have an antagonistic effect on each other. For example in the Dagut Science range itself the Triarii (Bacillus pumilus) and T-Gro (Trichoderma harzianum) may not be applied simultaneously as a foliar spray as Triarii will decrease the T-Gro count.
6. Compatibility with other organic products, for example, with plant extracts, should also be taken in consideration as it may also have a negative effect on beneficial micro-organism counts.
7. When beneficial insects are used for biological control, it is important to ensure that biological micro-organisms that control insects do not control the beneficial insects released in crops.
8. Biological control products are not systemic and for this reason, when applied as a foliar spray, the application should be effective to give an optimal cover spray.
9. For optimal biological control of insects, it is best to apply these products when the insects are stationary. Trials have shown that spraying for insects after sundown is up to 70% more effective than during the day time.
10. Frequent soil applications of the micro-organism are important to maintain high counts of beneficial micro-organisms. For example, if irrigation water contains high counts of plant parasitic nematodes that are continuously introduced into the soil, then a once off application of beneficial micro-organisms will not be sufficient.
11. Foliar applications must also be done weekly as new leaves develop and will not be protected. Also, the foliar surface exposed to UV and high temperatures is not an ideal living space for micro-organisms. Biological product formulations are often focused on improving micro-organism survival on leaves like the carrier of Dagut Science.
12. Application of biological crop protection products should be done in such a manner that the target disease or pest life cycle should be the focus.
13. When disease or pest populations increase, the biological product application period must be shorter, for example, every 5 days instead of every 7 days and the product's concentration per hectare must be increased.
14. Understand what the different micro-organism biological products control and what other benefits they have such as root stimulation. This will assist the farmer in using these products in the best way possible.
15. Always apply biological products just before planting or at planting. Never start at germination as this gives bacteria and fungal pathogens an opportunity for infection.

**Using natural products to control plant diseases and pests protect both mankind and nature yet make it possible for the farmer to have profitable economic yields.**

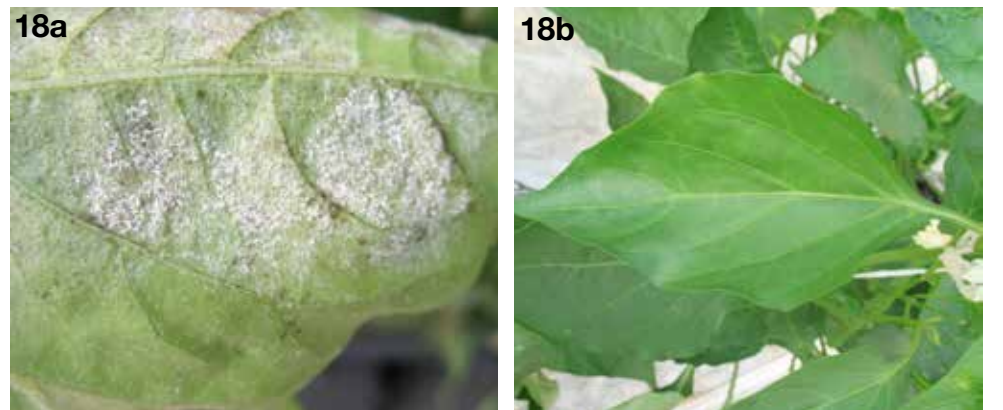
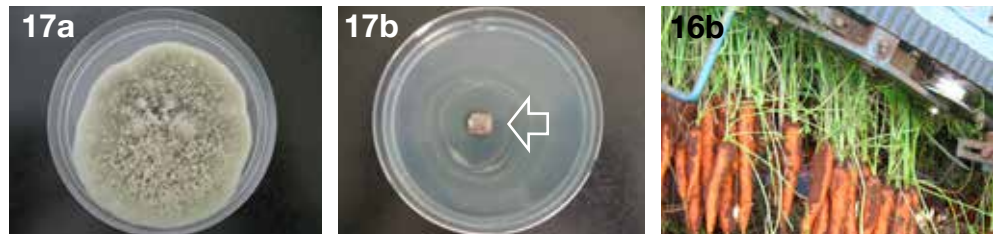
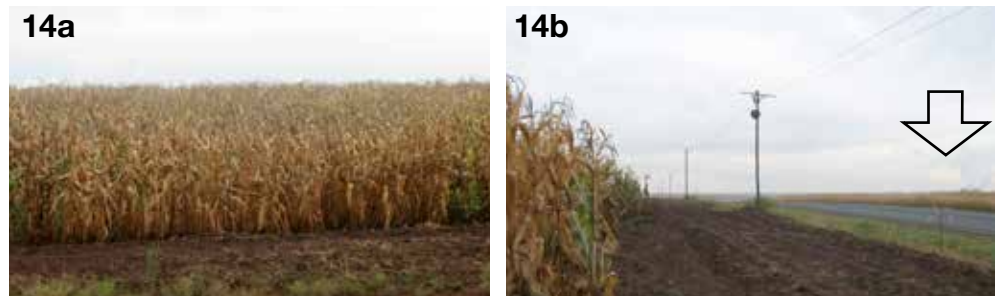


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Dagutak Science produce biological crop protection products. Contact Jan Keyser if you want to protect your crop with mushrooms from nematodes, bacterial and fungal diseases.

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# ORGANIC FARMING

## Maize production and breeding

### History of maize

Maize is one of the most popular staple foods in Namibia. It originates in Central America, where it was domesticated around 9000 years ago and is derived from a grass named Teosinte. Using the breeding method of mass selection - the simplest, easiest and oldest method of selection - farmers selected individual plants based on their phenotype and performance. This method is still practiced by farmers all over the world, who keep seeds from their maize harvest for the next season. Through mass selection, the ears of maize became larger. Modern maize varieties have hundreds of exposed kernels attached to a cob which is completely covered by husks.



Teosinte (*Zea mays* spp. *Provarglumis*, progenitor of maize)



The success of mass selection (Photo: Tuschling, KWS)

While in its country of origin and other countries in Central and South America, thousands of different varieties are cultivated for human consumption. In southern Africa various white maize varieties are the most popular.



Maize varieties in Peru (Photo: Schmidt, KWS)

## Maize seed breeding

In Peru, during a period of 2000 years, maize and runner beans were selected as ideal complementary intercropping plants. However, modern maize breeding has developed cultivars exclusively for being grown in weed-free sole cropping systems. Modern maize varieties have lost their ability to compete with weeds and to perform in an intercropping system.

While weeds are a strong concurrent for maize in mono-cultural systems, runner beans and maize are ideal partners. Beans fix nitrogen in the soil for the maize while maize is used as a bean pole by the runner beans (Schmidt, 2014).



Maize and runner beans (Photo: Schmidt, KWS)



Maize and weeds; Dr. W. Goldstein (Photo: Schmidt, KWS)

Dr. Walter Schmidt, a plant breeder with 40 years experience in maize breeding and long-time Head of the Maize Breeding Section at KWS SAAT AG, Germany, advises various Capacity Development projects between KWS SAAT AG and several research partners in Peru. These experiences inspired him to support research in developing maize and runner bean varieties for intercropping systems in temperate climates, a co-evolutionary breeding approach.

### Breeding for organic farming needed

There is a growing realization that if organic farming is to succeed in the long term, it will be necessary to breed healthy, productive, nutritious crops and breeds of animals that are suited to the production systems used by organic farms. Such crops and animals also need to be capable of being productive under the stresses imposed by global climate change. Organic farming is a holistic approach that includes concepts of balance, productivity, quality, and integrity. Appropriate breeding objectives for "organic" agriculture might include:

1. Breeding crops that are uniquely adapted to organic conditions;
2. Selecting them for enhanced health, vegetative vigor, taste, and nutritional value combined with productivity; and,
3. Practicing and teaching a qualitative-quantitative approach to breeding and management that includes organic values and involves and encourages others to practice this approach.

The result should be unique seeds that combine productivity and nutritional quality and are adapted to organic farming, contributing to enhanced nutrition and preserving the environment. (*Thoughts of Dr. Walter Goldstein, maize breeder in USA*)

Dr. Goldstein currently develops a diverse set of maize cultivars with higher protein quality that still produce high grain yields in an organic research project. In particular, the project selected for higher contents of methionine and lysine in hard and soft kernelled maize. Though the best hybrids are 10-15 % lower in yields per hectare, they have found up to 40 % higher protein yields per hectare. Most of the breeding is for maize that has a lot of carotenoids and they also breed large kernelled, high nutritional value white maize.

### Organic maize breeding trials

Organic production systems have high requirements from varieties and focus on yield stability because they aim to close the nutrient cycle without using chemical inputs. It maintains and increases the long-term fertility of soils. The requirements of seed to perform well under organic farming conditions are much higher than in conventional systems.

Suitable organic maize varieties need to be superior in a wide range of properties because many inputs from conventional farming are not allowed:

Challenges in Organic Farming	Organic seed requirements
Chemical seed treatment not allowed	Seeds need a better genetically based germination ability and vigour
Protection against birds	Seeds need to be sown deeper Better seed quality, higher thousand seed weight
Herbicides not allowed	Organic varieties need excellent competition abilities against weeds in mono-culture; outstanding youth development is a main condition
Fast soluble mineral fertilizers not allowed	Organic varieties must be capable to buffer nutrient stress, at least temporarily
Genetically Modification strictly inhibited	Organic varieties have to be naturally resistant to pest and diseases
Abiotic stress factors, e.g. drought stress	Organic varieties need to have a high level of natural tolerance to drought stress

## Organic breeding objectives are more challenging

From 2004 to 2006, detailed scientific experiments were conducted in close cooperation with the University of Hohenheim by researchers of KWS SAAT AG. Several hundred maize hybrids were tested under both organic and conventional conditions in parallel and multi-locational trials. This experimental series gave the researchers many valuable insights into how to design an optimal variety for organic farming, based upon a conventional breeding program, and how organic and conventional breeding could enormously benefit from each other.

**Conclusion:** The best maize varieties in this trial performed very well under organic conditions; they germinate optimally, form closed plant stands, escape the weeds, are capable of buffering nutrient deficiencies and are able to withstand drought periods quite well. These characteristics endow organic varieties with high yield stability and hybrids resulting from such lines benefit both farming systems (Schmidt and Burger, 2010).



Farm-saved local maize seeds from Hainan, China

## Open source seed?

### Open-source seed regimes are indispensable for food security

For more than 10 000 years, farmers have been breeding and cultivating agricultural crops. They have shared and exchanged agricultural seeds and treated them as a truly common good. In doing so, man has adapted crops to various and favourable environments and created rich crop diversity.

This heritage is being lost because seeds are being privatised and monopolised. Supported by seed and patent laws, plant breeders assert intellectual property rights (IPR) on their varieties. Today, three seed companies (Monsanto, Syngenta and Du-Pont) have a global market share of more than 53%, 10 companies control more than 73%, and this process of market concentration is continuing.

Monopolised seed companies who follow the economy of scale and offer

their varieties as a mass product, have an enormous crowding-out effect on local varieties. At the same time, plant breeders who are not part of the big players are increasingly excluded from access to germ-plasma for breeding and their number is shrinking continuously. This results in a dramatic loss of diversity, a loss of genes in terms of varieties, cultivars and populations and a loss of plant breeders who can no longer afford to exist. This loss jeopardises a valuable resource, which is urgently needed to achieve food security, to cope with climate change and difficult production environments such as the northern areas of Namibia.

In reaction to this, various NGOs all over the world have created an open-source for seed initiatives. Can the open-source principle that have been applied successfully for computer software be transferred or adapted to agricultural seeds? Would this be an entry point to develop a legal framework with no breeding restrictions, reviving a public and community plant breeding sector, including participatory plant breeding with farmers and, finally to obtain a multitude of seed sources? More information can be obtained from Johannes Kotschi (kotschi@agrecol.de), who works on this subject for AGRECOL, a German based NGO (www.agrecol.de).



# Organic vs Chemical Agriculture?

## The Rodale Institute's 30 year Farming Systems Trial (FST)®

The Farming Systems Trial (FST)® at Rodale Institute is America's longest running, side-by-side comparison of organic and chemical agriculture. Started in 1981 to study what happens during the transition from chemical to organic agriculture, the FST surprised a food community that still scoffed at organic practices. After an initial decline in yields during the first few years of transition,

the organic system soon rebounded to match or surpass the conventional system. Over time, FST became a comparison between the long term potential of the two systems.

After 30 years of side-by-side research in their Farming Systems Trial (FST)®, Rodale Institute has demonstrated that organic farming is better equipped to feed us now and well into the ever changing future.

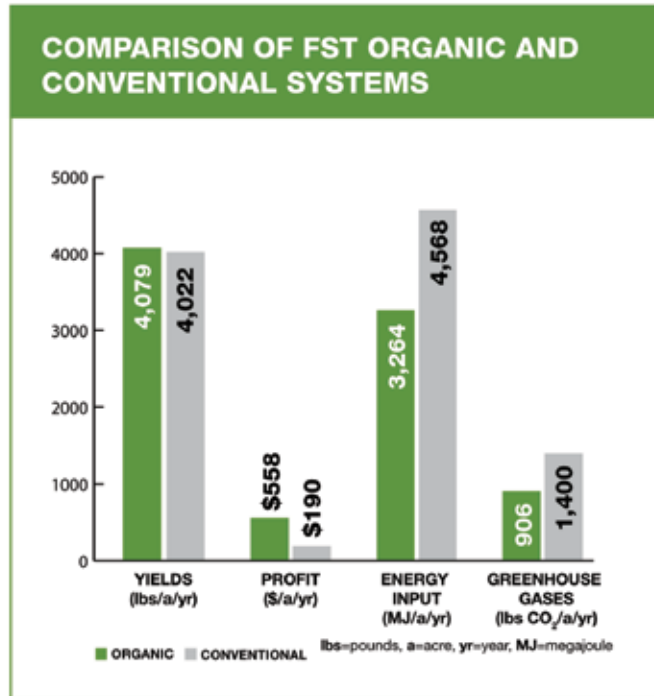
Organic farming is far superior to conventional systems when it comes to building, maintaining and replenishing the health of the soil. For soil health alone, organic agriculture is more sustainable than conventional. When one

also considers yields, economic viability, energy usage, and human health, it's clear that organic farming is sustainable, while current conventional practices are not.

Throughout its long history, the FST has contained three core farming systems, each of which features diverse management practices: a manure-based organic system, a legume-based organic system, and a synthetic input-based conventional system. In the past three years of the trial, genetically modified (GM) crops and no-till treatments were incorporated to better represent farming in America today.

## FST FACTS

- Organic yields match conventional yields.
- Organic outperforms conventional in years of drought.
- Organic farming systems build rather than deplete soil organic matter, making it a more sustainable system.
- Organic farming uses 45% less energy and is more efficient.
- Conventional systems produce 40% more greenhouse gases.
- Organic farming systems are more profitable than conventional.



### SUSTAINABLE

As it pertains to farming, this term does not have a standard definition. For the purposes of this paper, we will define sustainable as a system that can maintain or enhance soil fertility indefinitely.

### ORGANIC

Most simply, this refers to a system of farming that does not use synthetic chemicals and, instead, mimics natural systems. This may encompass different farm sizes, practices and philosophies that, at their core, reject the use of toxic, synthetic chemicals.



## THE DIFFERENT SYSTEMS



### ORGANIC MANURE

This system represents an organic dairy or beef operation. It features a long rotation including both annual feed grain crops and perennial forage crops. The system's fertility is provided by leguminous cover crops and periodic applications of manure or composted manure. This diverse rotation is also the primary line of defense against pests.



### ORGANIC LEGUME

This system represents an organic cash grain system. It features a mid-length rotation consisting of annual grain crops and cover crops. The system's sole source of fertility is leguminous cover crops and the rotation provides the primary line of defense against pests.



### CONVENTIONAL SYNTHETIC

This system represents the majority of grain farms in the U.S. It relies on synthetic nitrogen for fertility, and weeds are controlled by synthetic herbicides selected by and applied at rates recommended by Penn State University Cooperative Extension. In 2008, genetically modified (GM) corn and soybeans were added to this system.



### NO-TILL SYSTEMS

Each of the major systems was divided into two in 2008 to compare traditional tillage with no-till practices. The organic systems utilize our innovative no-till roller/crimper, and the no-till conventional system relies on current, widespread practices of herbicide applications and no-till-specific equipment.

## 1. Soil Health

For plants to be healthy, the soil they grow in must be healthy, too. Healthy soil may be defined simply as soil that allows plants to grow to their maximum productivity without disease, fertility or pest problems limiting production, and without a need for unusual supplements or support.

Fertile soil, rich in organic matter and microbes, creates a more stable environment for plants. In times of stress, organically-managed soil has greater ability to provide for crops what the weather has not. The Farming Systems Trial has provided the following insights about soil quality:

- Soil health in the organic systems has increased over time while the conventional systems remain essentially unchanged.



- Carbon increase was highest in the organic manure system, followed by the organic legume system. The conventional system has shown a loss in carbon in more recent years.



- Organic fields increased groundwater recharge and reduced runoff.
- Soils of the organic systems are better equipped to store and use water efficiently.

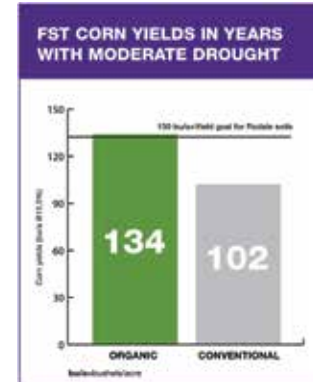
## 2. Yields

- Over the 30 years of the trial, organic corn and soybean yields were equivalent to conventional yields in the tilled systems.

- Wheat yields were the same for organic and conventional systems. (Wheat was only added to the conventional system in 2004).

- Organic corn yields were 31% higher than conventional in years of drought.

- Corn and soybean crops in the organic systems tolerated much higher levels of weed competition than their conventional counterparts, while producing equivalent yields.



## 3. Genetically Modified Crops

According to the U.S.A. Department of Agriculture, 94% of all soybeans and 72% of all corn currently grown in the United States are genetically modified to be herbicide-tolerant or express pesticides within the crop. So, in 2008, genetically modified (GM) corn and soybeans were introduced to FST to better represent agriculture in America. GM varieties were incorporated into all the conventional plots.

We incorporated the GM crops to reflect current American agriculture, rather than to specifically study their performance. Our data only encompasses three years, but the research being done in the community at large highlights some of the clear weaknesses of GM crops:

- Farmers who cultivated GM varieties earned less money over a 14-year period than those who continued to grow non-GM crops according to a study from the University of Minnesota.
- Traditional plant breeding and farming methods have increased yields of major grain crops three to four times more than GM varieties despite huge investments of public and private dollars in biotech research.

- There are 197 species of herbicide-resistant weeds, many of which can be linked directly back to GM crops, and the list keeps growing.

- GM crops have led to an explosion in herbicide-use as resistant crops continue to emerge. In particular, the Environmental Protection Agency (EPA) approved a 20-fold increase in how much glyphosate (Roundup®) residue is allowed in our food in response to escalating concentrations.



Pesticides commonly used in agriculture have been found in drinking water, sometimes at levels above regulatory thresholds.

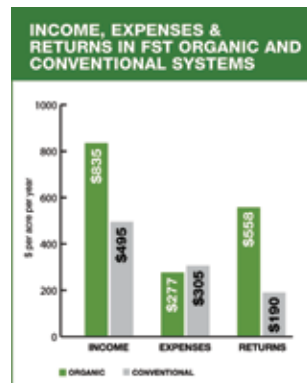
# ORGANIC FARMING

## 4. Economics

Organic farmers have the potential to make more money with less land than conventional farmers. And the organic market is still growing.

The FST showed that:

- The organic systems were nearly three times more profitable than the conventional systems.
- Even without a price premium, the organic systems are competitive with the conventional systems.



## 5. Human Health

Conventional systems rely heavily on pesticides (herbicides, insecticides, fungicides, etc.) many of which are toxic to humans and animals. They are by name, definition, and purpose, designed to kill.

Numerous studies have begun to capture the true extent of how our low-level exposure to pesticides could be quietly causing serious health problems in our population. The toxins are nearly inescapable in the water we drink, the food we eat and the air we breathe.

- Atrazine<sup>1</sup> exposure at time of conception has been linked to lower math and reading skills in children.
- Researchers measured organophosphates<sup>2</sup> in the urine of children and discovered levels of chemical indicators up to 14 parts per billion. (All of which disappeared when they were put on an organic diet.)
- Glyphosate<sup>3</sup>-based herbicides, currently legal in our food at low levels, have been shown to cause DNA damage, infertility, low sperm count, and prostrate or testicular cancer in rats.
- Pesticides (including ones that have been banned for years) have been found in breast milk and umbilical cord blood.
- Inactive ingredients in herbicide and pesticide brands have been found to be just as toxic, if not more so, than the active ingredients, and these ingredients aren't tested for human health impacts before being released.
- Some research has found certain agricultural chemicals can alter our DNA, meaning the effects can be passed on through the generations.

- More than 17,000 pesticide products for agricultural and non-agricultural use are currently on the market. Exposure to these chemicals has been linked to brain/ central nervous system disruption, breast, colon, lung, ovarian, pancreatic, kidney, testicular, and stomach and other cancers.

<sup>1</sup>Atrazine is an active ingredient in herbicides.  
<sup>2</sup>Organophosphates are the basis of many insecticides and herbicides, and are widely used as solvents and plasticizers.  
<sup>3</sup>Glyphosate is the active ingredient in the herbicide Roundup®

When we've sampled for herbicide and nutrient leaching into groundwater in the FST, we've found:

- Water leaching from the conventional system more frequently exceeded the legal limit of 10 parts per million for nitrate-nitrogen concentrations in drinking water compared to the organic systems.
- Atrazine leaching in the conventional system sometimes exceeded the maximum contaminate level set by the EPA for drinking water. And concentrations in all conventional samples exceeded 0.1 parts per billion, a concentration that has been shown to produce deformities in frogs.

## 6. Energy

As the world's energy crisis continues, smart and efficient use of resources will become increasingly essential. Currently, conventional agriculture uses an enormous amount of oil to manufacture, transport and apply fertilizers and pesticides. All these processes release large amounts of greenhouse gases into the atmosphere. Figures from the Intergovernmental Panel on Climate Change (IPCC) say that agricultural land use contributes 12% of global greenhouse gas emissions.

### Inputs

Our data from FST shows that the organic systems use less energy and are more efficient than conventional systems:

- The organic systems used 45% less energy than the conventional systems.
- Diesel fuel was the single greatest energy input in the organic systems.
- Nitrogen fertilizer was the single greatest energy input in the conventional systems representing 41% of the total energy.
- Production efficiency was 28% higher in the organic systems than in the conventional systems, with the conventional no-till system being the least efficient in terms of energy usage.

When it comes to greenhouse gas emissions, the FST data shows conventional systems contribute much more to the atmosphere:

- The conventional systems emit nearly 40% more greenhouse gases (GHG) per pound of crop produced than the organic systems.
- The biggest GHG emissions from direct inputs in the organic system came from fuel use and seeds.

## 7. Feeding the world

Agribusinesses have long clung to the rallying cry of needing to increase yields in order to feed the world. However, feeding the world is not simply a matter of yields.

The global food security community is shifting swiftly in support of an organic approach.

"Organic agriculture has the potential to secure a global food supply, just as conventional agriculture is today, but with reduced environmental impact." This is according to a report that came out of the Food and Agricultural Organizations of the United Nations (FAO) International Conference on Organic Agriculture and Food Security.

Agroecological farming methods could double global food production in just 10 years, according to a report from the United Nations. Agroecological practices, like organic practices, attempt to mimic natural processes and rely on the biology of the soil and environment rather than synthetic sprays and other inputs.

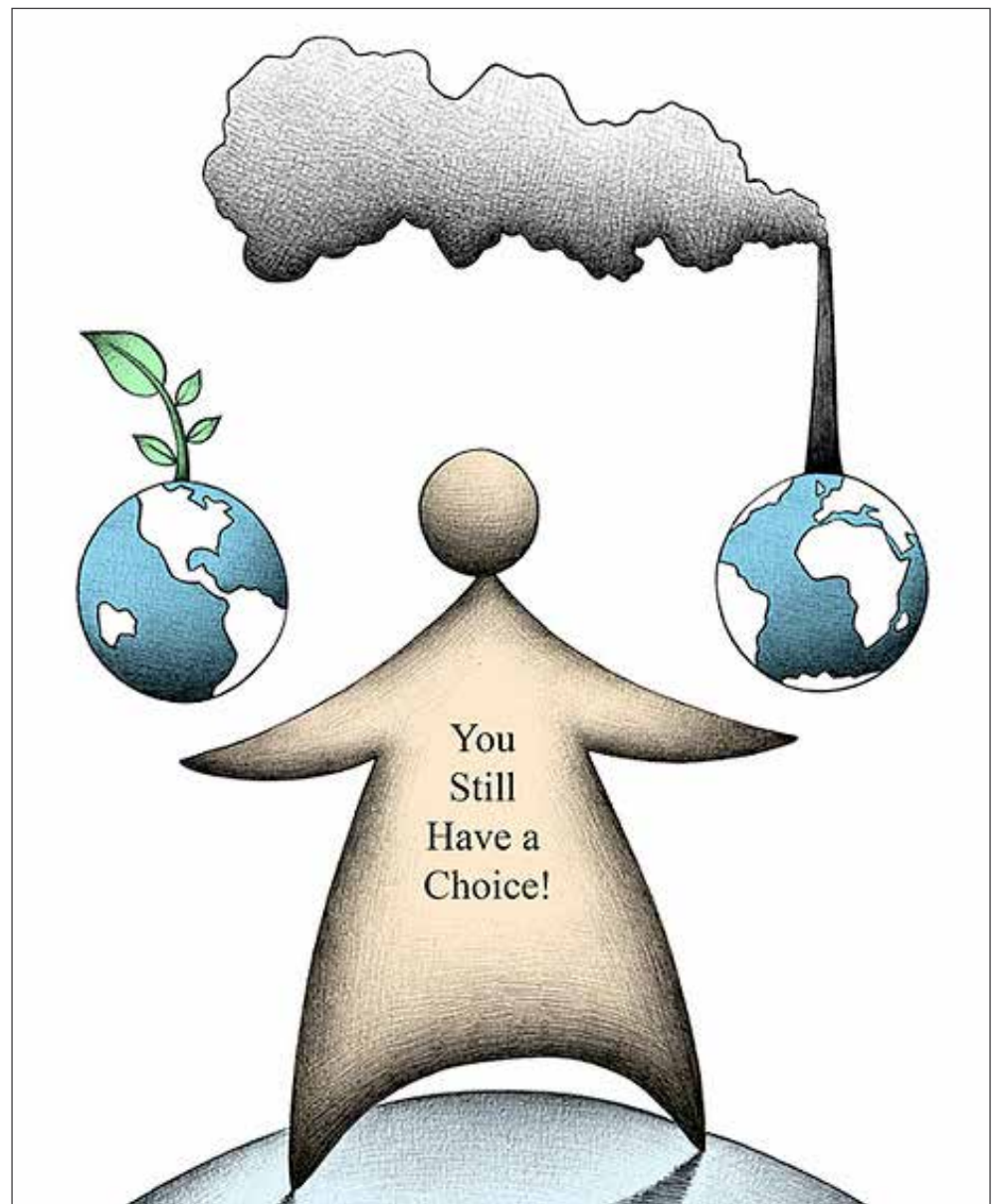
Switching to organic methods in communities where people struggle to feed themselves and their families can lead to a harvest 180% larger than that produced by conventional methods.

### Conclusion

The hallmark of a truly sustainable system is its ability to regenerate itself. When it comes to farming, the key to sustainable agriculture is healthy soil, since this is the foundation for present and future growth.

As we face uncertain and extreme weather patterns, growing scarcity and expense of oil, lack of water, and a growing population, we will require farming systems that can adapt, withstand or even mitigate these problems while producing healthy, nourishing food.

Source: The Rodale Institute's Farming Systems Trial (FST)®, <http://rodaleinstitute.org>



# Terra Nova

Reg. No. B4145 Act No. 36 of 1947

**HYGROTECH'S LATEST ADDITION TO THE SUSTAINABLE SOLUTIONS PACKAGE**

Terra Nova is a wonderful catalyst for natural processes to optimise plant growth, while enhancing the soil at the same time.

Based on composted chicken manure, Terra Nova offers the following benefits:

- Enhances root development
- Increases the cation-exchange rate in the soil
- Enriches soil and the natural microbial life in soil
- Decreases leaching of nutrients
- Increases organic matter
- Improves soil structure
- Increases carbon in soil
- Slow release of nutrients
- **Is extremely cost effective** compared to organic and inorganic fertilizers

Terra Nova has a large range of applications:

Crop	Time	TerraNova Kg / Ha
Lawns & turf	Pre-plant	300-500
	At planting	100-200
	Post plant	300-600
Vegetables	Pre-plant	500-2 000
	At planting	500-1 000
Corn	At planting	250-400
Sunflower	At planting	250-400
Soya	At planting	250-350
Other beans	At planting	250-350
Wheat	At planting	250-350
Forage		200-500

*BEAUTY IS IN THE EYE OF THE BEHOLDER.*

## Agri-gro Namibia

Together we make it grow

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## General principles of organic beef production

Organic farming aims to produce food of high nutritional value and healthy, quality livestock and crops while enhancing and protecting the farm's natural assets. These include fertile, mineral and micro-organism rich 'living' soils which are the foundation of organic production.

### Animal and plant health stems from soil health

The underlying principle of organic animal production is that: 'healthy animals grow from healthy plants, and healthy plants grow from healthy soil'. Well balanced, biologically enhanced soil - measured by adequate organic matter, humus level, crumb structure and feeder root development - forms the basis of organic beef production.

### Animals fed to suit their physiology

Feeding should be suited to the animal's physiology. Ruminants require a high proportion of forage in their diet so their digestive systems can function naturally. The preferred method of nourishing organic livestock is by 'free choice' feeding, where animals are free to select from a wide variety of foods natural to their diet.

Cattle must have access to range land / veld and only eat certified organic feed. Organic standards require that animals graze on and are fed certified organic lands and supplements. There are limits to the amount of in-conversion and non-organic (meeting

specific criteria) that may be fed to animals in a year, based on the total dry matter intake for the year. Specific details can be found in the standards to which the producer wishes to certify. Feeding of mammalian material (excluding milk) to ruminants is prohibited, as is the use of growth promoters - including hormones and antibiotics in feedstuffs.

### Husbandry systems conform to highest welfare standards

The welfare of animals is paramount in organic farming. Maintenance of livestock must be guided by an attitude of care, responsibility and respect. It is believed that the health and vitality of an animal largely depends on the way in which an animal is kept. Stress is seen as a contributing factor to development of disease, and distressed animals are reportedly less able to adjust to change.

### Animal health is maintained through preventative husbandry, animal welfare and appropriate feeding systems

Organic animal health aims to build immunity and develop resistance to disease, infection, parasitic attack and metabolic disorders through good management. This means practicing preventative healthcare, providing sound nutrition and ensuring good breeding and selection of environmentally well adapted animals.

The cause of any disorder needs to be corrected, rather than simply treating the symptoms. Sound nutrition can be achieved through correct soil fertility and through diversity in the diet, which in turn provides balanced mineral and dietary input.

Dietary intake should be based on balanced quality forage, and not reliance on supplements or concentrates. Feedlotting is generally considered unnatural - especially for ruminants. Organic standards prohibit intensive feedlot production.

### Prophylactic chemical treatments are avoided

Standards generally allow the use of vaccines for endemic diseases, treatment of external parasites and for two courses of antibiotic treatment per animal per year. However the use of antibiotics is not permitted in organic agriculture in the USA and Australia, and there are strong calls within the UK and some continental countries for their total ban in certified organic livestock production. At the Second IFOAM Organic Animal Husbandry Conference held in 2012 members of the Namibian Organic Association successfully defended the right of African organic farmers, certified to one of the IFOAM Family of Standards, to maintain the right to use two courses of antibiotics. The push for the total ban arises from the abusive use of antibiotics by non-organic livestock farmers which is leading to the development of antibiotic resistant "super bugs" and the diminished number of antibiotics which can be used to treat humans.

(For more information see <http://www.soilassociation.org/antibiotics>.)

It is imperative that any organic livestock producer continuously ensures that they have the latest information from their certifier regarding antibiotic use in their enterprise.

Diseases and parasites are controlled by management practices rather than

reliance on veterinary products. If management efforts prove insufficient, use of permissible products such as homeopathic medicines is a secondary measure, and not a substitute for good management practices.

If permissible treatments fail, producers must use other veterinary-recommended medicines which are not permitted in organic standards if continued avoidance of these would result in unnecessary suffering for the animal. Unfortunately, the meat from these treated cattle can then never be marketed or sold as organic.

Animals given such prohibited treatments must be identified and quarantined from organic land and animals for at least three times the withholding period of the treatment. Their offspring can be sold as organic, providing the non-permitted treatment was given prior to the last trimester of pregnancy. Product residue testing may be required.

### Natural breeding and rearing

Livestock should be bred using the natural method of sires. The use of artificial insemination is again

standard-specific. Embryo transfer, genetic engineering and routine use of reproductive hormones or synchronising drugs are not permitted in organic farming.

To give animals natural immunity against infection, calves should be reared by their mother. Suckling or bucket-rearing on organic whole milk for a minimum period after birth can be required in organic standards.

### Minimum qualifying period

Farms intending to raise organic cattle must have reared the cattle on land managed in accordance with organic standards for at least one year in order to qualify for certification as 'in conversion' to organic. A minimum of three years' compliance is required to qualify for certification as full organic.

### Avoid contamination and spray drift

Potential sources of contamination, from spray drift, water sources or other means, can require careful consideration. Buffer zones are likely to be required between organic and non-organic crops.

Neighbours must be informed of contamination risk and co-operation

sought. Soil tests may be required to check for chemical residues in soils from previous land use.

### Genetic engineering is banned

The use of genetically engineered organisms (GMO's) and their products are prohibited in any form or at any stage in organic production, processing or handling. Crops and land must be free of GMO contamination.

### Limits on introduced livestock

Livestock should be bred on the property. Animals introduced from other than certified organic sources may be limited to a certain percentage of the herd per year and may need to be quarantined from organic land and stock for a set time. While these introduced animals may never be sold as organic, their progeny can be certified organic if organic management practices defined by the standards have been adhered to. Residue testing of meat products can be required.



## Are cattle climate killers?

In some public debates, cattle are climate killers, and therefore, apparently, we should stop eating red meat. But the main problem is the environmentally unfriendly cattle.

Cows "burp" methane, which is 25 times more damaging than carbon dioxide. However, there needs to be distinctions between different agricultural systems: from eco-friendly and sustainable resource use and energy intensive industrial approaches.

The highest agricultural emissions are caused by the synthetic fertilisers used in

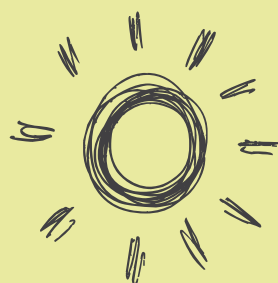
the vast monocultural production of concentrated feed as part of intensive agriculture. Chemical fertilisers need a lot of energy in the making and later emit nitrous oxide - which is 295 times more damaging to the climate than carbon dioxide.

In contrast to this cows and other ruminants can actually reduce climate change. And the reason for this is - pasture covers about 40% of the global land mass. Through sustainable pasture management carbon is stored as humus in the soil and contributes to the fertility of the soil. Each ton of humus in the soil captures about 1.8 tons of carbon dioxide from the atmosphere.

Yes, cows burp methane. Yet they and other ruminant animals are vital for feeding the world: through

sustainable grazing they can provide milk and meat from grass while contributing to the maintenance of soil fertility and climate change mitigation. We just need to choose and support the right agricultural system.

Source: Anita Idel, a veterinarian, mediator and a lead author of the IAASTD report. A revised and enlarged English translation of her book, 'The cow is not a climate-killer! How the agricultural industry destroys the earth and what we can do about it' is in preparation. [www.anita-idel.de](http://www.anita-idel.de)



Sustainable rangeland management captures carbon in the soil. Sprinbokvley, Namibia

# ORGANIC FARMING

## Maize production for small-scale farmers

### Traditional maize intercropping systems in South America

Intercropping or polyculture, is agriculture where multiple crops are allowed to grow in the same area over a production period, imitating the diversity of natural ecosystems.

In South America, an intercropping system called Milpa, or the “three sisters”, has existed for more than 2000 years. Milpa means that maize, beans and curcubitae grow as ideal “partners”, complementing each other in the fields as well on the plate from a nutritious point of view. The advantages of this polycultural system are that they increase the maize and bean yields, improve soil fertility and enhance efficient pest control.

### Push and Pull Strategy – a scientific developed maize intercropping system in Africa

In Kenya, farmers and researchers from ICIPE\*

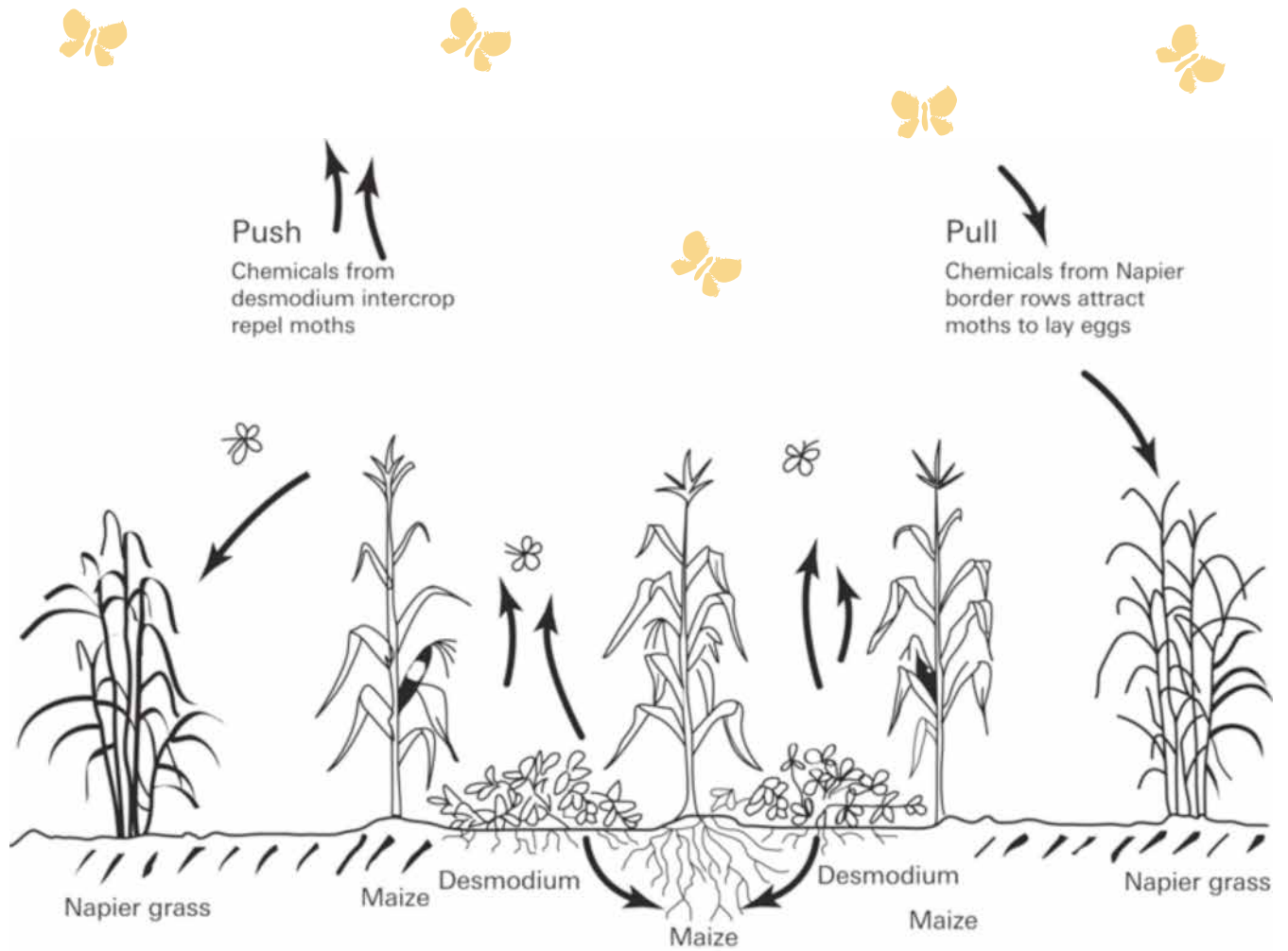
developed the “push-pull” strategy to control parasitic weeds and insects that damage crops. The strategy “pushes” away pests from maize by inter-planting corn with insect-repelling varieties like Desmodium, while “pulling” them towards small plots of Napier grass, a plant that excretes a sticky gum which both attracts and traps pests. The system not only controls pests but has other benefits as well, because Desmodium can be used as fodder for livestock. The “push-pull” strategy can double maize yields and milk production while, simultaneously improving the soil.

(ICIPE\* International Centre of Insect Physiology and Ecology); read more at: <http://www.push-pull.net/>)



Intercropping system using Maize and Desmodium, Kenya (Photo: Koechlin)

## Small scale farmers



Push and Pull System (ICIPE)

## Make your own organic pesticides

### Neem oil

Neem oil is extracted from the neem tree (*Azadirachta indica*) which grows in the northern parts of Namibia. Originally from India, this relative of mahogany has white honey scented flowers and yellow olive shaped fruit. It is a broadleaved evergreen tree that, as a tender perennial, cannot withstand freezing temperatures. It grows well in hot, dry conditions in poor soil, but cannot withstand overwatering or frost. Neem can be used as a natural pesticide to control pests, mites,

nematodes, and some pathogenic fungi. Neem trees can be cultivated from seeds, or cuttings and small trees can be sourced at the Ministry of Agriculture, Water and Forestry.

Neem oil is an organic pesticide made from the seeds or leaves of the neem tree. One of the most potent components is the limonoid azadirachtin, which when applied, leaves some insect larvae unable to metamorphose, preventing them from becoming adults and reproducing. It also prevents the insects feeding and acts as a repellent. It is effective for over six hundred different species of chewing and sucking insects, while the other, friendlier garden creatures such as bees, are not affected. Neem oil

pesticide also protects plants from fungal diseases. Growing neem is inexpensive and supplies a gardener or small-scale farmer with a steady supply of seeds and leaves that can be used as needed.

### Steps to make your own neem pesticide

Step 1. Collect neem seeds or leaves



Step 2. Pound it into a paste



Step 3. Add water



Step 4. Strain and apply to plants. Adding a small amount of dishwashing soap to the water as an emulsifier can help suspend the neem in water.



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## Small scale farmers

### Improving soil organic matter for the small scale farmer

Soil organic matter is essential to the soil's capacity to hold water and nutrients and supply them to plants when they need them

The aim of any good farmer is to build active soil with a good structure that can hold water and supply plants with nutrients. Organic farmers achieve this by applying practices that improve the organic content of the soil and enhance the activity of soil organisms.

Any plant and animal material added to the soil decomposes and partially transforms into soil organic matter, also called humus. Under natural conditions, the organic matter content of soils increases slowly as a result of continuous addition of organic materials to the soil.

#### Soil organic matter:

- Acts as a reservoir for nutrients and releases them in a balanced way, contributing to good plant health;

- Binds soil particles together and improves the soil's structure, which increases water infiltration, resistance to erosion and enhances root growth;
- Regulates the acidity or alkalinity of the soil, improving the ability of nutrients to become soluble and available to plants;
- Provides food and a favourable environment for soil organisms, improving nutrient mobilisation from organic and mineral sources, and soil health;
- Acts like a sponge with the ability to absorb and hold up to 90% of its weight in water, increasing the water holding capacity of soil.

**In a country as dry as ours, it is important to increase the water capturing and holding capacity of soils, using the following techniques:**

- Growing green manures, particularly legumes or oats and rye over the winter, for the large quantities of fresh plant material they produce. They are then cut and ploughed back into the soil to feed the soil organisms and provide nutrients for the crops that follow;
- Intercropping cover crops such as velvet bean, cow peas and sun hemp as living mulch. Regularly

slash the cover crop before it competes too much with the main crop;

- Mulching with especially hard to compost or woody material such as thick cardboards or grasses. They break down slowly and contribute to an increase in soil organic matter over time;
- Growing trees and shrubs for agroforestry in and amongst crops, on the edges of fields or on fallow plots, where they are regularly pruned and the branches used as mulch;
- Returning crop residues from harvest crops in the form of husks, leaves, roots, peelings and twigs either as compost or mulching materials;
- Adding organic materials from primary agro processing, such as wood shavings;
- Introducing livestock on the farm for a regular supply of manure and bedding for recycling; and,
- Practice Namibian-specific conservation tillage when planting mahangu, maize or cowpeas.



#### Adding organic materials to the soil



Mulching



Tree cuttings



Crop residues



Animal manures



Cover crops



Compost



Balanced rotation



Green manures

### Soil organic matter

... provides food and a favorable environment for soil organisms, improving nutrient mobilisation from organic and mineral sources, and soil health.

... binds soil particles together improving the soil's structure, which increases water infiltration, resistance to erosion and enhances root growth.

... acts as a reservoir for nutrients and releases them in a balanced way, thus contributing to good plant health.

... regulates the acidity or alkalinity of the soil, improving the ability of nutrients to become soluble and available to plants.



... acts like a sponge with the ability to absorb and hold up to 90 percent of its weight with water, thus increasing the water holding capacity of soil.

For more information download the **AFRICAN ORGANIC TRAINING MANUAL**  
[www.organic-africa.net](http://www.organic-africa.net)

## Organic Box

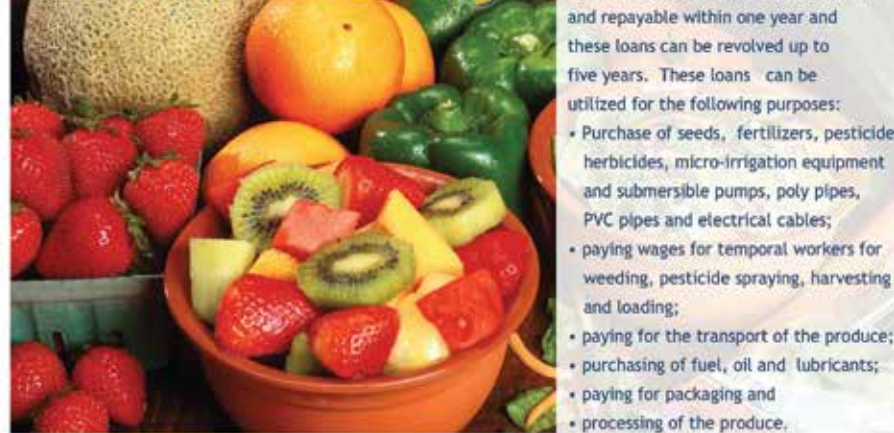
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## Horticulture Production Loan Facility



Agribank offers agronomic production loans for small scale farmers and corporate projects which are seasonal and repayable within one year and these loans can be revolved up to five years. These loans can be utilized for the following purposes:

- Purchase of seeds, fertilizers, pesticides, herbicides, micro-irrigation equipment and submersible pumps, poly pipes, PVC pipes and electrical cables;
- paying wages for temporal workers for weeding, pesticide spraying, harvesting and loading;
- paying for the transport of the produce;
- purchasing of fuel, oil and lubricants;
- paying for packaging and processing of the produce.

- Applicants must have a clean credit record.
- Applicants can either be full or part time farmers.
- Applicants should be Namibian citizens.
- Applicants must provide a business plan.
- Agribank offers flexible installment options to suit client's financial needs. The available installment options are: monthly, quarterly, bi-annual or annual.
- Loans are granted against security of fixed property, investment or any other acceptable form of security (fixed deposits, investments and surrendering value of policies).
- Quotations from registered dealers /suppliers must be provided.
- Companies or co-operatives should provide audited financial statements, certificate of registration, association agreement, shareholders or directors of the company and must have a registered Auditing Firm.



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# Growing Organic Agricultural Sector

## Global Organic Statistics 2014



Manjo Smith, Namibian Organic Association

Namibian farmers are encouraged to supply organic products for the local and international market.

**1.9 million certified organic farmers in 164 countries on 37.5 million hectares and a global market for organic food worth 63.8 billion US dollars is what the organic movement achieved up to 2012. The global trend remains positive, but the ambitions of the organic movement go far beyond the present uptake.**

For more information visit <http://www.organic-world.net>

The positive trend of the past remains unbroken; consumer demand increases (with 10 % market growth in the world's largest organic market, the US), more farmers cultivate organically (+5%) and more land is organically certified (+0.5%) by the end of 2012, as shown in the 2014 edition of the FiBL-IFOAM study "The World of Organic Agriculture".

### Global Statistics 2014: The market, the producers, and the area

The market research company Organic Monitor estimates the global market for organic products in 2012 reached almost 64 billion US dollars (ca. 50 billion euros). The leading market is the United States with 22.6 billion euros, followed by Germany (7 billion euros) and France (4 billion euros). The countries with the highest per capita spend were Switzerland (189 euros) and Denmark (159 euros).

Moving from consumers to

producers; according to the FiBL-IFOAM survey, approximately 80 percent of a global total of 1.9 million organic producers (up from 1.8 million) are located in developing countries. As in previous years, the countries with the most producers are India (600'000), Uganda (189'610), Mexico (169'707), and Tanzania (148'610).

From a farmland perspective, a total of 37.5 million hectares were organic at the end of 2012. An increase of almost 200'000 hectares was reported compared with 2012. In Africa, organic land increased by seven percent and in Europe by six percent.

One third of all global organic agricultural land is in Oceania (32 percent; 12.2 million hectares), followed by Europe (30 percent; 11.2 million hectares), and Latin America (18 percent; 6.8 million hectares). Australia is the country with the largest organic agricultural area (12 million hectares, with 97 percent of that area

used as grazing), followed by Argentina (3.6 million hectares) and the United States of America (2.2 million hectares). The countries with the largest share of organic agricultural land of all farmland are the Falkland Islands (36.3 percent), followed by Liechtenstein (29.6 percent) and Austria (19.7 percent).

The most significant expansion in organic area as well as solid market growth noted in recent years has been in Europe. More information is available from a recently published study by the European Union Group of IFOAM, FiBL and the Mediterranean Agronomic Institute (CIHEAM-IAMB) which shows the potential for further growth in Europe based on a supportive public policy environment and increasing consumer demand.

### Organic in Namibia

According to Manjo Smith,

Namibian Land use	Hectares
Horticulture	26.40
Crops (agronomy)	448.00
Rangeland	2,2605.00
Wild Harvesting	2,400,000.00
Total*	2,423,079.40

\*Number of organically certified hectares in Namibia.

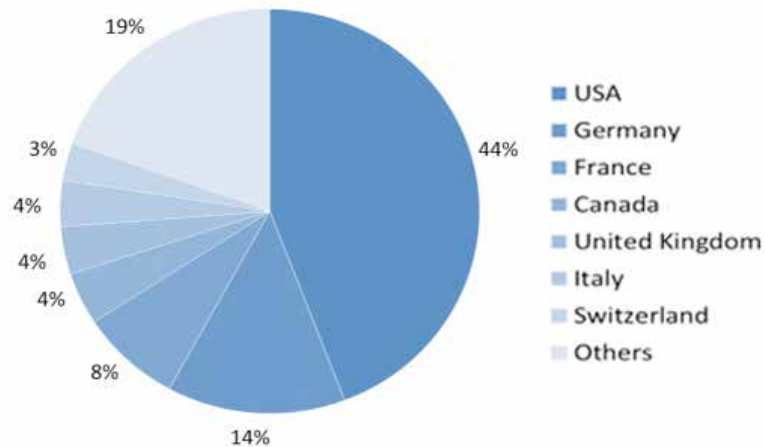
chairperson of the Namibian Organic Association and IFOAM World Board Member, the market demand in Namibia is much higher than the local supply. "The demand for organic certified food in all categories is simply not met; vegetables, fruit, meat, dairy and grains as well as fodder for organic animals. This poses a great opportunity for small-scale and large-scale producers who want to serve this market. We find that consumers choose organic for different reasons: personal and family vitality and health because of the increased nutritional value of organic food and the lack of agricultural chemicals

such as pesticides and the fact that organic production sustains and improves the environment, the support for biodiversity in the environment. The demand for genetically modified (GM) free food is also a huge driver towards organic, as genetically modified organisms are not allowed in organic production. Currently, 2,400,000 hectares are certified organic in Namibia through 3rd party certification and 23 079 hectares through the Namibian Organic Association's Participatory Guarantee System (PGS).

See graphs below:

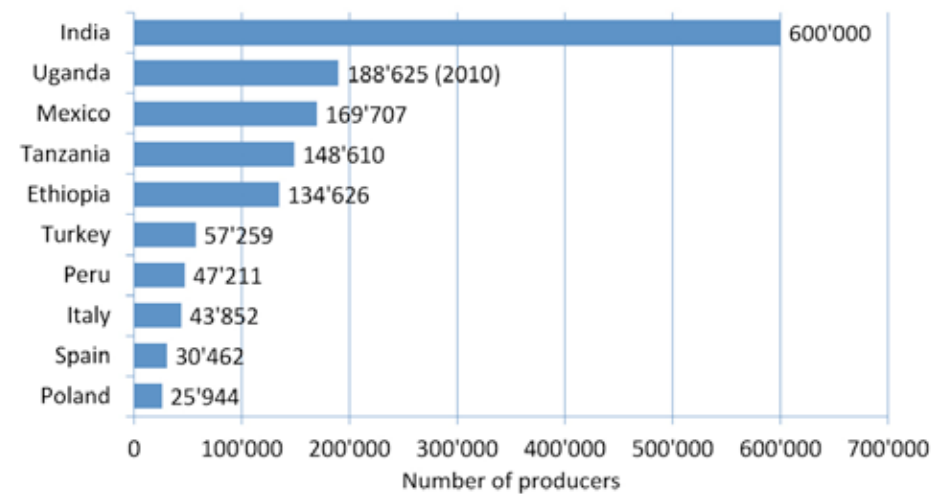
### Global Market: Distribution of total retail sale value by country

Source: FiBL-AMI-IFOAM Survey 2014



### The ten countries with the largest numbers of organic producers 2012

Source: FiBL-IFOAM Survey 2014



## Training Courses

The Namibian Organic Association offers tailor made courses to farmers, development projects, lodges with their own vegetable gardens and home gardeners. Training takes place on various aspects of organic agriculture:

- Conversion to organic agriculture
- Building soil fertility through compost production, crop rotation and green manuring
- Principles of organic vegetables, herb and fruit production
- Pest and disease control

Contact NOA for more details. [info@noa.org.na](mailto:info@noa.org.na)



Midgard Country Estate gardeners trained in organic vegetable production methods.



Organic training course offered to the Bridge of Hope Feeding Project (or Katatura and Groot Aub Soccer Academy).



NOA board members Fltr: Stephen Barrow (insert), Richard Kamukuendjandje, Eric Garnie, Manjo Smith, Edith Kalka, Eckhart Förtsch, Ina Cramer, Judith Isele.

## About NOA

The Namibian Organic Association (NOA) is a membership-based association of persons and corporate bodies who share interests regarding the production, processing and marketing of organic products, and provides training in organic farming principles.

Anyone interested in joining or supporting NOA is welcome to become a member. Visit [www.noa.org.na](http://www.noa.org.na) for NOA news and activities.

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