

Newsletter

07

What is Biological Farming?



The Reams Soil Tests, which tests for plant available nutrients, are showing that our soils are depleted of minerals needed to grow good quality food for ourselves and our animals.

The Reams Soil Test used in conjunction with an acid based soil test gives the farmer/grower a clear picture of the plant available nutrients and the total nutrients in your soil. Soil Foodweb testing is showing that our soils have little life in them and what life there is – it is bacterial.

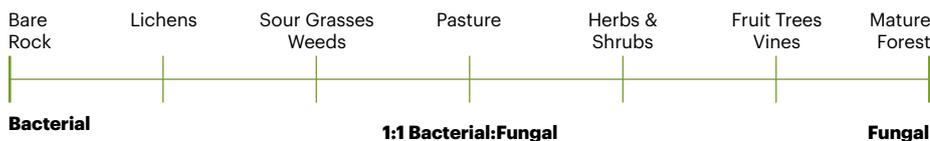
The Successional Time Line (see diagram below) was developed by Dr Elaine Ingham of the Soil Foodweb, and is based on how soil develops from bare rock (pioneer ecosystems) through to mature forest (or climax ecosystem). All soils are trying to reach a climax ecosystem.

Bacterial dominated soils are good for pioneer ecosystems – which grow weeds and lichens. Weeds grow to re-vegetate the soil, to prepare it for more complex plants such as pasture and trees. If you want to grow pasture, your soil needs to be balanced between bacterial and fungal. If you want to grow fruit trees, your soil will need to have more fungi than bacteria.

Trying to grow plants in the wrong part of the Successional Time Line (for example growing fruit trees in a 1:1 bacterial/fungal system better suited to pasture, or growing pasture in a bacterial dominated soil where lichens and weeds should be growing), will produce sick plants that get attacked by insect pests.

Every time we spray weeds or disturb the soil through cultivation, we are putting our soils back in the successional timeline towards the “bare rock” end where pasture/fruit trees are not suited to grow (opening them up to disease and insect attack).

Continued on page 2 >



PIONEER ECOSYSTEM

CLIMAX ECOSYSTEM

Standard agricultural practices keep sending system back towards “bare rock” eg. spraying, acid fertilisers, cultivation etc.

(Based on work of Dr Elaine Ingham)

Inside this issue:

- Pg 1** What is Biological Farming?
- Pg 2** Importance of Sulphur
- Pg 3** Increase your Brix Levels
- Pg 3** Foliar Feeding Rules
- Pg 4** Roundup strikes again
- Pg 5** Farming controversies
- Pg 6** Living in Turangi



SAVE 50% ON YOUR NITROGEN BILL

Add EF Humates @ 5% and reduce your Nitrogen applications

What is Biological Farming? contined...

In biological farming we are aiming for soil microbes to cycle minerals to supply all the nutritional requirements of our plants. However, to take our soils (which are depleted of soil life and the minerals needed to grow plants) to a level where the microbes are cycling

the nutrients, we need to first nurture them. We need to supply nutrients in a plant available form that will not be readily leached by the first rainfall. We also need to re-inoculate our soils with the beneficial soil microbes needed to cycle these nutrients to the plants.

Environmental Fertilisers sell beneficial soil microbes and a lot of our fertilisers are inoculated with these microbes to start building the soil biology on your farm as you fertilise. Lets rejuvenate the soil biology and get them working for us again.

Sulphur's importance in the soil

Adapted from Hugh Lovell

While carbon in almost any form is a benefit to the soil, it helps enormously if it is accompanied by the right ratios of nitrogen, sulphur and phosphorous.

Though these ratios are not set in stone, a target for carbon to nitrogen is 10:1; for nitrogen to sulphur is 5.5:1, and for nitrogen to phosphorous is 4:1. This works out to an ideal carbon to sulphur ratio of 55 to 1, and a carbon to phosphorous ratio of 40 to 1.

A more urgent deficiency to remedy is sulphur. Sulphur works at surfaces and boundaries making things accessible. As such it is the catalyst for most of plant and soil chemistry. For example, sulphur is what peels the sticky, miserly magnesium loose from its bonding sites in the soil. Without sufficient sulphur the plant may not take up enough magnesium, even if it is abundant in the soil. This deprives the plant of sufficient chlorophyll to make efficient use of sunshine, and then there is a shortage of sugary root exudates to feed nitrogen fixation—which requires ten units of sugar to produce one amino acid. Considering how common magnesium deficiency is in plants growing on magnesium rich soils, we shouldn't ignore sulphur deficiencies in the soil reserves. Many soils are abundant with magnesium, but without the 55 to 1 carbon to sulphur ratio needed for optimum growth plants can easily

be magnesium deficient, poor in photosynthesis—and when they don't make enough sugar they won't have good nitrogen fixation.

One can amend sulphur in the soil in various ways. With chars or raw humates, both of which are deficient in nitrogen and sulphur. Small amounts of ammonium sulphate (34 to 90 kg/ha) can be helpful – but keep in mind this is a soluble chemical and only so much can be absorbed by the soil's carbon complexes and the microbial life they support.

Potassium sulphate might also be of use (but total testing often indicates an abundance of total potassium), but again this is a soluble chemical and can interfere with magnesium uptake, which usually is counterproductive.

Gypsum (calcium sulphate) is most commonly used for corrections, though only about 50 ppm of sulphur (0.9 to 1.3 tonnes/ha) can be absorbed by the soil in one application.

The problem here is sulphate tends to leach if there's too much. That might be good if all it carried with it was magnesium, as most soils are high in magnesium. But, what if the sulphate carries copper, zinc, manganese or even potassium along with it? Can we afford such losses? If we try to keep soluble sulphur topped up at 50 ppm (Morgan test) by using gypsum mixed with compost or raw humates, gypsum probably will work beautifully and not acidify the soil. It may take a few years to build sulphur levels into the soil totals, but patience is a virtue.

However, when the soil pH is already 7.0 or above, elemental sulphur becomes the input of choice. Elemental sulphur pulls oxygen out of the atmosphere as it oxidises to sulphate and this lowers pH—which for alkaline soils is desirable. Again, try to keep the soluble sulphur level around 50 ppm and gradually build this element into the soil reserves as humic reactions or interactions progress.

Although sulphur deficiency limits phosphorous availability, the key deficiency that often must be remedied to make phosphorous available from soil totals is copper. Phosphorous is useless without copper. Though 2 ppm soluble copper is generally considered adequate, 5 ppm gives more margin and 10 is not harmful unless the soil is extremely light with poor humus reserves.

Zinc deficiency can also keep phosphorous tied up, and a 10 to 1 phosphorous to zinc ratio is a desirable target in total tests. Total tests of rock phosphates generally show the desired amount of zinc. Usually trace mineral deficiencies such as copper and zinc show up most clearly in winter where these elements work 1/100th less efficiently at -1°C or 4°C as they do at 21°C or 27°C. The signs of these deficiencies are quite obvious in winter, and if the deficiencies are remedied, growth in cool periods of spring or autumn will be much better.



How to Increase Your Brix Levels in Pasture

Instead of re-grassing your paddocks and going through the expense of buying new “high sugar” grass seed and sowing the seed and so on, you can actually increase the brix levels in your pasture with a few simple steps.



Oats and tama mix growing in Hauraki.

Brix is the measure of the concentration of sugars, vitamins and other minerals dissolved within plant. A refractometer is used to measure the Brix level of the plant. The higher the Brix level, the more sugars and minerals in the pasture, the healthier your stock will be.

High nitrogen rates applied to pasture does not increase brix levels. In fact it does the opposite. In a paddock that is transitioning to biological farming, which received 200kg/ha of Environmental Fertilisers' BioRocket (a nitrogen fertiliser), the Brix measured 7, compared to an area that received twice the amount of BioRocket at 400kg/ha, where the Brix was only 5.

To increase your Brix levels in your pasture you need to supply your plants with luxury levels of calcium and phosphorus, with boron to back it up. The only way to do this is through knowing what your soil and plants needs through using the Reams Soil Test.

The Reams Soil Test is different from your standard soil test you may have had done in the past. Developed by Dr Carey Reams using milder extractants to mimic how plant roots extract minerals from the soil, the Reams Soil Test tells us what minerals in the soil are available for plants to use. The Reams Soil Test quickly shows us when plants need more minerals such as calcium and phosphorus.

Cardinal Rules for Foliar Feeding

Foliar sprays are a powerful command to plants saying, “Get to work--make more corn, tomatoes, etc”.

The plant requires energy to respond to that foliar command. To replenish the energy requirements, plants draw upon the energy in the soil while making the crop. If energy is abundant in the soil, plants will be productive.

Foliar sprays increase productivity by providing nutrients and an energetic stimulus. A foliar spray program can increase yield/productivity by several percentage points if the soil has energy.

When soil conductivity (energy) is low, yield suffers, quality suffers and profit suffers. Foliar spraying with low soil conductivity is like expecting top performance from the red team. They just didn't have enough energy to perform.

Here is the practical application of this principle. For gardeners, greenhouse growers and market gardeners, first get your energy up in the soil by fertigation of nutrient drenches, then foliar spray for increased yield and quality.

For farmers with margins tightening, every dollar counts. Please recognise that the same foliar spray that can make you more money is the same spray that can lose you money if your conductivity is not maintained.



Roundup (glyphosate) strikes again

By Greg Tate

I've written about this herbicide before and it's wide-spectrum toxicity to humans and farm animals and must sound the alarm again.

Genetically modified (GM) crops like 'Roundup-Ready' patented varieties are designed to withstand lethal doses of Roundup, which means that the plant is permeated by high levels of Roundup from repeated weed spraying. This is ingested by farm animals from stock feed and humans (imported soy and canola oil being predominantly GM), resulting in a raft of health problems already reported on in previous newsletters. NZ imports a lot of GM stock feed, and glyphosate is a commonly used weed killer on NZ farms for spraying out pastures etc.

The following comments are from Dr Mercola's website, with the latest findings on Roundup and how consumers in the US are getting wise to its human health fallout through the GM labelling controversy.

Monsanto has steadfastly claimed that Roundup is harmless to animals and humans because the mechanism of action it uses (which allows it to kill weeds), called the shikimate pathway, is absent in animals. However, the shikimate pathway is present in bacteria, and that's the key to understanding how it causes such widespread systemic harm in both humans and animals. Bacteria in your body outnumber your cells by 10 to 1 (its these bacteria in your stomach that help to digest your food). For every cell in your body, you have 10 microbes of various kinds, and all of them have the shikimate pathway, so they all are affected by glyphosate. The same argument applies to animals.

Roundup was patented as a biocide. That is, it's an antibiotic (kills bacteria), so it affects not only the soil by killing the beneficial bacteria that provide nutrients for plant growth, but it also kills beneficial bacteria in your gut. It kills the beneficial bacteria Bifidus and Lactobacillus, but



GMOs anyone?

not disease-causing bacteria like E. coli, Salmonella, and botulism bacteria. When you kill beneficial gut bacteria, your immune system and digestive tract are both compromised, resulting in toxins and undigested food particles being absorbed and chronic inflammation developing.

Tests showed that people in 18 countries across Europe have glyphosate in their bodies; while another study revealed that the chemical has estrogenic properties and drives breast cancer proliferation in the parts-per-trillion range⁴. This finding explains why rats fed Monsanto's GM maize developed massive breast tumors in the first-ever lifetime feeding

study published last year (see previous newsletter 04 in 2012).

Other recently published studies demonstrate glyphosate's toxicity to cell lines, aquatic life, food animals, and humans. In fact, research⁵ has shown that Roundup is toxic to human DNA even when diluted to concentrations 450-fold lower than used in agricultural applications. Liver-, embryonic- and placental cell lines are adversely affected by glyphosate at doses as low as 1 ppm. GMO corn can contain as much as 13 ppm of glyphosate, and Americans eat an average of 90 kg of GMO foods annually.

Continued on page 5 >

Roundup strikes again
continued...

This is what your grocery store looks like without bees



What will be the average NZ intake with no effective GM labelling of our processed foods and GM feed being fed to our stock?

The message is clear. The Fonterra botulism scare was bad enough to freak out importing countries all around the globe (do a Google search for botulism + GMO to find out). But the GMO-glyphosate story could be much more damaging to overseas markets when consumers realise they are being stealth-poisoned by glyphosate residues and alien genes in their milk, meat and plant produce.

The tide in America is already turning against GM ingredients and glyphosate in foods as supermarkets see the negative impact GM ingredients are having on food sales. Consumers are voting with their dollars against GM foods as they learn of the insidious human health effects of these crops.

My advice is to vigorously oppose the introduction of any GM crop varieties into the NZ farming scene (it will increase the use of glyphosate); avoid feeding your cows stock feed containing GM varieties, and find another way to prepare paddocks for pasture renewal instead of using glyphosate.

In addition, if you want to live to a ripe old age and avoid the chronic effects of GM food ingredients, read all food labels and avoid all processed foods, especially those containing soy or canola oil or 'vegetable oil', which being highly refined contains trans-fats – very bad for your health. Also avoid sugar, high fructose corn syrup, MSG, food colourings and artificial sweeteners like aspartame. These are all poison to your body, and especially to children.



Immediate Protection Required

“Grow your own vegetables without any pesticides or herbicides and make your food so you know what ingredients are in it.”

Greg Tate



Life in Turangi

By Greg Tate

The pace of life has considerably slowed down since leaving EF, apart from when I get out on the lake with the boat.

It's a different experience waking up without the urgency to get to work, and think about fishing instead. There's hardly been standing room in the river just below the bridge at the moment with the trout heading up river to spawn. My fish finder also tells me there are heaps of fish around the lake drop-off zone. But I haven't been fishing yet.

Having to eat supermarket greens for the last few months galvanised me into a planting frenzy, resulting in lettuce, mesculin, brassicas, kale, parsley and strawberry seedlings filling the garden patch and feijoas, mandarins, and fig trees along the front boundary. Even some roses for Lauraine.

A group of 30 Māori women are starting up a community garden on a vacant section just around the corner.

Found them while walking the dogs. So I have an opportunity to help them grow nutrient dense produce.

I've run into some interesting types down here. An electrical inspector who worked on the power station project, which through a complicated series of tunnels divert stream water from different catchments south of here, funnelling them through the Tokaanu power station and improving the inflow to lake Taupo by 25%, thereby enabling the Waikato river power stations to increase power output by the same amount, and increasing the lake level by a meter. We will check it all out sometime.

We have the national trout hatchery down here so might be able to wangle some hatchlings for my aquaponics venture which is on my list of 'things to do'.

Not enough hours in the day to do all I would like to do, and with the slower pace it takes longer.

God bless you all.



Ring our sales team for this seasons new products and specials!

0800 867 6737

Our Goal

To maintain and grow your soil health & productivity, pasture & crop yields & profitability by supplying fertilizers producing mineral-dense feed/food.

Our Motto

Healthy soil, healthy pasture/crops, healthy animals, healthy consumers.



Environmental Fertilisers | Beyond Organics™

1 Railway Street, Paeroa,
Waikato, New Zealand
PO Box 204 Paeroa

P: 0800 867 6737
F: 07 862 8169
E: info@ef.net.nz

www.ef.net.nz