

BUSINESS | PLANET | WELLBEING



element

elementmagazine.co.nz



The agriculture issue

Is biological farming New Zealand's great opportunity?

Photo essay

The Syrian crisis


Solving the DoC dilemma

Nutrition

The power of green smoothies

Plus: Te Radar / Gardening / Organics / Technology / Agri Finance

The iconic images of rural New Zealand are known around the world – the advertising for our largest export sector. This is a country built on agriculture.



Country practice

Alongside our agricultural tradition has grown unrivalled technical expertise in the sector, which is held in high regard and sought around the farming regions of the planet.

But with the singular goal of maximising productivity has come unwanted consequences; environmental degradation, depletion of soils, increased greenhouse gas emissions and the pollution of waterways.

Yet significant progress is now being made to reverse this by forward-thinking farmers and growers, ironically often by returning to older ways of working the land, and most logically by utilising the natural processes of replenishing soil and cleaning water.



Humus, worms and deep roots; the signs of healthy soil. Photo: Ted Baghurst

What lies beneath

Healthy soils are the basis of all life on land and the essential building blocks of sustainable farms and nutritious food.



GRAEME SAIT

New Zealand-born author and educator Graeme Sait is CEO of Australian company NTS. He travels the world training farmers, consultants and medical practitioners in the importance of nutrient dense, medicinal food and the strategies to produce this food with less chemical intervention. Sait has trained many thousands of farmers on four continents with his four-day, 100-hour Certificate in Sustainable Agriculture, scheduled to start in Napier in November.

SOIL SCIENCE

A few weeks back, while having my hair cut at a salon, I was asked about my profession. I said I taught farmers around the world how to grow food with less need for chemicals. I explained that I was constantly researching the links between soil health and human health with an emphasis upon the importance of nutrient-dense food. The hairdresser responded: 'What has the soil do with food?'

The price of depletion

We are what we eat and what we eat comes from the soil. We are a shadow of our former selves. The loss of millions of microbes and humus from our soils has necessitated increasing levels of chemical intervention which has, in turn, further exacerbated the losses. It is the proverbial vicious cycle and unfortunately we are the big losers in this equation. The sustainability of continuing down the current path is questionable. This is best illustrated by the fact that we have used more chemicals every year since we began the "chemical experiment" in agriculture (decades of extractive farming) and yet every year there has been a global increase in pest and disease pressure. Last year was a record year for chemical usage around the world (involving a 14% increase) and this significantly exceeds the previous year, which was also a record. Dowsing soils and food with more chemicals each year, with less response, is surely the definition of unsustainable.

What determines a healthy soil?

The cornerstones of a highly productive, disease-resistant soil, as previously mentioned, are minerals, microbial life and humus.

Minerals are the plant's building blocks for the phytonutrients (vitamins, carotenoids, antioxidants and protective compounds like sulforaphane, lycopene and anthocyanins) that determine medicinal qualities in food. The availability of minerals to plants is determined by supply, balance and biology. For decades, we mined minerals from our soils through crop removal and replaced three or four. We also ignored the biology that delivers these minerals and protects the plant from regularly assaulted soil life with salts and biocides rarely replaced or nurtured those that remained. However, it is more than the simplistic, nitrogen, phosphorus, potassium (NPK) approach and neglect of biology that has impacted soil health, mineral delivery and, consequently, farm profitability. No mineral is an island and each impacts several others. It is all about balance.



BIOLOGICAL AGRICULTURE

Farming smart

Biological agriculture is a blend of science and conservation that has farmers counting worms, smelling the soil and getting excited about the complex ecosystem that lives under the grass.

The buzz around biological farming seems to be catching. At the recent Field Days in the Waikato, Steven Haswell, managing director at BioAg New Zealand, described his 'walk-up traffic' as "significantly different" from other years.

"There's an unease with the current way of doing things – yields, productivity, animal health. The problems are getting more complex. Farmers are looking at options. Biological agriculture is a system for every farm, and it simply incorporates looking after the living part of the soil's biology. It has, in the past, largely been ignored by the mainstream in terms of its fertility.

The aim of biological farming is to improve the microbiology of the soil and restore the balance of minerals. The techniques are numerous, from reducing the application of synthetically derived pesticides and fertiliser, to decreasing stock numbers and focusing on quality, to rotating pasture and making manure from effluent.

It is not a return to the plough and ox, it is about getting the "beasties in the ground to do the work for you," as Waiuku biological kiwifruit grower Murray Reid puts it.

The rotation of stock on different pastures increases soil depth and quality and at the same time sequesters a considerable amount of carbon. Without the use of synthetic chemical fertilisers, soil biology – the growth of soil bacteria, fungi, worms – plus the use of a wider range of pasture species, results in the build-up of soil carbon in the form of plant roots and a layer of humus (rich black or brown decayed plant matter that gives soil nutrients).

The initial reaction to biological methods from many farmers is that productivity will drop, and a drop in yield threatens the financial viability of the farm. "A non-existent farm is not sustainable," says Dave Gobles, a biological sheep and beef farmer from West Otago.

But the results coming from farmers like Max Purnell near

Taupo, Jeff Williams in the Manawatu, Greg Hart in Hawke's Bay, and Rick Braddock on Motutapu Island, combined with the reduced cost of biological farming, means that it is gaining traction.

With support and partnership from the Department of Conservation (DoC), cattle farmer Rick Braddock has helped transform crown-owned Motutapu Island in the Hauraki Gulf from a weed-infested island overrun by wallabies to a pest-free biological farm.

Braddock is optimistic about the trend in sustainable farming; the small but growing turn away from urea fertiliser indicates that farming practices are not set in stone.

"Urea is the cocaine of agriculture; it provides a quick fix and then it's over."

Another conventional farming problem that can become cyclical is antibiotic use. High input dairy farmers can find themselves spending \$1,200 – \$1,500 per month on antibiotics. While biological agriculture doesn't rule out the use of antibiotics if an animal is sick, the need is dramatically reduced.

"With smart farming, as I like to call it, the cost is lower, the animals are happier and the soil is in a far better condition," says Braddock.

With the help of DoC Braddock has fenced off all natural waterways and created wetlands on the island.

In Braddock's mind, increasing the foothold of biological farming in New Zealand requires three things; the use of local and regional council regulation to implement nutrient caps; a premium associated with biological produce and increasing the connectivity between farmers.

The past summer saw the worst drought in forty years, but the pastures and animals on Motutapu coped well. Braddock attributes this to good residual cover and the healthy state of the soil. In the Hawkes Bay a similar scenario has occurred with farmers practicing biological farming.



Rick Braddock biologically farms Motutapu Island in the Hauraki Gulf. Photos: Ted Baghurst.

"With conventional spraying, the weed can be removed quickly, but the helpful organisms that live in the soil and help fight weeds are killed, resulting in the promotion of weed growth. So you have to continue to spray and it becomes a vicious cycle."



KATE BEECROFT

Kate Beecroft has an MPhil in the governance of sustainable agriculture in New Zealand from Massey University. She has worked as an editor and writer for several years and now works as a policy advisor in the Ministry of Business, Innovation and Employment.

An estimated 200,000 hectares of land is farmed under biological principles in New Zealand out of a total of 14 million hectares of pastorally farmed land.

The majority of this is in sheep and beef farming, while dairy lags behind, largely due to the pressure put on dairy farmers to produce ever-increasing milk yields.

However, some dairy farmers are catching onto biological methods as a way to reduce nitrogen and are getting better dry matter rates for healthier cows. This includes Federated Farmers Dairy Chairman Willy Leferink, who is himself a practitioner of the system. He says the system is catching on in Canterbury, where some farmers are applying significantly less nitrogen fertiliser.

The recently announced dairy industry Water Accord will provide further incentive for dairy farmers to think about what they are putting on the soil (see page 38).



Weeds tell the story

Agro-ecologist Nicole Masters explains that the appearance of certain weeds indicate microbial disturbances in soil. For instance, ragwort can indicate that there is a phosphorus and copper deficiency – biological farming is a way to redress those imbalances and manage the problem rather than trying to eradicate it. But Masters adds that there isn't an overnight fix. "With chemical spraying, weeds are removed quickly, but spraying selects for soil organisms which promote more weed growth in the long term. So you have to continue to spray and it becomes a vicious cycle."

