

Biological Agriculture

'Truth goes through three stages - first it is ridiculed, second it is violently opposed, third it is accepted as being patently obvious'

Biological agriculture is a best of both worlds combination of organic and conventional agriculture oriented towards increasing soil humus levels and improving the vitamin and mineral levels of our food. It is a natural sciences approach based on chemistry, physics biology and microbiology using sound agricultural management practices.

The first fundamental of biological farming is to consider people: their health and well being as a function of the food and environment that we produce in farming. The second fundamental is valuing the soil and its biology as the basis for all fertility.

Applying biological agriculture perspectives and methods results in:

- higher mineral and antioxidant levels in produce
- increased soil fertility, yields and storability
- reduced erosion, fertiliser use, and leaching
- fewer insect, weed and disease pressures.

All this is accomplished profitably in an environmentally sustainable fashion and is applicable to all production sectors. Biological agriculture is an approach not a product. It stresses the importance of robust soil microbiology and considerate re-mineralisation of our soils for maximum quality yields.

There are no 'single silver bullet' products that achieve high humus and brix levels. The emphasis is on understanding the natural sciences underpinning agriculture, monitoring soils and crops for plant available nutrients and applying fertilisers in small, frequent doses to maintain optimum soil and plant energy levels. We don't eat once a season and we shouldn't expect plants to either.

“We are not standing on dirt. We are standing on the roof of another world.”

Creating healthier soils will produce healthier feed and healthier animals. Biological farming addresses environmental and human health problems by dealing to their causes not simply trying to mask the symptoms created by unbalanced soils and poor soil biology. A robust soil foodweb with many millions of diverse oxygen-loving micro-organisms per gram of soil is needed to achieve soil balance and health.

To get this we buffer the fertilisers with complex carbohydrates like humates and molasses which feed and stimulate the microbes to create humus and feed the plant. Healthier well-fed plants produce complex sugars and complete proteins which are not attractive to insects and diseases thus reducing the need for pesticides. Biological agriculture is not bound by set procedures but instead focus on the outcome of high brix, nutritionally dense produce. It has a large and flexible toolbox of amendments and techniques to achieve optimum plant growth.

“ Any management act that promotes biological integrity is appropriate.....” Dr. Arden Andersen

A shift to biological farming involves a three year plan and the application of a protocol of:

- Testing soils for both mineral reserves and immediate plant available minerals
- Frequent application of fine lime with carbohydrate and trace minerals to strength cell walls and feed microbes
- Applying microbe friendly phosphate that is readily available such as MAP, fish emulsion and soft rock phosphate
- Use of complex amendments like humic acid, fish emulsion and sea minerals to provide important trace elements and nutrient complexity.
- Re-introducing microbiology through compost, compost teas or soil inoculums to stimulate microbial digestion of residues and creation of humus
- Monitoring soil nutrient levels, plant sap brix, electrical soil current and sap pH to assess whether plants are being fully nourished.
- Being prepared to quickly apply dilute doses of liquid fertilisers in the course of the growing season
- Incorporating crop residues and green manure crops quickly into the soil to speed humus formation
- Understanding plant and soil relationships and doing what it takes to maximize oxygen levels in the soil for health microbiology.

Your most important livestock are the ones you can't see – the ones beneath your feet that are the source of all soil fertility.

What is possible:

- Growing crops without the *need* for herbicides, pesticides and fungicides while maintaining or increasing yields and farm profit.
- Producing food that has higher than standard nutrition, higher than conventional yield/ input, higher than conventional economic return.
- Increasing soil humus and carbon levels along with improved nutrient density in foods.

Through re-establishment of humus levels through broad spectrum fertilisation practices that are microbiology friendly, the soil eco-system can provide nutrients for greater productivity, fewer emissions, more carbon sequestering and better profits. This is happening now on the ground on farms in NZ.

- Better calcium levels and less rot in squash plants with comparable yields (Bostocks bio ag squash trial 2007 season)
- 10% increase in MS production with better soil structure, palatability and no topping (Kevin Davidson, Plantation Rd Dairy Ongaonga Sept 06 – May 07)
- Doubled yield of early harvest high DM and brix kiwifruit at 2/3rds the average input cost in 2007 season (Clarrie Head, Katikati)
- Topping the Stortford Lodge sales with ewe lambs and better submission rates for A.I, semen quality of sale bulls, sheep scanning figures and no flystrike (Will Mc Farlane, Maraekakaho)
- Two tonne (per Ha) increase in maize yield with reduced N and pesticide use (April 2007 Ian Gavin, Hamilton)

Points to remember:

- Farmers need to understand the consequences of their actions or inactions. Farmers produce FOOD FOR PEOPLE!

- Food and fibre are fundamental basic needs that determine the health and well being of people. Whatever they contain – nutrients and toxins – directly determines our quality of life.
- Sustainability of human life requires sustainability of farming, which requires
- comprehensive **nutrition in the soil**.
- Medicine and agriculture are intimately connected.

Our food today is LESS NUTRITIOUS than before WWII

Mineral Depletion in Food 1940-1991

Vegetables

Lost **76%** of their copper
 Lost **49%** of their sodium
 Lost **46%** of their calcium
 Lost **27%** of their iron
 Lost **24%** of their mag
 Lost **16%** of potassium

Fruits

Lost **19%** of their copper
 Lost **29%** of their sodium
 Lost **16%** of their calcium
 Lost **24%** of their iron
 Lost **15%** of their magnesium
 Lost **22%** of potassium

The Composition of Foods, Ministry of Agriculture, Fisheries and Foods and the Royal Society of Chemistry, UK.

Considering the amazing technological advancements in plant breeding, genetic engineering, conventional precision farming practices, how is it possible that all this has actually reduced food nutritional value?

Why Biological/Sustainable?

- First and foremost: Consumer Demand.
- It is just good agriculture; good science.
- Better Profit & Loss statements.
- Better farm autonomy/independence.
- Better human / environmental health.
- Better lifestyles.
- Long term sustainability in \$\$ and yields.
- We are here for our children and grandchildren and their children's children.

Biological / sustainable farming methods work; actually they are the only methods that work and solve the problems of agriculture – weeds, diseases, insect pests, soil erosion, compaction, carbon sequestration, rising costs of production, market competition, shelf-life, food value, taste, aesthetics, community safety, rural quality of life, water conservation, and morality / consciousness regarding one's neighbour.