



What is Biological Agriculture?

Biological farming is a ‘best of both worlds’ mix between conventional and organic farming practices, involving careful monitoring of crops and soils to ensure production is of highest quality.

How do we measure it?

Success in biological agriculture is judged by steadily increasing soil humus and higher levels of nutrient density in the crops. Humus is the dark brown, biologically rich earth that healthy microbes create. It improves soil water holding capacity. It is a home for microbes and a savings account for soil nutrients. Without humus we have degraded soil that cannot support healthy plants. Building humus in our soils results in long term carbon storage in the soil. We know we’re doing the right thing by our soils and our pocketbooks when we are “growing” humus with our agricultural practices.

The other measure of success for biological farming is nutrient density or high levels of complex vitamin and minerals in the food we produce for people to eat. We use the Brix meter in the field to test plant sugar levels. The Brix, or percentage sugar of the sap, tells us whether the plant’s photosynthesis factory is working to full capacity – whether all the building blocks of minerals and enzymes are available to manufacture carbohydrates (sugars) for plant growth and for the plant to feed the soil microbes around its roots. Generally, the higher the Brix level, the higher the plant mineral levels and the healthier the plant. A brix level of 12 or above indicates a healthy plant. High brix plants are not susceptible to disease and insect pressure resulting in cost savings in chemicals as well as an increase in production.

How do we do it?

By combining an understanding of soil chemistry, physics and microbiology with sound farm management practices, we address and **solve** weed, disease, and insect problems at their root causes rather than masking the symptoms with pesticides. The approach emphasizes application of calcium, trace elements and humic acids that feed soil microbes. Research indicates that the calcium in lime reduces facial eczema spores and stimulates root growth. Better tilth, better grass growth and healthier animals result from calcium being available in your soil.

It is the soil microbes that do the work of digestion and bringing food and water to the plant. They also create enzymes, vitamins and even antibiotics to assist their host plant to be healthy. There is a mutually beneficial relationship with the microbes helping the plant and the plant feeding sugars to the microbes through its roots. A strong diverse community of beneficial microbes around plant roots can depress or kill disease bearing microbes that would threaten their host plant. It’s an amazingly complex relationship but it is the basis of all plant health, humus formation and ultimately it’s the basis of our human health as well. The nutritional quality of what we

eat determines our wellness and resistance to diseases. With food grown biologically with the help of soil microbes, we get better levels of nutrition and our health can improve along with our animals' health.

Under a biological approach we work to improve the mineral balance making calcium more available along with trace elements and crucial plant nutrients like phosphorus. Most New Zealand pastoral farmers are sitting on a huge reserve of phosphorus that has been applied over the years. Unfortunately a large portion of this phosphorus is locked up with elements such as iron, aluminum and calcium. Did you know that within days, as much as 80% of superphosphate fertiliser applied is tied-up and unavailable?

The most effective way to access this frozen bank account of this vital growth element is through biological activation of your soil. There are many creatures in a diverse and healthy soil microbe community dedicated to the release of locked up phosphate. New Zealand farmers have the exciting opportunity to significantly reduce their phosphate fertiliser use. The cornerstones of a biological approach are reinstating soil fertility through beneficial soil microbes and by making phosphorus and calcium available to the plant.

The key roles of soil microbes include organic matter digestion, making locked up minerals available and providing nutrients for their host plant. The outcome of these processes is humus formation and an improved asset (the soil) for farmers. And since there is an expanding market for soil carbon credits – farming to grow humus could actually create another income source. Humus and humic acids also play a crucial role in holding fertilisers in the root zone reducing nitrate leaching and decreasing the amount of fertiliser needed to grow quality crops.

Biological farming principles emphasise the importance of educating farmers so they know how their capital asset account functions and how to grow its worth. After all – farm soils are our primary capital asset and the source of our income and ultimately, our health.

Results?

Kiwifruit growers such as Keith Holdom are experiencing earlier harvest dates of larger fruit with better TZG scores. Dairy farmers such as Kevin Davidson in Hawkes Bay are winning national awards for production. Cropping farmers are experiencing increased yields and improved soil structure. Every agricultural sector benefits from biological farming's full spectrum approach to providing balanced minerals and complex foods for soil microbe health. Hundreds of farmers on tens of thousands of hectares around New Zealand are adopting biological practices and reaping the benefits in yield, reduced costs, crop quality, carbon sequestration and soil fertility.

The Future?

New Zealand has a tremendous international opportunity to create a point of difference with our biologically grown premium quality, high brix produce. The market demand for verifiable nutrient quality in food is growing. We can improve soil quality while providing real solutions to climate change and environmental challenges of fertiliser leaching into our streams and rivers. Biological agriculture is a comprehensive, natural science approach that answers the issues vexing our

environment and economy. Learn all you can about it ...it is the new conventional farming of the future, with solutions today.

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