



Why BioAg?

The BioAg Approach to Regenerative Agriculture



Biologically Active Soil.....enhancing productivity and quality

Healthy soils contain a diverse and active population of organisms, including bacteria, fungi, protozoa, nematodes, earthworms, arthropods. These organisms play an integral role in the soil by regulating nutrient availability and pH for optimal plant growth; fixing nitrogen, carbon and other nutrients from the air; recycling plant materials into humus and minerals; providing complex food (metabolites) essential for plant growth; and protecting and improving soil structure.

Mainstream Approach

- Declining size and diversity of microbial population can occur due to continuous cultivation, excessive use of acid fertilizers and over-reliance on pesticides
- Poor soil structure is directly linked to reduced microbial activity, nitrogen loss, humus production, nutrient recycling, excessive moisture retention and compaction

The BioAg Approach

- Microorganisms used to regulate the soil environment
- Improves soil structure and fertility by enhancing the population, diversity and activity of soil organisms. This aids nitrogen functions in soil e.g. N-fixing bacteria; oxygen entry via improved structure
- Stimulates humus development for optimum nutrient cycling, water infiltration and soil carbon maintenance

Insects, Disease and Weeds

Mainstream agriculture dictates that weeds, disease or insects should be removed pesticides.

The regenerative biological approach uses the presence of certain weeds or insects as indicators of possible nutritional deficiencies or excesses and/or soil structure issues and seeks to address the causes rather than simply treat the symptoms.

Mainstream Approach

- Stressed plants susceptible to insect attack or disease
- Pesticides are used to control insect pests, diseases and weeds – treat symptoms not underlying causes
- Pesticides impact on beneficial insect species, affecting biological control of pests and diseases and disrupting natural nutrient cycling and soil fertility processes. They disrupt beneficial soil bacteria and fungi functions.
- Weeds thrive because of nutritional deficiencies or excesses e.g. nitrates, imbalances or poor soil structure

The BioAg Approach

- Increases plant sugar levels to enhance natural resilience to pests and disease
- Plants require high levels of available phosphate in the soil to synthesise sugars
- Creates a balance of *functionally-available* nutrients in the soil, allowing desirable micro-organism species to thrive

“Farming is the management of an ecosystem”

Emeritus Professor Don M. Huber, Purdue University



Phosphorus – the regulator

Phosphorus (P) plays an essential role in plants, acting as a catalyst for the process of photosynthesis, whereby carbon dioxide and water are turned into simple sugars via the energy of the sun. These sugars are building blocks for other compounds e.g. amino acids, proteins, enzymes, vitamins and hormones used in the plant. Phosphorus also plays an important role in nutrient uptake, nutrient transport and reproduction.

Mainstream Approach

- Provides P in acidic forms e.g. superphosphate or ammonium phosphate
- Phosphate anion is highly unstable and readily binds with cations (e.g. calcium, iron, aluminium) in the soil
- Applied phosphate becomes ‘locked up’ in the soil. Excess can disrupt/antagonise other minerals.

The BioAg Approach

- Provides functional P based on high quality bio-activated RPR (Reactive Phosphate Rock) in conjunction with direct soil biology stimulants.
- Provides immediate and continuing release of plant-available (i.e. citrate soluble) phosphate
- Improved microbial activity unlocks previously-applied nutrients
- Rejuvenates natural soil fertility. Rejuvenates mycorrhizal fungi.

Calcium – the energy provider

Calcium (Ca) plays an integral role in soil, plant and animal nutrition. In soils, it determines nutrient availability and structure. In plants, it is essential for root, stem and foliar growth. It not only contributes to cell wall strength and thickness, but regulates cell functions and water content. In animals, it is vital for bone and muscle development.

Mainstream Approach

- Nutrient availability is considered to vary with pH
- Lime is applied to neutralize low pH (acids) soils
- Applies large amounts of lime (up to 3.5 t/ha) infrequently

The BioAg Approach

- Nutrient availability is considered to vary with the **availability of functional calcium**
- Lime is applied to increase functional availability of calcium in conjunction with soil biology stimulus
- Smaller amounts of lime (400 – 600 kg/ha) applied regularly

A silver lining rather a silver bullet

BioAg is not a miracle cure. Most farmers observe positive changes within a season but keep in mind that full remediation or rejuvenation of biological function takes time and is an investment in your natural capital. Increased capability for the farm and your bottom line is a compilation of continuous small improvements.

BioAg takes an integrated whole farm approach which considers all required inputs and impacts for long term benefit of enhanced productivity, profit and the maintenance of natural capital

“The degree of soil fertility is determined by the intensity of the life processes of the microbial population”