THE GAIAZYME APPROACH

An introduction to mineralized ecological agriculture

by Rory Turnbull

Two of the biggest dogmas in agriculture are that “organically” produced food is, by default, healthier than “conventionally” grown food - polarized by the myth that conventionally managed farms are more efficient than those following organic guidelines. While our research shows that farms following ecological methods are capable of producing world class yields AND quality - such successful protocols aren’t automatically inherent in organic regulations. Organic production standards focus more so on avoiding toxins and synthetic materials than producing the highest quality, most nutrient dense foods. Furthermore, many doubt the integrity of national “organic” certifying agents with rumors of questionable activity approved when enough money is present. However, even when enforced properly, the protocols are translated from the academia of conventional agronomy; which is based on outdated concepts of soluble plant nutrition.

While plants do absorb nutrients as soluble ions, in nature plants are connected with soil ecosystems wherein microorganisms use their biotic fluids to locally solublize nutrients and deliver micro-doses directly to plant roots. Under the right conditions, these micro-doses can accumulate into the perfect quantity and diversity of nutrients required for achieving peak genetic potential. When one learns the efficiency of these microbial mechanisms, the concepts of adding soluble materials to soil to ionize through irrigation or precipitation seems archaic and irresponsible. In light of this, one can understand how people advocate hydroponics as a global answer to sustainability but environmental toxicity associated with the leaching and volatilization are only part of the issue; Cation/anion overdose and imbalance – particularly nitrate – directly correlates with pest and disease susceptibility. Not to mention, these terrestrial plant-microbial ecosystems are essential for global biogeochemical cycles and wildlife biodiversity.

Physics and chemistry are generally the focus regarding soil management and crop production when, in actuality, it is the biology of the soil itself that is one of the most significant factors governing nutrient availability, soil fertility and disease suppression. The biological component of soil is a highly complex web of creatures ranging from microscopic organisms like bacteria and fungi, to relatively larger creatures like mites, grubs, worms; all the way up to things like gophers and birds. This “soil food web” is more precise than the most sophisticated fertigation systems in the world and most organic farmers aren’t using it to its full potential while conventional farming routinely vanquishes it all together.

Though organic farmers tend to be somewhat educated on the existence of soil biology, most are simply “organic by neglect” and generally unaware of its potential and importance. Simply using natural resources and/or abstaining from toxic materials does not necessarily imply sustainability or environmental compatibility; but rather, it is the strategies and systems in which these resources are managed and applied that govern such criteria. The missing link for these status quo conventional and organic farmers lies in Mother Nature’s model of perennial, polycultural systems; in where the synergy between diverse, living communities is utilized as a flywheel of momentum for maintaining perpetual matter and energy cycles.

While it is the soils biology that creates conditions conducive to plant growth, it is the plants and their associated ecologies that maintain the conditions conducive to the health of the soil biology. Even certified organic farms are generally monoculture based systems that rely on imported nutrients and

lack the diversity and density of surface biology needed to maintain a thriving subsurface ecology. Soils exposed to sunlight lose organic matter to volatilization, while soils shielded from photons by dense foliage but with low biodiversity will experience an entropic loss in the soils mineral reserves and microbial diversity.

While the depleted nutrients and lacking biology can be addressed through various means; there is an unrivaled level of efficiency and resilience associated with promoting biodiversity – and these effects are compounding. Interplanting multiple crop species will better maintain both a sustained release and an optimized uptake of nutrients. Different plants associate with different soil organisms, each of which are adept in their own spectrum of nutrient mining and storage; as well as amalgamating their own unique set of life processes and ecological interactions, which make these nutrients available across various timelines.

This system is governed by plants to a degree that actually is far more accurate than even the most sophisticated fertilizer and irrigation programs. Plants exude various carbon/energy rich compounds from their roots; that not only attract and feed beneficial microorganisms, but can actually act as chemical “messages” that essentially give them control over the whole operation. When the conditions are right, they can assemble networks of organisms capable of supplying the optimum quantity, quality and diversity of nutrients required for absolute premium production.

These carbon rich “exudates” are also utilized to help build soil organic matter as they get converted into more stable compounds - largely humus and glomalin. The role of organic matter in soils is indispensible and many would argue the single most influential factor determining overall fertility. It provides primary physical habitat for the soils microbiology, while its parent compounds work chemically as polymers and adhesives to build the soil into a stable aggregate that resists compaction, erosion, flooding and desiccation. Most know there is currently much interest in excess greenhouse gasses related to climate change and research suggests that as much of the carbon in these gases was from biomass and soil compounds that literally vaporized from agriculture and deforestation as petroleum and fossil fuel combustion.

The organic (or “humic”) fraction of a soil is also the major determining factor of its ion holding and exchange capacity. Farms that have decimated their soils biology and organic matter, experience resulting decline of the soils ability to hold water, anions and precious trace minerals. While many organic farms maintain soil organic matter and biology; they are consistently ignorant to the role and importance of minerals and trace elements – many even stigmatizing them as “chemicals” to be avoided. The absence of these secondary and trace minerals in both scenarios has resulted in a major decline in crop nutrient content across the board; which in turn correlates to crops with weakened immune systems and thus an increased demand for pesticides. Years of consuming empty calorie crops, covered in immune system compromising chemicals is starting to take a toll on personal health as a societal whole.

To summarize; optimizing mineral levels equals’ maximum production and quality, while optimizing soil biology and crop ecology equals maximum efficiency and sustainability. Between these concepts rests the foundation of our approach here at Gaiazyme. We help clients assess crops and soils for the range and levels of these minerals, provide them with comprehensive solutions and treatment protocols for addressing pest and disease resilience, remediation of deficiencies and toxicities and fortification of yields and nutritional density through establishment and optimization of ecological systems that harvest, deliver, conserve and recycle resources.

