

Putting the Art Back into Agriculture

English poet, painter, and social reformer, John Ruskin once opined that, ‘Industry without art is brutality’. It may seem strange beginning a scientific article with a liberal arts quote; but, if soil microbiology is anything then it is as much art in its make-up as it is science. And how we’ve treated the soil since the Industrial Revolution tells us we must treat our soil and water as though they were and are the most important objects of art on this planet.

When we speak of improving food nutrients we usually are speaking of ways in which we can boost nutrition that is lost the further down the food processing system we go. We must remember that like a photograph we reproduce for multiple uses, the image suffers degradation each time it is reproduced. The same degradation occurs at each step of processing of our crops and this process first begins in the soil. This rule explains why a factory produced snack cake has zero nutrient value and costs less than a stalk of celery. While the snack cake starts out with a bit of flour from wheat and is mixed with a center of hydrogenated soybean oil to imitate whipped cream and is later sprayed with a mist of high fructose corn syrup this snack cake hardly reflects the nutrient value of these basic crops. But back to improving both soil and water quality and how this improvement can affect the higher nutrient value in the crops we raise.

We know for example that a tablespoon full of healthy organically cared for soil has a billion forms of life, including earthworms and insects we can see as well as millions of microbes, bacteria, and fungi we cannot see. Much of the soil’s eco-system has been damaged or destroyed since the Industrial Age through soil compaction, pesticide use, fungicide use, and the use of other petrol-based chemicals. This hidden destruction has resulted in our utter dependence on these toxic inputs into the very basis of our healthy food systems. This invasion of our soil and water quality now means that over 70% of our nation’s soil fertility must come from artificial sources. While this fact does have serious implication for our food nutrient value, it also poses a serious threat to our national and international food security. So long as we continue our addiction to petrol-based soil fertility we risk losing the availability to feed our own population if terrorists sink an oil tanker in the Suez Canal blocking the flow of oil which will later be reproduced into soil inputs. Or Russia could block the sale of gas which provides the basics for ammonia hydroxide we use on both of corn and soybeans. The nutrient value for crop and soil the crops come from? Zero of course. The degradation of what amount of nutrients left in soil and crops from these artificial inputs? Who really knows; except as we see a general increase in the degradation in the health of populations especially in Western societies where this type of soil damage has occurred over the last two-hundred years.

Even today I can stand up in front of an audience holding two heads of lettuce and ask the group to identify which head holds the highest nutrient content. Of course an audience made up of potential investors, agronomists, and food technicians cannot tell the difference based on appearance only. Both heads look

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Stephen Carr*

International Soil and Water Renewables Group, LLC, USA

***Corresponding author:** Stephen Carr, International Soil and Water Renewables Group, LLC, PMB 141 Salem, Indiana 47167, USA, Tel: 812-276-6036; Email: stephen@sw2systems.com

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the same. They look like healthy nutrient rich heads of lettuce. Both heads are green, both heads are uniformly round like lettuce heads. When cut open both heads have that lettuce crunch sound. But one head came from a bed made up of healthy soil while one head came from a bed of poor nutrient quality soil.

“So what”, you ask? What real difference does this difference make to a corporate user of lettuce like McDonalds for example who must first satisfy its fiduciary responsibilities to McDonalds shareholders before concerning itself with its customers’ health. But what if a McDonalds could have their famous lettuce, tomatoes, and pickles at thirty-percent lower cost with thirty-percent higher nutrient value than its current menu offering? These improvements could lead to its beef and chicken products as well.

For some ardent proponents of a cleaner, more sustainable environment the loss of all types of artificial food suppliers would be their preference, however today’s economically driven global system prevents such a dramatic occurrence. Instead we need to “double clutch” to find a crop growing system which gives us crops of bio-nutrient rich quality coupled with a commercial crop growing system making farming an economically viable business.

Recently the Soil Renaissance group announced the formation of its Round Table in order to explore just such a proposal aimed at improving the soil health of our planet. The plan includes these four points:

I would propose that the third goal, “Education” would be the greatest challenge of this ambitious plan. Since educating the public has been the catalysis for the growing consumer demand for healthier more environmentally sustainable means of growing our food supply. But we stop short of our righteous demands for a healthier, more economically fair-priced based food supply unless we travel down our food chain to our soil nutrition. Even one of the world’s oldest most extant writings namely the Bible tells us that God formed man (and by extension woman) from the nutrient rich soil of a garden. He did not produce us from a software program, or some engineer’s blueprint, but from nutrient rich soil. Regardless of one’s particular religious persuasion, the link between soil health and nutrition, and human and animal health and nutrition is well researched.

For example the symbiotic organism mycorrhiza which binds a crucial fungus to plant roots in their early development is unknown to the wider general public. Yet if we discovered a new planet named “mycorrhiza” the world would be transfixed by such a discovery, yet as a critical component of our own planet’s health we understand little about such soil activity in society in general.

Well, I would offer the arrival on the world stage an innovative, low cost, sustainable technology that can bridge the gap between organic quality crops grown with economic efficiency. This new system called the SW2, (www.sw2systems.com) reconditions the soil by improving both the soil’s **structure and texture**. This restructuring has been studied for many years now by Roy Stephen, PhD, President and owner of the independent research firm, Arise Research and Discovery of Martinsville, Illinois. Dr. Stephen and his science team have established that the SW2 system of land imprinting creates an environment in the soil that results in an improved environment for commercial crop production. This simple patented system allows for the prevention of soil erosion while mitigating some of the effects of climate change by reallocating the use of rain by sequestering moisture in the soil for when a plant decides it needs a drink. This last feature is important to soil structure because crops do not eat their food, but rather a plant drinks its food. So it is critical for the soil to have reduced soil bulk density and increased water fill pore-space. Similar results have been found by university research done in Mexico, along with the Hangzhou Academy of Agricultural Research in southern China, by PhD Administrator and scientist Chen Wenyue.

Research has established that the SW2 system improves the use of earth’s three most important elements, carbon, hydrogen, and oxygen. The more of these natural three elements we have in our soils, the less dependent we are on our addiction to artificial N, P, K and their false promise.

In addition to preserving our nation’s most valuable resources, our soil and water, through the prevention of soil erosion, the SW2 also creates what is called a “microbial-well” that serves as a sort of greenhouse effect for each plant seed and eventual plant.

This “microbial-well” captures the silt, clay, and loam necessary for a nutrient rich environment for the plant as it creates compost from decaying plant material changing this material into healthy compost. The microbial-well offers a perfect environment for the speeding up of organic material over the now established process of leaving organic matter on a flat soil surface.

This microbial-well also lessens the need for irrigation by more effectively allowing the use of our dwindling water supplies (we don’t have a lack of water on this planet, which is a popular myth; we have a water re-location issue on the planet. This is a political issue, not an environment issue). PhD Roy Stephen and his team of scientists have concluded that microbial-wells are the best solution for depleted soils because “they aid natural processes exponentially.”

The Arise Research team also found in the field research that SW2’s microbial-wells “help replace missing micronutrients that have been lost through soil erosion.” And that the wells act like a greenhouse for each plant in that “They protect the seed nurturing germination and support optimal root development”. This new innovative system sequesters soil moisture allowing for a greater heat exchange and overall evapo- plant transpiration” which is critical in semi-arid climates where there is sufficient water; but extreme heat can stress or damage plant stealing valuable nutrients the plant directly needs towards its survival instead of nutritious fruit production.

I offer a theory that since over half the planet’s surface is covered by soil, wide spread use of the new SW2 system for topsoil management including construction and mining, besides agricultural use could allow SW2 soil to serve as a heat sink within the planet’s hydrological scale. These SW2 inspired wells can also serve as reservoirs of bio-nutrient dense organisms. These newly patented but yet fully realized wells increase the soil’s surface area by 30% while taking advantage of the varying degrees of sunlight throughout the day. This increase in the soil’s surface area supports longer plant photosynthesis without heat stress. Plants grown within these microbial wells have 30% more plant leaf surface area aiding to increases plant photosynthesis and therefore, great plant architecture and improved plant yields at lower input cost.

This new cropping system by U.S. based company International Soil and Water Renewables, LLC create micro- and macro-soil fractures which promote N, O, and H circulation at the root which promotes better health nutrient for the plant. These wells also show an increase in microbial activity. Better **soil tilth** insures improved soil conditioning, porosity, and structure. Earthworm casting, more frequently found in SW2 conditioned soil is especially valuable for improved microbial action. This microbial action by the SW2 cropping system makes possible the cultivation of large quantities of high quality produce as never before.

The time is quickly approaching when producers will be paid based on the nutrient value of crops grown rather than on yield quantities only. In my travels outside the U.S. and E.U. countries I see such an idea of nutrient over quantity value in emerging markets. This type of system can have a positive effect on over-all community health by putting the “culture” back in “agriculture” and backing away slowly from the social, environment, political, and economic cliff of today’s “agri-business”. Want higher food nutrition? Then this must be a consumer led gentle revolution. Asking the crop/food industry politely to adopt new innovative systems for the sake of our children usually falls on deaf ears. But as more and more consumer vote with their billfolds, industry experts will adopt whatever food system consumers demand.

When our food was produced with less invasive science, less soil erosion, and less soil compaction, farming was an art as our title stated. Farming can be an art again instead of just science, as is advertised. Farmers used to be artists, taking bare soil and turning it into something beautiful, on the inside, at the nutrient

level. Ever notice how today much of our base produce even taste the same? If you can't tell the difference in the taste and cooking value of today's commercially grown food ask your favorite chef to explain the difference. At the world-class land-grant Purdue University, 9% of the enrollees major in agriculture with over half of them majoring in agricultural marketing and agribusiness. The vested interest of the chemical industry provides on the farm training. Looking to soil health as the key to food health and subsequently people and animal health is an art we must re-capture if we are to survive on this planet. Adopting bridging technology like the innovative SW2 cropping system is a win-win system for us all and a long term cure for drought stricken regions like California, the southern U.S., Northern China, India, and Australia.

Water re-allocation as an impending political crisis? Treat our soils with an artist touch and the crisis will dissipate. As pop singer John Mellencamp writes in his hit song, "Paper and Fire", (to paraphrase) "that unless we change our appetites we will consume ourselves". What is this popular recording artist talking about? Let's just use pork tenderloin sandwiches for an example. Now unless a hog has changed since I was a boy visiting on grandpa's farm where we butchered a pig every fall, a pig only has two tenderloins. So this fact means you need thousands of hogs raised in confinement operations to satisfy America's lust for this delicious sandwich. Aside from poor hog health and poor living conditions, the amount of cheap feed grown from depleted soils plus the water used in crops for feed and water for processing and you have an unsustainable system. Add to this train wreck an out-of-control government that unnecessarily subsidizes excessive amounts of monoculture crops instead of subsidizing

bio-nutrient rich diverse crops that can build soil immunity and health and we have the last element of this planet-wide "perfect storm": Peak Oil, population explosion, and Environmental degradation. Turning these disastrous events around begins with improved soil health through yes, mechanical means rather than through pharmaceutical, genetic, or bio-engineered crop growth.

We must learn from recent history that not all technological developments are good for all man's endeavors. Steam powered tractors led to poor soil health through soil compaction. This development was further re-enforced through the invention of internal combustion engines allowing for even greater sources of power meaning heavier equipment which further damaged the soil which we covered up through the miracle of chemical manipulation. All of this "progress" was done at the altar of the cheaper, better cost efficiency of our economically driven society. Even in today's world of agribusiness in the West, corn stalks and roots are treated as a problem to be overcome, instead of valuable organic matter. At least in many emerging nations, corn stalks and roots are harvested for fuel.

If we possess the technology to land a Rover on Mars, leave a soft imprint on the soil, collect samples, analyze those samples and return the data to earth for study, surely we can travel over tender soils to plant our crops without compacting our soils and robbing them of their base nutrients.

Carr is the CEO of International Soil and Water Renewables, LLC and developer of the new SW2 Cropping System. If you have an interest in investing in this well developed start-up and bring this technology to market, then write Carr at stephen@sw2systems.com or call Stephen directly at 812-276-6036.