



Re-Mineralizer

Over the last couple years, we have talked about the poor quality of our food today from toxic chemicals on and in it, to the lack of nutrition. One of the most positive developments in soil science and gardening is the use of rock dusts to improve soil fertility and quickly regenerate soils to a healthy status.

As a society we have known for generations that rock dusts improve soils, however with the obsolete toxic chemical rescue model of gardening and farming that were taught by the chemical companies, we have forgotten important principles our forefathers knew. The book called "Bread from Stones" by Julius Hensel was written over 100 years ago explained how crushed rock improved fertility and yields. In the book "Survival of Civilization" by John Hamaker and Don Weaver they explain how adding rock dusts to our soils creates a massive carbon sink helping to fight climate change and restore fertility. The book "Geotherapy" in 2015 discussed studies all over the world, rock dusts were essential to restore fertility and rapidly re-build healthy soils.

In the 1980's Dr. Phillip Callahan published many papers on an effect called para- magnetism that increased plant growth and health and helped energy enter the soil. He showed how volcanic rock sands can help supply this property to soils, reducing insect pressure and increasing yields.

Most of the problems we encounter in gardening and farming are caused by nutrient poor soils, especially minor, trace, and micronutrients. Numerous studies have shown one of the fastest ways to rebuild soil health is with the use of rock dusts sometimes referred to as mineral enriched sands.

Microorganisms need these trace minerals to rapidly grow and reproduce to very high levels. When they die their bodies turn into a stable colloidal humus that is vital for plants, animals

and humans to thrive on. We have learned that many microbes from bacteria to algae can collect nitrogen from the air **IF** there are the correct trace minerals (elements) available in the soil. These microbes also pull carbon dioxide (CO₂) from the air to create many types of organic molecules that help feed our plants and form valuable humus.

My first experience with rock dusts occurred many years ago when planting a early spring vegetable garden. I planted Brussel sprouts, cauliflower, broccoli, and cabbage. This was on rich soil maintained organically and amended with leaf mold compost and organic fertilizers for many years. On every other transplant I applied a tablespoon of a rock dust product from New Zealand called Eco-Min to the bottom of the hole. Nothing showed a response except the Brussel sprouts, and Boy did they!



In horticulture there is a law known as “Liebig’s Law of The Minimum”, which states that plant growth is limited by the element (mineral) in shortest supply. Obviously, the rock dust had some element in it that the Brussel sprouts required that the other vegetables did not, and the lack of this nutrient was limiting the growth of the Brussel sprouts.

There are many types of rock dusts available in the market but they are NOT the same! For example, we often find powdered limestone (Ag Lime) which is a common rock dust, however it only contains two primary elements, calcium (Ca) and maybe magnesium (Mg). Often scientists and vendors (myself included) use the word minerals interchangeably with elements. Over 1,000 minerals contain calcium but they provide only the one element calcium. Hence, one needs to be careful when reading labels as they can be misleading.

The most nutrient rich sources (contains the most elements) are found in igneous rocks like granite and basalt and in some rocks that form in the deep body of the ocean like glauconite from which we get greensand.

Rock dusts or mineral sands are not soil. Healthy soil is formed by a very complex interaction between the weathering of rock minerals (geology) and soil biology. As the microbes and plant roots react with the decomposing of the rock minerals the elements in the minerals are released. Some of the most fertile, rich, and productive soils on the planet are found near volcanoes. This is why historically many cultures lived near volcanoes in spite of the dangers. When we use these type minerals to regenerate soils, we are just copying nature but greatly speeding up the process of soil restoration. Similarly, we find very fertile soils below glaciers where the moving ice sheets have ground the rocks down into dust. This dust gives the water from melting ice a milky appearance and is extremely rich in nutrients creating very fertile soils downstream. Many of the historically fertile fields of the USA were created as the glaciers grew and melted from the last ice age.

A couple years ago we went through all 79 elements found in the human body and found that hundreds of health problems are caused or aggravated by trace element deficiencies in our food supply. If these elements (minerals) are not in the soil, our fruits and vegetables cannot absorb them hence we have more health problems. The elements found in healthy human blood closely match those found in seawater. For reference, the 84 elements in seawater are shown in the chart below. Since greensand comes from the ocean it has these same elements in it.

Granites and basalts also have many of these same elements but in a different mineral form and these types of mineral rich sands are also para-magnetic which provides many additional benefits. When microbes in the soil eat the greensand, granite or basalt sands, the nutrients (elements) are released and become available for plants.

For example, of the benefits, elements like molybdenum (Mo) and vanadium (V) are required for microbes to fix nitrogen from the air. Without these elements the microbes cannot provide the free nitrogen (N). As the mineral sands are broken down and these elements released, they become available for the microbes to capture nitrogen.

Particle size is another very important property of rock minerals. When the particle size gets smaller, the surface area increases, giving the microbes more area to attack and break down the minerals faster releasing the elements. If the particle size is very large then the breakdown and release of the elements is very slow. Conversely, if the rocks are ground down to a powder the minerals are released faster than the soil and plants can utilize them, hence they are leached out of the soil and washed away. For most purposes sand size particles offer the best balance between release rate of the elements and cost (grinding rocks into a powder or dust which is very expensive).

Application rates vary depending on many factors. Some types of rocks have low levels of various elements hence it may take up to 10 tons per acre to provide benefits. However, granite, basalt and glauconite (greensand) are some of the most nutrient (element) rich rocks in the world, thus they are the most cost effective. They provide more elements at lower application rates per acre. A mix of these rock minerals have shown results at as little as 400 pounds per acre. Many farmers and rancher like to use 5 tons per acre, however for most acreages a rate of one ton per acre is a good starting point, then repeat if needed. One ton per acre converts to approximately 5 pounds per 100 square feet, or a 40-pound bag will cover 800 square feet at this rate of application. These type of rock minerals will not burn plants hence they can safely be applied at much higher application rates.

Mineral sands can be applied through many types of commercial fertilizer spreaders on large acreage. Smaller spreaders are available for utility vehicles and mount on the trailer hitch. On standard size yards and gardens one can just scatter it like chicken feed by hand.



These mineral sands can be added as a feedstock to compost. The high microbial activity in a compost pile accelerates the release of the elements by the microbes and converts them into a plant available form creating an enriched compost.

Benefits of Remineralization

- Provides slow, natural release of elements and trace minerals.
- Increase the nutrient intake of plants.
- Increase yields and increases Brix reading.
- Rebalances soil pH.
- Increases growth rate and diversity of microorganisms.
- Increases earthworm activity.
- Increases seed germination rates
- Speeds up formation of the humus complex in soil.
- Prevents soil erosion.
- Increases aeration and helps loosen tight soils.
- Increases the nutrient storage capacity of soils.
- Increases the moisture retention ability of soils.
- Increases resistance to insects, disease, frost and drought.
- Increases nutrient density of food crops.
- Increases a plants resistance to pathogens.
- Enhances flavor of crops.
- Reduces weed problems.
- Reduces plant mortality rate.
- Makes organic fertilizers work more efficiently.

84 Elements in Seawater

Element	Atomic weight	ppm	Element	Atomic weight	ppm
Hydrogen H ₂ O	1.0079	110,000	Molybdenum Mo	0.09594	0.01
Oxygen H ₂ O	15.999	883,000	Ruthenium Ru	101.07	0.0000007
Sodium NaCl	22.989	10,800	Rhodium Rh	102.905	.
Chlorine NaCl	35.453	19,400	Palladium Pd	106.4	.
Magnesium Mg	24.312	1,290	Argentum (silver) Ag	107.870	0.00028
Sulfur S	32.064	904	Cadmium Cd	112.4	0.00011
Potassium K	39.102	392	Indium In	114.82	.
Calcium Ca	10.080	411	Stannum (tin) Sn	118.69	0.00081
Bromine Br	79.909	67.3	Antimony Sb	121.75	0.00033
Helium He	4.0026	0.0000072	Tellurium Te	127.6	.
Lithium Li	6.94	0.170	Iodine I	166.904	0.064
Beryllium Be	9.0133	0.0000006	Xenon Xe	131.30	0.000047
Boron B	10.811	4.450	Cesium Cs	132.905	0.0003
Carbon C	12.011	28.0	Barium Ba	137.34	0.021
Nitrogen ion	14.007	15.5	Lanthanum La	138.91	0.0000029
Fluorine F	18.998	13	Cerium Ce	140.12	0.0000012
Neon Ne	20.183	0.00012	Praesodymium Pr	140.907	0.00000064
Aluminium Al	26.982	0.001	Neodymium Nd	144.24	0.0000028
Silicon Si	28.086	2.9	Samarium Sm	150.35	0.00000045
Phosphorus P	30.974	0.088	Europium Eu	151.96	0.0000013
Argon Ar	39.948	0.450	Gadolinium Gd	157.25	0.0000007
Scandium Sc	44.956	<0.000004	Terbium Tb	158.924	0.00000014
Titanium Ti	47.900	0.001	Dysprosium Dy	162.50	0.00000091
Vanadium V	50.942	0.0019	Holmium Ho	164.930	0.00000022
Chromium Cr	51.996	0.0002	Erbium Er	167.26	0.00000087
Manganese Mn	54.938	0.0004	Thulium Tm	168.934	0.00000017
Ferrum (Iron) Fe	55.847	0.0034	Ytterbium Yb	173.04	0.00000082
Cobalt Co	58.933	0.00039	Lutetium Lu	174.97	0.00000015
Nickel Ni	58.710	0.0066	Hafnium Hf	178.49	<0.000008
Copper Cu	63.54	0.0009	Tantalum Ta	180.948	<0.0000025
Zinc Zn	65.37	0.005	Tungsten W	183.85	<0.000001
Gallium Ga	69.72	0.00003	Rhenium Re	186.2	0.0000084
Germanium Ge	72.59	0.00006	Osmium Os	190.2	.
Arsenic As	74.922	0.0026	Iridium Ir	192.2	.
Selenium Se	78.96	0.0009	Platinum Pt	195.09	.
Krypton Kr	83.80	0.00021	Aurum (gold) Au	196.967	0.000011
Rubidium Rb	85.47	0.120	Mercury Hg	200.59	0.00015
Strontium Sr	87.62	8.1	Thallium Tl	204.37	.
Yttrium Y	88.905	0.000013	Lead Pb	207.19	0.00003
Zirconium Zr	91.22	0.000026	Bismuth Bi	208.980	0.00002
Niobium Nb	92.906	0.000015	Thorium Th	232.04	0.0000004
			Uranium U	238.03	0.0033
			Plutonium Pu	(244)	.



Note: At Nature's Way Resources we recently received permission from the Office of the State Chemist to start selling these mineral sands in bags. We call it "Re-Mineralizer" and it is a blend of the most valuable mineral sands to make it simple for gardeners. It is now available in 40-pound bags. We recommend 40 pounds per 800-1,000 square feet every few years, hence it is very inexpensive for the benefits it provides. Since all the material comes from Texas it is a lot cheaper and provides far more elements (nutrients) than other products being sold in our area shipped in from thousands of miles away.

Re-Mineralizer

- Texas Green Sand (all minerals in seawater)
- Granite Sand (rich in K and is para-magnetic)
- Basalt Sand (rich in Fe, Mg and is para-magnetic)

It provides all the elements found in the human body and then some!