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REMINERALIZE THE EARTH  
Joanna Campe, Publisher and Editor

The concepts of remineralization and utilizing rock flours is not new, nor without substantial research precedence. As a brief historical overview, the recent history of remineralization shows that it has been researched and explored by three different groups:

First, nutritional biochemist Julius Hensel pioneered remineralization in the 1880's with his book BREAD FROM STONES and a modest agriculture movement came into being. Since the late 1930's many scientists have done research on remineralization in Germany and Central Europe for agriculture and forests.

An example in forestry is a study which showed that in the case of new pine seedlings remineralized with basalt rock dust, there were gains over the untreated area after the sixth year. After 24 years the wood volume of the treated area was four times higher than in the untreated area. It was only after 60 years that the advantage tapered off.

Second, is a more recent development called agrogeology and this research has been carried out mainly in Canada, Brazil, Tanzania, the Canary Islands, and West Africa -- especially on laterite soils. Because of the intense tropical rainfall, NPK fertilizers are washed out in only a few weeks and cannot be stored by the soils, and are especially harmful to the groundwater. Rock fertilizers not only give nutrients over longer periods to cultivated plants, but also improve the ion-exchange-capacity of soils by forming new clay minerals during the weathering of the fertilizer.

Third, is the grass roots movement concerned with the premise of John Hamaker in the book THE SURVIVAL OF CIVILIZATION that remineralization is not only the key to restoring soils and forests, but in the larger context, absolutely necessary and urgent to reduce levels of carbon dioxide in the atmosphere and stabilize the climate.

This movement began with Hamaker's writing in the early 1970's and expanded in the 1980's into a global network consisting of ecologically concerned individuals and organizations, farmers and gardeners, scientists and policy makers.

To facilitate networking and the flow of information and to promote remineralization as advocated by John Hamaker and Don Weaver, SOIL REMINERALIZATION, A NETWORK NEWSLETTER, began in 1986 and became REMINERALIZE THE EARTH magazine in 1991. The magazine, published and edited by Joanna Campe, has networked to people all over the world and has collected research and a wealth of anecdotal results of farmers and gardeners, and for silviculture and foresters to substantiate the results of remineralization. The most recent results of these efforts are two manuals which contain the following listing of research reports.

- 1.The Importance and Effect of Rock Dust in Orchards and Gardens. Fritz Leipold
- 2.Remineralization Trials: Minplus and Bananas, A Cost Benefit Study. T.D.

Edwards

3. Soil Rejuvenation with Crushed Basalt in Mauritius. D. Hotman de Villiers
4. Azomite Rock Dust as a Cure for Citrus Blight Disease. J.F.L. Childs
5. Dusting Chickpea with Fine Rock Powder: Effects on Yield and Damage Caused by *Heilcoverpa armigera*. M.P. Pimbert and C.P. Srivastava
6. Pot Test Trial I of Basalt, Serpentine, Feldspar, Dolomite and Bentonite. Dr. Gemot Graefe, Austrian Academy of Sciences
7. Pot Test Trial II of Basalt, Serpentine, Potassium, and Kaolin Clay. Dr. Gemot Graefe, Austrian Academy of Sciences
8. Rock Fertilizers: A chance for West Africa's Food Production. Dr. Gunter Matheis
9. The Use of Ground Rocks in Laterite Systems: An Improvement to the Use of Conventional Soluble Fertilizers. O.H. Leonardos, W.S. Fyfe and B.I. Kronberg
10. Silicate Dusts as Natural Fertilizers. Peter von Fragstein
11. Organic Extracts for the Treatment of Rock Powder Fertilizers in Bio. Agriculture. P. von Fragstein and H. Vogtmann
12. The Weathering Properties of Silicate Rock Dust Under Laboratory Conditions. P. von Fragstein, W. Pertl and H. Vogtmann (This report is in German with a condensed English version)
13. Silicate Rock Powders: Qualitative and Quantitative Aspects. P. von Fragstein, W. Pertl and H. Vogtmann
14. Fertilizing With Rocks. Stephen Strauss
15. Agricultural Alchemy: Stones Into Bread. Ward Chesworth, Felipe Macias-Vazquez, D. Acquaye and E. Thompson
16. Late Cenozoic Geology and the Second Oldest Profession. Ward Chesworth
17. Mulch Farming in the Canary Islands. E. Fernandez Caladas and M.K. Tejedor Salquero
18. The Use of Rock Flour in Agriculture: A literature Survey on Granites, Feldspars, Micas and Basalts. Eliot Coleman
19. Bibliography of Rock Dust Studies (112 entries, all of them in German)
20. Preliminary Results for the Soil Remineralization Forestry Trials on Grandfather Mountain in North Carolina. Dr. Robert Bruck, Ph.D
21. An Interview with Dr. Robert Bruck, Ph.D, Director of the Environment for North Carolina on the State of the Appalachian Forests and Remineralization. Joanna Campe
22. Soil Improvement: The Step Beyond Conservation, Men of the Trees Remineralization Trials. Barrie Oldfield

23.Information for the Application of Silicate Rock Dust for the Amelioration of Forest Soils. U. Sauter and K. Foerst (This report is in German with a summary in English)

24.The Effects of Basalt Dust Emissions on Spruce Trees at the Basalt Quarry Albert, Huhnerberg in Comparison to Spruce Trees Outside the Range of Emissions. Fritz Leipold

25.Applications of Diabase Rock Dust in Brixlegg Forest. Georg Abermann

26.Compensational Fertilization with Silicate Rock Dust for Buffering Damaged Forest Soil. Ulrich Hahn (This report is in German with a condensed English version)

27.Effect of Silicate Rock Dust in Forests. Ulrich Hahn

28.Possibilities for the Development of the Wood and Forestry Economy that include Remineralization in Germany. Edgar Gartner, Research Group Productivity Development

29.Forest Fertilization: A Bibliography with Abstracts on the Use of Fertilizers and Soil Amendments in Forestry. Compiled by Donald P. White and Albert L. Leaf

30.A Technique Called N-Viro: Soil Remineralization Using Sewage Sludge Mixed with Cement Kiln Dust. T. Montgomery

31.Bio 2 Biological Activator Accelerates Wastewater Treatment. Meridian Environmental Group

If you have an interest in obtaining any of the above resource material, or in a Membership / Subscription to REMINERALIZETHE EARTH, they may be contacted at:

REMINERALIZATION THE EARTH  
152 South Street  
Northampton, MA 01060-4021 USA  
Phone: (413) 586-4429  
Fax: (413) 586-6064  
E-mail: ReminEarth@aol.com  
mailto:ReminEarth@aol.com

Earth Regeneration Society

The Earth Regeneration Society works to reduce atmospheric carbon dioxide (CO<sub>2</sub>) buildup.

If you are interested in learning how remineralization helps stimulate plant and forest growth to absorb carbon dioxide (CO<sub>2</sub>) and what you can do to help, write or call for free information packet.

Earth Regeneration Society  
1442 A Walnut St. #57  
Berkeley, CA 94709  
Phone: (510) 849-0183  
Fax: (510) 849-4155

Y. Rado, "The Wonders of Powdered Gravel", REMINERALIZE THE EARTH, 1994.

THE FACTS:

Nearly all soils on earth are thousands of years old. They are generally quite "sick" and depleted. Finely ground stones and gravels, applied to such soils, can literally restore them by supplying a broad range of minerals.....minerals which have been slowly lost through the ages, by erosion, leaching, and farming.

A soil which has an abundance of minerals really "comes to life." Billions of microbes flourish, by feasting on the mineral elements, and they, in turn, supply the plants, worms, and so forth, with the basic compounds needed for health.

The earth's soils haven't always been in such poor shape, as they are now. Five thousand years ago, the situation was quite different. Back then, the soils had an abundance of minerals. The result was an incredible richness of LIFE, everywhere.

The trees in the forests of Europe grew so huge -- oak tree trunks were often a hundred feet tall, to the first branch! Imagine an entire an entire forest of such trees, or having much of the earth covered with them. Well, that's exactly how it was. But now, after thousands of years of leaching, erosion, farming, overgrazing, ....plus the more recent assaults with chemicals, the soils are a mere shadow of what they once were.

The symptoms of mineral depletion are everywhere, and getting worse each year. The forests are actually dying in many areas. Crops are diseased, insipid, insect infested, and nutritionally "bankrupt." Soils are compacted, nearly lifeless, and easily eroded away. Plants and trees are stunted, sickly, sensitive to frosts and droughts.

People and animals are in similar shape. You really ARE what you EAT! Everything from susceptibility to AIDS or cancer, to "learning difficulties" can usually be attributed, largely, to the condition of the SOIL.

How It Works:

Powdered rocks and gravels are Nature's "fertilizer." Glaciers and volcanoes are the primary methods She uses to produce the powder. But those methods are very slow, and the job of re-mineralizing needs to be done right away. We need to use efficient machines to grind gravel into powder, so that the soil life can get to the minerals that are trapped in the rocks

When powdered gravel is applied to the soil, a marvelous thing happens. The microbes in the soil (and in the guts of earthworms) "digest" the powder, and

extract whatever useful elements they find. The higher plants then extract the mineral rich juices from those microbes, and pass them down the line to the animals.

Given an abundance of minerals (like zinc, copper, calcium, etc.), and water, the soil microbes, earthworms, plants, and animals THRIVE because the minerals are critical to every function of living things. The worms bore miles of tunnels, which aerate the soil. The microbes work extra hard to glue the soil particles into spongy "crumbs." The plants develop huge root systems, which resist drought. Insects are repelled by the healthy juices of the plants. Foods become more flavorful and satisfying. Both yields and quality increase. The plants become more heat and frost resistant. Diseases become rare events. And so on. The minerals are truly the FOUNDATION of all life on earth!

Plants need a balanced "diet" just like people do. Too much of a good thing can be very harmful. That's a problem with compost, manures, and chemical fertilizers; they release too much of some nutrients (like Nitrogen and Phosphorous) and not enough of others (such as the many trace minerals). And to make matters worse, they are very soluble in water, which means that the plants are FORCED to absorb them, throwing the plants out of balance. Powdered rock, on the other hand, is practically insoluble, and so it cannot cause an imbalance, nor can it pollute the ground water or streams. It could make a World of difference.

A BRIEF PERSPECTIVE  
On Soil Remineralization and the Climate

"A BRIEF PERSPECTIVE On Soil Remineralization and the Climate", REMINERALIZE THE EARTH, Spring, 1993. This information is condensed from the writings of John Hamaker, Don Weaver, Larry Ephron and Joanna Campe.

Soil Remineralization:

The soils of the entire world have become severely demineralized by erosion over thousands of years. Plants require a continuous intake of minerals, just as we do, and for very similar reasons -- calcium to build structural support, iron to carry oxygen, and so on. Plants growing on mineral-depleted soil do not get enough nourishment and so become smaller, less-abundant and less hardy, more vulnerable to the insects, worms and fungi they are prey to.

Remineralization causes a phenomenal growth of the microorganisms in the soil. It increases the nutrient intake of plants. It counters the effects of soil acidity, prevents soil erosion (just for that reason it would be worth applying rock dust), increases the storage capacity of the soil, contributes to the building of precious humus complexes, has anti-fungal properties, and when you spray it on plants it repels insects as well. The plants and trees become highly resistant to insects, disease, frosts, and drought. Remineralization also enhances and speeds up the process of composting, so if you're composting for your garden, consider putting on some rock dust. It can be even more effective than just directly applying it to the land.

For Forests:

The results of long term experiments released in 1986 showed that in a forest where pine seedlings were remineralized, after 24 years the wood volume was four (4) times higher than in the untreated area.

For Agriculture:

The best source of soil minerals is simple crushed gravel dust. In 1976 John Hamaker spread gravel crusher screenings on part of his ten acres in Michigan. The following year, in an area of sparse rainfall and dry summers, and with no irrigation, his corn produced 65 bushels per acre, compared to yields of under 25 from other local farms.

Moreover, when independent analyses were done, Hamaker's corn was found to contain 28% more protein, 47% more calcium, 57% more phosphorous, 60% more magnesium and 90% more potassium than the same type of corn grown with chemical fertilizers nearby.

Twenty years ago the USDA published studies which showed that cement kiln dust (a less-satisfactory source of minerals) also produced better crops, but they couldn't understand "what element" in the dust was responsible and dropped the matter.

Don Weaver grew 18-foot pole beans on remineralized soil (Jack and the Beanstalk?) and got two to four times the normal organically grown yield. Alan LePage of Vermont grew a crop of carrots averaging 1-1/2 feet long. And there was no insect damage to any of these crops. Hamaker estimates that on fully remineralized soil, American agriculture could grow four times as much food as it is capable of now -- or the same amount of food at about one-fourth the cost -- and with no pesticides or chemical fertilizers.

The Nutritional Aspect:

When we eat food grown on depleted soil we too, like the plants, lose our natural resistance to disease. All the degenerative diseases have been on the rise in America in recent decades. Dietary fat, cholesterol, salt and overly-refined foods seem to be major factors, but a serious deficiency of minerals in our food may be another. Mineral depletion of soils has been found to be directly correlated with death rates. And deficiencies of only one of a number of trace minerals -- copper, iron, selenium, etc. -- have been found in laboratory studies to be associated with an increased risk of cancer. You may want to grow more complete, nourishing food for yourself and your family.

A Global Perspective On Climate:

The problem of soil demineralization also has a global perspective. It is known that the Earth's soil becomes demineralized during each interglacial period, the relatively short 10,000-year warm period between each 90,000-year major Ice Age. Consequent decline and death of the world's forests and other vegetation which occurs cause great quantities of carbon dioxide to be given off. The level of carbon dioxide in the Earth's atmosphere has been rising exponentially for the past century. Carbon dioxide and other greenhouse gases trap excess heat from the sun, potentially affecting the world's climate.

It is also well-known that when the glaciers advance and then recede during each recurrent Ice Age, they grind down rocks in their path, and that their

mineral-rich dust is blown far and wide over the surface of Earth, remineralizing its soil and causing plant life to thrive again.

John Hamaker has supplied one missing piece of the cosmic puzzle to provide an explanation, long sought, of the awesome 100,000-year cycle of major Ice Ages. Hamaker points out that the greenhouse effect occurs primarily in the tropics, which get the most sun, rather than in the polar regions which get very little. When this happens, the temperature differential between the tropics and the poles increases, resulting in fierce wind systems, hurricanes, tornadoes and storms.

The moisture picked up by these increasing storm systems also is transported to the higher latitudes, where it gets deposited as snow and ice, eventually bringing on glaciation and the next Ice Age. This has been happening in recent years, with record snow cover in the Northern Hemisphere and a shortening of the growing season, by weeks in some places, a pattern which is also accelerating year by year. Hamaker estimates that within a few decades the growing season may have decreased so much that millions of people will starve, in the rich nations as well as the poorer.

#### Rock Dust Application Brings Large Improvement to Vineyard in Solano County, California

Cannard, Bob, "Rock Dust Application Brings Large Improvement to Vineyard in Solano County, California", Distributed by EARTH REGENERATION SOCIETY, 4 July 1992.

"The four-acre vineyard had been heavily over-cultivated and heavily degraded. The soil supported weeds about three inches tall that went to seed very early in the season.

We chiseled the ground, broke it up by mechanical compaction -- ripped it up about 18 inches -- and we planted cover crop on the ground and fed the whole vineyard, including the cover crop, by broadcasting application of about 500 pounds of crushed basaltic rock and 200 pounds of crushed oyster shell rock, which is a calcium resource. The rock was broadcast (spread) equally over the four acres -- right on top of the soil maintenance crop as well as underneath the grapevines -- using a small, standard tractor spreader about six feet wide driven between the rows.

We did this for three years. In the first year, the cover crop went up to about 2 feet, and in the third year it went up to about six feet, but it did not mature. It was not mowed or cultivated until the final crop was totally mature in June, at which point it was mowed. It was so thick and lush and vigorous.

The grapevines, which had problems predominantly associated with nutritional deficiencies, were manifesting a whole range of disorders, but mainly one that is labeled as "utypa". The leaf surface was small, the fruit yield was low, the cane diameter was very small; there was heavy predominance of fruit rot (botrydis and mildews on the fruit), even with a fungicide spraying program.

I was there a couple of days ago and the place is absolutely green and lush. There is no evidence of "utypa" decline in the vineyard. It has an excellent crop of firm, plump berries -- a really beautiful crop. It's a really stunning turnaround.

The vines are in rows, 6 x 10 foot spacing, and 12 years old. The ground was not very well prepared when they were planted -- on well cropped, heavily compacted soil. It was chiseled or ripped a little, but not very well to start with, and then they subsequently went into annual clean cultivation -- year in and year out for the first five years -- which caused it to collapse. The vines were going to die. (Clean cultivation means that no weeds are allowed to manifest and grow. They are killed as quickly as possible -- as soon as the soil dries out enough to get a tractor in.)

The owners plant one crop a year of Chardonnay grapes, and they will continue to apply smaller quantities of rock dust annually. We've declined 100 pounds per year per acre. We're now at about 200 pounds per acre, and I think we'll continue in the same fashion.

The object is to give the earth many, many small meals -- you don't want to OD it by giving it too much all at once. If you place more raw crushed alkalis than the system can absorb, it won't do any good and can actually be deleterious. You want to use enough to feed the system, and giving it many light meals is more effective."