

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

My first exposure to the importance of trace minerals occurred about 28 years ago. I was planting some early spring vegetables in the garden behind my house. This extremely rich organic soil had been amended with compost and organic fertilizers for years. There was a new trace mineral package called Eco-Min (granite sand based) that had just been introduced to the market and I decided to test it. I planted many of the cool season vegetables from transplants (cabbage, broccoli, Brussels sprouts, cauliflower, etc.) and for every other plant; I placed a tablespoon of the mineral package in the bottom of the transplant hole. Nothing showed a response except the Brussels sprouts, but did they respond as shown in the picture below! Obviously, there was some trace mineral (element) in the package that the plant needed that was limiting growth.



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This experience reminded me of **Liebig's Law of the Minimum**, often simply called **Liebig's Law** or the **Law of the Minimum**. It is a principle developed in agricultural science by Carl Sprengel in 1828 and later popularized by Justus von Liebig. It states that plant growth is controlled; not by the total amount of nutrient resources available, but by the scarcest resource (the limiting factor) like a needed element. From Wikipedia "The availability of the most abundant nutrient in the soil is only as good as the availability of the least abundant nutrient in the soil." On the other hand, to use an old analogy, "A chain is only as strong as its weakest link."

Most agricultural and horticultural departments in our universities teach that we only need 16 elements to grow a plant. As the photo above shows, we really do not know what a plant needs, much less what an animal or humans need. If the trace elements are not in the soil, microbes cannot release them, plants cannot take them up; hence, they do not get to the animals or to the humans that eat the plants and animals.

"Micronutrient deficiencies are widespread across the globe in both developed and developing countries. These deficiencies pose a serious threat to long-term health and longevity. Deficiencies in key minerals, such as magnesium and potassium, increase the risk of chronic diseases, including cardiovascular disease and diabetes. It is estimated that 1 out of 3 people in the United States has at least 10 minerals they are deficient in. Those 10 minerals being potassium, manganese, magnesium, calcium, zinc, iron, copper, selenium, chromium, molybdenum and boron." From the Mineral Fix

This is why we now recommend adding trace minerals like the Re-Mineralizer to the soil for all plantings to ensure that all the needed elements for microbes, plants, and animals are present.

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For the healthiest and most nutritious plants it is always best to use a good organic fertilizer like Microlife and the Re-mineralizer as they complement each other.

To compile the information in this review of all the elements and what they do, I have collected hundreds of articles from various journals and other publications as well as the books and magazines listed below to list a few.

References:

To compile the information in this review of all the elements and what they do, I have collected hundreds of articles from various journals and other publications as well as the books and magazines listed below to list just a few.

Nature's Building Blocks - An A-Z Guide to the Elements, John Emsley, Oxford University Press, 2011, ISBN 978-0-19-960563-7

Trace Elements in Soils and Plants, Alina Kabata-Pendias, CRC Press, 2011, ISBN 978-1-4200-9368-1

Trace Elements in Abiotic and Biotic Environments, Alina Kabata-Pendias and Barbara Szteke, CRC Press, 2015, ISBN 978-1-4822-1279-2

How Plants Work, Linda Chalker-Scott, Timber Press, 2015, ISBN 978-1-60469-338-6

Seawater Concentrate for Abundant Agriculture, Arthur Zeigler, Ambrosia Technology, Arthur Zeigler, 2012, ISBN: 978-0-615-66614-3

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"The Hidden Half of Nature: The Microbial Roots of Life and Health", David Montgomery and Anne Bikle, W.W. Norton and Company, 2016, ISBN: 978-0-393-24440-3

The Handbook of Trace Elements, Istavin Pais and J. Benton Jones, 1997, CRC Press/St. Lucie Press, ISBN 1-884015-34-4

Soil Mineralogy with Environmental Applications, Editors Joe Dixson and Darrell Schultz, Soil Science Society of America, 2002, Library of Congress Card Catalog Number: 2002100258

Food Forensics - The Hidden Toxins Lurking in Your Food and How You Can avoid Them for Lifelong Health, Mike Adams, BenBella Books, 2016, ISBN: 978-940363288

Chemical Exposure and Human Health, Cynthia Wilson, McFarland Publishers, 1993, ISBN: 0-89950-819-3

Rare Earths - Forbidden Cures, Joel Wallach, DVM, ND and Ma Lan, MD, MS, 1994, Happiness Publishing, Library of Congress Catalog

Minerals for the Genetic Code, Charles Walters (Dr. Olree), Acres, USA, 2006, ISBN: 0-911311-85-8

Dead Doctors Don't Lie, Dr. Joel Wallach, DVM, ND and Dr. Ma Lan MD, Wellness Publications, 2015, ISBN: 0-9748581-0-2

The Elements, Theodore Gray, Leventhal/Workman Publishers, 2009, ISBN: 13-978-1-57912-814-2

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The Art of Balancing SOIL Nutrients, William McKibben, Acres, USA, 2012,
ISBN: 978-1-60173-032-9

The Soil-Human Health Nexus, Rattan Lal, ISBN: 978-0-367-42214-1, CRC Press, 2021,
Advances in Soil Health Series

The Mineral Fix – How to Optimize Your Mineral Intake for Energy, Longevity, Sleep and More,
James Dinicolantonio, PhD and Siim Land, ISBN: B08ZLPL8TX

Life Extension Foundation, LE Publications. A monthly health magazine, which summarizes
hundreds of papers in the medical research journals.

Newsletters by Dr. Mercola - articles.mercola.com and several other researchers.

Minerals - Foundations of Society, American Geologic Institute, 2002

Earth Magazine - American Geosciences Institute, assorted articles

Journal of Rocks & Minerals - assorted articles

All the journals of the Soil and Crop Science Societies, and many more.

Note: The October issue of Life Extension magazine was on fruit and vegetables and titled “The
Power of Plant-Based Nutrients”. It is an excellent summary of how eating fruits and
vegetables can improve our health.

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To give you a teaser a couple of the articles are: Anti-Cancer Effects of Broccoli and Plant-Based Multivitamins.

I have purchased 100 copies of the magazine, as it is so loaded with beneficial information. They will be available on a first come first served basis at Nature's Way Resources as soon as they arrive.

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