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JOHN'S CORNER:

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

by John Ferguson

I am often asked why organic matter is important in our soils. Here is another reason to add to the list of the many benefits of organic matter. For every 1% of organic matter in the soil, 100 square feet of soil will hold **two pounds** of pure nitrogen (N). Depending on the weather and microbial content of one's soil, 1-4% of this nitrogen is released each year. This nitrogen is released (mineralized) as nitrate or ammonium depending on the plant species and the type microbes in the soil. When one has a high organic matter content in their soils, it will supply all the N-P-K (nitrogen, phosphorus, and potassium) our plants require. In addition, the organic matter will supply minor nutrients (calcium, iron, magnesium, etc.) and micronutrients. Note 1: Artificial fertilizers have none of these extra benefits. Note 2: Really healthy soil will have organic matter of 8% or more.

The next question I often receive is "How do I build my organic matter?" The two major ways and the most cost effective, are to use a high-quality compost like our "Leaf Mold Compost" and the second is to use our composted or "Aged Native Mulch". According to Dr. Elaine Ingham (microbiologist), the majority of material sold in this area as compost, is actually putrefied organic matter which can be harmful to plants. As the old adage goes, "One gets what they pay for".

As gardeners we often hear that we need to aerate our soils. In nature (forest or prairies) soils do not have to be aerated. So why do we need to aerate the soils in our yards and gardens?

1) Artificial fertilizers are chemically salts, that lock soil particles together.



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- 2) Artificial fertilizers kill beneficial life in the soil from microorganisms to earthworms that naturally work to keep the soil loose and aerated.
- 3) Herbicides kill the plants that we call weeds, one of their roles in nature is to loosen compacted soil and restore nutrient balance (Often if one corrects the soil problem the weed often goes away as it has done its job and is no longer needed).
- 4) Minerals are formed from the chemicals in our municipal water supply that cement our soils and create hardpan. Two common ones are Fluorapatite $\text{Ca}_5(\text{PO}_4)_3\text{F}$ and Chlorapatite $\text{Ca}_5(\text{PO}_4)_3\text{Cl}$, (from Principles of Soil Chemistry, 4th Edition, Kim H. Tan). If you notice in the chemical formulas above, we first notice our friend the phosphate ion (PO_4) that is required for healthy soils and plants. We next notice calcium (Ca) that all gardeners know is essential to having healthy plants. However, when these good guys are exposed to fluorine (F) as in the fluoride and chlorine (Cl) that are found in our water systems it turns them into minerals that cement our soil particles together creating hardpan. So, the more one waters, the more often one will need to aerate and in general the more problems one will have.

Note: Following a conversation with Bob Daily several months ago about how long has it been since we have watered our yards, I have been asking friends, customers and colleagues the same question. Gardeners whom have been using the modern organic methods for many years, have not needed to water their grass or flowerbeds since the drought of 2011 (saving thousands of dollars in water bill expense).

We have talked about the link between soil care and human health many times. When one eats foods grown or treated with the herbicide Round-Up, the body cannot absorb magnesium. This is one of the reasons 90% of Americans are magnesium deficient. [This link is to a short article on the health benefits of magnesium \(Mg\).](#)



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Another article published in the journal of The American Osteopathic Association (2018) found vitamin-D cannot be utilized without sufficient magnesium (Mg) present in our bodies.

Many gardeners enjoy green tea. A study published in the Journal of Biological Chemistry, scientists from Lancaster University found that a compound found in green tea breaks up and reduces the protein plaques found in blood vessels and those with similar structure to the amyloid plaques found in Alzheimer's disease.

Another study from Chalmers University of Technology in Sweden (2018) has found that eating whole grains like rye, oatmeal, and muesli was found to prevent type 2 diabetes. Since European countries do not use/allow GMO grains hence in the USA look for organically grown grains to obtain the same results.

We often hear about how we as a people are using up the Earth's resources faster than they can be replaced. It reminds me of the prophecy from the book of Isaiah 51:6 (NIV) that states, "the earth will wear out like a garment". If you would like to find out how much your lifestyle is contributing to this problem there is a new [Environmental Footprint Calculator available online](#).