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JOHN'S CORNER:

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

by John Ferguson

Another reason to avoid high nitrogen artificial fertilizers or other high nitrogen manures like poultry manure has been discovered. The Leibniz Institute of Plant Genetics and Crop Plant Research has discovered that in conditions of high nitrogen in the soil, plant roots do not grow deep or wide. Conversely, they discovered that in low nitrogen conditions plants expand their root zone searching for nitrogen. Journal of Nature Communications 2019. This is another reason people have to water so much, as they regularly apply artificial fertilizers to green up the grass hence between the salt build up creating hardpan and the excess nitrogen, roots of turf grass do not grow deep.

Reasons to avoid artificial fertilizers continue to grow. A new study from Cornell University has found that the polluting emissions from artificial fertilizer plants (think ammonia an extremely toxic and potent greenhouse gas) were 100 time higher than the fertilizer industries self-reporting estimates. When one uses these toxic products, they contribute to climate change during manufacture, escape of methane from the fertilizer, pollution of our waterways and destruction of organic matter in the soil releasing carbon dioxide. Journal Elementa Science of The Anthropocene (May 2019).



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Over the last few years I have been doing a lot of study on how plants use nutrition (minerals and elements) to grow. I recently read a paper published in the American-Eurasian Journal of Agronomy (2010) on the effects of chicken manure on the growth of sweet potatoes. Poultry manure has been used for generations as a fertilizer for plants and works well if only used occasionally. Long term usage can lead to a salt buildup in the soil which is harmful and it is not a balanced fertilizer, hence repeated usage can lead to chemical imbalances in the soil. This study found that small amounts of poultry (chicken) in this case gave satisfactory to good results. However as increasing amounts of manure were applied yields actually declined.

Note 1: Never use poultry manure from factory farms as it is often contaminated with antibiotics, arsenic, and other toxic materials.

Note 2: Poultry manure is high in water soluble phosphorous (P). When there are high levels of phosphorous in the soil, the extremely beneficial mycorrhizal fungi DO NOT colonize a plants roots. The picture below courtesy of Mike Amaranthus, PhD, illustrates the importance of mycorrhizal fungi. This study was done in Southern California in highly saline soils in a very dry drought prone area. The only difference between different sides of the fields is the lemon trees on the right had been inoculated with mycorrhizal fungi at planting time.



Note 3: Over 80% of plants on earth require mycorrhizal fungi to be healthy.

A study of 3,600 people by the Barcelona Institute for Global Health found that adults who were exposed to natural outdoor environments as children, have several health benefits. These range from better cognitive development, better mental and physical health when as children they were exposed to green space (gardens, parks, forests, urban parks) and blue



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space (canals, ponds, creeks, rivers, lakes, beaches, etc.). International Journal of Environmental Research and Public Health (2019)

The Australian National University has found that children who spend one half an hour per day out in the sun decrease their risk of inflammatory bowel disease (IBD). Journal of Pediatric Gastroenterology and Nutrition, (2019). This is another reason school gardens and playing outside are important to their health.

Our pollinators are in serious decline and a recent study (2018) by the University of Hawaii confirmed that exposure to glyphosate (Round-Up) disrupts the healthy gut flora of bees. Other studies have found similar gut disruption effects in chickens and cows. Several studies have found that glyphosate targets an enzyme found in beneficial gut bacteria that plays an important role in detoxifying harmful chemicals, and it is now considered a possible cause of the rise in modern human diseases worldwide.

To make matters worse testing by the consumer advocacy group, Moms Across America (MAA), has revealed that the meat free Impossible Burger (made from genetically engineered soybeans) is full of glyphosate. This chemical also is believed to be related to the tremendous increase of nonalcoholic fatty liver disease (NAFLD).

The reasons to “go organic” in our gardening and “eat organic” in our food continue to increase.