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JOHN'S CORNER:

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

by John Ferguson

We have talked about the multiple health benefits of gardening many times. A study found the most common hobby among centenarians is gardening! Coincidence?

Most gardeners intuitively would know this, however, a study by Cornell University found that apple orchards surrounded by agricultural lands are visited by a less diverse collection of bee species that orchards surrounded by natural habitats. This is important as the yields go up and is directly correlated with the number of species doing the pollination.

A study in the journal PLOS 1 (2019) has found that the ground beetle family Ozaena parasitize ant mounds. The larva of this beetle has adaptations that allow them to hunt and eat the ant eggs.

Dead wood is essential for a forest to regenerate and provide habitat from beneficial fungi to insects like the ground beetles mentioned above. The dead wood (rotting logs) that decomposers leave behind is habitat for a tremendous number of organisms like millipedes, microarthropod's, earthworms, to many birds like woodpeckers and owls. This dead wood can be standing dead trees to logs lying on the forest floor. For years I have always placed a few logs in my flowerbeds under the shrubs. This practice provides many benefits to a gardener from providing food for microbes (bacteria and fungi) that starts the soil food web, to all the other life in the soil that helps our plants grow strong and healthy. Many beneficial insects that eat pests live in these rotting logs and come out at night to eat pests from aphids to scale and whiteflies. When the logs are fully decomposed, they have been turned into rich humus that helps build beautiful soil and helps the soil store water.



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This same idea is behind the very successful gardening methods popular in Europe known as “Hugelkultur” where woody material is incorporated into mounded planting beds.

Organic gardeners have sworn for years that planting Marigolds intermingled with their tomatoes protected the tomatoes from many pests. A study by Newcastle University published in the journal PLOS 1 (2019) has found the chemical limonene released by marigold’s is the main component that keeps whiteflies away from the tomato plants. Note: Limonene is the same chemical found in citrus peels and orange oil.

I have reported on the poor nutrient quality of our food many times. Most conventionally grown food beside using toxic chemicals also uses tillage which destroys the soil. A study published by the Rodale Research Institute has found that reduced-tillage increases the nutrient concentrations in winter squash.

A study published in the journal Molecular Ecology (2019) has found that exposure to certain pesticides like neonicotinoids, changes the expression of genes in bees. So, in addition to affecting the nervous system of insects it also alters their behavior, reducing their ability to forage and develop colonies.

A study by the National University of Singapore published in the Journal of Alzheimer’s Disease (March 2019) has found that older people (seniors) whom consume more than two portions of mushrooms (fungi) weekly have 50% reduced odds of cognitive impairment. Many species of mushrooms provide health benefits. Growing one’s own mushrooms is becoming a common practice amongst gardeners.

Earthworms are sometimes called a gardener’s best friend. A study in the journal of the Soil Science Society of America (February 2019) has found that earthworms and bacteria working together was very effective at fixing nitrogen from multiple sources and prevent it from leaching by storing it in the soil which can then be used by plants.



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A study published in the journal *Frontiers of Plant Science* has found that growing grasses along side blueberry plants corrects iron (Fe) deficiencies when growing in an alkaline soil with a pH of 8. When growing in an acid soil iron is naturally soluble and available to the blueberries. In an alkaline soil iron is not available and blueberries lack the enzymes required to release iron. However, when grasses are grown along side the blueberries the grasses provide the required enzymes to make iron available. The association produced other benefits from increased yield to increase levels of anthocyanins and other antioxidants compounds. Note: grasses have been found to improve plant growth and yield in olives, grapes, and citrus. We are learning more and more about the benefits of companion planting and increasing species diversity in our plantings.

Researchers at Rice University have found a link between a diet low in the vitamin B-12 and an increased risk of infection by deadly pathogens in animal studies using nematodes (*PLOS Genetics*, 2019). The vitamin B-12 molecule is built around the cobalt atom (Co), if we do not have cobalt in the soil, the microbes do not produce B-12 for plants to absorb. This is why I recommend using the Re-mineralizer product ever few years around all our fruits, vegetables, and herbs.

A mega-study comprised of 46 independent studies, published in the journal of the American Agronomy Society (2018) found that cover crops provided early season weed suppression comparable to those provide by toxic chemical or mechanical weed control methods.

Research at the HeartMath Institute have found that the earth's magnetic field carries biologically relevant information that connects all living systems that helps to synchronize, energize, and support the interconnection of all these systems. For example, most people in the presence of trees experience pleasant, relaxed, comfortable feelings. Medical doctors in Japan are prescribing walks in the forest for many medical problems (Forest Bathing) and have found it if more effective than drugs for treating many health problems. In past issue I have



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talked about research on how trees communicate with each other and share resources (Wood Wide Web). We now know that fungi can connect trees miles apart and help them share information and even nutrients. Science is only now beginning to explore the many benefits that come from a conscious awareness of the interconnectivity with people, nature, animals, trees, and the microbes in the soil and in or on our bodies.

In past issues we have discussed how fluoride in our public water systems hurts the growth and health of many plant species. A recent article in the Journal of Well Being (vol. 28, No.1) talks about how fluoride blocks iodine receptors in our thyroid gland which then triggers weight gain, fatigue, depression and even hair loss. Another finding was that glyphosate the main ingredient found in the herbicide Round-Up, binds tightly to the metals mercury and aluminum and carries them directly into one's brain. This effect also cause endocrine disruptors to shut down our thyroid glands and trick your body into storing more fat. It was also reported that glyphosate blocks certain enzymes in our liver and prevents the liver from breaking down and removing many types of toxic materials. It also prevents the body from converting vitamin-D into its active form that we require for good health, which contributes to vitamin-D deficiency. Glyphosate is on most grains, soy, corn, and all GMO products. The GMO products also have many times higher levels of glyphosate on them (I call them products since they are not true foods). The good news is that sunlight and sulfur rich foods (garlic, onions, leeks, cruciferous vegetables) and pasture raised meat and eggs help the body get rid of glyphosate. The reasons to purchase organically grown food continues to increase ever day.