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## **JOHN'S CORNER:**

### **NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS**

*by John Ferguson*

As summer approaches, many of us are busy with our vegetable gardens. I was reading in the July 2016 issue of the magazine "Life Extension," and there were several articles on the health promoting properties of fresh vegetables. We all know that vitamin-C will prevent scurvy. Researchers have found that chemicals in spinach called carotenoids (lutein/zeaxanthin) can reduce macular degeneration caused by aging. Another article in the Journal of Nutrition (March 1, 2016) has found that chemicals in broccoli (chopped or steamed) called sulforaphane, reduced the risk of fatty liver disease and liver cancer.

In the Journal Ophthalmology researchers found that consuming high amounts of vitamin-C could slow the progression of cataracts. The Journal Nutrition Research found that people with high levels of lycopene another carotenoid (gives tomatoes and watermelons their red color) reduced one's risk of dying by 33%. Another article found that the spice saffron from the *Crocus sativus* flower improves visual acuity. They used a dose of 20 mg per day over an 11-month period and the average visual acuity improved by two lines on the Snellen test chart! A flavonoid (Cyanidin-3-glucoside or C3G) found in many fresh berries was beneficial in improving night vision. These are many good reasons to grow our own vegetables organically.

A paper in the Journal Philosophical Transactions of the Royal Society B: Biological Sciences (2016; 371) has found that the function and quality of forest ecosystems is directly related to the diversity of animals and plants. The food webs are extremely complex and that the flow of energy through the leaf litter is extremely high if the decomposer community is rich in species and individuals. "The study showed that the functioning of the ecosystem is ultimately determined by simple relationships: the higher the number of individual animals and the higher the species richness, the better the system functions". The suffix "cide" means to kill. When one uses the toxic pesticides, herbicides, fungicides, etc. the landscape does not function as well. When one uses these chemicals, we lose species numbers



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and diversity. This results in more weeds, disease, and insect problems as well as more fertilizer and water required.

An issue affecting mulch prices on the East Coast and deep southeast USA is the clear cutting of our forests to make wood pellets to fuel electric generating plants in Europe to replace coal. New studies have shown that burning wood pellets actually increases the amount of CO<sub>2</sub> produced. The spin is that using trees is carbon neutral, however when a tree is burned it will take 50 years for another to grow and reabsorb the same amount of carbon. The loss of tree material to make mulch has created shortages in some areas raising the price of mulch.

There is a good article on the E-Nature blog on Poison Ivy. It can be found at:

<http://wild.enature.com/blog/how-can-you-avoid-poison-ivy-and-poison-oak-and-treat-them-if-disaster-stri>

This quarter's issue of the Journal Compost Science and Utilization (2016, Vol.24) had several good articles. If ones soil has a carbon to nitrogen ratio (C:N) between 20-30:1, then nitrogen is immobilized in the soil and not lost to leaching. Composts in this range (mature composts) were found to be as effective as artificial fertilizers in increasing yields on barley. The compost also increased nutrient uptake (nitrogen and phosphorous) by the plants, particularly in drought years. The compost also provided substrate and energy needed for microbially mediated N<sub>2</sub>O production (free nitrogen from the air).

Another article found that adding small amounts of gypsum (CaSO<sub>4</sub>) to the active composting phase reduced the amount of nitrogen lost, increasing the finished compost's nitrogen levels. This is very important when composting with lots of manure as a feedstock.

A study on growing Agave's found that using vermi-compost (earthworm castings) significantly increased the dry weight, the fructan, glucose, and fructose content of the plant. It also increased the mycorrhizal colonization of the roots. This led to the plant being able to absorb water and nutrients better. Organic gardeners have known for years that earthworms in our soil provide that service for us, *if* we do not kill them with pesticides and artificial fertilizers. A related study found that medicinal plants when grown in media that had been vermi-composted were of higher quality.

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In the journal of the Soil Science Society of America (April 2016) researchers found that the turnover of roots from deep rooted perennial grasses increased organic matter far more than most amendments. They also found that substances with the most nutrients (bio-solids, manure, and compost) produced the greatest organic matter, which persisted seven years after the last application.

There is a study with 40 years of data in the journal, Rangeland Ecology and Management (2016) by researchers at Kansas State University. They learned managers need to increase burning to more than once every three years to keep the tall grass prairie eco-system from transitioning to woodlands. It was also the most economical way to manage their land.

**Question from a subscriber:** *I have two worm bins, and can't supply enough eggshells for them; some sources say I should use dolomite or some source for calcium carbonate.*

**C.P.**

Charlie, I have two worm bins, a large one at the business and a backyard one at home. At work, I do not add anything but feedstocks. However, at home I do add mineral dusts with each new layer of material. I use an equal mix of basalt sand, granite sand, and greensand. I just mix it together and have it well blended. I add a couple ounces each time I add feedstock by sprinkling it on top of the new layer. The combination provides grit and all minor and trace minerals.

Note: The greensand is high in calcium

A few times a year I add a couple cups of good compost to ensure the bin is full of good microbes for the worms to eat.

Regards,

John