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## **JOHN'S CORNER:**

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

*by John Ferguson*

A study published in the Journal of The American Society of Agronomy (2019) has found that overuse of artificial fertilizers can damage plant roots. They used special boxes that would allow them to see and monitor root growth on Canola since it has a long tap root. They used 3 types of artificial fertilizers applied in bands and found that they can cause damage to the roots. When the roots were damaged, the plants could not take up nutrients and water. Another reason to only use organic fertilizers.

We all know that Enzymes are essential for us to digest our food and obtain maximum nutrition. A study published in the Journal of the Soil Science Society of America (2019) has found the same thing in soils. They found that enzyme activity was highest when a good compost was used in conjunction with plants (in this case cover crops). Enzyme activity was lowest when compost was not used.

Most folks consider Dandelions a weed, however it has many benefits from indicating soil health issues to being very nutritious and has a long history of being used as a medicinal herb. The botanical name is *Taraxacum officinale* and is an herbaceous perennial originally from Europe. It was brought to America due to its health and nutrition benefits. The root is best harvested before it goes to seed in early spring or late fall.



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According to the journal Society for Biomedical Diabetes Research the root contains many nutrients and bioactive compounds. It is found to be: Anti-inflammatory, anti-oxidant, anti-rheumatic, anti-hyperglycemic, hepatoprotective, and anti-cancer.

The root can be roasted ground up and used as a coffee substitute and it can be used to make dandelion tea. In soils it grows best when there is compaction and low available calcium (Ca) in the topsoil as its role in nature is to correct these problems. Hence, it is a good indicator plants when our soils are not as healthy as they should be. A few studies have shown that the seed will not germinate in real healthy soils with lots of available calcium.

**H**ave you ever wondered why in a group of plants one will get a disease and others nearby will not? A paper in the journal Scientific Advances (2019) by researchers from York University and colleagues from China and the Netherlands have discovered one reason why. A bacterial wilt pathogen ( *Ralstonia solanacearum* ) found all over tomato fields sometimes will not infect all the plants. They found the plants that were unaffected had pathogen suppressing *Pseudomonas* and *Bacillus* bacteria in their root's microbiome. They also found that this disease resistance could be transferred to the next plant generation with soil transplants. This is similar to fecal transplants in humans that is used in medicine.

**W**e have often talked about the importance of trace and micro-nutrients for our health (and the health of our soils, in particular the microbes that protect plants and help them grow). A study from James Cook University mentioned that two billion people worldwide suffer from micronutrient deficiencies. Eating more seafood would help folks



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in coastal communities. For the rest of us the best way is to grow our own food and Re-mineralize the soil .

**P**lants manufacture sugars from photosynthesis, where these sugars are transferred to the growing shoots, the growing roots, fruit and seeds, and for root exudates. When plants are grown on healthy soil the sugar content of the sap goes up. If the sugar content is high enough insects will not eat them as high sugar content will make the insects sick or even kill them. One way to increase the sugar content in the sap is to use foliar sprays as plants can absorb nutrients through their leaves.

I love to grow lantanas in my butterfly garden and in hot summers they would sometimes get spider mites. I have found that using products like Super Seaweed from Microlife TM, will work as a curative and a preventative. I often use Ocean Harvest from Microlife TM to also help feed the plant both as a foliar spray and as a root drench.

For the best results I use both the Super Seaweed and Ocean Harvest and maybe a little humic acid added to a good compost tea. The combination really helps plants green up and grow without any problems.

**A** new trend in gardening is getting with neighbors, garden club members, and others to create habitat corridors. The University of Wisconsin-Madison did an almost 20-year study published in the Journal Science (2019) that found by connecting small patches of savannas (prairies or wildflower meadows) to each other via habitat corridors showed an annual increase in the number of species.



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Habitat restoration is a key priority across the planet. The United Nations declared 2021 through 2030 the UN decade of Ecosystem Restoration. Ecosystem restoration is critical to stopping greenhouse gasses, improving food quality, preventing erosion of our soils and protecting fresh water supplies. Gardeners can be part of the solution rather than be part of the problem.

Ever wonder why some plants grow faster than others? One reason is the plant growth hormone called auxin that regulates plant growth. A paper in the journal PLOS Biology (July 2019) has found that a calcium binding protein is responsible for working with auxin. This protein regulates both auxin responses and calcium levels in the plant.

Several species of fungi collect calcium in the soil and store it on their hyphae to trade with the plant for root exudates. At the same time, earthworms produce auxins in their castings and in the mucus, they line their burrows with.

When we use a fungicide, we kill the good fungus and when we use artificial fertilizers or pesticides, we kill the earthworms. As a result, plants do not grow as well and have more problems. More reasons to use the modern methods based on soil biology that are often called "organic".

The fallout from the dangers of using glyphosate-based herbicides like Roundup continue to be exposed. In the USA there are now over 42,700 lawsuits for causing one's cancer (July 2019).

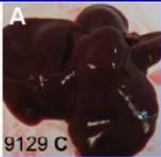








With Thanksgiving around the corner this leads me to think; What happens to animals fed grain with glyphosate on it? The vast majority of turkeys come from industrial factory farms where they are fed GMO corn loaded with glyphosate and then injected

with massive amounts of antibiotics to prevent disease from the filthy conditions they are raised in. Animal studies have shown that when eaten over many months the animals develop tumors (see slide below). These toxic chemicals get passed onto us when we eat the turkey. To protect one's family, look for organic, pasture raised turkeys. As a bonus they taste better.

**Chronic Toxicity of GMO Crop or Roundup®**

GMO and/or Roundup cause adverse health effects

- 50% males & 70 % females died prematurely
- (Tumors developed after 4-7 months vs 23 mo in control)
- Females = 2-3 X mammary tumors & pituitary disorders
- Males = kidney & skin tumors, liver & kidney damage
- All GMO and RU had digestive disorders

Livers (L) UTC; (R) GMO+R		Mammary cancer: GMO, GMO+RU, RU @ (1 ppb)		
				
Kidney damage (below)				
(L) UTC	GMO	GMO+R	RU	
				

I remember in college we used microwaves to sterilize samples since they can kill life. We know that microwaves can heat up and cook objects (e.g. microwave ovens). So, what is going to happen to our plants when they constantly get exposed to large amounts of microwave radiation from the 5G cell phone technology when it is mounted on a telephone pole outside your home? The Dr. Mercola newsletter [has an article](#) that is a good summary of the problems for those whom are interested.