

JOHN'S CORNER:

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

by John Ferguson

A study from Rutgers University has found a new method of how plants acquire nutrients from microbes called the "rhizopagy cycle". "Rhizopagy" means root eating. They have found that bacteria and fungi cycle between a free-living phase in the soil and a plant dependent stage within cells of plant roots. Microbes harvest nutrients from the soil (nitrogen and other elements), the microbes enter the cells of the plants roots and the nutrients are extracted from the microbes by the cells of the plant. Over 50 species of plants have been studied so far, and this cycle was present in all of them, hence it is believed to be true to all plants. We have known for years that plants cultivate microbes on their roots by excreting exudates that feed the microbes especially sugars that provide energy for the microbes to do their work. The microbes grow and then enter the root cells at their tips where the cells are growing and lack hardened cell walls. The microbes become trapped and lose their cell walls, and chemicals produced by the plant remove the nutrients. The surviving microbes stimulate root hair growth, regrow their cell walls and then leave at the root tip to return to the soil to repeat the process. *Journal of Microorganisms*, January 2019.

When we do things that hurt the microbe's (artificial fertilizers to toxic pesticides, fungicides, and herbicides), we destroy this natural cycle and lose the benefits. This mechanism helps explain why good compost and organic fertilizers are far more effective in growing healthy plants.

One of my favorite things to do when I am in the garden is to smell the flowers and herbs that I grow as it just makes me feel good. A paper in the journal *Frontiers in Behavioral*



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Neuroscience (2018) has identified a compound in the Lavender plant called linalool that when smelt (via neurons in our olfactory cells) it exerts its calming effects and helps relieve anxiety.

I have been asked to remind everyone that we now have a second gardening radio show in Houston called Home Show Garden Pros. This show is about sustainable methods of gardening using modern organic techniques and products. The host of the show is Danny Milikin, the conservation director at the Memorial Park Conservancy. The show airs every Saturday morning from 7:00 to 9:00 am on Sports Radio AM 610. The call-in number is (713) 572-4610. This show is supported by several of the major independent garden centers in Houston whom provide experts to answer questions in addition to Danny. There is also a lot of short Info videos on their website at <https://homeshowgardenpros.com/>. Additional information can be found on their Facebook page at <https://www.facebook.com/HomeShowGardenPros/>

The World Health Organization has called bacterial antibiotic resistance “one of the biggest threats to global health, food security, and development today.” The EPA under pressure from pharmaceutical companies wants to open the floodgates to permit widespread use of antibiotics in citrus production (grapefruits, oranges and tangerines). Despite the building national and international crisis of deadly bacterial resistance to antibiotics, this new allowance would expand on an emergency use decision the Environmental Protection Agency made in 2017. It permits up to 480,000 acres of citrus trees in Florida to be treated with more than 650,000 pounds of streptomycin per year; 23,000 citrus acres in California will likely be treated annually.

The two approved antibacterial chemicals (antibiotics) to be used as pesticides in citrus production are streptomycin and oxytetracycline. Their use was permitted by the U.S. Environmental Protection Agency (EPA) under an emergency exemption in May, 2017 for a citrus greening disease caused by the bacterium *Candidatus Liberibacter asiaticus* (CLAs) in Florida citrus crops through December of 2019.



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The Environmental Protection Agency announced March 15, “EPA is issuing these tolerances without notice and opportunity for public comment as provided in FFDC [Federal Food, Drug and Cosmetic Act] section 408(l)(6).” EPA states, “Time-limited tolerances are established for residues of streptomycin in or on fruit, citrus, group 10-10, at 2 ppm, and the dried pulp of these commodities at 6 ppm.” For oxytetracycline, EPA is allowing residues “in or on all commodities of fruit, citrus, group 10-10, at 0.4 ppm.” [See below; organic standards do not allow antibiotic use.] Now, EPA is moving forward with a permanent allowance of these chemicals. For more see www.beyondpesticides.org

Dr. Mercola’s newsletter had a nice article on the health benefits of gardening. [It can be found here.](#)

For those whom want to learn how to protect their families from glyphosate exposure, [this short video](#) (7 minutes) talks about this poison in our food supply.

Another good video about our growing water crisis [is here.](#) (video 1 hour and 4 minutes)