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JOHN'S CORNER:

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

by John Ferguson

In the November 2018 issue of Life Extension there is an article on Basil which is classified as a super food. I always plant some basil for the fragrance as I just feel good when I smell it, and my wife uses a little in cooking. Basil also has strong anti-bacterial properties and helps fight even drug resistant varieties of bacteria like Enterococcus, Staphylococcus, and *Pseudomonas*. A study in 2012 found that basil helped ease symptoms from tuberculosis due a synergistic effect of the various compounds in basil. A 2013 study found that basil could help with several types of cancer via several modes of action. These are all good reasons to add basil to our gardens each spring.

As gardeners we all know how soft a growing root tip can be, or how easily a fungal hyphae strand in our soil tears apart. Have you ever wondered how root tips will grow into concrete or how a fungal hyphae will grow into solid granite if they are so soft and fragile? I finished reading a textbook a few weeks ago that has an explanation of how this is done by roots and fungi ("Radical Mycology - A Treatise On Seeing and Working With Fungi" by Peter McCoy, 2016, Chthaeus Press, ISBN 978-0-9863996-0-2). The explanation presented is that fungi and root hairs have the ability to form a different phase of water called the exclusion zone (EZ) in their tissues. At the microscopic level water molecules will layer up in a form a few molecules thick and become harder and stronger than steel. This physical change in the water molecules of the root tip along with the chemical action allows fungi and roots to penetrate the hardest substances. Being a scientist and never having never heard of this effect before I ordered and read a book called "The Fourth Phase of Water - Beyond Solid, Liquid, and Vapor" by Gerald Pollack, 2013, Ebner & Sons Publisher, ISBN 978-0-9626895-4-3. Dr. Pollard is with Washington State University and has spent decades studying water. The book is about all the research on this effect called the Exclusion Zone (EZ) and how it is used in science and nature, where it explains many effects seen by other researchers that have never been explained. The book is

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easy to read with lots of photos for those whom love science. For gardeners it explains why water dropped onto the leaves of certain plants curl up and form into balls that just roll off the leaves. This effect also explains why some mulches (or low quality compost) become hydrophobic (water haters) and prevent water from entering the soil even after a hard rain.

I was listening to a local gardening show the other day and the caller had removed their concrete patio to plant grass and they had a lot of nutsedge growing. The host of the show patiently tried to explain that compaction (as under a concrete slab) favors the growth of plant species like nutsedge. The caller had difficulty understanding where the nutsedge seed came from as the dirt had been covered for many years. The stabilized sand often used under concrete is often full of nutsedge seeds and these seeds can remain viable for decades.

So have you ever been asked "How long can seeds survive?" The seed of the South American herb achira (*Canna* sp.) from an ancient Indian necklace that was dated 550 years old has germinated and is growing fine. A 1,300 year old Lotus seed has been germinated and grown successfully. A 2,000 year old date palm seed has also been grown successfully. The longevity winner is seeds that were frozen in Siberian permafrost which have been thawed by Russian scientists and germinated that are over 30,000 years old.

A major new study published in the journal JAMA Internal Medicine of over 70,000 adults (78% women) and an average age of 44 years, found that those whom regularly ate organic food for just 5 years had 25% fewer cancers than those whom did not. The most frequent consumers of organic foods in the study had 76% fewer lymphomas, 86% fewer non-Hodgkin's lymphomas and a 34% reduction in breast cancer that develop after menopause. I wonder what the results would have been if they had eaten organic foods for 20 years or more?

The organic food movement was a \$45 billion industry last year and is rapidly growing. More and more people have found out it is far less costly to eat organic foods and be healthier, rather than pay hospitals, insurance and pharmaceutical companies.

For those interested in preventing cancer, The Environmental Working Group has just published this year's lists on the foods most contaminated with toxic and cancer causing chemicals and the least contaminated foods we purchase. They call it the "Dirty Dozen" which is the produce



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that has the most toxic chemicals on them and the "Clean Fifteen" which have the least. One can download or view the guide at <http://www.EWG.org/FoodNews>

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