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JOHN'S CORNER:

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

by John Ferguson

Seeds are an amazing thing. Some of the oldest living seeds germinated after resting for 30,000 years! So how do seeds survive in the soil? We know that birds, bats, and the wind can spread seeds, and many seeds emerge from the buried seed bank even decades after falling to the ground. I have seen this at the little farm I purchased for retirement a few years ago. There had been no native grasses or wildflowers in the fields for decades. It had been farmed for decades and later planted in Bermuda and King Ranch Bluestem for hay and cattle grazing.

After applying 400 pounds/acre of trace minerals (a mix of greensand, basalt sand, and granite sand) and having a fungal based compost tea applied to the fields by Sustainable Growth Texas, long dormant seeds began to awaken. The first year Little Bluestem showed up along with a few wildflowers. The second year bushy bluestem showed up and little bluestem was spreading (thousands of plants), and there were 10X more wildflowers than the year before. This third year Indian grass has shown up, and it has been non-stop wildflowers from early spring till now and many are still blooming. Bluebells, Antelope tears for the monarchs, native rain flowers, dozens of more species and butterflies everywhere. So back to the original question "how does seeds survive?" Some seeds use chemical methods that deter predators and pathogens. Other seeds use physical properties like a very hard seed coat which is difficult for animals and microbes to penetrate to get to the tender nutritious material inside. We are now finding that some seeds are protected by microbes in the soil. Nature (God) has created these magnificent survival strategies. For example, the hard seed coat will take years to biodegrade enough in the soil so moisture can soak into the seed and trigger the germination. This ensures survival of the species since out of a batch of seeds produced in one year, they may germinate over many different years ensuring that many of them will find the correct growing conditions.

A study from the University of California at Berkeley has found the chemicals lupeol and pristimeren found in dandelions and mangos were able to prevent sperm from fertilizing an egg. They hope this will lead to a new class of "natural Plan B" birth control products.

I was asked the other day about using fish waste from fish farms to make compost. Fish waste from wild caught fish is an excellent ingredient for making compost. However, waste from fish farms is full of toxic



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chemicals (and in the fish they sell to us). Farmed salmon contains 5X more toxins than any other food tested, with higher levels of PCB's and dioxin. Other tests on farmed salmon have found PBDE's, and flame retardant chemicals. Composting this type of fish waste would concentrate these chemicals even more. Hence, farmed fish waste is not a good feedstock for composting.

I was reading another article in the Journal of Environmental Quality (May 2018) on dairy manure compost and growing vegetables. In 2011 in the USA there were 297,624,078 pounds of antibiotics fed to livestock. As a result soils where the manure was applied or in compost made from the manure, there were very high levels of antibiotic resistant bacteria as well as the antibiotics themselves. The researchers found that most of these could be destroyed by static pile composting methods. The problem is that almost all of the feedlots (all that I am aware of) in Texas and New Mexico use what is known as windrow methods that are quick, cheap and fast. These methods DO NOT destroy the dangerous antibiotics or the resistant bacteria. I would not want to eat vegetables from beds with this type compost applied. Note: Cattle manure also tends to be high in salts which are not good for many of our Gulf Coast soils.

Speaking of manures, the flooding caused by hurricane Harvey last year caused over 800 sewage treatment plants to dump raw sewage into our bayous and streams, over 2 million pounds of contaminates.

I finished reading a interesting new book last week called, The PLANT PARADOX -The Hidden Dangers in "Healthy" Foods that cause Disease and Weight Gain, by Steven R. Gundry, MD, 2017, ISBN: 978-0062427137.

This book explains how plants defend themselves from being consumed by animals or humans and how eating the wrong ones at the wrong time immeasurably hurts our health. One of the tidbits of knowledge that I picked up and had never thought about before was when I eat fruits out of season. Plants produce toxic and bitter chemicals in their fruits to prevent them from being eaten until the seeds are mature. Have you ever taking a bite out of a very green banana or a persimmon that has not turned orange and soft? These chemicals that are designed to protect the fruit from being eaten and are toxic to humans. What food suppliers and grocery stores have learned to do, is to artificially get the fruits to turn color and look ripe when they are not and then we eat these toxic chemicals. There are many more examples of how our food causes us to gain weight or have diabetes, Alzheimer's or other diseases. Dr. Gundry provides valuable insight on how he helped his patients reverse autoimmune and neurodegenerative diseases and lose weight through the foods they eat.

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Another 10 year study on forests, published in the journal Nature Communications (2018), has confirmed that the larger the diversity of animals and fungal species, the healthier the forest. These same ideas apply to our flowerbeds and gardens, the larger diversity of plants, the less insect and disease problems we have. Even little things like the type of mulch we use makes a huge difference. Pine or hardwood bark, dyed mulches, etc. do not contain or feed microbes. A good composted native mulch which is made from hundreds of species of plants will contain thousands of species of good microbes. Little things add up to make our gardens healthier.

In addition to Boron (B) being required to grow healthy plants, a little trivia I found interesting. The Carnegie Institute for Science has found that trace amounts of the element Boron, is what makes diamonds blue (think of the world famous Hope Diamond). They also found that these Blue diamonds are formed many times deeper in the earth (much hotter and higher pressures) than regular diamonds.