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JOHN'S CORNER:

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

by John Ferguson

A growing problem is that many of our pets are developing cancer. They roll around in landscapes treated with toxic chemicals, from some of the dyes on colored mulch, to coal ash to harmful chemicals in artificial fertilizers. Each year, over 12 million dogs and cats are diagnosed with cancer... here's what you can do to SAVE them. A recent article speaks to this issue and gives the links to a documentary on how to protect our pets.
https://www.naturalnews.com/2018-03-22-each-year-over-12-million-dogs-and-cats-are-diagnosed-with-cancer-heres-what-you-can-do-to-save-them.html

A study from Michigan State University (Journal of Agriculture, Ecosystems and Environment) has found that farmers whom have take steps to increase the number of birds and other wildlife on their land have actually increased yields and profits. Farmers are also learning how to use predator birds to control pest birds that eat crops from cherries to blueberries. By installing nest boxes the natural helpers like American Kestrels (small falcons) come in and nest preventing the pest birds from doing damage. Additionally they control rodents from voles to rats that kill fruit trees by gnawing on their bark and roots. Similarly, several times over the years I have read about gardeners whom got rid of squirrels that were damaging their fruit by installing nest boxes for owls.

A paper in the Proceedings of The National Academy of Sciences (January 2018) has found that salinity and alkalinity have significantly increased across 37% and 90% respectively of the drainage area of the continental USA. This was primarily due to the prolonged use of chemical salts as fertilizer (e.g. artificial fertilizers) and road de-icing treatments, and the accelerated weathering of mined areas and from construction materials like concrete.

The Rodale Institute along with scientists and others have developed a new third- party standard for regenerative organic agriculture (RO Certification). When completed in will go beyond current "USDA organic" by establishing higher standards for soil health, land management, animal welfare, farmer and worker fairness.

One of our native shrubs has been recently dubbed a "super food" for all the health benefits it provides. It is the common native American Elderberry (*Sambucus canadensis*). Elderberry is a perennial multi-trunked shrub that will grow into large colonies. This plant has beautiful white flower clusters all summer that are essential and irresistible for pollinating insects especially bees and butterflies. Many parts of the plant are edible from the delicious flowers to the fruits that are used to make many things from juice to jelly and jams to wine. Elderberries grow best when there are two groups to help complete pollination for larger fruit set. Elderberries are a very tough plant and the ones in our nursery came through the floods of Harvey and the freezes and did not blink an eye and are already full of flowers. For more information see http://ecofarmingdaily.com for additional information.

One of the reasons gardeners are moving away from peat moss or pine bark based potting media is the shrinkage which can cause many problems after a while. For example a study published in the Soil Science Society of America Journal (10/2017) found that in spite of pine barks high C:N ratio it will degrade by 50% in just five years. When one uses artificial fertilizers and irrigation water then the degradation occurs faster.

In gardening we sometimes hear the words "living mulch" while in agriculture it is called "cover crops". A study in the Journal Agricultural & Environmental Letters has found using a multi-species cover crop significantly increased soybean yield, moisture content, and soil inorganic nitrogen (N) content compared with single and double species cover crops. This supports other studies where the greater diversity of plants then the greater the benefit to the eco-system.

The reasons to grow our own fruits and vegetables organically continues to increase. One of these is depression which is a often symptom of nutrient deficiency. Over 13 million Americans now take medications every day for this issue. Several studies have found that a shortage of magnesium (Mg) is one cause of depression. From our study of the elements and minerals we know that 90% of Americans are magnesium deficient and the leading cause is eating foods with glyphosate (Round-Up) on them, especially GMO foods which have very high levels of glyphosate. People diagnosed with depression are also often low in the element zinc (Zn) and low in vitamin D. Experienced gardeners know that growing our own food on mineral rich soils (amended with greensand, granite sand and basalt sand) produces nutrient rich foods and the sunlight allows our bodies to produce vitamin D.

A new study in the Journal Animal by a team of scientists in Europe found that animal (live stock) health and performance was positively associated with the level of soil organic carbon (organic matter). Just by

changing their grazing patterns for the animals, they were able to increase soil carbon and increase the sustainability and profit of the farms.

A study published in the Soil Science of America journal has found that chipped branches and limbs influence soil and water conservation. The mulch reduced erosion and increased water infiltration rate directly proportional to the amount of mulch applied. This study found the same results that Canada's department of Forestry found decades ago.

Another study in the Journal of Agronomy found that *fresh* woodchip mulches produced from branches and limbs has allopathic effects and suppressed some weeds. The mulch particles were less than two inches in size and had a carbon to nitrogen (C:N) ratio of 47. Weed biomass decreased as the amount of mulch used (thickness) increased. However, crop yields also decreased. After five years of mulching soil organic carbon significantly increased.

In the Journal HortScience (April 2018) there is a study comparing artificial fertilizers and organic fertilizers on growing onions by the University of Georgia. Nutrient content of the bulbs fertilized organically were significantly higher in concentrations of phosphorous (P), potassium (K), calcium (Ca), magnesium (Mg), sulfur (S), boron (B), iron (Fe), copper (Cu), and manganese (Mn). Another study in the same issue by the same group found that the percentage of extra large bulbs also increased with increasing organic fertilization rates. They also concluded that if they had used higher levels of organic fertilizer they would have increased total and marketable yield even more.