



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

**By John Ferguson**

**M**any garden products contain PFAS that are extremely toxic compounds. On numerous occasions we have talked about the dangers of PFAS chemicals short for per- and poly fluoroalkyl. There are now over 400 recent studies showing the danger of these chemicals at levels orders of magnitude less than current guidelines.

The most common source of exposure is fertilizers made with sewage sludge like Milorganite or Houactinite which were made by the city of Houston and sold as a fertilizer in garden stores around Houston. The second major source is from eating food grown in soil where these fertilizers were used or from sewage sludge applied directly to the growing fields.

Working in the garden to lay grass sod for one's yard is another source of exposure, as Turfgrass farms often use sewage sludge to fertilize the grass. Several pesticides and other gardening chemicals are additional sources of exposure.

Exposure shows up in health issues like child obesity which costs society \$2.7 billion annually or hypothyroidism in women which costs \$1.26 billion per year.

The November 19, 2022, issue of Science News had a nice overview of the dangers and health problems caused by these chemicals.

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As I was writing this article, I read a new study this morning published in the journal JHEP Reports (2022) by the Keck School of Medicine that these chemicals also cause liver cancer.

**W**ith our erratic weather the last few months several folks have mention having Blossom End Rot in their tomatoes this fall.

Most vegetable gardeners know that a lack of calcium (Ca) is often associated to this problem. However, there are other causes that may trigger this issue. Over watering or under-watering can be the trigger disrupting soil microbes leading to the problem.

Over fertilizing with artificial fertilizers is another common cause. Most artificial fertilizers acidify the soil which changes the pH and can cause the end rot to occur. Some varieties of tomatoes are more susceptible to this issue hence choose ones good for our area. Root damage may also be a trigger whether from weeding and cutting some roots or pests eating the roots, both resulting in poor nutrient absorption by the plant. Lastly, sometimes planting to early or late can be the trigger as timing affects many things from microbial activity to opportunity for disease growth.

Some gardeners like to use crushed or powdered egg shells as a source of calcium but they need to be decomposed by soil microbes first. While it works well, it will be the following season before the calcium and other nutrients are available.

I remember when I was a young boy my grandmother would have take a hammer and beat oyster shells into a powder for her tomatoes. This another source of calcium and many other elements that are found in sea water.

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In general, a well drained soil made with lots of good compost, fertilized with a good organic fertilizer and some re-mineralizer every few years, followed with a good composted mulch prevent the problem from occurring.

**A**s gardeners we are always concerned about watering our plants. Many gardeners claim and have found that when they use organic fertilizers and a good compost, they need far less water for their plants to be healthy.

I was reading an article that helped explain one of the reasons why this happens. Artificial fertilizers as they dissolve release ions into the soil. For each nitrate ion it requires three molecules of water to convert it to amino acids that the plant can use. This process increases a plants water requirements and decreases a plant drought resiliency. The reasons to use the modern methods based on soil biology that we call organic increase every day as we learn more.

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