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NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

By John Ferguson

A question I often get asked is why do I recommend organic fertilizers?

The short answer is they provide better results at a lower cost. They improve our health and the environment.

The other option is to use toxic artificial fertilizers which are expensive, dangerous, and harmful to the environment. Hence, let's look at artificial chemical fertilizers and what they do.

- many plant problems like insect and disease issues are caused by the artificial chemical fertilizers

- artificial chemical fertilizers are expensive and have increased in price 300% over the last few years. We see this in the rapidly increasing cost of food.

- artificial chemical fertilizers are a major source of water and air pollution

- artificial fertilizers are a major source of greenhouse gasses linked to climate change

- they kill beneficial microbes living in the soil that prevent diseases like brown patch in our lawns

- artificial fertilizers are a major cause of soil erosion

- artificial fertilizers acidify the soil

- they destroy the soils organic matter (humus)

- artificial fertilizers create hardpan layers

- they pollute lakes, streams, and oceans (major cause of the dead zone in the Gulf of Mexico and hundreds of other dead zones all over the world)

- they destroy soils structure reducing aeration which favors disease, poor root growth, and weed seed germination

- plants require a lot more water when artificial fertilizers are used

- they increase bacteria growth in soils which favors weed growth over perennial plants

- they are a major cause of the growth of pathogenic bacteria in our bayous and streams which is then linked to greatly increased mosquito issues

- the mining of phosphates and potassium minerals (potash) are very energy intensive, environmentally destructive, and directly affected by the price of natural gas and oil plus nitrogen like ammonium nitrate is made from natural gas.

A study from the University of California Berkeley published in the Journal Current Biology, July 2018 has found the more artificial fertilizer applied to plants, the amount of

disease increased. The study clearly showed that the amount of artificial fertilizers applied changed the community of microbes on the leaves which then allowed pathogens to attack the plant.

An article in the Microchemical Journal (March, 2012) was on cadmium (Cd). In our study of minerals last year, we talked about the dangers of this element. It turns out the major source of this toxic element is the rock phosphate ***used to make artificial fertilizers***. Some of the rock phosphates had levels of cadmium over 507 ppm.

The Leibniz Institute of Plant Genetics and Crop Plant Research has discovered that in conditions of high nitrogen in the soil, plant roots do not grow deep or wide. Conversely, they discovered that in low nitrogen conditions plants expand their root zone searching for nitrogen. Journal of Nature Communications 2019.

This is another reason people must water so much, as they regularly apply artificial fertilizers to green up the grass hence between the salt builds up creating hardpan and the excess nitrogen, roots of turf grass do not grow deep.

A study from Cornell University has found that the polluting emissions from artificial fertilizer plants (think ammonia an extremely toxic and potent greenhouse gas) were 100 times higher than the fertilizer industries self-reporting estimates. When one uses these toxic products, they contribute to climate change during manufacture, escape of methane from the fertilizer, pollution of our waterways and destruction of organic

matter in the soil releasing carbon dioxide. Journal Elementa Science of The Anthropocene (May 2019).

We often think if a little is good…then more is better. A study published in the Journal of The American Society of Agronomy (2019) has found that overuse of artificial fertilizers can damage plant roots. They used special boxes that would allow them to see and monitor root growth on Canola since it has a long tap root. They used 3 types of artificial fertilizers applied in bands and found that they can cause damage to the roots. When the roots were damaged the plants could not take up nutrients and water.

An article in the Journal of Environmental Horticulture 17(2):95-98, June 1999 where the researchers found that Azalea Lace Bugs were actually attracted to plants fertilized with artificial fertilizers! Artificial fertilizers create fast, but weak unhealthy growth that actually attracts insect pests and increases a plants susceptibility to disease.

For example, artificial fertilizers are labeled 10-10-10 which means they contain 10% nitrogen (N), 10% phosphorous (P), and 10% potassium (K). This is where the NPK comes from and it is the amount of nutrient in the fertilizers (30%). Did you ever ask yourself what is in the other 70%?

The mayor of Quincy, Washington first noticed children becoming sick, livestock dying and crops failing. She figured out that they had one thing in common, they had all been exposed to a local artificial fertilizer. She contacted Duff Wilson whom was an

environmental reporter for the Seattle Times and they found the fertilizer contained hazardous waste. The complete story and the government cover up is told in the book Fateful Harvest, by Duff Wilson (Harper Collins Publisher, ISBN 0-06-019369-7).

It explains how the hazardous waste is disposed of in synthetic fertilizers, ends up contaminating the food supply and hurting our children and pets. The State of Washington and the Country of Canada made this practice illegal, however on October 23, 2002 the EPA made it legal for hazardous wastes (heavy metals) to be disposed of in artificial fertilizers and they do not have to tell you (no labeling).

The State of Washington's environmental department tested numerous brands and found that many of them contained hazardous materials including some sold here in the Houston area.

Artificial nitrogen fertilizers increase the amounts of toxic nitrates in our dietary intake. According to the National Research Council, 6 of the top 7 and 9 of the top 15, foods with oncogenic (cancer causing) risk are produce items with high nitrate content from nitrogen fertilizers or pesticides. A 12-year study comparing organically grown versus chemically grown showed that chemically grown foods had 16 times more nitrate (a carcinogen).

Excess salts used in synthetic fertilizers cause two problems. First, they reduce the moisture holding ability of soils and cause what moisture is present to be bound more tightly to the soil making it harder for plants to absorb. Second, also salt exposure

reduces a plant's roots ability to absorb water even if the soil is fully saturated. Plant roots do not like salts and will avoid them if possible. Since most commercial fertilizers are composed of soluble salts (ammonium nitrate, potassium chloride, etc.) and as these salts build up in the soil more water (irrigation) is required, the plants are weaker and more susceptible to insects and disease hence require more pesticides, fungicides, etc.

New studies have shown that nitrate from artificial (synthetic) fertilizers stimulate the germination of weed seeds. In tests of 85 species of weeds it was found that nitrate could replace light requirements for germination, and increase germination under adverse temperatures. Other studies have shown that nitrate increases weed germination rates 11 times higher (3% to 34%). Acres USA February 1997, Harold Willis, Ph.D.

Artificial fertilizers are responsible for the loss of soil health, ozone depletion, biodiversity loss, air pollution, impacts on human health and transgression of human rights.

The world can no longer afford the food systems addiction to toxic chemical artificial fertilizers.

Gardeners can be part of the solution by only using modern biological methods (organic) and using good organic fertilizers.

There are many good brands of organic fertilizers on the market. However, before someone asks, I only use the Microlife™ line of organic fertilizers personally. It is the one we use in our nursery and the only ones we sell at Nature's Way Resources.