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JOHN'S CORNER

Organic Fertilizers and Nutrients – 1 What Happens When We Use An Artificial Fertilizer?

By John Ferguson

This week we are going to start a new series on organic, natural fertilizers and nutrient sources.

The old obsolete model of plant nutrition is based on feeding the plant directly via water soluble nutrients. The modern methods are based on soil biology where one feeds the soil and the microbes in the soil feed the plant. These are very different approaches.

A question often asked is why an organic or natural product versus an artificial fertilizer? So this week we will look at what happens when we use an artificial fertilizer.

I became interested in this subject over 30 years ago when I started studying natural and organic methods. My interest was increased when I read 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.

Another 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%?

A lady 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, an environmental reporter for the Seattle Times. 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 hazardous waste is disposed of in synthetic fertilizers and 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 fertilizers are chemically salts. The reason we put salt in canned goods, jerky, pickles, etc. is to kill bacteria. There is a good bacteria that lives in healthy soil (Actinomycetes) that is salt sensitive. This bacteria's role in nature is to control fungal pathogens (it eats them). When artificial fertilizers are applied, we lose this good bacteria and diseases like Brown Patch, Take-All, and St. Augustine Decline are given an opportunity to grow unchecked in our lawns.

Synthetic nitrogen fertilizers increase the amounts of toxic nitrates in 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 pesticides or nitrogen fertilizers. A 12 year study comparing organically grown versus chemically grown showed that chemically grown foods had 16 times more nitrate (a carcinogen).

Chemicals not absorbed by the grass can leach into ground-water and pollute the water supply. In time local ponds, streams, and lakes become polluted. Salts accumulate in the soil and can "lock up" water and other nutrients making them unavailable to grass, salt buildup also reduces the soil's ability to absorb water and air. Fast release chemicals needlessly stress the grass making it more susceptible to insects, disease and injury. Slow-release fertilizers are coated with other materials that can further pollute the soil and environment. Thatch greatly increases with the use of synthetic fertilizers since the soil becomes too acidic for earthworms and microorganisms (if the salts have not killed them first) hence they are not available to break down the thatch back into beneficial organic compounds. Thatch makes a good home for insect pests like chinch bugs and sod webworms. Chemical burning and browning often occurs if synthetic fertilizers are over applied to grass. Destruction of earthworms and microorganisms leads to a reduced root zone in the soil which means more watering required and additional fertilization required to keep plants green which starts the cycle all over again.

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 plants root's 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 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.

The other issues with artificial fertilizers is that when we try and feed the plant directly, we have to purchase many different types: turf grass, hibiscus, azalea, palm tree, rose, etc. This is very expensive and requires a lot of storage and extra work.

Artificial fertilizers that contain herbicides (Weed and Feed) should never be used. They are some of the most damaging to soil and plant life. If a Weed and Feed is used on turf grass is used it will harm trees even 100 feet away, as tree roots may grow 100 feet or more from the trunk of the tree.

For additional information on the problems with artificial fertilizers see the following papers at http://www.natureswayresources.com/infosheets.html

"Why Organics"

"Organic Fertilizers - The Nutrient Story"

SUMMARY:

We do not need artificial fertilizers anymore as there are many good organic ones and better, lower cost methods of supplying nutrients that reduce and even prevent the secondary problems. The better nurseries and garden centers now carry organic fertilizers and are easily available.

ARTIFICIAL FERTILIZERS:

PROS:

- widely available

- inexpensive (IF total costs are ignored)

- promotes fast growth (subject to increased disease and insect problems)

CONS:

- quality, type, and value varies greatly

- many types or formulations are required for different species of plants

- many types acidify the soil requiring lime to neutralize the acidity

- some brands contain hazardous waste

- destroy the soils organic matter (humus)

- create hardpan layers

- pollute lakes and streams

- major cause of the dead zone in the Gulf of Mexico

- destroy soils structure reducing aeration which favors disease and poor root growth

- requires more water

- may kill earthworms and other valuable soil life

- causes the release of greenhouse gasses such as carbon dioxide and nitrous oxide (major cause)

- require public water supply to spend more taxpayer dollars to remove dissolved nutrients

- lowers the quality of food

- increase some types of bacteria growth in soils that favors weed growth over perennial plants

- causes growth of pathogenic bacteria in our bayous and streams

- some types hurt trees and other plants making them more susceptible to insects and disease

- attract insect pests and disease.