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NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

By John Ferguson

A growing problem in agriculture and gardening is the microplastics produced as plastic products degrade. The world produces 400 million tons of waste plastic each year. One study found that China alone used 1.5 million tons of plastic mulch in 2016. Even though the plastic mulch gets removed, what is left behind hurts the soil.

Other sources of microplastics in the soil include sewage sludge, compost made from sewage sludge (biosolids), and fertilizers that are made from sewage sludge and these products are used as fertilizer to grow our food. Personal care products, chicken manure, and landfills are other sources.

As the material degrades its negative effects on the soil build up causing reduced yields, lower plant height and weight, increased water evaporation, reduced water infiltration, and reduced availability of nutrients. Global Change Biology 2022

Other studies have found that nano sized plastic particles adhere to root tips and accumulate in the epidermis and endodermis. This prevents several biological/microbial processes from occurring that benefit the plant.

Another study found that a plastic called polyamide which is used in clothing and textiles is showing up in our soils. The full impact of how this affects human health is unknown, but it is not good.

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There are some biodegradable plastic mulches being developed however preliminary studies have shown it takes well over a year to decompose. As one writer stated, “let the farmer and gardener beware!”

Another reason to buy and grow organically. An article in the Journal of the National Cancer Institute (2023) has found that the herbicide glyphosate introduces oxidative stress in animal and in vitro studies. Oxidative stress is behind many health problems and often an indicator of carcinogens. If one does not raise their own food or at least purchase organically, you are consuming this toxic chemical.

Many gardeners love to grow and cook with herbs. A study published in the journal Nutritional Neuroscience (2023) has a research paper on the benefits of cinnamon from the *Cinnamomum* tree. It is well known that cinnamon is an anti-inflammatory, antioxidant, anti-cancer, and can boost the immune system.

The new study found that the bioactive compounds in cinnamon also boosted brain function, particularly memory and learning.

Many folks associate fungi with disease and plant issues. However, with millions of fungal species on Earth, the over whelming majority are beneficial and only a very few cause plant problems.

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Most gardeners know about the white rot and brown rot fungi that break down organic matter and turn it into humus or the mycorrhizal fungi that colonize and protect a plant's roots.

I recently read about another one that removes mercury (Hg) from the soil and prevents plants from absorbing mercury. Researchers at the University of Maryland found that the fungus *Metarhizium robertsii* removes mercury from around a plant's roots. It works for both freshwater and salt water species of plants. Proceedings of the National Academy of Sciences (2022)

Previously this fungus was found to colonize a plant's roots and protect them from herbivorous insects. We now know it is a multi-tasker.

When we apply a fungicide to our lawn or flowers, we are killing thousands of good guys for every bad one creating a dysfunctional soil system which leads to many gardening problems. In a good quality leaf mold compost, there are many species of good bacteria that only eat the bad fungi and leave the good guys alone.

A good example of this is when we top dress our lawns with a fine screened leaf mold compost to control the fungal pathogen called Brown Patch (*Rhizoctonia solani*). It works better than the fungicides as it gets rid of only the bad guy.

If you want to have a healthy lush green lawn and reduce water requirements by 80% or more after a couple of years:

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- top dress with a good quality fine screened leaf mold compost from Nature's Way Resources. Note: Like all good products, there is a lot of knock offs of much lower quality in the Houston market.
- only use a great organic fertilizer like Microlife
- apply Remineralizer every 3-5 years
- mow St. Augustine high (4" or more) *with a sharp blade*
- do not water till the grass wilts.

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