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NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

By John Ferguson

I normally do not talk about flowers directly since Brenda does such a great job. However, last week while at the farm I found a pleasant surprise growing on a fence line that I wanted to share.

This is one of our native vines (*Clematis texensis*) commonly known as Scarlet Clematis. It appears quite happy in spite of the drought we have there.

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A new study has found that pesticides and other chemicals including artificial fertilizers, alter the electric-magnetic field around flowers. This alteration makes bumble bees and other pollinators less likely to visit them. PNAS News (2023).

We have known for decades that sound waves in water interfere with whales and dolphins, artificial light confusing moths, and other nighttime insects, disturbing

migrations routes, etc. The artificial fertilizers were found to create a sense of noise pollution to the pollinators that prevented them from finding the flowers.

We hear a lot about climate change these days. An article in my Crop Science of America newsletter last year was on peat. Peatlands cover only 3% of the planet's surface but hold more carbon than all other vegetation in the world combined.

When we mine peat for peat moss or use peatlands for farming, we turn peat lands from a carbon storage to a carbon source. These damaged peatlands by themselves account for 5% of the annual total anthropogenic carbon emission of carbon dioxide.

When we as gardeners purchase peat or buy plants grown in peat, we are contributing to global warming that is a major cause of climate change.

Gardeners often hear about companion planting and its benefits. A new study from Spain has found another benefit. The study was done in an extremely harsh environment in soils full of gypsum.

They found that mature plants helped smaller ones survive even of different species, a process called facilitation. They found the larger plant shielded the seedlings. The mature nurse plant also produced more and larger flowers.

By studying the plants entire lifetime, they found the benefits build up over time. The leaf litter from the large plant mulched the smaller plant and fed the beneficial fungi in the soil as it decomposed. This led to a series of benefits from more organic matter, better water holding capacity, more microbial density, and diversity, etc.

Probably the most popular vegetable to grow in one's garden is the tomato. However, modern tomato varieties are very susceptible to disease and insect damage which then require toxic chemicals.

Researchers at Purdue University has found that modern tomatoes are more sensitive because they have lost the protection of microbes in the soil.

They found that wild-type tomatoes are strongly associated with fungus in the soil. Those with the fungus grew larger and resisted disease better than modern plants. Modern varieties have lost their ability to work with soil microbes.

When treated with a beneficial fungus (*Trichoderma harziamum*) the wild varieties had over a 500% increase in root growth and 90% increase in plant height. When modern varieties were treated there was modest increase in roots (0-50%) and only10-20% increase in height.

The researchers then introduced disease causing pathogens to both wild types and modern types that had been inoculated with the fungus. The wild types had increased resistance between 56-94% for the pathogens. In modern types the beneficial fungi actually increased disease levels. Another reason to add heirloom varieties to one's garden.

To increase the levels of beneficial fungi in your soil, mix in some fungal compost into the soil at planting time and mulch the tomatoes with a partially composted (aged) Native Mulch.