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JOHN'S CORNER:

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

by John Ferguson

Research at Arizona State University published a study in the Journal Earth's Future on the value of Urban Agriculture. The study found that there was the potential for millions of tons of food production, thousands of tons of nitrogen sequestration, billions of kilowatt-hours of energy savings, and billions of cubic meters of avoided storm runoff. In a flood prone area such as Houston this last item could be very significant (just one billion cubic meters is over 264 billion gallons of water)! They estimated that the annual value of ecosystem services provided by existing vegetation to be \$33 billion. With all the combined benefits they estimated the annual value of Urban Agriculture could be as much as \$160 billion per year.

My wife provided me with this organization called "Tree Sisters". TreeSisters is a global network of women who donate monthly to fund the restoration of our tropical forests as a collective expression of planetary care. As a feminine leadership and tropical reforestation organization, we exist to call forth the brilliance and generosity of women everywhere and channel it towards the trees. Our goal is to make it as normal for everyone to give back to nature as it currently is to take nature for granted. They are planting over 176,000 trees every month and have planted over 2 million trees so far. <https://www.treesisters.org/>

Most of us have heard about the Victory Gardens that were planted in world war two to help feed America. A new theme is emerging called "Climate Victory Gardens". Additional information can be found on the Green America website:

<https://www.greenamerica.org/search-page/climate%20victory%20gardens>

CLIMATE VICTORY GARDEN COMMITMENTS

My garden can be a tool to fight against climate change. I will:

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- Grow Edible Plants**
 - Keep Soils Covered**
 - Encourage Biodiversity**
 - Plant Perennials**
 - Ditch the Chemicals**
 - Compost**
 - Integrate Crops & Animals**
 - Use People Power**
 - Rotate Plants & Crops**
 - Get to Know My Garden**
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A study published in the journal Archives of Agronomy and Soil Science compared the effects of organic and conventional toxic chemical farming on onion yield, chemical quality, and soil health.



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Organic onions had slightly lower yields but much higher levels of anti-oxidants, higher levels of phenols, total flavonoid, ascorbic acid, and quercetin-3-glucoside (all are components that promote human health). The organic plots exhibited improved soil health, higher levels of soil organic carbon (fights climate change), a larger population of soil microbes, more enzymatic activity from beneficial microorganisms, and a higher fungus-to-bacteria ratio. The authors concluded that organic farming is far more sustainable than toxic chemical farming.

The journal of Plant Nutrition and Soil Science (April 2017) had an article that compared organic versus conventional toxic chemical farming in rice. They found that organic matter increased (organic carbon), there was an increase in the soils aggregate stability, there was a stimulation of soil microorganisms, and the production of enzymes that converted unavailable nutrients into a form that plants could use which overall increased nutrient cycling. The study concluded that organic farming in rice was more sustainable.

The country of Germany recently set goals to ban diesel cars as they produce nitrogen dioxide (NO₂) that is found in diesel fumes) the study found that there were over 6,000 deaths from this chemical from just diesel fumes). Two other very large sources of this chemical are artificial fertilizers and landfills. Nitrogen dioxide is also a potent greenhouse gas that molecule for molecule is hundreds of time worse than carbon dioxide.

A study from the Smithsonian Tropical Research Institute (March 2018) has found *contrary to current belief* that a shortage of phosphorus (P) did not limit the growth of forest communities. They studied 19,000 individual trees of 541 tree species. They found that trees growing on low phosphorus soils grew faster than those trees on high phosphorus soils.

A three year study funded by the United Nations and the World Bank that was performed by 400 scientists have found that the toxic chemical methods of food production are not working. They convincingly found that agroecology (farming that imitates natural ecosystems) is the most promising way to sustainable food systems on all continents.

A five year study on dry-land corn growing, found that mulching with straw increased yield, above ground biomass, soil organic carbon, particulate organic carbon, and microbial biomass. Journal of The Soil Science Society of America, March 2018.