

REVERSING CLIMATE CHANGE

Saving the Planet One Backyard at a
Time

Climate Change an Existential Threat

- ▣ Current U.N. Climate Summit, COP24, attended by 200 nations (but not the U.S.) warns of a 'collapse of our civilizations'
- ▣ United Nations' Intergovernmental Panel on Climate Change (IPCC) has determined that carbon emissions must decrease 40-50% by 2030 with no net additional greenhouse gases in the atmosphere by 2050.
- ▣ Coastal flooding, crop failure, famine, species extinction and mass migrations are expected if these goals are not achieved.

Carbon Goals Unlikely to be Achieved through Conservation

- ▣ Current population trends alone make achieving carbon neutrality by 2050 unlikely.
 - World population continues to grow, demanding increases in agricultural production, electric power and other resources
 - Over $\frac{1}{4}$ of current world population under 18 years of age, increasing demand on world's resources as this group matures and reproduces.

Sequestering (fixing) CO2 is the only way to meet IPCC targets

- ▣ Industrial methods of CO2 sequestration, mainly pumping CO2 underground into depleted gas and oil fields, will require extensive infra-structure and funding.
- ▣ Planting the millions of trees to absorb current CO2 emissions will also require massive funding and may not provide the needed sequestration to meet the IPCC targets.

Most Efficient Way to Sequester CO₂:

Increase Soil Organic Matter

- According to a scientific study completed in 2008¹.

"An increase of just 0.15% in organic carbon in arable soils in a country like Italy would effectively imply the sequestration of the same amount of carbon within soil that is currently released into the atmosphere in a period of one year through the use of fossil fuels," write Enzo Favoino and Dominic Hogg, authors of the paper appearing in a 2008 issue of *Waste Management & Research*, a UK-based journal.

- ¹https://www.eurekalert.org/pub_releases/2008-02/spu-cct022208.php
- ² <https://blogs.scientificamerican.com/guest-blog/how-soil-microbes-fight-climate-change/>

Soil Capable of Holding More Than Current CO₂ Emissions

- ▣ There is ample proof that soils can sequester even more carbon emissions than those currently being generated. According to a 2016 article in Scientific American:

‘Global soils already hold three times as much carbon as exists in the atmosphere, and there’s room for much more. According to a recent study in Nature, enhanced carbon storage in the world’s farmland soils could reduce greenhouse gas concentrations by between 50 and 80 percent.’

Conventional Compost Has Limitations

- ▣ Conventional composting limitations.
 - Large quantities of carbon based materials must be acquired, transported and manipulated to produce a finished product. The finished product then must be transported to a targeted land parcel and spread mechanically.
 - All of the above processes require expenditure of fossil fuels and generate additional CO₂.

Backyard Composting Limits

- ▣ While backyard composting does not generally require the use of fossil fuels, there are other limits to its employment.
 - requires proper mix of 'green' (high nitrogen) and 'brown' (high carbon) plant materials
 - mixture must be of appropriate small size and require manual shredding
 - compost pile must be at least 1 cubic yard for proper function
 - pile must be turned to accelerate process and reach optimal temperature to kill dangerous bacteria
 - conventional compost must be cured prior to use

Worm Compost Advantages

- ▣ Can be employed in virtually any location in any quantity.
- ▣ Can be utilized year-round, not subject to outdoor temperature restrictions
- ▣ Provides a richer nutrient content and more diverse microbial population than conventional composting.
- ▣ Much easier to maintain than conventional composting.

Introducing Composting to the Public

- ▣ Most citizens are unaware of the science behind soil carbon sequestration.
- ▣ Explanation will require easily observable benefits of the above process.
- ▣ A program of community education will have to be developed to reach local influencers.
- ▣ Presentations in community centers, churches, libraries and similar entities must be conducted