



HEALTHY SOILS CAN HELP REVERSE GLOBAL WARMING

#6 in a series of

Climate Restoration Solutions

A partnership of the Moral Action on Climate
and Biodiversity for a Livable Climate
(see www.bio4climate.org/solutions for others)



Healthy soils store huge quantities of carbon. Cutting emissions is important but even successful reductions will not reverse the high levels of carbon already in the atmosphere. Fortunately for the planet, we can reverse global warming by restoring dry lands and desertified soils to health so they can capture and sequester large amounts of carbon. Soils rebound quickly but governments and individuals need to act rapidly and globally to ensure success. The time is running out so we must act NOW.

The math is simple. Human activity over the past 200 years has turned huge swaths of Earth's grasslands and swamplands into degraded and desertified soils and, according to Rattan Lal (2004), has led to the loss of between 50 and 66% of historic soil carbon. Restoring health to agricultural soils, grasslands and swamplands could recapture much of this carbon. "The technical potential of carbon sequestration in world soils may be 2 billion to 3 billion metric tons per year for the next 50 years"¹, which is the equivalent to 1/2 to 3/4 of the total carbon added annually to the atmosphere.²

Industrial agricultural practices are a main source of CO2 emissions. Farming techniques created over 200 years ago have changed little: till the soil, plant, fertilize (now with chemicals), grow, reap and then leave soil exposed to the elements until next spring. From 1850 to 1970, "twice as much atmospheric carbon dioxide has derived from farming practices as from the burning of fossil fuels ..."³ After 1970, fossil fuels emitted more but the level of emissions from agriculture did not decrease. I.e., emissions from burning fossil fuels exceeded that from soils.

Leaving soils exposed to the elements and the application of chemical fertilizers and herbicides kill the earthworms, microbes and bacteria that form the lifeblood of healthy soil. Unhealthy soils quickly lose carbon and moisture and topsoil turns to windblown dust or is washed into streams and rivers. "In the past 150 years, between 50 and 80 percent of organic carbon in the topsoil has gone airborne."⁴ And "[g]lobally, each year some seventy-five billion tons of soil is lost. That would cover about thirty-eight thousand square miles of arable land, an expanse larger than the nation of Australia. ... In the United States, Cornell soil scientist David Pimentel says that 90 percent of our cropland is losing soil to wind and water erosion at thirteen times the rate that soils is being formed."⁵ Better soil management practices can stop this loss.

Solutions: Restore dry lands and desertified areas and farmlands.

Large scale government support is necessary to carry out massive projects to plant trees, grasses and crops on dry lands and desertified areas. "Drylands account for 41.3 percent of the world's landmass, including 44 percent of land under cultivation."⁶

Yacouba Sawadogo, a farmer in Burkina Faso who improved upon a traditional method of water harvesting to turn the Sahel, a semi-arid region below the Sahara, into an oasis of trees and crops. Governments and donors could provide substantial resources to spread this method all along the Sahel. <http://rutube.ru/video/780ad79d3e4fb33d51829b7f30187f7c/>



Photo Credit: Chris Reijj

The Loess Plateau of China loses so much soil to the Yangtze River that the river's name is Yellow River. However, the government is supporting the return of the degraded and desertified Plateau to soil health and feeding 2.5 million people. <https://www.youtube.com/watch?v=kK8z0qDtE2g&feature=youtu.be>



Loess Plateau, before and after - Till Niermann and Erick Fernandes, World Bank

Educate farmers on why and how to plant cover crops when not growing cash crops. Cover crops add nutrients, retain moisture and the moisture and crops cool the earth and sequester carbon. <https://www.youtube.com/watch?v=nWXCLVCJWU>



Source –Cover Crops: Under Cover Farmers

Grow crops year round and do not till the soil. They simply push over the cover crops before flowering, which makes a bed over the soil that retains moisture and prevents weeds from growing – and sequesters more carbon. The land is then pierced in rows and seeds are planted. See Under Cover Farmers: <https://www.youtube.com/watch?v=nWXCLVCJWU>

What you can do

1. **Buy organic** as much as possible and ask organic farmers if they use cover crops and no-till.
2. **Talk to your state and national representatives** and tell them you want their support for:
 - Soil restoration to be included in all climate change discussions and legislation
 - Funding (a) to educate farmers about cover crops and no till and to pay farmers to use cover crops and to convert to no-till farming and (b) to restore health to non-farmed drylands and desertified areas.
3. **Learn more and share your knowledge with others.** A list of additional readings and videos is available at www.bio4climate.org/solutions.
4. **Help us spread the word, DONATE** to: www.bio4climate.org/donate/, <https://donatenow.networkforgood.org/IMAC> and www.TheCarbonUnderground.org/donate-now/

¹ www.ifpri.org/sites/default/files/publications/focus16_05.pdf

² <http://co2now.org/Current-CO2/CO2-Trend/acceleration-of-atmospheric-co2.html>

³ Judith Schwartz, *Cows Save the Planet*, Chelsea Green, 2013, p. 12.

⁴ Schwartz, p. 12.

⁵ Schwartz, p. 37.

⁶ Schwartz, p. 52.