

Soil regeneration

Soil regeneration as a particular form of ecological regeneration within the field of restoration ecology is the act or idea of replenishing the Earth's soil with beneficial nutrients (including carbon) using natural methods. The focus—building soil health—has many benefits, both proven and theorized, including the soil sequestration of carbon in response to a growing threat of climate change.^[1]

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Climate change and the carbon cycle

There has been much evidence to show a significant connection between the carbon cycle and climate change. Most greenhouse gases are primarily composed of carbon and they produce an effect where warmer air that is heated by the sun is kept from leaving the atmosphere by forming a barrier in the troposphere. According to the Intergovernmental Panel on Climate Change, greenhouse gasses produced by human activity have been noted as the most significant cause of global climate change since the 1950s.^[2] Without human interaction, carbon is removed from and reintroduced to soil through a variety of ecosystem processes known as the carbon cycle. Humans have been significantly influencing the global carbon cycle since the Industrial Revolution through various means, such as transportation and agriculture. Through these actions, most of this carbon has moved in one direction, from the lithosphere and biospheres to the atmosphere. By means of oil, gas and irresponsible farming, much of the natural carbon in the earth's pedosphere has been released into the atmosphere, contributing to greenhouse gasses.

Regenerative agriculture

Agriculture is seen to be one of the main players in the depletion of soil richness in human history. Certain agricultural practices can deplete soil of carbon, such as monoculture, failing to rotate crops sufficiently, and intensive livestock grazing.^[3] Soil that is low in carbon will not support plant life and is susceptible to desertification. Without plants, soil cannot hold water sufficiently, and will become dry and brittle over time. Agroecology is an overarching category of approaches to creating a more sustainable agricultural system and increase the health of soil. It includes "permaculture", originally being a combination of the words "permanent" and "agriculture", which is a systems thinking approach that can increase the carbon content of soil by using natural patterns in already existing ecosystems to promote a higher efficiency of food production, a lower need for human involvement, and a healthier ecosystem. Permaculture focuses on using the land and a strong knowledge of plants, animals and natural cycles to create ecosystems that yield plentiful produce and help keep themselves healthy and productive. This can be done through intentional landscaping that would utilize as much rainfall as possible or placing nitrogen fixing plants near another crop that might need them. Agroecology also includes the ideas of holistic management. This approach stems from the work of Allan Savory who claims that planned grazing can improve soil health and reverse the effects of desertification.

Monoculture is a style of agriculture where only one type of crop is harvested in a field season after season. This depletes nutrients from the soil because each type of plant has a specific set of nutrients that it need to grow or can replace back into the soil. With a lack of plant diversity, only certain nutrients will be absorbed, leaving none of those in the soil, and only certain others will be returned into the land, leaving large gaps in the richness required to maintain a healthy level of production. Permaculture and holistic management are two different methods that focus on increasing biomass and returning nutrient richness and diversity to the soil. The more biomass that is present in an ongoing cycle, the more carbon that can be sequestered into the soil and that can be converted into oxygen by plant matter. To accomplish these goals, permaculture encourages the idea of planting more than one crop on a piece of land at a time. Any combination of plants that are chosen to grow together in a permaculture garden or farm would help the other plants be more healthy and grow as well. In permaculture design, each individual aspect of a farm would help other aspects attain the necessary nutrients and conditions to be as plentiful as possible. This helps to regenerate soil health because the diversity of the crops and even livestock used would help maintain a balance of all necessary nutrients, including carbon. Holistic management focuses mainly on increasing biomass through the carefully planned grazing of livestock. The idea behind holistic management is that grazing livestock can actually help improve the growing conditions for more biomass through means such as naturally fertilizing the land and tilling with hooves.

See also

- Carbon cycle
- Environmental soil science
- Climate change
- Land restoration
- Regenerative agriculture

References

1. "Healthyag - Soil" (<http://www.healthyag.com/soilreg.html>). *www.healthyag.com*. Retrieved 2015-12-24.
2. Edenhofer, O.; R. Pichs-Madruga; Y. Sokona; E. Farahani; S. Kadner; K. Seyboth; A. Adler; I. Baum; S. Brunner; P. Eickemeier; B. Kriemann; J. Savolainen; S. Schlömer; C. von Stechow; T. Zwickel; J.C. Minx (eds.). *IPCC, 2014: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (<https://books.google.de/books?id=jrUNCgAAQBAJ&dq=isbn:9781107654815&hl=de>). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. ISBN 9781107654815.
3. Sundermeier, A., Reeder, R., & Lal, R. (2005). Soil Carbon Sequestration Fundamentals. Columbus, OH.

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