"A nation that destroys the soil, destroys itself." Franklin D. Roosevelt

Agriculture Resiliency

Regenerative Agriculture

Photo: Modern Farmer

Snohomish Conservation District

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REGENERATIVE AGRICULTURE

Regenerative agriculture is just what its name implies—it's a way of farming the land while at the same time regenerating the natural functions of the farm ecosystem. This way of farming aims to improve soil health, water quality, and biological diversity simultaneously. Regenerative agriculture takes the "conservation agriculture" approach a step further to create an overall agro-ecosystem that mimics nature, using natural processes to the farmer's advantage (UNCTD, 2013). The key to regenerative agriculture is that it not only "does no harm" to the land but it actually aims to improve it, using practices that rebuild soil organic matter and restore degraded soil biodiversity.

Benefits

Because regenerative agriculture practices rebuild soil, rather than accepting a "tolerable loss of soil," it allows farmers to realize the benefits associated with improved soil health, such as increased yields, improved water infiltration rates and retention, increased resilience to droughts and floods, and a reduction in the need for costly external resources such as fertilizers and pesticides (Rodale Institute, 2014).

Not only is regenerative agriculture a holistic and sustainable approach to farming, it has been recommended as a top solution to reversing climate change. In the book *The Carbon Farming Solution: A Global Toolkit of Perennial Crops and Regenerative Agricultural Practices for Climate Change Mitigation and Food Security,* Eric Toensmeier, et al. (2016) extensively analyzes regenerative agriculture systems around the globe and has quantified the huge potential regenerative agriculture systems have for sequestering carbon in soils. As more states consider carbon trading or tax programs, the ability of farms to sequester carbon using these techniques could provide an additional source of income.

Principles and Practices

Regenerative agriculture seeks to achieve the following goals:

- Increase soil fertility, soil health, and crop yields while reducing the application of synthetic fertilizers. Reduce riverbank scouring and reduce sand deposition on the landscape
- Improve the soil's ability to retain water for crops during dry months and infiltrate water during wet months.
- Improve water quality of groundwater and nearby waterways.
- Improve agriculture's resilience to predicted climate changes.
- Improve habitat, biodiversity, and ecosystem health.
- Reverse a system of carbon emissions to one that sequesters overall carbon.

In order to achieve these goals, regenerative agriculture uses a wide variety of practices such as conservation tillage, multi-species cover crops, multi-cropping, crop rotation, pollinator strips, hedgerows, integration of animals into cropping systems, and application of compost, compost tea, and biochar. **For more detail on these practices, please see the Snohomish Conservation District's Agriculture Resilience fact sheets on Conservation Agriculture, Biochar, Agroforestry, Silvopasture, Integrated Pest Management, and Managed Grazing.**

Regenerative agriculture uses four key soil health-improving principles to rebuild soil:

1. Minimize or eliminate tillage. Building or rebuilding soil is fundamental to "regenerative" practices. A key first step in achieving this is to minimize or eliminate tillage. The general goal is the least amount of mechanical disturbance possible. Tillage breaks up (pulverizes) soil aggregation and fungal communities while adding excess carbon to the soil for increased respiration and carbon emission. Tillage can also greatly increase soil erosion and plug soil spaces for water percolation.

2. Protect the soil and increase fertility. Regenerative agriculture increases soil fertility through the use of cover crops and application of compost, biochar, and animal manures. Compost increases soil biodiversity, organic matter, nutrient cycling, disease suppression, and enhances soil structure. These soil benefits translate into greater soil health and productivity, while reducing water or fertilizer needs. The benefits are significant and accrue quickly: after only one application season of amending with compost, soil organic carbon and aggregate stability increase significantly compared with non-amended soils (Rodale Institute). Regenerative agriculture also focuses on protecting the soil that already exists—efforts to improve fertility are wasted if soil is then blown or washed away. Reducing erosion by keeping it covered or "armored" with living plants such as cover crops is key.

3. Increase biodiversity. Regenerative agriculture builds plant diversity through intercropping cash crops (growing two or more crops in proximity), crop rotations, and multi-species cover crops. Cover crop mixes in regenerative agriculture can range from 10 to 60 or more species. This plant diversity helps to build and sustain a soil microbial population to supply plants with the nutrients they need, greatly reducing or eliminating the need for synthetic fertilizers. Application of composts also helps to restore the soil microbial community population. The planting of hedgerows and tree crops further improves soil biodiversity and also increases habitat for pollinators and beneficial insects that are crucial for natural pest control.

4. Holistic grazing. By integrating managed grazing of livestock into a regenerative agriculture system, farmers are able to add diversity to the products they produce and add value to cover crops (annual forage crops). Managed-grazing practices improve overall pasture and grazing productivity while greatly increasing soil fertility through the application of animal manures.

How to Begin?

Regenerative agriculture can be a very creative and individualistic method of farming. From grazing operations to crop farming, all types of farms can incorporate regenerative agriculture methods. Start researching what methods you might want to begin incorporating into your farm. (As mentioned above, please see the Snohomish Conservation District's Agriculture Resilience fact sheets on Conservation Agriculture, Biochar, Agroforestry, Silvopasture, Integrated Pest Management, and Managed Grazing.) Natural resource professionals at the Snohomish Conservation District or WSU Extension offices can assist you in providing recommendations and developing a plan that is specific to your farm. A holistic analysis of current farming methods, goals, economics, and natural resources (especially soils and climate), must be analyzed as part of this planning process.

Those who are drawn to experimentation, are excited to try new things, or who are biologists/ecologists at heart would be excellent candidates to start this type of farming.

Find Out More

For more information on regenerative agriculture contact the Snohomish Conservation District at (425) 335-5634.

Below are various resources for further information on Regenerative Agriculture.

TED Talks from those practicing regenerative agriculture:

Regeneration of Our Lands: A Producer's Perspective. Gabe Brown. 2016. TEDxGrandForks
- https://youtu.be/QfTZ0rnowcc

Regenerative Agriculture – A Solution to Climate Change. Ben Dobson. 2014. TEDxHudson
- https://youtu.be/yp1i8_JFsao

A Six-legged March Toward Regenerative Agriculture. Jonathan Lundgren. 2017. TEDxBrookings
- https://youtu.be/qRJ0y9LMhI4

Practicing Regenerative Agriculture. General Mills. Modern Farmer. April, 2018.
- https://snocd.org/modern-farm-reg-ag

Collection of research and reports on regenerative agriculture through Regeneration International
- http://www.regenerationinternational.org/the-science/

Climate Smart Agriculture. United Nations Food and Agriculture Organization (FAO). 2013.
- https://snocd.org/fao-i3325

Levels of Regenerative Agriculture. Soloviev and Landau. 2016.
- https://snocd.org/levels

Compost in Agriculture. WSU Extension.
- https://extension.wsu.edu/snohomish/agriculture/compost/

References

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DEC, Vermont. Values of Riparian Buffers. Accessed 9/2018. https://snocd.org/riparian-values

Dwyer, J.P., Wallace, D., Larsen, D. 1997. Value of Woody River Corridors in Levee Protection Along the Missouri River in 1993. Journal of American Water Resources Association. 33(2):481-489.

Wallace, D.C., Wayne, A.G., Dwyer, J.P. 2000. Waterbreaks: Managed Trees for Floodplain. Agroforestry Notes. USDA Forest Service. AF Note-19