What is Regenerative Agriculture?

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"Regenerative Agriculture" describes farming and grazing practices that, among other benefits, reverse climate change by rebuilding soil organic matter and restoring degraded soil biodiversity – resulting in both carbon drawdown and improving the water cycle.

Specifically, ***Regenerative Agriculture is a*** *holistic land management practice that leverages the power of photosynthesis in plants to close the carbon cycle, and build soil health, crop resilience and nutrient density. R*egenerative agriculture improves soil health, primarily through the practices that increase soil organic matter. This not only aids in increasing soil biota diversity and health, but increases biodiversity both above and below the soil surface, while increasing both water holding capacity and sequestering carbon at greater depths, thus drawing down climate-damaging levels of atmospheric CO_2, and improving soil structure to reverse civilization-threatening human-caused soil loss. Research continues to reveal the damaging effects to soil from tillage, applications of agricultural chemicals and salt based fertilizers, and carbon mining. Regenerative Agriculture reverses this paradigm to build for the future.

Regenerative Agricultural Practices are:

Practices that (i) contribute to generating/building soils and soil fertility and health; (ii) increase water percolation, water retention, and clean and safe water runoff; (iii) increase biodiversity and ecosystem health and resiliency; and (iv) invert the carbon emissions of our current agriculture to one of remarkably significant carbon sequestration thereby cleansing the atmosphere of legacy levels of CO_2.

Practices include:

1. No-till/minimum tillage. Tillage breaks up (pulverizes) soil aggregation and fungal communities while adding excess O_2 to the soil for increased respiration and CO_2 emission. It can be one of the most degrading agricultural practices, greatly increasing soil erosion and carbon loss. A secondary effect is soil capping and slaking that can plug soil spaces for percolation creating much more water runoff and soil loss. Conversely, no-till/minimum tillage, in conjunction with other regenerative practices, enhances soil aggregation, water infiltration and retention, and carbon sequestration. However, some soils benefit from interim ripping to break apart hardpans, which can increase root zones and yields and have the capacity to increase soil health and carbon sequestration. Certain low level chiseling may have similar positive effects.
2. Soil fertility is increased in regenerative systems biologically through application of cover crops, crop rotations, compost, and animal manures,

which restore the plant/soil microbiome to promote liberation, transfer, and cycling of essential soil nutrients. Artificial and synthetic fertilizers have created imbalances in the structure and function of microbial communities in soils, bypassing the natural biological acquisition of nutrients for the plants, creating a dependent agroecosystem and weaker, less resilient plants. Research has observed that application of synthetic and artificial fertilizers contribute to climate change through (i) the energy costs of production and transportation of the fertilizers, (ii) chemical breakdown and migration into water resources and the atmosphere; (iii) the distortion of soil microbial communities including the diminution of soil methanothrops, and (iv) the accelerated decomposition of soil organic matter.

3. Building biological ecosystem diversity begins with inoculation of soils with composts or compost extracts to restore soil microbial community population, structure and functionality restoring soil system energy (C-compounds as exudates) through full-time planting of multiple crop inter-crop plantings, multispecies cover crops, and borders planted for bee habitat and other beneficial insects. This can include the highly successful push-pull systems. It is critical to change synthetic nutrient dependent monocultures, low-biodiversity and soil degrading practices.
4. Well-managed grazing practices stimulate improved plant growth, increased soil carbon deposits, and overall pasture and grazing land productivity while greatly increasing soil fertility, insect and plant biodiversity, and soil carbon sequestration. These practices not only improve ecological health, but also the health of the animal and human consumer through improved micro-nutrients availability and better dietary omega balances. Feed lots and confined animal feeding systems contribute dramatically to (i) unhealthy monoculture production systems, (ii) low nutrient density forage (iii) increased water pollution, (iv) antibiotic usage and resistance, and (v) CO_2 and methane emissions, all of which together yield broken and ecosystem-degrading food-production systems.

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This definition will continue to evolve as research and practice inform what builds the health of soils, sequesters carbon, and grows more topsoil for future generations.

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