Quarterly Viewpoint

FROM THE DESK OF RATTAN LAL

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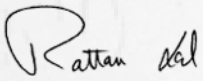
Tenets of Regenerative Agriculture in Response to the COVID-19 Pandemic

The COVID-19 pandemic has disrupted the traditional food production and supply chains and aggravated the global problem of food and nutritional insecurity. The COVID-19 pandemic necessitates a closer and an objective review of the manner in which the food is traditionally produced, stored, processed, packaged, transported, distributed, cooked, consumed, and the waste disposed of. The disruption caused by the COVID-19 pandemic is an important cause for a paradigm shift and reemphasizes the need to focus on strengthening of local food production systems and enhancing their resilience against any future disruptions caused by political or natural perturbations. The global disruption in all aspects of the food supply chain has also enhanced the importance of using the practices of regenerative agriculture (RA), or the soil-centric approach to innovative farming. Indeed, RA is focused on soil restoration, and conservation of natural resources (i.e., soil, water, biodiversity, energy). The goal of RA is to enhance health and functionality of surface soil by restoring soil organic matter (SOM) content, strengthening processes which recycle nutrients and enhancing storage of green water (i.e., the plant available water) in the root zone. The latter is critical to enhancing resilience of soil and of agroecosystems against climate-induced droughts (e.g., pedological and agronomical damage).

Therefore, basic tenets must be adhered to for enhancing the adoption and adaptation of RA under site-specific conditions (i.e., biophysical and the human dimensions) to mitigate the adverse effects of the COVID-19 pandemic. In this context, the objective of RA is "produce more from less,"meaning less land area, inputs of chemical fertilizers and pesticides, energy consumption, water use, emission of greenhouse gases (GHGs), depletion of SOM content, soil erosion, leaching and volatilization of nutrients, and the overall environmental footprint of agroecosystems. Examples of soil-centric RA practices include: conversion from traditional plow-till to no-till (NT) farming, retention of crop residue mulch on the soil surface, avoidance of in-field burning of crop residues, inclusion of a cover crop in the rotation cycle during the off-season, avoidance of excessive and uncontrolled grazing, minimization of inputs of fertilizers and pesticides, and change from flood-based irrigation to sub-surface drip-fertigation. Rather than puddled rice paddies, direct-seeded aerobic rice is a climate-cum-water smart option, albeit with some reduction in grain yield. Saving in water and energy normally used for puddled rice production would make direct-seeded aerobic rice more profitable, even with a somewhat lower yield. Furthermore, it would also reduce emissions of methane and nitrous oxide.

Ten tenets of RA practices, to be fine-tuned for site-specific conditions, include: 1) replace what is removed, 2) predict what may be altered, 3) conserve water and soil, 4) increase soil biodiversity, 5) create disease-suppressive soils, 6) improve soil resilience against extreme climate events, 7) promote nutrition-sensitive farming, 8) make agriculture a solution to climate change, 9) reconcile the need for food production with the restoration of the environment, and 10) save land and water for nature. These tenets are based on the "Law of Return."

Sincerely,



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