Soil strategies that could help offset agriculture's contribution to global warming

The inconclusive end of the 25th Conference of Parties—the international forum for climate negotiations—leaves the world and the world's farmers more vulnerable to severe weather events and a warmer climate that will probably result in unpredictable shifts in areas suitable for agricultural production.

At the same time, our colleague Alan Guebert's December 15th column tells of a *Politico* story about a closed-door meeting of "today's masters of the Big Ag universe… to agree that climate change was real and government action was needed to slow its rising impact on agriculture." At that private-no-press-allowed event "U.S. Secretary of Agriculture Sonny Perdue, couldn't even say the words 'climate change.'"

Our observation that governments and Big Ag are sitting on the sidelines afraid to publicly discuss the role of humans in climate change suggests that if any immediate progress is to be made in addressing human-induced global warming it will have to come from civil society: non-state actors, both individuals and organizations.

This community of non-state actors includes the sustainable agriculture community that can trace its recent history as far back as the years before the Great Depression, the organic agriculture community, and the more recently formed biochar community. These communities have many overlapping concerns and strategies, while also differing on some issues. What binds them together is their concern for the health of the soil and its importance in being able to provide a healthy, sustainable supply of food for all the earth's inhabitants.

In this context, we want to continue last week's discussion of biochar and terra preta—the anthropogenic black soil of the Amazon and other smaller regions around the world. The relatively recent rediscovery in the Amazon of vast areas of black soil that had not been tilled by humans in nearly 500 years is testimony of the ability of those soils to maintain their high carbon levels, both in the form of humus and char, over long periods of time.

The carbon level in the original soil was consistently increased by the addition of humus from plant and animal waste and char, probably from cooking fires that were regularly quenched by frequent tropical rains before the burning wood could turn from char to ash. The human and animal waste as well as some of the char could then have been taken outside the living area for sanitation and cleanliness purposes. These "dump" areas would have rapidly been covered with vegetation.

The residents could not have missed noticing the verdant growth in these areas, some of which may have included seeds from cultivated plants. In whatever manner it originally happened, it's clear that after a certain point people began to deliberately create this fertile black soil. As the "technology" was perfected it spread along a significant portion of the Amazon River.

Today the challenge of the biochar community is to figure out how to stimulate the will of the world community to replicate this process over a vastly larger physical scale and a shorter time scale—decades not centuries—if biochar is to remove enough CO_2 from the atmosphere to reduce the greenhouse gas level in the atmosphere and avoid the calamities predicted by climate scientists.

Agriculture is a part of this process. At present it is estimated that agriculture is responsible for some 10 percent of the increase in atmospheric CO_2 equivalent. The widespread

adoption of biochar techniques in agriculture could completely offset agriculture's contribution to global greenhouse gasses and begin the drawdown of these gasses.

Can ag do it alone? Not by a long shot, but it can lead the way. In addition to agricultural and forestry waste that can be used for biochar, there are municipal sewer waste and landfill waste that can be charred. Because of the contamination of these waste streams by medications and heavy metals, there are other uses for biochar. It can be added to concrete and other building materials. It can be used as an additive in the making of highways. It both cases, biochar makes significant contributions to the usability of these materials.

Done properly, biochar can make a positive contribution to the bottom line of farming operations. When implemented along with action by other economic sectors, it can make net positive economic contributions to society while improving the sustainability of the earth.

Policy Pennings Column 1007

Originally published in MidAmerica Farmer Grower, Vol. 37, No. 253, December 20, 2019

Dr. Harwood D. Schaffer: Adjunct Research Assistant Professor, Sociology Department, University of Tennessee and Director, Agricultural Policy Analysis Center. Dr. Daryll E. Ray: Emeritus Professor, Institute of Agriculture, University of Tennessee and Retired Director, Agricultural Policy Analysis Center.
Email: hdschaffer@utk.edu and dray@utk.edu; http://www.agpolicy.org.