Science Societies

A sustainable system requires strong collaborations among our three societies

By Marilyn L. Warburton, David Clay, and Ron Turco

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On the farm, costs are skyrocketing, the effects of climatic extremes are becoming commonplace, and farmers struggle with insects, diseases, and weeds that are increasingly resistant to our current corrective treatments. Headlines such as these would not be uncommon in newspapers written 100, 200, or even 413

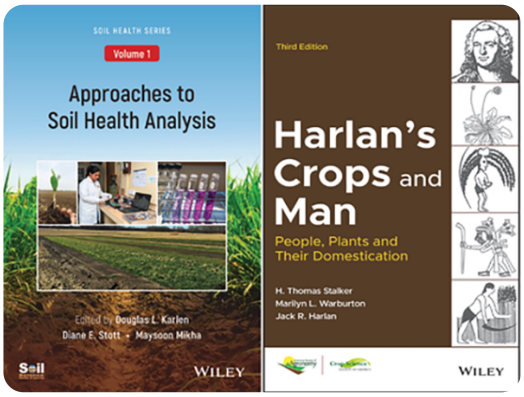


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years ago in the very first recorded newspaper. But although today's problems are like those of our ancestors, their solutions were very different. For example, Native American farmers before European settlement grew and traded or consumed the food they produced. In their fields, diversity was maintained by planting compatible crops, such as beans, squash, and corn; the seedbed was created manually with tools that caused minimal soil compaction, and seeds carefully stored over the winter were planted. They did not have draft animals, used fire to control pests and manage surface residues, and traded seeds with their neighbors. These farmers learned that plant diversity is necessary, a seed source is required, productive soil and fresh water are needed to produce food, and you can plan for but not manage the climate.

During and following the recent pandemic, we have also learned that (1) our food production system depends many interacting components; (2) the failure of any component can result in deprivation and possible starvation; and (3) sustainability is enhanced by the collective action of individuals. For example, within one field, economic sustainability is linked to purchasing the seed, planting the seed in healthy soil, applying fertilizer, and controlling the pests. Therefore, the food produced in this system depends on the availability of the seed, fertilizer, soil, and chemicals used to manage the pests. While the soil is a local resource, most of the remaining products are not produced locally but are the result of the collective action of many people and countries. This includes both manufacturing and supply chains and research collaborations.

Teaching, Research, and Outreach



An example could be a pathologist's discovery of a gene in a seed bank with enhanced pest resistance. A molecular biologist/plant breeder then transfers this gene to a crop plant. Agronomists and soil scientists then test this new cultivar at multiple locations in soils over many years. After 10 to 15 years of testing, this cultivar may be available to purchase by farmers worldwide. This process does not occur by magic but results from teaching, research, and outreach activities. Research results and examples of these activities are available in the numerous journals, magazines, podcasts, books, webinars, and blogs produced by our three Societies.

Suppose, for example, you are interested in teaching, research, and outreach around sustainability, the history of agriculture, and managing crops during adverse climatic conditions. In that case, there are two books that you might consider reading. Both can purchased by typing their titles into the search box on **Wiley.com**. The first book was published by SSSA and is Volume 1 of the Soil Health Series entitled **Approaches to Soil Health Analysis**. This book provides a well-rounded overview of the various methods and strategies available to analysts and covers topics ranging from the history of soil health to urban land reclamation. A second book published by ASA and CSSA last year is **Harlan's Crop and Man: People, Plants, and Their Domestication**. This newly updated edition of a classic book discusses the connections among plant breeding, people, and crops. It provides an overview of how the plants we changed by domestication, in turn, changed us from hunter-gatherers to an agrarian society and industrial economies.

We also hope you will join our ongoing discussions and attend the International Annual Meeting of our three Societies that will be held between 6–9 November in Baltimore, MD. See **www.acsmeetings.org** for details.

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