SOIL HEALTH NEWS

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Economics of Soil Health: Key to Adoption

By C. Wayne Honeycutt, Ph.D.

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INTRODUCTION

The current world population of approximately 7.4 billion is projected to increase to approximately 9.7 billion by 2050. Growing enough food, while also sustaining and improving our natural resources, is one of the greatest challenges of our time.

Recently, the concept of "soil health" has captured wide-ranging interest as a focal point for simultaneously achieving food production and environmental goals. Peer-reviewed, scientific research has in fact shown that many of the same farming/ranching practices to improve soil health can also reduce nutrient losses to ground and surface water, reduce greenhouse gas emissions, reduce erosion, increase yield, suppress plant diseases, and provide pollinator and other wildlife habitat. However, we must recognize that farmers and ranchers are not only land stewards, but are also business men and women. Therefore, the economics of soil health-promoting practices play a critical role in their adoption.

There are several aspects of economics that can influence land management decisions.

PROFITABILITY

The most obvious economic aspect is the relationship between monetary costs and returns. Some soil health-promoting practices may require additional costs when producers shift their focus to improve soil health. Examples include the cost of a no-till planter and cost of cover crop seed. However, these same practices can also provide significant savings, such as less fuel consumption using no-till and greater nutrient retention through the cover crop.

Every farming operation is a unique blend of soils, macro- and microclimates, production systems, management decisions, and their interactions, so calculating potential profitability of different soil health-promoting systems requires a large amount of information before reliable conclusions can be drawn. Currently, partners such as the Soil Health Partnership led by the National Corn Growers Association, are addressing this need through on-farm demonstration and evaluation sites across the Midwest U.S.

RISK

A key aspect of economics that is often overlooked is the concept of economic risk. This is another area where we may have some real opportunity.

While the concept of soil health includes chemical, physical, and biological properties, our ability to increase a soil's organic matter content cuts across all three. Most accurately measured as soil organic carbon, increases lead to enhanced nutrient availability, reduced erosion, greater water holding capacity, increased rate of water infiltration (therefore reduced runoff), and other benefits. It should also not go unstated that increasing soil organic carbon is a major component of what is often described as "carbon sequestration."

A review of several studies showed that a 1% increase in soil organic carbon increases a soil's capacity to hold plant-available water by approximately 2,500-12,000 gallons per acre in the top 6 inches alone! Consequently, increasing

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soil organic carbon through soil health practices not only benefits the environment, but also enhances on-farm resilience to both drought and heavy precipitation. We, at the Soil Health Institute, hypothesize that such increases in resilience lead to greater yield stability and therefore reduced economic risk for producers. Thanks to a recent grant from the Walton Family Foundation, we are currently conducting that analysis and plan to widely distribute those results to farmers and ranchers by next winter.

MONETIZATION OF SOIL HEALTH

To the extent that healthier soils reduce economic risk and enhance productivity, it naturally follows that soil health assessment could conceivably become an important component of land valuation. This may be expected to drive additional adoption of soil health-promoting practices and systems.

Although much more complex, establishing economic values to the ecosystem services derived through soil health could be yet another important aspect of monetizing soil health to drive adoption. Such efforts could include water quality and climate change mitigation benefits, whose quantification would contribute to expanding water quality and carbon markets.

CONCLUSIONS

The current interest in soil health represents a rare opportunity for simultaneously addressing our food production and natural resource needs. Together, with additional collaborations that include manufacturing partners such as General Mills, agricultural partners like the Soil Health Partnership and National Association of Conservation Districts, private conservation partners such as The Samuel Roberts Noble Foundation and The Nature Conservancy, public partners such as USDA-NRCS and USDA-ARS, and many others, economically viable solutions can be advanced to benefit farmers, society, and the natural resources upon which we all depend. Learn more at soilhealthinstitute.org.

Help Us Create a Research Site Master List

The Soil Health Institute requests your assistance in cataloging long-term (≥10 years) agricultural experiment sites in the United States, Canada and Mexico. Once compiled, this database will be publicly accessible for building teams and planning agricultural research requiring inter-institutional collaboration on large scales, including soil health. Only a minimal amount of information is requested. Please tell us about your site here.

Soil Health Institute Action Plan

The Soil Health Institute has developed an Action Plan that identifies gaps in soil health research and adoption, along with corresponding goals, priorities, desired outcomes and associated actionable steps. The Action Plan incorporates input from numerous stakeholders gained through the Soil Renaissance, the Soil Health Institute's first annual meeting (130 participants), five review teams and a public comment period. Specific details for Research; Measurement, Standards & National Soil Health Assessment; Economics; Communications and Education; and Policy will accompany the May 2017 release.

Living Soil: The Series

The Soil Health Institute's "Living Soil: The Series" is now available on Vimeo and YouTube. This video content is designed to educate producers and the public on the science of soil health and the specific management practices to enhance it. Current clips feature Brian and Keith Berns discussing no-till alternatives and cover crops in their production systems in Nebraska. The Institute plans to release a full documentary on soil health later this year!

SAVE THE DATE!

Powering UP OUR SOILS

SOIL HEALTH INSTITUTE

JULY 12-14 2017 | 2nd Annual Meeting St. Louis, Missouri

Soil Health Research Landscape Tool Released

In January, SHI released the Soil Health Research Landscape tool, a searchable database of the most up-to-date information on soil health to help users connect soil health problems, management actions and desired outcomes with research addressing a particular situation. Developed in partnership with Datu Research, LLC, and with contributions from USDA-NRCS, this is an important first step in providing a comprehensive, searchable and publicly-available information system for soil health. The tool will eventually include data, metadata, methods descriptions, standards and related economic impacts. All engaged in soil health are invited to contribute articles to expand the tool's utility and benefits. The Soil Health Research Landscape tool can be accessed here, where a tab for adding new articles is also found.

▶ UPCOMING SOIL HEALTH EVENTS

WHAT	WHEN	WHERE
The Ecology of Soil Health Summit	June 5-7	Fort Collins, CO
First World Conference on Soil and Water Conservation under Global Change	June 12-16	Lleida, Spain
4R Nutrient Stewardship Summit	June 12-13	Minneapolis, MN
"Powering Up Our Soils" – Soil Health Institute's 2nd Annual Meeting	July 12-14	St. Louis, MO
National Association of Conservation Districts Summer Meeting	July 15-18	Des Moines, IA
SWCS 72nd International Annual Conference – "Conservation Connection: Creating Pathways to Sustainability"	July 30-August 2	Madison, WI
International Conference on Clean Water, Air and Soil	August 25-27	Bangkok, Thailand
Farm Progress Show	August 30-September 1	Decatur, IL
Tri Societies Annual Meeting: "Managing Global Resources for a Secure Future"	October 22-25	Tampa, FL
National Conference on Cover Crops and Soil Health: "Harvesting the Potential"	December 7-8	Indianapolis, IN

Complete details for upcoming soil health-related events hosted or attended by the Institute or its partners in the Coordinating Coalition for Soil Health can be found under the Events section on the Soil Health Institute website.

Robert Foster and Greg Ruehle join the SHI Board

The Soil Health Institute is pleased to announce that **Robert Foster**, a dairy farmer and co-founder of Vermont Natural Ag Products, and **Greg Ruehle**, the Chief Executive Officer of Servi-Tech, will join its Board of Directors.

Foster is a fourth-generation dairy producer who received his undergraduate and Masters degrees from University of Vermont in agricultural engineering and agricultural economics. Bob and his family manage a thriving 1,800 acre farm near Middlebury, VT.

As regional innovators, the Fosters were pioneers of Cow Power, with Bob actually coining the term. By converting methane gas from manure into electrical energy, they have become almost electrical-energy independent. The Foster Brothers Farm also has developed one of the largest compost companies in New England. They gather residual nutrients from area farms, process manure for use as fertilizer, blend the different formulas together, and distribute the resulting product as fertilizer and soil amendments through their company, Vermont Natural Ag Products.

Robert Foster

Greg Ruehle

Foster is a seasoned Board member having served on the Cabot Cheese Board of Directors for 37 consecutive years.

Ruehle leads the nation's largest independent agronomic firm and oversees crop consulting on almost a million acres of U.S. farmland. Additionally, he directs three laboratory locations (Dodge City, Kan., Hastings, Neb. and Amarillo, Tex.) that evaluate nearly a half-million soil, livestock feed and environmental samples annually.

Earlier in his career, Ruehle served as CEO for the Independent Professional Seed Association and Executive Vice President of Nebraska Cattlemen after serving the National Cattlemen's Association (now National Cattlemen's Beef Association) as Director of Private Lands, Water and Environment in the Washington, DC government affairs office. Ruehle represented the association before Congress, Federal agencies and the Administration on a range of environmental and natural resource policy areas.

Update: Quantifying the Economic Risks and Rewards of Soil Health Management Systems

As described in the Fall 2016 newsletter, the Soil Health Institute and Datu Research received a $626,000 grant from the Walton Family Foundation to quantify the economic risks and rewards of soil health management systems. We are pleased to report that **Dr. Jeanne Reeves** and **Dr. Sean Bloszies** have been hired to conduct this analysis. Jeanne, who has a Ph.D. in Ag. Economics, brings 15 years of experience working with the cotton industry. Sean is a recent graduate from NC State University where he received his Ph.D. in Soil Ecology. Together, they make a strong team for tackling this project.

▶ RECENT PRESENTATIONS & EVENTS

- Foundation for Food and Agriculture Announcement of the National Cover Crops Initiative at the National Press Club in Washington D.C.
- Commodity Classic in San Antonio, TX
- Western Nutrient Management Conference in Reno, NV
- USDA Agriculture Outlook Forum in Washington D.C.
- North Carolina Ag Biotech Professional Forum in Durham, NC
- Soil Health Conference in Ames, IA
- National Association of Conservation Districts in Denver, CO
- Wilbur Ellis Meeting Presentation in San Diego, CA
- Global Soil Security Summit in Paris, France

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