PROMOTION AND ADOPTION OF SOIL HEALTH IN VIRGINIA: THE POWER OF A SIMPLE DEMONSTRATION AND STORY

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Abstract: Soil is a foundational resource for farming, natural resource conservation, and health in the 21st century. Virginia farmers have made significant progress in protecting and conserving natural resources. Controlling soil loss and nutrient runoff — non-point source pollution — from all possible sources continues to be critical for water quality protection and clean-up efforts throughout Virginia and the Chesapeake Bay Watershed. The current emphasis on soil health encourages an integrated, holistic, approach to soil management. Soil health principles bring to light the importance of soil organic matter (SOM), carbon, micro- (e.g., bacteria, fungi), and macro-biology (e.g., roots, worms) as integral for building and enhancing soil's physical and chemical properties. Virginia Tech, Virginia Cooperative Extension, Virginia USDA-Natural Resources Conservation Service, along with community partners, have worked to find common ground around a similar educational message for agricultural professionals, technical service providers, and the farming community. The message emphasizes soil as a living ecosystem and the need to care for the soil biological properties as well as the physical and chemical properties. Simple in-class and on-farm demonstrations (i.e., slake test, rainfall simulator) and stories of farmers' experiences (i.e., through panels, short videos and technical clips) are powerful in promoting and encouraging the adoption of core soil health principles in Virginia. The power of a simple demonstration and story complements on-going research and demonstration efforts, while enabling outreach to a broader educational audience. For example, a rainfall simulator demonstration at the Shenandoah Valley Produce Auction's Annual Membership meeting enabled Virginia Cooperative Extension and Virginia USDA-NRCS to reach not only 120 farmers within a Mennonite community with a soil health message but also women, youth, and children in the community who are stewards of land and market and family gardens.

Relevance

Soil is a foundational resource for farming, natural resource conservation, and health in the 21st century. Soil health educational programs must mesh with the farmers' production systems as well as with their vocabulary and preferred learning methods in order achieve improved understanding and management outcomes at the field level.

Complex Science, But Simple Educational Message

Enhancing the health, function, and biological/physical/chemical properties of topsoil involves complex underlying science with many unknowns. However, core strategies for enhancing soil health in the field are well known. We focus on conveying these strategies to land managers with four simple principles (see circle diagram below), thereby countering the intimidation factor so often associated with soil science. We then use practical field demonstrations and farmer stories to illustrate and reinforce those principles.

Virginia's "Circle of Soil Health Principles" Diagram
(derived from USDA-NRCS national soil health promotion campaign)

Response and Approach

- Illustrate and reinforce core soil health concepts and principles using hands-on demonstrations and comparisons.

Soil pit and cover crop rooting depth investigations

- Use farmers' stories and experiences as case studies -- ideally presented by farmers themselves – to show how soil health concepts can be applied to practical, real-world situations.

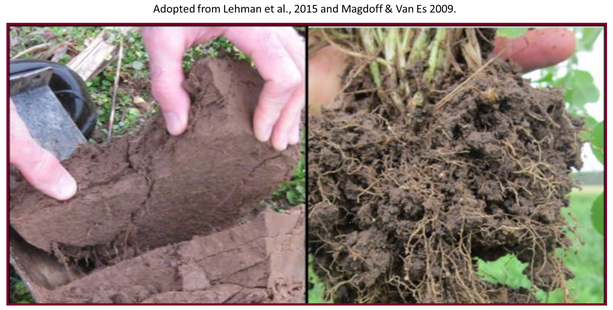
Our **"Common Ground Soil Health Profiles"** video series features Virginia farmers (including vegetable grower Ellen Polishuk) explaining how they apply soil health management principles to their diverse operations (see them on YouTube!)

With this approach, Virginia underscores the importance of understanding the soil ecosystem as a simple balance sheet, where management practices impact the direction of a soil's ability to function (Lehman et al., 2015; Magdoff & Van Es, 2009).

Balance Sheet of Soil Health

Tend to Reduce Soil Health	Tend to Promote Soil Health
Aggressive tillage	No-till or reduced tillage
Aggressive traffic on wet ground	Controlled traffic/ compaction prevention
Annual/seasonal fallow	Cover crops/ relay crops
Monocultures	Diverse crop rotations
Annual crops	Perennial crops
Crop-only farms	Crop-livestock integration
Crop residue removal	Crop residue retention
Inadequate fertilization	Adequate fertilization
Inorganic fertilizers	Organic fertilizers (manures)
Broad spectrum pesticides and herbicides	Integrated pest management (IPM)

Adopted from Lehman et al., 2015 and Magdoff & Van Es 2009.



Comparison of soil health management western Virginia soil.
Photo credit: Chris Lawrence of USDA-NRCS

Educational programming and outreach included 23 training events to account for 45+ hours of face-to-face instruction of more than 1,500 people; production of 11 videos and technical clips ; and more than 40,600 online views of soil health educational videos.


Inspecting crop residue

Emerging Results & Recommendations

The newly formed Virginia Soil Health Coalition endorses an integrated holistic approach to promoting soil health and finding common ground to:

- Reinforce soil health as the capacity to function, be resilient, and recover from stress (Doran et al., 1996; Karlen et al., 1997, Lehman et al., 2015);
- Promote an overarching 'win-win-win' concept of better productivity, environmental performance, and societal outcomes;
- Educate on soil carbon and organic matter as essential to soil life, habitat, function, and resilience;
- Focus on the whole character of the soil and not individual symptoms;
- Implement multiple principles across the farming system and not just individual practices;
- Encourage peer-to-peer learning and networking;
- Inform key decision-makers on soil-related policies; and
- Educate citizens on the value of soil health-building farming.

Virginia Cooperative Extension
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