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Soil Health

Editorial

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New journal: *Soil Health*

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Soil Health, also known as "Soil quality", is the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals and humans, and connects agricultural, horticultural and soil science to policy, stakeholder needs and sustainable supply-chain management[1-3]. Soil health or quality cannot be measured directly because both are surrogate properties. However, they can be interpreted from a series of measured soil physical, chemical, biological, and microbial properties[1-4]. Soil health indicators are determined using minimum datasets[5], linear (single or multiple) regression analysis[6,7], pedotransfer functions[8], principal component analysis[4,9], and factor analysis[2].

Historically, soil assessments were focused on increasing or sustaining crop production. Sustainable agriculture aims to maintain yields of food and forage crops under a given amount of inputs or increase yields without increasing the costs associated with the production while simultaneously maintaining environmental quality. Today, soil health includes the role of soil in water quality, air quality, climate change, human health and quality of life. Soil resource is treated as a dynamic but complex living system with multi-scale temporal and spatial variability[10]. *Soil Health* indicators are usually dominated by chemical or biochemical properties, despite the growing appreciation of the importance of soil biodiversity. This is likely due to the limited functional knowledge and lack of effective and rapid methods. More emphasis is needed on ecosystem services provided by soils, identifying a suite of indicators to determine soil functionality, integration of various measurable properties into informative soil-health indices, and appreciation of spatial and time scale variability of the indicators. Scientists need to understand that several dominant soil health indicators in the mid-west or the eastern United States would not be relevant for soil health determination in the southern or the southwestern United States or other similar arid areas of the

globe.

The primary functions of healthy soils include maintaining or improving ecosystem service, soil structure, soil water retention, nutrient cycling and storage, soil carbon, and plant/crop productivity. Soil degradation, characterized by a decline in soil health, is a problem across the United States because degraded soils reduce the ability of soil to support sustainable cropping systems in agroecosystems and grass cover in rangeland systems. Some of the major challenges for soil health management in humid regions are nutrient leaching, excessive tillage, compaction, and soil erosion; whereas, major challenges for soil health management in arid and semiarid regions are related to low precipitation, irrigation water quality, and land use and management. Leaving land fallow between cropping periods due to irrigation shortfalls, intensive tillage, removal of crop residues, and excessive grazing can lead to rapid degradation of soil health and productivity.

To enhance soil health and ecosystem services, United States Department of Agriculture Natural Resource Conservation Service (USDA-NRCS) proposed four soil health principles: minimizing soil disturbance, maximizing soil cover, maximizing biodiversity, and maximizing continuous living roots. Soil health management can involve practices such as using conservation tillage systems, decreasing frequency or intensity of tillage, improving irrigation methods, maintaining or improving land cover, use of cover cropping and crop rotation, weed control, residue management, rangeland/grassland restoration, integration of livestock, and use of digital technology in the production system. Scientists should embrace soil health as an overarching principle that contributes to the soil, water, and environmental sustainability goals and improves the quality of life, rather than only a property to measure.

The new *Soil Health* Journal aims to publish peer-reviewed articles on soil quality, soil water, soil chemistry, soil physics, soil fertility, soil microbiology, ecosystem services, rangeland issues, water management and reuse, water quality and scarcity, and use of brackish and produced waters for sustaining agricultural productivity, environmental quality, and their impacts on soil health. By publishing high-quality original basic and applied research, we firmly believe that the journal "*Soil Health*" will provide opportunities for interdisciplinary and transdisciplinary publications and advance the science related to the health soils.

DECLARATIONS

Authors' contributions

The author contributed solely to the article.

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Conflicts of interest

The author declared that there are no conflicts of interest.

Ethical approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

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