

# Caring for soil improves human health

## Review

Several definitions and concepts of soil health have been emerged in the literature since the mid-1990s. Soil health concept is described as “the continued capacity of soil to function as a vital living system, within ecosystem and land-use boundaries, to sustain biological productivity, promote the quality of air and water environments and maintain plant, animal and human health”.<sup>1</sup>

Since the creation of the earth, soils have been our treasures-precious natural resources that are critical to our public health because of their impact on human and animal food, nutrition, water and air. Healthy soils provide us with nutritious food that we eat, clean water that we drink and use for hygiene and fresh air that we inhale. Declining soil health negatively impacts the quality of these essential life-supporting resources. Naturally, we are well connected with and strongly tied to our soils. Soil is part of us and plays a major role in our routine daily lives, even though we might not often recognize it. We rely on soils every day, to grow plants that we use for food; to supply raw materials we use to build our shelters and make our clothes; to filter our drinking water and to purify the air we breathe.

In 1938, William Albrecht, a soil scientist and president of the Soil Science Society of America (SSSA), linked the health of soils to human health in numerous theoretical concepts and many practical scenarios. Albrecht wrote in the Year Book of Agriculture Soils and Men, 1938<sup>2</sup> “declining soil fertility, due to a lack of organic materials, major elements and trace minerals, is responsible for poor crops and in turn for pathological conditions in animals fed deficient foods from such soils and mankind is no exception.” He linked the declining health of people to poor soil and chemically-intense agriculture.<sup>3</sup> More than a half-century later, we have found that Albrecht was right about the connection between soil health and public health risks due to recent scientific research results.

In 2011, John Ikerd, a Professor Emeritus at University of Missouri specified in his lecture titled *Healthy Soils, Healthy People: The Legacy of William Albrecht*<sup>4</sup> that “animals, including humans, provide biochemical photographs of the soils in which their foods are grown”. Of course that was one of many important clips from Albrecht’s beliefs and ideology concerning this vital subject. Ikerd<sup>3,4</sup> also said “A half-century later, America is facing an epidemic of diet-related illnesses, including obesity, diabetes, heart disease, hypertension and various forms of cancer. If current trends continue, the cost of health care, which is already nearly twice the cost of food, will claim more than one-third of the U.S. economy by 2040.” He further added “Recent studies have linked a decline in the nutritional value of foods with the industrialization of agriculture. The result is foods rich in calories but poor in essential nutrients.” Ikerd also stated “Albrecht anticipated that reliance on commercial fertilizers to increase production would degrade both soil health and human health.” Albrecht’s prediction<sup>2</sup> was accurate.

In 2013, Joseph Mercola, MD stated in his article 3 “*Dirty*” *Ways to Recharge Your Gut Health*,<sup>5</sup> that “Soil health then connects to everything up the food chain, from plant and insect health, all the way to animal and human health. Health, therefore, truly begins in the soils in which our food is grown.” Nutrients and minerals in living soils are

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important for plant growth and health to provide us with food that is rich in nutrients. Consequently, these minerals and nutrients are also essential for people in order to boost their immune systems, keep their bodies healthy and to properly function in their daily life.

Soil microbiologist Walter Jehne<sup>6</sup> stated in October 2013 that “By composting food and organic waste in our vegetable gardens and by using regenerative agricultural practices we can return nutrients to soil, build soil (and microbial) health and grow plants with nutrient content to meet our body’s needs.” We are greatly dependent on chemicals (inorganic fertilizers, herbicides, insecticides and fungicides) in farming to increase yield productivity rather than to improve the health of our soils. The heavy usage of chemicals in farming has devastated soil microbial communities and evolution that impacts the entire soil ecosystem. These soil microorganisms are essential to nutrient cycling and enzymatic activities in soil that promote crop growth and eventually improve human health.<sup>8</sup>

In the midst of the Dust Bowl era, President Franklin Roosevelt<sup>7</sup> said during his March 1, 1936 speech when signing the Soil Conservation and Domestic Allotment Act “The history of every nation is eventually written in the way it cares for its soil.” He also added “A nation that destroys its soils destroys itself. Forests are the lungs of our land, purifying the air and giving fresh strength to our people.” President Roosevelt was right in his statements about soils!

As people of this planet, we are globally facing many soil, water, air, population growth, food, obesity, disease, environmental and climate change challenges. In order to meet and overcome these challenges, our responsibilities and roles as soil scientists, agronomists, farmers and others are to work together harder than ever before, to rethink our science and change our farming management practices in order to sustain the health of our precious and irreplaceable living soils upon which we all depend for the sake of our health, nutritious and secure food supply and clean water and air. By protecting our soil resource we provide comfortable habitation and human wellbeing for generations to come.

## Conclusion

Healthy soils usually produce healthy crops and nutritious food, in turn affecting significantly human health. Therefore, our priorities are to restore and improve the health of our soils, by increasing organic

matter, stimulating microbial activities, enhancing soil structure, preventing soil compaction, reducing heavy tillage and maintaining good vegetative cover with minimal external destructive inputs and practices in order to produce healthy crops, the source of our daily food for better human health and better tomorrow.

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### Conflict of interest

The author declares no conflict of interest.

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