

TABLE 1. Tier 1 Soil Health Indicators and Methods to be Assessed (updated 10/8/2018)

Indicator	Method	Reference
Soil pH	1:2 soil:water, standard pH electrode system	Thomas, 1996
Soil Electrical Conductivity (EC)	1:2 soil:water, standard electrical conductivity meter system	Rhoades, 1996
Cation Exchange Capacity (CEC)	Sum of Cations: For soil pH \geq 7.2: use ammonium acetate extractant; For soil pH < 7.2: use Mehlich 3 extractant	Knudsen, et al., 1982; Sikora and Moore, 2014
% Base Saturation (BS)	Calculation: For soil pH \geq 7.2: use ammonium acetate extractant; For soil pH < 7.2: use Mehlich 3 extractant	Knudsen, et al., 1982; Sikora and Moore, 2014
Extractable P	For soil pH \geq 7.2: use sodium bicarbonate extractant; For soil pH < 7.2: use Mehlich 3 extractant	Olsen and Sommers, 1982; Sikora and Moore, 2014
Extractable K, Ca, Mg, Na	For soil pH \geq 7.2: use ammonium acetate extractant; For soil pH < 7.2: use Mehlich 3 extractant	Knudsen, et al., 1982; Sikora and Moore, 2014
Extractable Fe, Zn, Cu, Mn	For soil pH \geq 7.2: use DTPA extractant derivatives; For soil pH < 7.2: use Mehlich 3 extractant	Sikora and Moore, 2014; Lindsay and Norvell, 1978
Extractable non-nutrient elements Al, As, B, Ba, Cd, Co, Cr, Mo, Ni, Pb, Si, Sr	Mehlich 3 extractant	Sikora and Moore, 2014
Total Nitrogen	Dry combustion	Nelson and Sommers, 1996
Soil Organic Carbon (SOC)	Dry combustion, corrected for Inorganic C, if present, using pressure-calculator	Nelson and Sommers, 1996; Sherrod, et al., 2002
Soil Texture	Pipette Method with a minimum of 3 size classes. Weight/volume measurements	Gee and Bauder, 1986
Aggregate Stability	Wet sieve procedure. Weight measurement	Kemper and Roseneau, 1986
Available Water Holding Capacity	Ceramic plate method measured at -33 kPa (-10 kPa for sandy soils) and -1500 kPa	Klute, 1986
Bulk Density (BD)	Core method: diameter to be determined, (most likely 2-inch or 5.08 cm)	Blake and Hartge, 1986
Saturated Hydraulic Conductivity	Two-ponding head method in field with Saturo™	Reynolds, et al., 2012
Crop Yield	Obtained from historical and current plot yield data provided by site manager	
Short-Term Carbon Mineralization	4-day incubation followed by CO ₂ -C evolution and capture at 50% water-filled pore space.	Zibilske, 1994
Nitrogen Mineralization Rate	Short-term anaerobic incubation with ammonium and nitrate measured colorimetrically pre- and post-incubation	Bundy and Meisinger, 1994