

# THE BASIS FOR SOIL HEALTH RANKING & SCORES

## CALCULATOR FOR SCORES

Soil health is not a single trait and is best evaluated by using multiple tests with known association and relevance to healthy soil functioning. Soil biological features impacted by agriculture have been subject of investigation for more than 40 years in western farming, especially within biological agriculture<sup>1 2</sup>. The concept of combining different indicator to form a Quality Index is also fairly well known<sup>3</sup>.

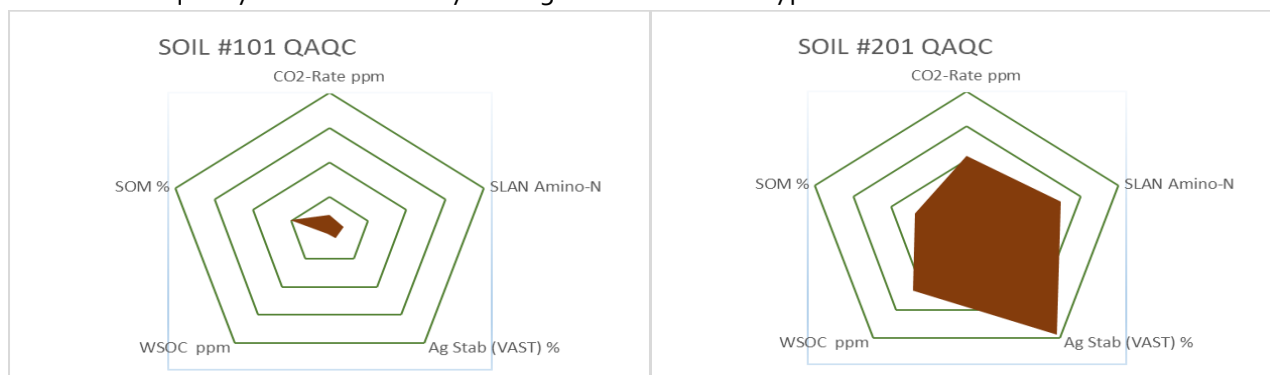
The key in forming a meaningful interpretation is to use tests that measure *different* features of soil quality (i.e. physical, chemical and biological). Woods End Labs has been involved in biologically-oriented soil test since the 70's and introduced one of the first integrated quality audits in the 1980's, earning an international award from IFOAM<sup>4</sup>.

To make biological tests more practical, in the 1990's Woods End developed a series of Solvita tests which address key biological parameters in a cost-effective protocol. The tests include CO<sub>2</sub> (an overall indicator of soil biology); amino-N (assesses stored biological nitrogen); and volumetric aggregate stability (physical structure). All are used in a matrix resulting in an overall rank (see Figure 1). To enhance the richness of the score, other relevant tests such as organic matter or active carbon can be optionally inserted and scored.

Parameter	Set Max Target	Soil Test Result	RANK (max = 50)
CO <sub>2</sub> -Rate ppm	200	82	20.5
SLAN Amino-N	300	150	25.0
Ag Stab (VAST)	80	62	38.8
Active Carbon	400	183	22.9
SOM %	7	3.8	27.2
Final Score			26.9

**Figure 1 To Create a "HEALTH SCORE" a matrix of biologically relevant tests are used.**

One way to display results is use of a "radar" plot – potentially meaningful to the customer. Fig. 2. compares the 2016 Solvita Proficiency Soils #101 (depleted Piedmont) and #201, a NE organic farm (#201 right). Assuming parameters are set up properly, a fuller chart is desired. The power of this visual representation is obvious as the samples diverge strongly from each other, supporting the thesis that soil health tests can be powerful tools to discriminate soil quality within differently managed farms and soil types.



**Figure 2 Radar Plot, L=Depleted Soil, R= Improved Management. Data from Soil Health Matrix**

For more information on soil health test tools contact Woods End Lab ([solvita@woodsend.com](mailto:solvita@woodsend.com) or call 800-451-0337).

<sup>1</sup> Lori, M. et al. (2017) Organic farming enhances soil microbial abundance & activity- A Meta-Analysis. PLOS One:1-25  
<sup>2</sup> Reganold JP. Comparison of soil properties as influenced by organic and conventional farming systems. Am J Altern Agric. 1988; 3:144.  
<sup>3</sup> Bastida et al. (2008) Past Present and Future of Soil Quality Indices. Geoderma 147:159-171  
<sup>4</sup> IFOAM 3<sup>rd</sup> Intern. Scientific Conference, Brussels. Gobbe et al. (1980) Natur et Progrès. 1980 award for "Most Meaningful Soil Test",