HEALTHY SOIL HEALTHY ENVIRONMENT

Solvita® CO2 Respiration Soil Health Test

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A measurement for determining soil health is the release of carbon dioxide (CO2) from the soil. Carbon dioxide emissions from soil are primarily due to microbial respiration. The level of microbial activity is indicative of the amount of active organic matter that is being broken down and nutrients being released. Some professional labs measure the CO2 release in controlled environments over a 7 to 12 day incubation period. It is possible to conduct similar assessment using Solvita ® - a patented measurement system, which uses a gel probe impregnated with chemistry that is sensitive to specific gas molecules and changes color in proportion to their concentration. The colors of the gel are visually compared to a color chart for interpretation. The color chart is divided into graduated color codes from 0 to 5. Each increment on color palette indicates doubling of soil respiration.

The Solvita Field CO^2 respiration test is designed for testing fresh, undisturbed soil not processed in a lab. A 3- inch tube of soil (use a bulb planter) is sealed intact in the sample jar with the gel probe. After 24 hours, the color of the gel probe is compared to the color chart to make interpretations. A digital color reader is also available through Sovita® to get a more accurate estimate of CO2 respiration.

Another respiration test is the CO 2 burst method. This is performed in a commercial lab where samples are shipped to the lab, then dried and sieved. Soil is rewetted with a specific amount of water, which causes a burst of carbon dioxide. This measures the soil microbe respiration potential under disturbed conditions. The burst method is usually 2 – 4 times higher than the field respiration method. The measurement is collected with analytical lab equipment.

Blue-Gray Color 0-1	1 – 2.5 Gray-Green	2.5 – 3.5 Green	3.5 – 4 Green-Yellow	4 – 5 Yellow
VERY LOW SOIL ACTIVITY Association with dry sandy soils, and little or no organic matter	MODERATELY LOW SOIL ACTIVITY Soil is marginal in terms of biological activity and organic matter	MEDIUM SOIL ACTIVITY Soil is in a moderately balanced condition and has been receiving organic matter additions	IDEAL SOIL ACTIVITY Soil is well supplied with organic matter and has an active population of microorganisms	UNUSUALLY HIGH SOIL ACTIVITY High/excessive organic matter additions
Carbon dioxide levels – PPM range				
0 – 5	6 – 12	13 – 30	31 – 70	71 – 160
Approximate quantity of nitrogen (N) release per year (average climate)				
<15 lbs/acre	15 – 25 lbs/acre	25 – 45 lbs/acre	45 – 75 lbs/acre	75 – 105 lbs/acre

Figure 1 – Solvita Index Color Scale, correlated CO_2 levels and predicted N contribution

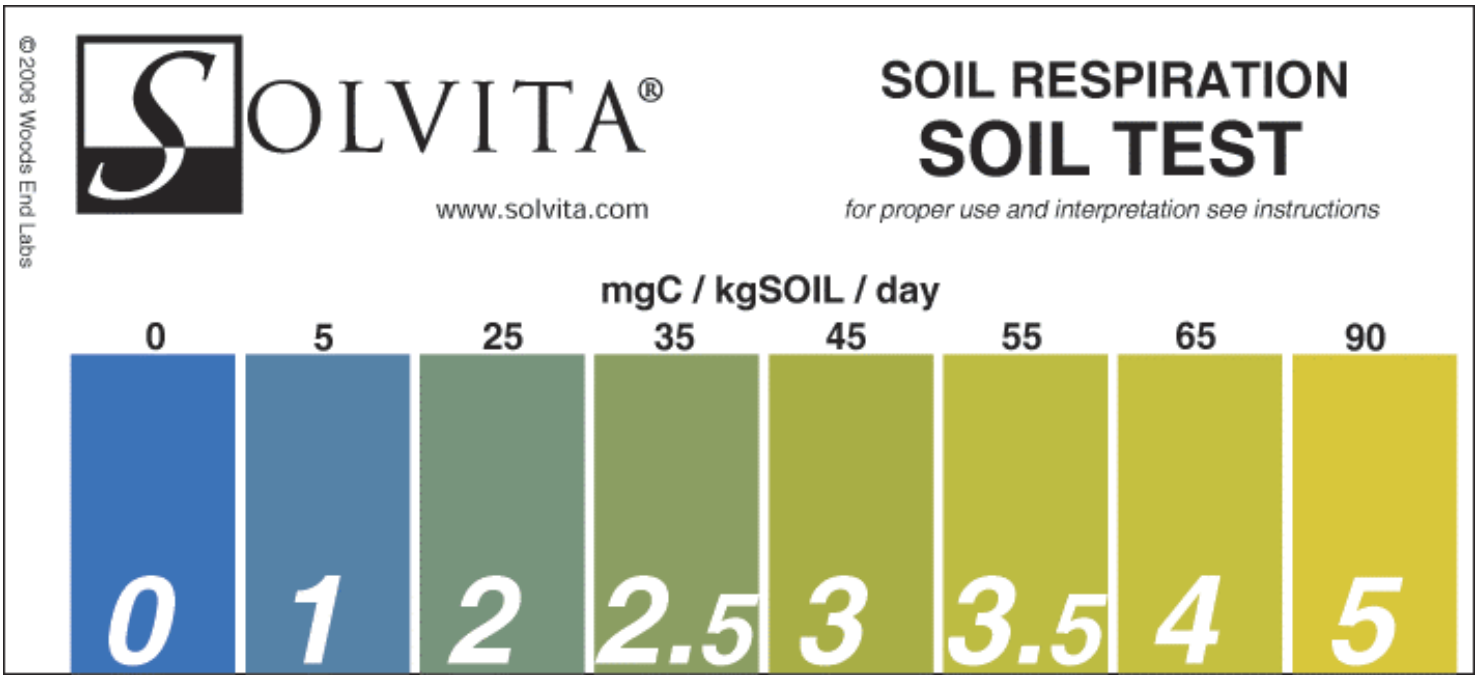

Figure 2 : Solvita paddle color chart. After 24 hours, compare color change to data table.

Figure 3 : Solvita Field Test kit

Caution should be used when interpreting the amount of nitrogen release estimated from respiration. A grass sod may have high microbe respiration but low available nitrogen. A soil nitrate test could accompany the Solvita test to gain confidence in available soil nitrogen.

Resources

For more information: solvita.com/