



Measuring Soil Organic Matter (SOM) with a Field Spectroradiometer

APPLICATION NOTE

Soil organic matter (SOM) is the basis for healthy vegetation. Soil organic matter greatly influences physical and chemical soil properties. As soil organic matter decreases, growing plants becomes increasingly difficult due to problems with fertility, water availability, compaction, erosion, parasites, diseases, and insects.

Measuring organic matter in soil by traditional methods is slow and labor intensive. Using an NIR field spectroradiometer for in situ measurements is faster, easier, accurate and less expensive. Nondestructive field measurements can be made with our contact probes or our benchtop probe with compactor.

Spectral Evolution offers a wide range of field portable spectroradiometers with high resolution and sensitivity, including the PSR+, RS-3500, NaturaSpec, NaturaSpec Ultra, NaturaSpec Plus and PSR-1100f.

Measuring soil organic matter begins with taking a spectra of your samples using a contact probe or benchtop probe with compactor. DARWin SP Data Acquisition software controls our spectroradiometers and displays the spectra you have taken. DARWin also provides first and second derivatives for highlighting important features in your spectra. Key wavelengths for soil organic matter include 433, 587, 1380, 1431, 1929, 2200 and 2345 nm. DARWin saves your spectra as ASCII files for use with analysis software such as chemometrics programs like Unscrambler from Camo Analytics. Unscrambler allows you to build, optimize and test your model. The coefficients from your model are used in the prediction engine built into our DARWin software to identify soil organic matter quantities in new samples.

Our NaturaSpec Ultra is a full range (350-2500nm) spectroradiometer that delivers the highest resolution available in a field portable spectroradiometer. This high resolution allows you to see more features in your spectra for faster and better identification of soil organic matter.

An example of multiple soil scans plotted together on DARWin SP Data Acquisition software and saved as ASCII files.



For field work, an optional rugged tablet is available with built-in digital camera, sunlight readable display, GPS and voice notes to capture and save all the data associated with your scans. All our spectroradiometers are designed for field use—rugged and reliable with no moving optical parts. The instruments are powered by lithium-ion batteries so you can put in a full day of scanning in the field.



Spectral Evolution’s UV-Vis-NIR field-portable spectroradiometers are rugged and specifically designed for the challenges of environmental remote sensing. Our NIR spectroradiometers offer the best combination of high resolution and high sensitivity resulting in the most precise spectral data from any field instrument available on the market. The wide variety of accessories & fore optics make our instruments the most versatile spectroradiometers for all types of measurements, including reflectance, radiance, irradiance, & transmittance.

