

# SPECTRAL EVOLUTION

## Identifying Nitrogen in Soil

Soil is a heterogenous combination of many constituents: minerals, organic material, microbial organisms, liquids and gases. Its composition can vary by location and time of year or even time of day. Within soil, nitrogen is a key ingredient for soil and plant health. NIR spectroscopy can be a useful tool for identifying nitrogen in soil that's faster and less expensive than typical laboratory analyses, and that can be performed in the field.

Traditionally, lab analysis is used to determine nitrogen in soil. However, lab analysis can be time-consuming, expensive, and work-intensive both in collecting, preparing and processing samples. NIR spectroscopy with a field spectroradiometer like the Spectral Evolution PSR+ is rapid, easy-to-use, non-destructive, accurate, repeatable and capable of analyzing multiple constituents in soil at the same time. Using light and its reflection, absorbance, or transmission by a material, the PSR+ correlates near-infrared radiation with the chemical and physical properties of a material producing a unique "fingerprint." By looking at features in wavelengths at 940,1050,1100,1200,1300, and 1550, a researcher can identify nitrogen in soil. Spectra gathered in the field can be analyzed using third party software, including chemometrics packages, as all spectra and associated metadata are saved as ASCII files.

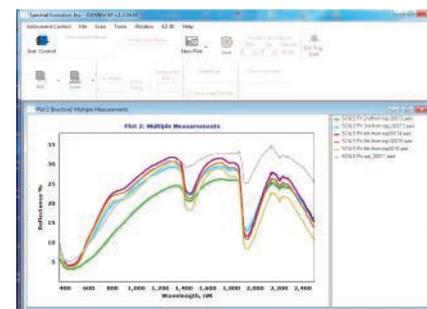
The PSR+ is available with the EZ-ID sample identification software. EZ-ID compares a target sample against a library of known samples. In addition, EZ-ID has a Custom Library Builder module that allows you to build your own soil library for use in the field.

The unit is lightweight, rugged and reliable and runs on two lithium ion batteries for a full day in the field. Spectra can be collected with a handheld contact probe or pistol grip with FOV lens in the field or a benchtop probe with sample compactor is available for lab use. In applications where vegetation is also being measured for health and growth, our unique leaf clip can be quickly configured.

The PSR+ delivers the highest resolution and sensitivity available in a field spectroradiometer across the full 350—2500nm spectral range. In addition to nitrogen, the PSR+ can identify total organic matter, total organic carbon, salinity, moisture and more—all from a single sample and its spectra.



*The PSR Series of field portable spectroradiometers is well-suited for scanning soil using a handheld contact probe, pistol grip with FOV lens, or benchtop probe with sample compactor.*



*Multiple scans in a single plot using DARWin SP Data Acquisition software.*

26 Parkridge Road ♦ Suite 104  
Haverhill, MA 01835 USA  
Tel: 978 687-1833 ♦ Fax: 978 945-0372  
Email: [sales@spectralevolution.com](mailto:sales@spectralevolution.com)  
[www.spectralevolution.com](http://www.spectralevolution.com)

