

Principle of Soil Spectrometer



Overview

Soil spectroscopy is based on the principle that different soil components absorb and reflect electromagnetic radiation in unique ways. Quality soil is an important component of agriculture that depends on accurate analysis to determine specific properties that ensure optimal growth and sustainability. Image Source: Flickr user Ruth Hartnup Spring is right around the corner and this year I am determined to start my very own garden. A primer on soil analysis using visible and near-infrared (vis-NIR) and mid-infrared (MIR) spectroscopy. 4060/cb9005en Revised [January 2024] The manual is linked to a series of five video courses, which were not yet available at the time of the manual's. Soil spectroscopy refers to the measurement of light interaction with soil. Various methods exist to measure this interaction with the goal of understanding the mineral and organic composition of soils. Soil. Mid-infrared (MIR) soil spectrometry offers a rapid, cost-effective technique for reliably estimating soil properties (such as clay, organic carbon, pH, etc).



Article Content

Jun 21, 2026

Soil spectroscopy

This document is an introduction to the use of soil spectroscopy for soil analysis; it enables readers to understand the fundamental and the basic procedures of using this technology for soil analysis.

Jun 02, 2026

In-field soil spectroscopy in Vis-NIR range for fast and reliable soil ...

Soil spectroscopy works due to energy-matter interactions: a material can reflect, absorb, scatter and emit electromagnetic radiation in a characteristic manner depending on its molecular ...

Jan 30, 2026

(PDF) Soil Spectroscopy: An Alternative to Wet Chemistry for Soil ...

The main aim of this paper is to describe the state of the art of soil spectroscopy as well as its potential to facilitating soil monitoring.

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Open Soil Spectral Library

Soil spectroscopy refers to the measurement of light interaction with soil. Various methods exist to measure this interaction with the goal of understanding the mineral and organic composition of soils.

Sep 22, 2025

Soil Spectroscopy: An Alternative to Wet Chemistry for Soil Monitoring ...

Soil spectroscopy has shown to be a fast, cost-effective, environmental-friendly, nondestructive, reproducible, and repeatable analytical technique. The main aim of this paper is to describe the state ...

Jul 18, 2026

An introduction to soil spectroscopy

Large soil spectral libraries (SSL) for farm or field scale applications? Are large scale calibrations suitable to resolve small scale variations? Can this be better than local few-sample-calibrations (10 ...

Mar 07, 2026

(PDF) Soil Spectroscopy: An Alternative to Wet ...

The main aim of this paper is to describe the state of the art of soil spectroscopy as well as its potential to facilitating soil monitoring.

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Soil Spectroscopy Essentials

Soil spectroscopy is based on the principle that different soil components absorb and reflect electromagnetic radiation in unique ways.

Jun 09, 2026

Methods of Soil Analysis Using Spectrophotometric Technology

There are several methods of analysis that can be obtained through near-infrared spectroscopy, which include both chemical and physical properties. Chemical properties can be ...

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Soil Spectroscopy | Precision, Analysis & Crop Yield

The technique hinges on the principle that different soil components absorb and reflect light differently. By analyzing these spectral signatures, it's possible to derive comprehensive ...

Jan 17, 2026

The Kellogg Soil Survey Laboratory Facilitates Soil Spectroscopy ...

Calibrating an MIR spectrometer is like calibrating a pH meter, but instead of the single instrument response of a pH meter, an MIR spectrum comprises hundreds of overlapping instrument responses ...

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