

Measuring Crop Residue Cover

Quantifying crop residue cover on the soil surface is an important factor in controlling soil erosion, evaluating the effectiveness of conservation tillage practices, and improving estimates of carbon sequestration. Current methods for quantifying crop residue cover are tedious and somewhat subjective. The standard technique for measuring crop residue cover used by the USDA Natural Resources Conservation Service (NRCS) is visual estimation along a line-transect. Rapid, accurate, and objective methods to quantify residue cover are needed.

Crop residues and soils are often spectrally similar and differ only in amplitude at a given wavelength. This makes discrimination between crop residues and soil difficult or nearly impossible using traditional reflectance techniques.



Here an OPE3 scientist is measuring the reflectance spectra of soil and crop residues with a portable spectroradiometer. Regional surveys and maps of crop residue cover and conservation tillage practices are feasible using airborne or satellite hyperspectral imaging systems.

In the graphs on the right, a broad absorption band near 2100 nm is clearly evident in the reflectance spectra of the dry crop residues, but is absent in the spectra of the soils. This feature is key to discriminating crop residues from soils.

