SOIL SCIENCE

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ABSTRACTS

Changes of Multispectral Soils Patterns with Increasing Crop Canopy. S. J. KRISTOF and M. F. BAUMGARDNER, Agronomy Department, Purdue University, Lafayette, Indiana 47907.——Multispectral data were obtained with an airborne optical-mechanical scanner over a test site in Tippecanoe County, Indiana, on May 26, June 26, and August 5, 1969.

Temporal changes in multispectral response, displayed as computer maps, were compared with results from approximately 200 surface soil samples analyzed for organic matter and assigned Munsell soil color designations.

There was a high correlation between soil organic matter and multispectral response for the May 26 scanner data. Although the multispectral computer-produced soil patterns were quite similar between the flights of May 26 and June 26, the correlation between soil organic matter content and multispectral response was much lower for the June 26 scanner data. The multispectral response on August 5 gave essentially no correlation with soil organic matter content. Soil color gave similar correlation results with multispectral response.

A Versatile New Field Spectroradiometer for Characterization of Soil Spectra. JAN E. CIPRA and MARION F. BAUMGARDNER, Agronomy Department, Purdue University, Lafayette, Indiana 47907.——An Exotech Model 20 Spectroradiometer was used to study the electromagnetic spectra of soil samples with the sun as the source of energy. This versatile instrument measures radiation over the spectral range from 0.35 micrometer to 13.88 micrometers, including a portion of the near ultraviolet, visible, reflective infrared, and thermal infrared energy. The instrument can be readily transported to the field, is operator oriented, and has real-time output.

Eleven surface samples and one subsoil sample were collected from eleven sites across Indiana. These disturbed samples were placed in 1 meter x 1 meter x 15 centimeter deep pits in a well-sodded location on the Purdue Agronomy farm. Data on spectral response, soil moisture, soil temperature, and soil surface roughness were collected in June and August of 1970.

This instrument was capable of detecting differences in soil spectra. Initial results appear to provide quantitative and repeatable spectral descriptions of soils.