

USING MULTISPEC TO IDENTIFY WEED INFESTATIONS IN SOYBEANS. Loree B. Johnston, Kevin D. Gibson and Case R. Medlin, Graduate Research Assistant, Assistant Professor of Weed Science and Extension Weed Specialist, Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN 47907-1155; Department of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078-6028.

Remote sensing has been proposed as a tool for weed detection and several studies have demonstrated the ability of remote sensing technologies to accurately classify weeds in a variety of settings. One shortcoming for this technology is that classification models need to be constructed on a site to site basis. Some researchers have suggested that weed species may have unique reflectance properties that would allow researchers to associate particular wavelengths or suites of wavelengths with individual weed species. To determine whether wavelengths used to classify weed species at one site could be used to classify the same species at a second site, experiments were conducted at the Agronomy Research Center near West Lafayette, IN and the Davis-Purdue Agricultural Research Center near Farmland, IN. During mid-May 2001, velvetleaf (*Abutilon theophrasti* Medicus), giant ragweed (*Ambrosia trifida* L.), common lambsquarters (*Chenopodium album* L.), and giant foxtail (*Setaria faberi* Herrm.) were seeded in 6-m by 6-m plots with and without drilled soybean [*Glycine max* (L.) Merr.]. Ground-based reflectance measurements were collected from both locations at or near soybean canopy closure using a field spectrophotometer positioned 7-m above the crop canopy. MultiSpec, a multispectral image data analysis system, was used to determine the effect of weed species, with and without soybeans, on reflectance properties of sample areas. Wavelengths selected at one location were generally useful in classifying treatments at a second location. Also, wavelengths associated with weed species grown in monoculture were generally useful in classifying weed species grown with soybean. Our results support the idea that wavelengths or suites of wavelengths can be associated with individual weed species.