Public Abstract
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Title:APPLICATION OF HYPERSPECTRAL REMOTE SENSING IN DETECTING AND MAPPING SERICEA LESPEDEZA IN MISSOURI

When conservationists in Missouri realized that sericea lespedeza was taking its toll by threatening the healthy growth of economic vegetation, they decided to start controlling the invasion of this species. A major challenge encountered is to map the extent of its spatial spread. While satellite remote sensing and aerial photography have been available for many years, newer detection technologies such as hyperspectral sensors have made it possible to acquire large-scale laboratory-like spectra of sericea patches and surrounding natural grasses in the air. In this study, sericea was mapped using the Airborne Imaging Spectrometer for Application (AISA) sensor that records images at high spectral (9nm bandwidth, visible-infrared) and spatial (~1m) resolution. Ground spectra were measured using the FieldSpecPro Full Range (FR) spectroradiometer from Analytical Spectral Devices (ASD, 2006). The study area is a grass field within the Mark Twain National Forest. The AISA images were processed with three different classification methods, and the results are validated based on field surveys. Major findings include: (1) the averaged sericea spectra is more accurate for mapping purposes; (2) moderate spectral response instead of strong spectral response is better in sericea mapping for they have less confusion with other classes; and (3) the MNF (Minimum Noise Fraction) and MTMF (Mixture Tuned Matched Filtering) approach is the best for mapping sericea.
Key words: Hyperspectral remote sensing, weed invasion, classification.