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Wyoming Assessment Project and remote sensing of leafy spurge

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Abstract:

In the Wyoming component of the TEAM Leafy Spurge Assessment Project, large mixed-species releases (3,000 each of *A. nigriscutis* and *A. lacertosa* per site) resulted in not only significant, but very large reductions of leafy spurge in just two years. In contrast, non-release sites showed constant or increasing levels of leafy spurge during the three years of this study. Flea beetles were effective in reducing leafy spurge in all habitat types including riparian areas of very dense leafy spurge, wooded areas, and open upland areas. Flea beetles also effectively reduced leafy spurge on all aspects and soil textures. *A. lacertosa* was observed in greater numbers than *A. nigriscutis* on almost all of the release sites. In addition, *A. lacertosa* appeared to be more effective in controlling leafy spurge in a wide variety of conditions, with the largest crater sizes, and therefore the most rapid control occurring in cooler, moister riparian and north and east facing sites.

A fundamental research need in leafy spurge management and invasive plant management as a whole is cost-effective, large-scale mapping of plant populations. We acquired hyper spectral Airborne Visible / Infrared Imaging Spectrometer (AVIRIS) data over a 25 square-mile study area in Crook County, Wyoming on July 6, 1999. In 1999, we used an ASD FieldSpec spectroradiometer to collect ground calibration and reflectance data of leafy spurge, other vegetation, and soils. These spectra were used to perform spectral mixture analysis on the AVIRIS scene. A major advantage of this technique is that it can effectively “unmix” a pixel and provide an estimate of the areal extent of leafy spurge within the pixel. With its hyper spectral capabilities, AVIRIS provides the best resolution (spectrally, radiometrically, and spatially) for detecting and mapping leafy spurge.