

Public Abstract

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Graduation Term: Summer

Graduation Year: 2008

Title: Integrated management of the invasive weed, cut-leaved teasel (*Dipsacus laciniatus* L.) along a Missouri Highways.

Cut-leaved leaved teasel is an invasive, exotic, and noxious weed in Missouri. Plants are biennial and infest highways and low disturbance areas. Studies on seed biology, detection with remote sensing, and control were conducted to optimize management. Seed characteristics studies included such viability after flowering, emergence patterns and persistence was conducted in central Missouri. Hyperspectral images were collected along a four mile section of Interstate Highway 70 to determine cut-leaved infestation. Hyperspectral (63 bands and 12 bands) images were processed using maximum likelihood and spectral angle mapper supervised classification. In addition, chemical control and grass establishment were conducted to reduce the incidence of infestations.

Cut-leaved teasel produced viable seed capable of germination 12 days after flowering. Seedlings emerged in April and October, with total emergence of up to 31 % in those two months. Most of the seed (75 to 81%) was lost or died after three year storage under field conditions; only 6.1% remained viable. Cut-leaved teasel can be detected with greater than 80% accuracy using maximum likelihood classification on hyperspectral image. Application of the herbicide aminopyralid in May and October as well as establishment tall fescue, Canada wildrye and bufallograss were the best combination to reduce infestation levels of cut-leaved teasel.