DETECTION AND MANAGEMENT OF CUT-LEAVED TEASEL USING DIGITAL IMAGES.

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Cut-leaved teasel is an invasive plant that has been declared a noxious weed in Missouri. It is a biennial plant capable of producing up to 33,000 seeds. Cut-leaved teasel colonizes along roadsides and unmanaged or low maintenance areas. Teasel plants reduce visibility to motorists and the diversity of desirable vegetation. Remote sensing can readily detect populations of invasive plants and is a useful tool for locating plants targeted for control. Analyzing digital aerial pictures provides information regarding the size of infestation and the effectiveness of management practices. The objective of this study was the detection of teasel patches and implementation of different control techniques to improve cut-leaved teasel management.

For pre-determined areas infested with cut-leaved teasel, digital aerial pictures were recorded at the Bradford Research and Extension Center and along Interstate 70 between mile markers 89-93 in July 2006 and 2007. Images were cut, rotated, georeferenced (real coordinates on the ground). In November 2006 and May 2007, herbicides including dicamba, triclopyr, aminopyralid and metsulfuron-methyl were applied on teasel at recommended label rates in a completely randomized design with 5 treatments and 4 replications along highway I-70. Tall fescue (*Festuca arundinacea* Schreb.), Canada Wildrye (*Elymus canadensis* L.), and Buffalograss (*Buchloe dactyloides* Nutt.) were seeded in November 2006 and May 2007 to provide competing vegetation for teasel.

Georeferenced images (less than 2 meter of error) were used to determine the spectral signature of teasel. With these images, cut-leaved teasel plants can be differentiated from other species with greater than 80% accuracy. Repeated treatments of aminopyralid or dicamba in the fall and spring resulted in greater than 98% control of teasel rosettes. There was no difference in the visual evaluation of grass establishment after the chemical treatments.

Sustained management of infested areas must include a combination of herbicides and desirable competitive grasses. Remote sensing is a tool that can successfully detect teasel infestations along large areas of Missouri highways. Teasel detection and implementation of management techniques should improve safety along Missouri roadways.