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A most troublesome weed: What has been done, what else can we do?

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Abstract:

In weed science, the most troublesome weeds are generally deep-rooted, creeping, herbaceous perennials capable of vegetative reproduction from roots or rhizomes. For many ranchers and land-managers in the Northern Great Plains, the most troublesome weed is leafy spurge. To date, management of leafy spurge has focused on preventing its spread by creating awareness and controlling infestations by applying all possible control measures. In fact, this is consistent with the goal of the T.E.A.M. Leafy Spurge program for ecologically-based integrated pest management. One component of integrated weed management is biological research to understand the fundamental cause of the problem in order to improve existing and identify new control measures. Although the payoff from fundamental research can be uncertain, and it may take 10 to 20 years to realize the benefits, it will continue to be a critical component for the effective control of leafy spurge. The primary reason that many weeds like leafy spurge are able to escape, avoid, and persist despite the application of chemical, cultural, mechanical, and biological weed control measures is they develop reproductive propagules such as buds and seeds and maintain them in various states of dormancy until growing conditions are suitable for plant growth. We are using cutting edge biotechnology like microarray analysis to reveal signals, pathways, and mechanisms regulating root bud dormancy in leafy spurge. We plan to examine gene function using viruses and to devise new ways to control leafy spurge and other perennial weeds based on virus-induced gene silencing.