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## **Potential control of leafy spurge by Vesicular-arbuscular mycorrhizae fungi**

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Leafy spurge (*Euphorbia esula* L.), a noxious weed infesting millions of acres of range and farmland in the north central United States, is infected with Vesicular-arbuscular mycorrhizae (VAM) fungi. These fungi, which inhabit the plant's fine roots, are widely accepted as beneficial organisms in the majority of plant families. The objectives of this work are to ascertain how VAM fungi impact the growth and development of leafy spurge and determine if such information can be used to generate a strategy for control of this noxious weed. Plants harvested from various sites in Wyoming exhibit varying degrees of infection levels, and plants grown in the greenhouse have variable infection levels depending, in part, on the plant's age. Results show plants infected with VAM fungi are slower in regrowth when clipped, compared to noninfected clipped plants. The VAM fungi use the plant's stored carbohydrates for energy, which may explain the decreased regrowth. Attempts to eradicate the VAM fungi with the fungicide Tilt® (1-((2-(2,4-dichlorophenyl)-4-propyl-1,3-dioxolan-2-yl)methyl)-1H-1,2,4-triazole) proved ineffective. Inoculation of leafy spurge with 13 VAM fungi endophytes shows *Glomus mosseae* Colorado isolate, *G. mosseae* Arizona isolate, *G. etunicatum*, and *Acaulospora spinosa* having the greatest levels of infection. The effectiveness of the fungicide metalaxyl (N-(2,6-dimethylphenyl)-N-(methoxyacetyl) alanine methyl ester) for VAM fungi eradication will be evaluated, and plant biomass reduction will be determined utilizing a clipping study with VAM inoculated and noninoculated plants and analyzing root total nonstructured carbohydrate levels.