CAN SOIL BECOME BIOLOGICALLY SUPPRESSIVE TO VELVETLEAF? Jane Okalebo, John Lindquist, Rhae Drijber and Gary Yuen, Graduate Student, Associate Professor, and Associate Professor, Department of Agronomy and Horticulture, University of Nebraska, Lincoln NE 68583-0817 and Professor, Department of Plant Pathology, University of Nebraska, Lincoln NE 68583-0722.

Weed-suppressive soils consist of naturally occurring microorganisms that biologically suppress a weed by inhibiting its growth and development. Increased knowledge of soil-pathogen-weed interactions can assist weed scientists in identifying management practices that improve and enhance suppressiveness of soils, thereby promoting sustainable agroecosystems. Velvetleaf death and growth suppression was observed in a field (*A*) at the University of Nebraska Agricultural Research and Development Center (ARDC). Soils from five fields (including *soilA*) were collected from the ARDC and greenhouse studies were conducted to determine if these soils were biologically suppressive to velvetleaf. Surface-sterilized velvetleaf seeds were sown in pots containing the five soils and emerging seedlings thinned to a constant density. Following eight weeks of growth, velvetleaf mortality was greatest (89%) and biomass was smallest (0.4 g plant^{-1}) in *soilA* compared to the other soils. In a preliminary experiment conducted to further test the biological suppressiveness of *soilA*, pots filled with *soilA* were either sterilized or not. Velvetleaf plants grown for 8 weeks in sterilized *soilA* yielded a total biomass of 4.87 compared to 0.3 g pot^{-1} for the unsterilized soil. The high mortality and reduced growth observed in these experiments was attributed to soil pathogenic fungal species. Results of this research indicate that a soil pathogen may negatively influence velvetleaf population biology. Further research is needed to isolate and identify the species and verify their pathogenic effects on velvetleaf and its associated crop species.

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