European Buckthorn (*Rhamnus cathartica*) Seed Germination and Seedling Growth in Mulch Amended Soils: Implications for Restoration

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European buckthorn (*Rhamnus Cathartica*) is a common invasive species that spreads rapidly and threatens the biodiversity of savannahs, woodlands and prairies throughout the Midwest. The modification of soil properties and processes in buckthorn invaded areas are thought to facilitate buckthorn invasion. Soils under buckthorn thickets are characterized by having higher available Nitrogen (N) levels, moisture, pH, as well as elevated soil biological communities and decomposition rates (Heneghan et al. 2008). Current studies are exploring methods to address these soil modifications in order to successfully restore a buckthorn invaded ecosystem to a biologically diverse native habitat. One potential method under investigation is the addition of high carbon (C) woody material into soil to alter C/N ratios and to slow down modified N cycles (Reever-Morghan and Seastedt 1999; Averett et al. 2004). This experiment explores the potential for this method for reducing buckthorn reinvasion both in the field and in a greenhouse. The field experiment examines the reinvasion of *R. carthartica* seedlings from recently cleared areas following carbon soil amendments of two different types of mulch (Commercial and Buckthorn) and those with no soil amendments. The results of this field experiment show a reduction in buckthorn reinvasion in both soil amendment treatments with the greatest reduction in reinvasion in the buckthorn mulch treatment. The greenhouse experiment examines the impacts of buckthorn-seedling germination and growth in these same soil treatments. Based on initial field results, it is expected that the addition of mulch will significantly deter growth and that this effect will be greater with buckthorn mulch. Germinated seedlings were weighed and transplanted into larger pots of the same soil treatments and allowed to grow for three months in a growth chamber. Stem length, biomass, and leaf number were recorded. There was a significant reduction in plant growth in both soil amended pots compared to the no amendment control. Overall, mulch addition to soil seems to slow invasion but not completely deter invasion.