Title: Facilitating mine restoration with nurse plants and cover crops
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Abstract

Mine reclamation is a type of ecological restoration that involves returning land disturbed from mining into useful and functional ecosystems. Mine lands are degraded and lack productive soils, thus it is essential to incorporate organic soil amendments (e.g. compost, wood chips, biochar) to enhance plant recruitment and overall reclamation success. It is economical for mines to use locally available soil amendments, and revegetate with agronomic species because such species can readily establish and persist on poor sites, providing quick erosion control and aesthetic values. On the contrary, there is growing interest in restoring native plant communities with the aim of increasing biodiversity and overall ecosystem integrity, as well as cultural values. Revegetating with native species comes with several challenges; native seed is expensive, difficult to source, and native species do not establish readily on poor sites. Plant interactions are a widely researched subject in ecology, and recent studies suggest that there is potential to apply the theory of facilitation (positive plant interactions) to restoration practices to accelerate ecosystem development. Nurse plants can facilitate target plant establishment by modifying harsh physical conditions, particularly in semiarid and desert environments where moisture levels are low and temperatures are extreme. A research project involving a field and greenhouse component is currently underway to test the efficacy of locally available soil amendments, and to determine whether big sagebrush is a suitable nurse plant for restoration of semiarid grasslands. Preliminary findings show no detectible effects of nurse plants on soil moisture and surface temperatures during the growing season.