1. Does Dalmatian toadflax alter soil microbe communities to the detriment of native rangeland plants?

Investigators: Timothy Collier and Naomi Ward

Issue: Understanding the mechanisms by which invasive, non-native weeds detrimentally affect native and desirable rangeland plant species could provide insight into the variability of weed management success. A potentially important, but poorly studied, mechanism of invasion is that invasive weeds inhibit soil microbes that are beneficial to native plants.

Goal: Use a novel experimental approach to determine whether Dalmatian toadflax alters soil microbes in a way that affects native plant growth.

Objectives: Evaluate the growth of native plant seedlings—western wheatgrass (*Pascopyrum smithii*) and a forb commonly called blazing star (*Liatris punctata*)—receiving a small batch of soil microbes from soils altered by Dalmatian toadflax or from unaltered “control” soils.

Impact: This research is a starting point for future studies on how different management strategies affect what might be called “microbially mediated” invasion by non-native weeds. The key issue is the extent to which different weed management strategies restore an important ecological service provided by soil microbial communities: promoting desirable vegetation production on rangelands.

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Keywords: soil microbial effects, weed invasion, Dalmatian toadflax

PARP: III:3,5

2. Vegetables and herbs under high and low tunnels

Investigators: Karen Panter, Sadanand Dhekney, Ami Erickson, Chris Hilgert, and Jim Heitholt

Issue: Fresh, locally grown produce may not be as readily available in Wyoming as in other states for reasons including short growing season, adverse climatic conditions, and high altitude. Unheated high tunnels, alone or in combination with low tunnels (row covers), may help producers overcome some of these obstacles.

Goal: Help Wyoming vegetable and herb growers establish more sustainable production systems utilizing relatively inexpensive season-extension technology.

Objectives: We are comparing two season-extension systems for growing tomatoes, basil, peppers, and green beans at the Laramie Research and Extension Center (with a similar study at the Sheridan R&E Center): high tunnel and low tunnel within a high tunnel.

Impact: The project should provide important information on the usefulness of low tunnels within high tunnels for production of the four crops. Results may also benefit commercial vegetable and herb producers by providing Wyoming-based research information for extending the growing season.

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Keywords: vegetables, high tunnel, low tunnel

PARP: not applicable