Evaluating Herbicide Mixtures and Seeding of Cheatgrass-Dominated Sites

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Introduction
Invasive annual grasses, such as downy brome (aka cheatgrass, Bromus tectorum), have broad-reaching impacts for agriculture and conservation across Wyoming and the West. Sites that have been affected by both annual grass invasion and repeated surface disturbances may have severely depleted perennial plant communities.

Objectives
The objectives of this project are to evaluate various herbicides within a restoration setting for their ability to reduce cheatgrass competition and facilitate desirable native species establishment.

Materials and Methods
On April 21, 2016, we applied 10 different herbicide treatments plus a non-treated check to 10- by 60-foot plots replicated three times in a randomized complete block design. The study is at the Sheridan Research and Extension Center (ShREC) property east of Sheridan near Wyarno, Wyoming. Herbicides included Esplanade 200SC®, Method 240SL®, Accord XRT®, Lambient™, and Plateau®. We seeded five perennial grasses in late November 2016 and seeded the same species in spring 2017 to evaluate effects of different delay times between herbicide application and seeding. Grass species include western wheatgrass (Pascopyrum smithii), Indian ricegrass (Achnatherum hymenoides), green needlegrass (Nassella viridula), blue grama (Bouteloua gracilis), and crested wheatgrass (Agropyron cristatum). We evaluated plots May 30, 2017, for cheatgrass control, and we estimated seeding success on July 28, 2017, using emergence (%).

Results and Discussion
Most herbicides exhibited greater than 90% cheatgrass control (Fig. 1); however, emergence and establishment of all seeded species were very low (<10%). If we can identify methods for reestablishing desirable species in cheatgrass-dominated areas, this information can help land managers increase the carrying capacity for livestock, improve habitat for wildlife species, and reduce wildfire risk. We anticipate that future data collection should show additional seeded-species establishment.

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Figure 1. Seedling native grasses (foreground) establish in an area with successful cheatgrass control. Non-treated plot visible in background.