Evaluating New Herbicide Mixtures for Rangeland Cheatgrass Management

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Introduction
Cheatgrass is present throughout a large portion of Wyoming at varying intensities. Although current methods for cheatgrass control are fairly effective, they require relatively frequent re-treatment to maintain cheatgrass suppression on infested sites. Some herbicides not previously used in rangeland settings may provide longer-term control with a single application. Additional tools for suppressing or controlling cheatgrass may improve the ability of land managers to restore cheatgrass-impacted rangelands while diminishing potential for developing herbicide-resistant cheatgrass populations by repeated applications of herbicides with the same mechanism of action.

Objectives
The objectives are to evaluate seven herbicide mixtures at two different timings for their effectiveness in reducing cheatgrass and their impacts on associated vegetation.

Materials and Methods
Seven herbicide mixtures at two different timings (March and April) were applied in spring 2016 with a total volume of 20 gallons per acre with a CO₂-pressurized sprayer and a 10-foot boom with six 8002 nozzles. The study at the Sheridan Research and Extension Center (ShREC) was applied to 10 × 30 foot plots set in a randomized complete block design with three replicates and a replicated, non-treated check. Treatments included Plateau® (7 oz/ac) and Olympus™ (1.2 oz/ac) applied alone and in combination; Esplanade® (5 and 7 oz/ac) combined with Roundup WeatherMAX® (16 oz/ac) or combined with Olympus™ (1.2 oz/ac).

Applications on March 3 occurred with a 54°F air temperature, 38% relative humidity, 41°F soil temperature at 2 inches deep, and 5–8 mph wind. Cheatgrass on-site varied from the 1–3 leaf growth stage, and roughly half the plants were purple due to semi-dormancy from cold weather.

Applications on April 21 occurred with a 60°F air temperature, 54% relative humidity, 48°F soil temperature at 2 inches deep, and 3 mph wind. Cheatgrass was 2–3 inches tall and actively growing.

Cheatgrass control (% visual relative to non-treated) was evaluated in early summer and in late fall 2016.

Results and Discussion
In early summer 2016, only treatments containing Roundup showed reductions in cheatgrass. By fall 2016, treatments containing Esplanade provided high levels of cheatgrass control, irrespective of application timing (Figure 1). We will continue to evaluate cheatgrass control and respective treatments in 2017. These preliminary results confirm concurrent research at other institutions that Esplanade provides good to excellent cheatgrass control in the short term.

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Figure 1. Cheatgrass control (% visual) provided by seven herbicide treatments (plus a non-treated check) at two different timings six months after treatment at ShREC.