Wyoming Restoration Challenge: Cheatgrass, a Scientific and Social Demonstration Project

Beth Fowers1,2, Brian Mealor1,2, Clay Wood1,2, and Rachel Mealor3

Introduction

Millions of acres of western rangelands are negatively impacted by invasive species, and cheatgrass (Bromus tectorum) is one of the most widespread. Also known as downy brome, its ability to alter species composition and ecological functions negatively impacts habitat quality for livestock and wildlife alike. Hundreds of research papers have been published on its ecology and management, yet land managers in Wyoming and around the West are still uncertain of the most effective, cost-efficient methods to restore cheatgrass-dominated systems to a higher-functioning status. The Wyoming Restoration Challenge is a land-restoration competition where teams are implementing their own strategies to restore a cheatgrass-dominated pasture to a more diverse, productive state.

Objectives

Objectives of this project are to: (1) increase land managers’ knowledge about techniques for restoring weed-dominated pastures; (2) build awareness of the importance of managing invasive weeds in general; (3) evaluate various methods for restoring degraded pastures infested with cheatgrass and other annual weeds; (4) share information with various audiences on those methods and their relative performance; and (5) encourage participatory learning and friendly competition among teams.

Materials and Methods

We issued an open invitation through various outlets for teams to enter into the competition. Each team was assigned one 1/4-acre plot by drawing plot numbers. Teams were given access to plots at the James C. Hageman Sustainable Agriculture Research and Extension Center (SAREC) in April 2015 and will be evaluated annually through 2017. Any legal methods for removing cheatgrass and reestablishing a diverse, desirable plant community are allowed. Teams are evaluated on multiple categories (Table 1). The most efficient way to follow the competition is at www.facebook.com/WYrestorationchallenge/.

Results and Discussion

Twelve Wyoming-based teams and one Nebraska team registered for the challenge, including community college and university faculty and staff members, county weed and pest control district personnel, Extension educators, ranchers, government agency employees, and graduate, undergraduate, and high school students. During the first and second years of the competition, teams assessed their plots, devised strategies, and began implementation. Integrated weed-management strategies were abundant as teams implemented high-intensity, short-duration grazing, multiple herbicide applications, mowing, burning, tillage, cover crops, weed-suppressive bacterial applications, and seedings of desirable species. Cheatgrass cover was reduced in all plots, with reductions ranging from 20% to 96% relative to pre-treatment measurements (Figure 1). Perennial grass (desirable) change varied from a slight loss to substantial gains (as much as 4,000% [Figure 1]). Bare ground greatly varied by plot as some teams reduced bare ground by 100% while others greatly increased bare ground compared to pre-treatment cover. A preliminary ranking was compiled based on 2016 vegetation data and educational activities for the top five teams (Table 1). Final evaluations will be performed summer of 2017 and a final ranking of teams will then occur. Our plan is to present awards at this year’s SAREC Field Day, scheduled August 24. The challenge will remain as a demonstration project, illustrating various cheatgrass management methods. Communication and education between teams and to other individuals and groups continue to be a dynamic part of the project. We are developing a website based on current content that will also house videos. Our ultimate
goal is to release a short educational video (~30 minutes) that mimics a reality TV format.

Acknowledgments
Many thanks go to the Wyoming Agricultural Experiment Station and SAREC crew for support of the challenge; our partners that helped publicize the event, the Wyoming Society for Range Management and Wyoming Weed and Pest Council; and the University of Wyoming range weed science team for assistance and participation.

Contact Information
Brian Mealor at bamealor@uwyo.edu or 307-673-2647.

Keywords: cheatgrass (*Bromus tectorum*), rangeland restoration, participatory learning

**Table 1.** Rankings following the 2016 growing season by judging criteria. Teams are only in order of plot number (not shown). The number within each category is the relative rank for that team.

<table>
<thead>
<tr>
<th>Team</th>
<th>Education</th>
<th>Cheatgrass</th>
<th>Productivity</th>
<th>Diversity</th>
<th>Scalability</th>
</tr>
</thead>
<tbody>
<tr>
<td>UW Range Club</td>
<td>3</td>
<td>8</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>UNL Brome Eradicators</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Cundall Ranch/Platte County NRCS</td>
<td>4</td>
<td>6</td>
<td>10</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>UW Weed Control Freaks</td>
<td>2</td>
<td>1</td>
<td>9</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>SMRR Brome Bashers</td>
<td>1</td>
<td>2</td>
<td>11</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

1Department of Plant Sciences; 2Sheridan Research and Extension Center; 3University of Wyoming Extension.