Eastern Idaho crested wheatgrass diversification study update

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Introduction

- Determine the effect of disking and herbicide application timing on control efficacy and subsequent reseeding success
- Began 2008
  - Large plot study (Aberdeen, ID)
    - Crested wheatgrass control treatments and reseeding success
  - Small plot study (Dubois, ID)
    - Crested wheatgrass TNC trends and phenology
    - Herbicide efficacy
Disking
Herbicide Application
## Seed mix

<table>
<thead>
<tr>
<th>Drill mix</th>
<th>%</th>
<th>Full Rate</th>
<th>#PLS/ac</th>
<th>PLS/linear ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatone bluebunch wheatgrass</td>
<td>40</td>
<td>8</td>
<td>3.20</td>
<td>20</td>
</tr>
<tr>
<td>Magnar basin wildrye</td>
<td>10</td>
<td>8</td>
<td>0.80</td>
<td>5</td>
</tr>
<tr>
<td>Bannock thickspike wheatgrass</td>
<td>10</td>
<td>6</td>
<td>0.60</td>
<td>4</td>
</tr>
<tr>
<td>Thurber’s needlegrass</td>
<td>10</td>
<td>6</td>
<td>0.60</td>
<td>5</td>
</tr>
</tbody>
</table>

**Broadcast mix**

<table>
<thead>
<tr>
<th>Broadcast mix</th>
<th>%</th>
<th>Full Rate</th>
<th>#PLS/ac</th>
<th>PLS/linear ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maple Grove Lewis flax</td>
<td>5</td>
<td>8*</td>
<td>0.40</td>
<td>5</td>
</tr>
<tr>
<td>Mtn. Home Sandberg bluegrass</td>
<td>5</td>
<td>4*</td>
<td>0.20</td>
<td>9</td>
</tr>
<tr>
<td>Blue Penstemon</td>
<td>5</td>
<td>8*</td>
<td>0.40</td>
<td>5</td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>10</td>
<td>0.5*</td>
<td>0.05</td>
<td>4</td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>5</td>
<td>3*</td>
<td>0.15</td>
<td>5</td>
</tr>
</tbody>
</table>

* The broadcast seeding rate for each component is double the standard full seeding rate for drilling
Sampling
Depended on year

- Disking in 2009; however, had no effect on CWG density in 2010.
Herbicide effects on crested wheatgrass density

- Depended on year
  - The fall herbicide application did not reduce CWG cover in either year.

![Graph showing mature crested wheatgrass density](chart.png)
Effect depends on year

- Disking and early season herbicide in 2008 effectively reduced CWG cover in 2009.
- In 2009, only the first herbicide application without disking had any effect on CWG cover in 2010.
Seeding in both 2008 and 2009 caused a modest, but statistically significant increase in CWG cover, in 2009 and 2010, respectively.
Cheatgrass cover (data not shown) was <1%. Year and treatments had no effect cheatgrass cover.

Cheatgrass density was also low, but density was greater in 2010 than in 2009.
Seeded grasses

- Grass seedling density was greater in 2009 than in 2010 for each species and cumulative
Seeded grasses

- Disked treatments had less seeded grass seedling density than the undisked, with the exception of Wheatgrass which was not different.
- Herbicide treatments had no effect on seedling density.
Seeded forbs

- Seeded forb density was less than 1 plant/m² in 2009
- Control treatments had no effect on forb density.
Seeded shrubs

- Shrub seedling density is very low with about 1 plant per 100 m².
- There was no effect of any of the control treatments.
Year effects explain most of the variability in CWG control and Seedling Success.

Spring disking and herbicide application may be more efficacious when followed by a dry summer.

With the exception of grasses in 2009, seedling success is poor. None of the CWG control treatments had an effect on seedling success.