Improving Seeding Success on Cheatgrass-Infested Rangelands in Northern Nevada

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On the Ground

• Cheatgrass has transformed secondary succession in arid sagebrush plant communities in the Great Basin by providing a fine-textured, early maturing fuel that increases the chance, rate, spread, and season of wildfires.
• The best known method to suppress cheatgrass densities and associated fuels is through the establishment of perennial grasses.
• Crested wheatgrass plots seeded the first fall following the wildfire (2006) averaged an establishment of 9.6 plants/m² compared with plots seeded the second fall at 3.9 plants/m². Native perennial species bluegrass and squirreltail experienced high failure rates.
• Over the 2-year study, un-disced cheatgrass plots averaged more than 1,350 cheatgrass seeds/m², while plots receiving our April/May discing application averaged fewer than 250 cheatgrass seeds/m², an 82% reduction in cheatgrass seed bank densities, which significantly improved seeded species establishment.
• The use of soil-active herbicides, Imazapic (Plateau) and Sulfometuron methyl (Landmark), reduced first-year cheatgrass densities by 95.6% and 98.7%, respectively. This level of cheatgrass reduction drastically improved seeded species success.
• The establishment of perennial grasses reduced aboveground cheatgrass densities by more than 93%, thus reducing the chance of reoccurring wildfires and improving the chance that critical browse species can return to the site and improve wildlife resources.

Keywords: seeding, weed control, suppression, fuels management.

doi 10.1016/j.rala.2017.10.003
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Invasion of alien plant species influences many phases of wildland research in the Great Basin. The accidental introduction and subsequent invasion of cheatgrass (Bromus tectorum L.) onto millions of hectares of Great Basin rangelands has led to the conversion of former big sagebrush (Artemisia tridentata Nutt.)/bunchgrass communities to cheatgrass dominance (Fig. 1). Native to Europe, central Asia, and northern Africa, cheatgrass was accidentally introduced to North America, where it was first identified in Pennsylvania around 1861 and believed to be in contaminated wheat. It was not identified in northern Nevada until 1902, where it spread rapidly throughout big sagebrush rangelands. Cheatgrass has transformed secondary succession in more arid big sagebrush plant communities throughout the Great Basin by providing a fine-textured, early maturing fuel that increases the chance, rate, spread, and season of wildfires. Whisenant estimated the presence of cheatgrass has reduced the interval between wildfires on the Snake River Plains from the previously reported 60 to 110 years to 5 years. Aldo Leopold recognized more than a half century ago how impossible it is to protect wildlife habitat from wildfire because of the presence of cheatgrass. This invasive annual grass truncates secondary succession by largely inhibiting the establishment of perennial seedlings through competition for moisture. It is extremely challenging for resource managers and landowners to restore or rehabilitate cheatgrass-infested rangelands. The best known method to suppress cheatgrass densities and associated fuels is through the establishment of perennial grasses. In this paper, we will describe our experiences in establishing perennial grasses and shrubs on cheatgrass-infested rangelands with the ultimate goal of reducing cheatgrass densities and associated fuels and wildfire risks in an effort to allow succession to take place and improve grazing and wildlife resources.

One of the reasons cheatgrass is so competitive is that it produces many more seeds than are needed to sustain the population while also exhibiting the ability to acquire seed dormancy and build persistent seed banks. Even though cheatgrass germinates at a wide range of constant and alternating temperatures, persistent cheatgrass seed banks...