

# Cheatgrass Ecology and Management in Wyoming

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## Ecological Relations

Cheatgrass, aka downy brome (*Bromus tectorum* L.), is a widespread exotic and invasive winter annual grass that is a problem in much of western North America. Abundant cheatgrass reduces desirable forage plant productivity and diversity of plant species. In large areas within the Great Basin, including western Utah, Nevada, and southern Idaho, cheatgrass-fueled wildfires have converted native grasses and sagebrush (*Artemisia tridentata* Nutt.) to low seral cheatgrass-dominated landscapes. Many resource managers are now concerned that a similar fate awaits the sagebrush steppe found across Wyoming. Of special concern are the cheatgrass-driven loss of critical sage grouse and other wildlife habitat, and secondary weed invasions that have followed cheatgrass across the Great Basin such as Rush skeletonweed (*Chondrilla juncea* L.) and medusahead wildrye [*Taeniatherum caput-medusae* (L.) Nevski].

Cheatgrass is not new to Wyoming. Herbarium records indicate the presence of cheatgrass in much of the state by the early 20<sup>th</sup> century. Overall, increased fire frequencies or vast conversions of sagebrush to annual range have not resulted. This conversion is rarely seen in Wyoming. Why have conversions not occurred? The primary answer may lie in the biology of cheatgrass and other invasive winter annual bromes and Wyoming's climate.

Annual bromes have primarily evolved in Eurasian climates characterized by cool, wet, mild winters and hot, dry summers. Winter annuals exploit this climatic regime to the exclusion of perennial species. They rapidly germinate following fall rains, may grow through the winter or are protected by snow cover, and complete their life cycle the following spring before most perennial grasses begin rapid growth. This pattern exploits soil moisture before perennial plants initiate spring growth. Annual bromes survive hot, dry summers as dormant seeds, while perennials must survive with limited soil moisture. Over time, cool season perennials may decline in vigor and competitiveness. Cheatgrass is effective in surviving continuous years of drought and may grow vigorously following drought.

Cheatgrass is being reported in new habitats of states in the Intermountain Basin, and geneticists have found ecotypes that may be adapted to different habitat conditions. Variations in genetic material and apparent capability to evolve in new habitats has led to fears that cheatgrass will spread to new areas in Wyoming.

Wyoming's elevation and location within the continent produces a climate different from areas where cheatgrass has degraded native plant communities. Cheatgrass is widely found in low abundance. It can become locally abundant on specific sites when favorable conditions develop. Climatic and elevation differences across Wyoming influence types of sites where cheatgrass may be found.

## Southern counties in Wyoming or other areas above 6,000 feet elevation

Fall precipitation needed for cheatgrass germination before onset of cold temperatures is rare in zones where 14 inches or less precipitation is received annually. Most precipitation comes in April and May when perennial species are actively growing. Cheatgrass tends to



occur where there is low perennial grass cover, recent fire, soil disturbance, or shallow soils. At higher elevation sites with precipitation greater than 14 inches, cheatgrass favors warmer microclimates of south and southwest facing slopes where early fall snow melt provides moisture for

germination, and early spring snow melt occurs before perennial plants begin growth.

## Bighorn Basin

Lower elevations and warmer fall and spring temperatures provide an opportunity for cheatgrass to flourish if precipitation comes in the fall. Appropriate precipitation regimes are relatively rare. Cheatgrass may become abundant where land is disturbed or has a diminished perennial plant community. Examples include roadsides, recent stream deposition, and recently burned juniper or sagebrush stands. Cheatgrass generally declines if management allows perennial species to flourish because the predominant precipitation comes in spring.

## East and Northeast Wyoming

Cheatgrass and Japanese brome (*Bromus japonicus* L.) appear to be always present throughout this region apparently because of the lower elevation, warmer fall and early spring temperatures, and fall rain. Intermittent warmer temperatures during winter melt snow and allow for cheatgrass growth. Spring precipitation can result in a bumper crop. Occasionally, spring conditions favor germination, although growth appears to be less than with fall germination. The coincidence of appropriate temperatures and precipitation in fall and spring do not result in high abundance of cheatgrass in most years. Late summer fires reduce litter that encourages cheatgrass growth. Japanese brome may be the prevalent annual species in undisturbed native plant communities while cheatgrass is more prevalent with disturbance.

## Cheatgrass Management in Wyoming

Cheatgrass control may be warranted in some situations in Wyoming. These include new infestations where cheatgrass has not been historically present, areas of urban-wildland interface where protection from wildfires is necessary, critical sage grouse and other wildlife habitat, and areas where cheatgrass dominance limits productivity or diversity.

Cheatgrass management falls under two basic categories. The first strategy entails maintaining a vigorous perennial plant community, particularly grasses. Precipitation peaks in spring and early summer favor perennial grasses. Grazing repeatedly during the boot stage in perennial grasses is detrimental. Grazing practices favorable to perennial grasses include rotated deferment or short duration grazing with moderate use.

Since cheatgrass responds to soil disturbance, roadsides and trails invite cheatgrass movement into new areas. Where possible, quickly establish good perennial grass cover. Winter feeding areas and permanent livestock water sources are also areas of heavy disturbance. These areas should be monitored for cheatgrass and other noxious weeds. Spot treatments to small patches of cheatgrass with herbicides can reduce its spread. Plateau® (imazapic) at 4-6 ounces per acre applied preemergent (just before cheatgrass emerges) or early post-emergent (when cheatgrass is a seedling and less than two inches tall) are both very effective. The post-emergent application requires the addition of the additive MSO (methylated seed oil) at 1 quart per acre. Properly calibrate your sprayer to avoid over-application. Rates of Plateau® above 8 ounces per acre may injure or kill many cool season grasses, so higher rates are detrimental! Do not apply Plateau® in the spring because control will be very poor. Roundup® (glyphosate) at 0.75 percent volume per volume or 1 pint per acre is effective in the spring when cheatgrass is actively growing but before perennial grasses have broken dormancy. Application of Roundup® to actively growing perennials will result in severe injury or death.

A strategy for large acreages already heavily infested and low perennial grass cover remaining entails containment and prevention of new patches outside of the main infested areas and active control to reduce the size of the main patches. Grazing is a useful tool for management of large patches. Grazing is effective when cheatgrass is near flowering to the soft dough stage of seed maturation. This high intensity, short-duration timing minimizes injury to desirable perennials and maximizes injury to cheatgrass. Massing sufficient animals to treat large acreages may be difficult. Cheatgrass will still produce a few seeds following intensive grazing.

Broadcast treatments of Plateau® may control cheatgrass and release any residual perennial grasses within the infestations. Plateau® applications at 4-6 ounces per acre preemergence in the fall or post-emergence to seedling cheatgrass in the fall are very effective for control. Sprayer calibration is critical to prevent over application and severe injury of cool season perennial grasses.

Where reseeding with perennial grasses is feasible, glyphosate (Roundup®) at 1 pint per acre is the primary herbicide option for cheatgrass control to allow the seedlings to establish. The application timing may be in the spring or fall before seeded perennial grasses have emerged.

In summary, cheatgrass will occur across the state in varying abundances. Avoid becoming complacent because unique precipitation patterns, disturbance, inappropriate management, and specific soil or topographic situations will result in locally abundant cheatgrass. Weather adverse to cheatgrass and good grazing management should usually limit cheatgrass to local situations that can be effectively managed to further reduce cheatgrass. Where needed, herbicides may be applied to reduce cheatgrass and allow residual perennial grass to increase.