Living with Cheatgrass in the Great Basin Annual Rangeland
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Early explorers and settlers found a vast expanse of big sagebrush, Artemisia tridentate, in the foothills and valleys of most of the Intermountain West. The understory of this shrubland was composed largely of perennial bunchgrasses that provided nutritious forage for native grazers and pioneer livestock. Today, the understory grass in a large part of the sagebrush country is an introduced annual grass. This annual grass, known as cheatgrass, bronco grass, downy brome, June grass, and Bromus Tectorum, is so well adapted to the Intermountain sagebrush environment that it outcompetes many native plants. It has replaced the original perennial bunchgrasses on much of the drier lower elevation sagebrush country and on the wetter parts of the upland salt desert shrub rangeland.

**PLANTS ARE THE KEY**

Vegetation is the yardstick by which success is often measured in range management. Traditionally range managers and ranchers prefer native perennial plants to introduced annuals. Range quality is often judged against the pristine or native vegetation thought to have originally existed on the range. Rangeland is generally labeled by the plants it could produce under pristine or natural conditions. Calling much of the altered big sagebrush rangeland in the Great Basin "annual range" is a departure from tradition. Making this change may be a significant step in proceeding with the business of range management as it pertains to present day reality.

**CHEATGRASS AS FORAGE**

Cheatgrass is a valuable forage resource. It provides a substantial amount of forage for many livestock operations, probably more than any other single species in Nevada. It also provides some of the earliest green feed available to deer on some winter ranges. Both the seed and green leaves are also a necessary feed for chuckar partridge.

Because cheatgrass is an annual, its production depends on the weather. In very dry years production can be so low there is little soil protection and little to graze. In wet years cheatgrass may produce tremendous ground cover and more forage than is possible to harvest, resulting in a severe fire hazard. However, even when production is high, shallow-rooted plants can't effectively use soil moisture below their roots. In most years cheatgrass cures before deeper-rooted perennial grasses. Though the forage value of green grass is very high, the forage value of cured grass is often below the grazing animal's maintenance needs.

**CHEATGRASS IS NOT NATIVE TO AMERICA**

Cheatgrass probably evolved in southwest Asia. It was accidentally brought to the United States in the late 1800s and spread so effectively, it is now widely distributed. In Nevada, cheatgrass was first discovered in Elko County in 1906.
Once introduced to heavily grazed sagebrush rangelands, the preadapted cheatgrass spread rapidly. Cheatgrass reaches its greatest development on the semiarid big sagebrush/bunchgrass ranges in the Intermountain area between the Sierra-Cascade and Rocky Mountains.

GERMINATION AND COMPETITION

Cheatgrass is an adaptable species that will germinate in the fall with adequate early moisture. This occurs about once every five years in the more arid parts of sagebrush country. Otherwise cheatgrass germinates in the early spring. In either case, cheatgrass grows early in the spring and effectively removes soil moisture before native perennial grasses can complete their growth. Once cheatgrass becomes well established on some sites in the arid part of the sagebrush zone, the community is essentially closed to reoccupation by native perennial species.

Cheatgrass was so well adapted to this environment that it eventually became a major and permanent part of the vegetation in areas with mild wet winters, early springs, and early dry hot summers. This widespread floristic change in the drier parts of the sagebrush zone occurred regardless of grazing use history. The inadvertent introduction of cheatgrass seed to North America predestined a major floral change on much of the Western range, especially in the basin and Wyoming big sagebrush, A. t. ssp. tridentata and A. t. ssp. Wyomingensis, sites of the Intermountain region. An obvious exception to cheatgrass dominance within the range of these big sagebrush subspecies is on sandy soils where needle grasses, Stipa sp., or Indian rice grass, Oryzopsis hymenoides, naturally occur.

FIRE

Adaptation to fire is another reason for the success of cheatgrass in the arid end of the sagebrush zone. The first year after a hot fire there may be only a few surviving cheatgrass seeds, but those few plants can produce several thousands seeds each. In about two years the stand may be as thick as ever. A cooler burning fire leaves many seeds that germinate the first year. Cheatgrass not only recovers from fire quickly but it provides a tremendous, fine fuel source that exceeds the flammability of native fuels in years with wet springs. In addition, it becomes flammable earlier in the season than native perennial range. If cheatgrass-dominated range burns early, while perennial bunchgrasses are still green, the effect of the fire on perennial plants is more sever than are later season fires in the pristine environment. Many native bunchgrasses are also adapted to fire. In fact, since livestock grazing began removing the understory fuel and more recently since man began fire suppression, the absence of fire has shifted species composition plants away from herbaceous plants and toward sagebrush or pinyon-juniper on many ranges. Natural fires, however, burned infrequently. Where cheatgrass is abundant and ungrazed, such as around urban areas, repeated fires create almost a pure cheatgrass stand that burns frequently. This has created recurring fire hazard in some parts of Nevada and other states. Many of these fires spread into valuable nearby areas such as deer winter range. They also threaten homes and other improvements. Each time a fire exposed soil erodes, the soil loss impairs future plant growth.

MANAGEMENT IMPLICATIONS

Setting management objectives requires knowledge of vegetation potential for any range area. Management objectives should recognize changes caused by cheatgrass.

On the higher elevation range sites such as mountain big sagebrush – Idaho fescue, A.t. subspecies vaseyana – Festuca idahoensis sites, cheatgrass is not as well adapted. Dominance of cheatgrass occurs only as the result of disturbance. On these sites, the pristine plant community remains the potential. Realistic management goals should reflect this. On Great Basin annual rangelands (those areas where pristine is no longer the potential), management objectives may include forage production, watershed protection, wildlife habitat, fire hazard reduction, etc. Monitoring should be designed to measure attainment of those objectives.

SEASON OF USE

The time of year when cheatgrass forage is likely to be most beneficial depends on the total ranch operation, especially on the nature of associated pastures. Generally, the period of optimum use is early to late spring and, in some
years on some ranges, winter. This is when other feed is in short supply and when cheatgrass is most nutritious. In dry years, cheatgrass dries out early and the period of abundant nutritious forage may be very short. In wet springs, cheatgrass may grow fastest in late spring or early summer, producing a long grazing season.

The value of cheatgrass for winter forage depends on weather and associated shrubs. Cheatgrass may not be available in a snowy winter. In an open winter, cheatgrass may provide grazing animals with only an energy source. Without fall greenup, palatable shrubs, or protein supplement, this diet will not maintain animal weight and condition. During years of good fall greenup followed by warm wet winters, cheatgrass may form the bulk of a nutritious winter diet. At these times the green leaves provide supplement for last year’s standing dead straw.

On ranges with a mix of perennials and cheatgrass, the perennials would be most favored by grazing at times other than the reproductive stage of the perennials. Dormant period grazing (late summer, fall, winter) and early spring grazing may favor perennial species on these mixed ranges. If early spring grazing is to favor perennials, the grazing season must end while there remains sufficient soil moisture to allow the perennial plant to regrow and complete seed set. Spring grazing of cheatgrass may also reduce the fire hazard and provide deferment for seedings or native perennial range in other pastures.

**UTILIZATION**

Annual forage plants such as cheatgrass can be more heavily grazed each year than most perennial forage species. On annual ranges, each year’s forage crop is dependent on an annual supply of germinating seed. However, because of the ability of cheatgrass to produce seed virtually regardless of grazing pressure or growing conditions, and because of a seed reserve in the soil, cheatgrass ranges can sustain heavy grazing use. Often the intensity of grazing on cheatgrass ranges is set by considerations other than cheatgrass. There must be sufficient forage for livestock to easily find each day’s full ration. Other resource values, such as watershed protection or wildlife habitat, may be of overriding importance. Also the variability of forage production makes intense utilization difficult on a regular basis. If the ranch depends on the forage and it doesn't grow, the alternatives may be costly.

**SEEDING**

Many cheatgrass ranges can be seeded to perennials. Unfortunately the range sites where cheatgrass is most competitive with natives are dry. The chances of success in range seeding are lower than on deeper soils and in wetter climates. This means that few species are recommended and establishing mixtures is difficult. The most dependable species is crested wheatgrass, *Agropyron cristatum*, *A. desertorum*, or *A. sibericum*.

Unlike native perennial grasses of the sagebrush zone, crested wheatgrass can be successfully competitive against cheatgrass. With appropriate cultural practices, crested wheatgrass seedings can be established and maintained on cheatgrass ranges. Dryland alfalfa, *Medicago sativa*, and lewis flax, *Linum Lewisii*, may provide forbs in the mixture. A shrub that provides valuable supplemental forage in late summer or through the winter is fourwing salt bush, *Atriplex canescens*.

Whatever species are seeded, cheatgrass competition should be controlled. The most economical time to plant on cheatgrass range is the fall after a very hot fire. Waiting longer than a year after a hot fire will allow the few surviving cheatgrass seeds to multiply and regain their competitive edge. A moderately hot fire (such as a grass fire without woody fuel) will not burn enough seeds to prevent germination and subsequent competition. Other means of controlling cheatgrass competition include: (1) tillage after the plants have germinated; and, (2) the atrazine fallow technique of herbicidal control.

**FOR FURTHER READING**


