# Cheatgrass: Changing Perspectives and Management Strategies

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Since the turn of the century, cheatgrass has spread across the Intermountain West, permanently altering the flora of the sagebrush steppe. This extremely adaptable species has created much controversy because of its negative and positive attributes. Our purpose is to show how one ranch located in north-central Nevada successfully uses cheatgrass for a significant portion of its forage base. Ranchers and land managers may want to reevaluate their attitudes towards cheatgrass and implement management strategies to make beneficial use of this grass.

#### **Ranch Description**

The T Quarter Circle Ranch, located in Humboldt County, Nevada, is a cow/calf operation and runs 1,100 head of brood cows in its base herd. This ranch is currently a year-long grazing operation in which the brood cow herd is maintained on salt desert range during winter, sagebrush foothills in spring, and river bottom pastures during summer.

Ownership and management is held by third (Jane and Hank Angus) and fourth (Nancy and Frosty Tipton) family generations. During interviews for a project involving ranch and range changes (Emmerich et al. 1992), the Tiptons and Angus' exhibited significant attitudes towards the impact of cheatgrass on the T Quarter Circle rangeland. They are aware of benefits of cheatgrass and its less desirable qualities, yet cheatgrass has become one of the most important forage species for their livestock.

#### Important Attributes of Cheatgrass

In reviewing cheatgrass literature, three relevant attributes were pinpointed. First, cheatgrass is an abundant forage (Fleming et al. 1942). Sufficient precipitation allows cheatgrass to grow and produce relatively abundant herbage, harvested by grazing animals as forage. Second, forage production can be unstable from year to year. It is highly dependent on amount and timing of moisture (Stewart and Young 1939). Cheatgrass yield can vary from near zero production to exceeding the harvest needs of the livestock herd. Third, fire is a significant factor in the extension and perpetuation of cheatgrass. This species is highly flammable and prompts range fire. This in turn results in the loss of native shrub species and may convert the shrub/grass rangelands to cheatgrassdominated range (Young et al. 1987).

#### An Abundant Forage

According to range studies in Great Basin communities, cheatgrass can average from 800 to 1,400 pounds/acre of air-dried forage (Hull and Pechanec 1947). Exceptional moisture can produce 4,000 pounds/ acre of cheatgrass, as noted at Emigrant Pass, near Elko, Nevada, during the 1964 growing season (Young et al. 1987).

Cheatgrass has primarily impacted the sagebrush steppe. Yet, the T Quarter Circle range provides an example of cheatgrass in the more arid portions of the sagebrush zone and even on the upper margins of the salt desert (Young and Tipton 1990). As cheatgrass encroaches into the salt desert shrub community, it colonizes bare ground amongst established perennial plants. Cheatgrass appears to continually adapt to a variety of different range types, even those with less moisture. Because it has a low tolerance for soluble salts, cheatgrass plants occupy sites of lower salt content as they migrate into the salt desert shrub environment.

On the salt desert rangelands of the T Quarter Circle, the cheatgrass plants retain their seeds late into the cooler months. In October 1986, cheatgrass seeds were collected on the T Quarter Circle winter range and analyzed for nutrient content. The analysis revealed cheatgrass seed was nutritionally similar to feed grains (Table 1).

On the T Quarter Circle, calves are generally weaned by October, and the main herd is turned onto winter desert range. Frosty Tipton stated that the cheatgrass seed on this range is comparable to turning their cattle onto a grain field, as the herd fattens for the winter months.

By November, with cooler weather approaching, the cattle spread across the desert range. The livestock wintering in this type of environment browse on shrubs such as winterfat and fourwing saltbush. The shrubs provide a digestible protein source, while carbohydrates in cured grass species supply energy to complete a balanced maintenance ration (DeFlon 1986).

In spring, cattle graze on the fresh growth of cheatgrass and other species, as they slowly progress from the desert valley into the foothill country. Water sources are shut off in the lower winter areas by April. Control over water in the desert valley ensures cattle move towards water sources at higher elevations, and permits re-growth and seed production on the winter range areas.

As grasses mature in the high country, some cattle

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Our appreciation to the T Quarter Circle family ranchers who were willing to discuss changing aspects of the rangeland. Oral interviews during 1989 and 1990 with family members provided the basis of material used in this article. Typed transcripts of the interviews from the T Quarter Circle Ranch Project are located in the Oral History Archives, University of Nevada, Reno. Our gratefulness to the reviewers of this article who took thought and care in suggesting improvements.



T Quarter Circle cattle passing through winter range. Photo by Nancy Tipton, 1991.

begin to drift toward the home meadows. The ranchers drive the rest of the herd down to river bottom summer pastures starting in late June. As the cattle move through the shadscale winter range, they readily graze, often favoring mature cheatgrass plants rather than mature native perennials. The ranchers commented that in the past the cattle never grazed these shadscale flats in summer since little or no cheatgrass was available amongst native shrubs.

Cheatgrass has increased in the desert community type the past few decades, and the ranch owners consider cheatgrass a positive change in the range forage composition. They observe their cattle selecting this species, and cheatgrass provides a suitable feed where bare ground existed previously. When cattle utilize cheatgrass, the intensity of use on native grasses may decrease, benefiting the rangeland condition.

Frequently, cheatgrass intrusion is considered a result of overgrazing or disturbance to the land (Hull and Pechanec 1947). Frosty Tipton, however, indicated that the recent encroachment of cheatgrass into the desert rangeland used by the T Quarter Circle was not due to excessive grazing. Their desert range has been continuously winter use, with cattle brought on after seedripe and moved off by spring. There have not been years of intensive overuse on this land. Instead, it was the aggressive, adaptive characteristics of cheatgrass to occupy open ground. Research by Svejcar and Tausch (1991) indicates that cheatgrass can appear in pristine areas or stable communities never grazed by cattle. Research by Melgoza and Nowak (1991) suggests that cheatgrass can

#### Table 1.

	Cheatgrass* seed	Concentrates**					
		Barley feed high grade	Corn feed meal	Corn and oat feed good grade	Rye grain	Wild oats	Wheat, soft Pacific Coast States
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Protein	9.0	13.5	9.1	10.9	12.6	12.7	9.9
Fat	1.6	3.5	4.2	4.0	1.7	5.5	2.0
Crude Fiber	11.0	8.7	2.1	6.1	2.4	15.2	2.7
N-free Extract	62.0	60.5	70.8	64.9	70.9	50.9	72.6

\*Information for cheatgrass seed obtained from Dr. James A. Young. Analysis conducted by Agritest Commercial Lab., Twin Falls, Idaho, 1986. \*\*Concentrate percents obtained from Morrison, Frank B. 1956. Feeds and Feeding: A Handbook for the Student and Stockman. 22nd ed. The Morrison Publishing Co., Ithaca, New York. 1156 p. successfully compete with established perennial plants.

### Variability in Forage Production

Cheatgrass production varies from year to year, often dependent upon amount and distribution of moisture. Cheatgrass is considered a winter annual, but it may not germinate until spring in Nevada. Germination occurs in the fall in northern Nevada about once every 5 years. With sufficient fall moisture, seeds germinate and produce a basal rosette of leaves that provide succulent forage. If this germination occurs in the fall and temperatures permit growth, the leaves can provide considerable forage during fall and winter. If germination occurs late in fall, the plant remains in the rosette stage during winter and produces little harvestable forage. The ground portion of these plants is virtually dormant, yet the root system is actively growing. Such over-winter root development allows cheatgrass to exploit soil moisture once temperatures moderate in late winter/early spring.

During low precipitation years when poor cheatgrass crops are produced, the seedlings of native grasses seem to be favored. This tendency has been noted during evaluation of the monitoring studies on the T Quarter Circle rangeland. Thus, if cheatgrass provides the bulk of a seasonal forage base, there is need to buffer the uncertainty of cheatgrass production. Extra forage in the form of leased pasture or hay is a prudent option available to ranches when confronted by fluctuating cheatgrass yield.

Modern range management practices have also led to better condition rangeland, thus lessening the impact of a poor cheatgrass year. The benefits of good condition rangelands are particularly evident during recent drought years on the T Quarter Circle. The owners have been cautious, keeping their utilization rates between 30 to 50 percent. The rangeland offers a variety of native forage species, although the cattle are often observed selecting cheatgrass.

#### Wildfire

The relation between cheatgrass and wildfires is a vital concern. The fine herbage of early-maturing cheatgrass greatly increases the chance of fire ignition, and the density of cheatgrass allows a rapid rate of fire spread.

In 1985, the T Quarter Circle Ranch experienced two extensive fires burning approximately 65,000 acres of winter use rangeland. It was necessary for the ranch to re-adjust their grazing patterns and reduce their base herd to accommodate the loss of range forage.

Rangeland fire is a concern, and the T Quarter Circle owners are constantly aware of its consequences. In the past, salt desert ranges have apparently been free of wildfires, lacking sufficient herbaceous fuel to spread fire. Recent encroachment of cheatgrass into these arid habitats has brought the risk of wildfires, which permit cheatgrass and other annuals to invade open sites created by the loss of desert shrubs (Young and Tipton 1990). Palatable desert shrubs such as shadscale, winterfat, and fourwing saltbush, which are not adapted to periodic fires, provide a much needed protein source on these winter ranges.

Management of cheatgrass must include fuel load management. Resting cheatgrass-dominated ranges in a grazing system that is meant to favor perennial grass is an open invitation for disaster. Cattle grazing can reduce the accumulation of cheatgrass litter and in turn reduce accumulation of fuel to lessen fire hazard (Pellant 1990, Young and Tipton 1990). By incorporating the concept of winter grazing, there is a reduction in excess cheatgrass herbage and seed source, yet protection to the dormant perennial grasses.

#### Looking Back Fifty Years

As we reflect back on more than fifty years of ranching and land management experience dealing with cheatgrass, perhaps a quotation from Fleming et al. (1942) would be appropriate:

On account of its (cheatgrass) wide and abundant distribution and its ability to maintain a high density of ground cover year after year it would seem that we should now recognize this grass as a highly important part of Nevada's grazing resources....Because of its grazing value at various stages of growth and maturity, it contributes at least as much feed for the grazing livestock as many other single forage plants found on Nevada ranges. Broncograss (cheatgrass) has become a permanent source of feed on many of our most important rangelands and it will necessarily have to be taken into consideration in the determination of seasonal use and in making grazing capacity estimates.

The insight of Fleming and his coauthors concerning cheatgrass and its impact on Nevada rangelands is still considered to be valid today. Cheatgrass range needs to be managed, possibly as an annual grass range rather than as a perennial grass range. The challenge is to manage grazing on these rangelands in a manner that protects the range productivity while making beneficial use of the forage resource. T Quarter Circle is an example of that kind of management.

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# A Survey on Range Management Effectiveness

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The range manager in the rain barrel is in a position somewhat like the range profession. The low water level limits his ability to accomplish his goal. His rain barrel can only hold so much water because the capacity is limited by a stave that is much shorter than the rest. Before he takes another bath, he'd better find the short stave and replace it with a longer one. There is also something limiting range professionals' effectiveness in managing rangelands. Only by replacing our short stave with a longer one can we improve our effectiveness.

In the barrel analogy, it's easy to recognize the short stave. However, effective range resource management is made up of many staves with complex and changing relationships that are not always obvious. In light of these complexities, the Society for Range Management (SRM) Excellence in Range Management Committee proposed a survey of the SRM membership to help identify our short staves. The SRM Board approved and agreed that a survey of SRM members would be useful for four reasons: (1) to discover who we as professionals are as we enter the decade of 1990s, (2) to develop insight on our perception of past professional effectiveness, (3) to learn what we think about current range management issues, and (4) to help guide our future professional activities.

#### The Survey Questionnaire

A detailed comparison of survey responses will not be included in this paper. Instead, this article focuses on the analysis of all 807 responses. Part 1 of the questionnaire surveyed the backgrounds of the respondents. It was divided into three areas: employment, selected interests, and personal data (i.e., age, gender).

Part 2 of the survey questionnaire directed respondents' attention to 24 issues selected to represent the most important staves of the range management barrel. We structured the questions so the respondents considered Young, James A., Raymond A. Evans, Richard E. Eckert, Jr., and Burgess L. Kay. 1987. Cheatgrass. Rangelands 9(6):266–270.

Young, James A. and F. Tipton. 1990. Invasion of Cheatgrass into Arid Environments of the Lahontan Basin. In: Proceedings-Symposium on Cheatgrass Invasion, Shrub Die-off, and Other Aspects of Shrub Biology and Management. Forest Service, Intermountain Research Station. General Technical Report INT-276. November 1990. pp. 37–40.



sets of opposite statements. They responded to each statement twice, once by putting an X on the number on a scale of 1 to 7 where they felt performance or effectiveness in range management "currently is" and then by circling the integer respresenting the relative position on the scale where they thought it "should be." The following example illustrates how a respondent might record a response.

#### Statement 4:

Concerned citizens	Concerned citizens			
are not informed	1284567	are informed about		
about range		range management		
management				

This structure allowed a comparison between the respondents' perception of the current situation and expectation for degree of accomplishment on each issue. The differences (if any) between the "currently is" and "should be" responses can be analyzed for a perceived "effectiveness" for each issue.

Statements were grouped into three categories. The first seven were designed to indicate a respondent's perception of past efforts in range management. The next

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