The Case for Cheat Grass

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In the Great Basin where rainfall is marginal and soil alkalinity is high, restoring cheat grass to a position of dominance can revitalize the cattle and sheep winter ranges. However, the reestablishment must be managed with care.

The discussion that follows presents a procedure for the development and management of such range on Promontory Ranch, Box Elder County, Utah. Promontory Ranch is located on the northeast corner of the Great Salt Lake in an area known as Rozel Flats. As a matter of historical interest, the ranch is located 10 miles west of the Golden Spike Monument—the historic place where the railroads from east to west joined on May 10, 1869. The ranch consists of 57 sections (some 35,000 acres) in one contiguous piece within our fence line. We winter 2,500 cows and 1,300 sheep. The precipitation averages approximately 12 inches on the east side which adjoins a wheat belt and decreases to about 10 inches along the edge of the lake to the west. It is considered one of the better winter ranges in northern Utah as, normally, it is not necessary to feed the cattle during the winter. The area is known as the “banana belt” with the average winter temperature during the month of January some 12 to 15 degrees Fahrenheit warmer than Ogden, 40 miles to the east. The ranch is located in what was the bottom of former Lake Bonneville. Vegetation types and productivity on the range are limited, not only by the rainfall quantity, but, most importantly, by the soil alkalinity. The alkalinity varies with the location, terrain, elevation, slope, soil texture, etc., with the heavier sedimentary clays tending to be the most alkaline. The degree of soil alkalinity is visually identified by the type of brush growing on it. Following is such a classification of vegetation growth related to soil alkalinity, beginning with the least alkaline:

1. Big sagebrush with some understory of grass (this could be potential wheat land).
2. Greasewood with a good understory of grass.
3. Shadscale with a good understory of grass.
4. Shadscale with little or no grass.

Except for the sagebrush areas, the soil pH will vary from 8.5 to 9.0. The climax vegetation before the area was overgrazed was largely western wheatgrass, with some Sandberg bluestem and galleta. Today, all evidence of the western wheatgrass has disappeared except for a few plants in very remote areas. The present productivity of the Sandberg bluestem and galleta is inferior to the annuals that have subsequently invaded the area.

The soils, largely heavy clays and clay loams, are very productive. The plants that are the most productive in these alkaline soils are halogeton, cheat grass, crested wheatgrass, tall wheatgrass and wild Russian rye. When we took over the ranch some 25 years ago, it had been continuously overgrazed to the extent that literally all the grasses had been replaced by halogeton. There remained some 30,000 acres void of any plants but brush and halogeton.

No discussion of cheat grass in the Great Basin area is complete without an understanding of halogeton. Halogeton is an insidious, noxious weed, having little food value, which flourishes in alkaline soil. It is reported to be poisonous to sheep and harmful to cattle. Each plant produces thousands of seeds each year, some of which remain viable for over 10 years. It appears to poison the soil by concentrating the alkaline salts in the immediate area thus, inhibiting the sprouting and growth of more desirable plants. The long term viability of the seed allows this plant to reproduce anytime the alkaline soil is disturbed.

Halogeton, however, has a weakness since its growth cycle starts about the time the cheat grass is drying up. The efficient root system of a good crop of cheat grass will deplete all the moisture from the soil and destroy the microclimate necessary for halogeton’s propagation. The cheat grass dries out the soil and shades the halogeton, preventing it from getting started even during years of summer rains.

The halogeton was eliminated from our ranch over a period of 12 to 15 years by keeping the livestock off the range during the month of April and half of May. The halogeton was gradually replaced by shepherds purse and cheat grass. The shepherds purse was later displaced by the hardier and more productive cheat grass. Our observation has been that it is not possible to establish a stand of crested wheatgrass in a field of halogeton without first going through the above steps of establishing cheat grass. The reason it took so long to replace the halogeton with cheat grass on our ranch was that the consistent overgrazing limited the availability of the cheat grass seed. We have since found that halogeton can be replaced by cheat grass in most areas in three to five years by eliminating spring grazing.

Cheat grass is a hearty winter annual that sprouts in the fall with the root system continuing to grow through the winter. In the spring, growth starts early. The root system is very dense and extends down, reaching some 24 inches by spring and quickly depleting the soil moisture. This adversely affects invading plants, including new seedlings of crested wheatgrass. The cheat grass depends upon a favorable moisture period in the spring to sprout additional seeds and for the fall plants to extend their roots further into the subsoil. In the Intermountain West and much of the western desert, appreciable amounts of snow fall in the winter, providing soil moisture in the spring thaw. If a dry period occurs in the next 3 to 4 weeks, the plants will be stunted and head out with little additional growth. To get a good crop of cheat grass, one must have at least one good rain three weeks after the grass.
starts to grow in the spring.

Annuals are short lived—their spring growth period from green-up to start of seed production can be over in 6 to 8 weeks. Should a drought or a succession of freezes or a period of hot dry winds occur during this period, the growth cycle can be largely terminated. One should keep all grazing animals off the annual ranges during this green-up period to maximize the amount of forage produced.

Many text books maintain that the cheat grass is good only for spring range during its short spring growing season while it is green. Grazing at this time can only result in the deterioration of the range. Because of the cropping of the leaves, the growth cycle is retarded both above and below ground. This results in extremely variable amounts of forage from year to year particularly if it is repeated each year. It is a mistake to graze livestock on this annual grass during the short spring green-up period. Grazing at this time reduces the volume of forage available for the critical winter period when this grass must be replaced by expensive hay for feeding livestock. We want to emphasize that cheat grass does not tolerate grazing during the green-up period without adversely affecting production.

The literature indicates that in the winter weathered cheat grass is at least nutritionally equal to that of weathered crested wheatgrass and is more palatable. Additionally, when there is snow on the ground, parts of the cheat grass are green, which enhances its nutritional value of the grass. Old plant material also protects the new seedlings in the spring. The old seed stalks protect the new grass from some of the frost effects. The deteriorating plants give off heat as they oxidize and shield the new seedlings from the drying effects of the winds. We have found that some dry grass litter on the ground is necessary for the seeds to sprout and grow.

In our area it is not uncommon for the cheat grass to grow 16 to 18 inches tall and as thick as an alfalfa field. In such years the amount of fodder produced will far exceed that of crested wheatgrass. One danger is that it may lodge or lie down. When this occurs in association with heavy winter snow, the grass can impact against the sod allowing snow mold to set in, thus preventing the emergence of new seedlings and smothering the fall seedlings.

We have found that running a chisel plow, equipped with points, to a depth of about 3 to 4 inches through the cheat grass in the fall will substantially increase the spring productivity. The chiseling loosens the soil, which traps additional winter moisture without breaking down the soil structure.

When the snow starts to fall, one really appreciates the value of the shrubs in the winter range. Shrubs projecting above the snow provide areas of snow-melt around the base of the shrub, exposing the buried cheat grass to the livestock. Snow will disappear from the brush lands long before it disappears on the fields of solid grass. This exposed grass with the brush provides sufficient food to maintain the livestock during most winters. The cheat grass and crested wheat by themselves will not supply a balanced diet for the livestock. These grasses are deficient in protein at this time and a supplement is needed.

The ideal winter range consists of either greasewood or shadscale with a good understory of cheat grass. The greasewood and shadscale have a deep taproot from which to draw moisture from below, while the cheat grass is a surface feeder. Therefore, the shrubs and the grass do not compete for the same moisture. This is not true of big sagebrush, which is largely a surface feeder. Since it competes with the cheat grass for moisture, it does not have the volume of grass around its base as do the other two brushes. Under no circumstances should one attempt to plow up shadscale and its understory of cheat grass in an attempt to replace it.
with crested wheat grass as it is too valuable as a winter feed. Further, it will be difficult to get any other desirable plant to grow in its place. We have had no luck in planting crested wheatgrass in such areas. The shadscale area and its accompanying alkaline soil is already at its highest and best use.

Nutritionally, the brush and cheat grass complement each other. The brush supplies the protein while the cheat grass supplies the carbohydrates. In our area we find that we must supply about one and one-half pounds a day of 20% protein block to keep the cattle in good flesh for the three months during the winter. At such times the livestock is particularly attracted to the leaves and seeds of the shadscale which are nutritionally high in protein. By spring the shadscale will be largely stripped of its extremities. In our area, the period when shrubs are most beneficial is from six weeks to two months beginning about Christmas time.

An ideal winter is one that provides several inches of snow on the ground all winter. The snow insulates the ground from the cold. The cheat grass sprouts in the fall and continues to grow, providing green grass under the snow all winter for the livestock.

We have found that the livestock wintering on cheat grass will maintain their weight. The average cow will weigh 50 to 75 pounds more on the above described range than the same animals if fed hay all winter. In some winters, it has been necessary to supplement the cattle with hay. The most we have ever fed, except for the Winter of ’84, was 200 pounds per animal per season. During most seasons no hay is fed. A bonus is the 20 to 25% larger calf survival rate due to the fact that the calves are dropped on dry ground and not in a foot of snow.

**Our cattle are put on this pasture on the first of November.** By the time the snows come, the cattle (whose calves have been weaned) will have gained 50 to 75 pounds. If the cattle are fat going into the winter, they will stay in good flesh until April, first when they are taken off the winter range.

Spring range is provided by crested wheat and tall wheat grasses. By April first these grasses have about four inches of new growth and from 18 to 36 inches of old growth. In our opinion, this is the place for these exotic grasses—spring range.

**The competitive nature of cheat grass has caused us problems.** Its presence makes it very difficult to get crested wheat grass started. With its efficient root system, cheat grass simply overwhelms and starves out the new crested wheat seedlings by absorbing all the moisture from the soil. Further, cheat grass seed germinates more rapidly at 50 degrees Fahrenheit than does wheatgrass. Once started, crested wheat grass will out-compete the cheat grass in the following years.

The recommended procedures for planting crested wheat grass just did not work in our area. We found that with disking, the alkaline soils became powdery, lost their struc-
ture and set up like cement. During the winter, crusts would form about two inches thick. The only plant that would grow was halogeton. Additionally, we found that the less one disturbed the soil, the better the chance to get a stand of these exotic grasses. We found that in spite of anything we did, the crested wheat seedling just didn’t have enough strength to break through the surface crust in alkaline soils.

Our greatest success in seeding has been as follows: In August or September when conditions are really dry, the old stand of cheat grass is burned. This procedure is followed by running a brush beater (rotary mower) over the ground, removing all remnants of brush and other vegetation. When the cheat grass starts to sprout, about the first week of October, we till the field about two inches deep with a chisel plow equipped with sweeps to suppress any sprouting cheat grass and remove any surface roots left from the brush. A deep furrow drill equipped with shoes spaced 14 inches on center followed by packer wheels is used to plant the seed about one-half inch deep.

One of the largest factors contributing to our success was the combination of seeds put in the seed drill. We found it was not possible to consistently feed less than about 10 to 12 pounds of seed per acre through the drill without plugging. Our seed mixture consists of 4-1/2 pounds of crested wheat, 4-1/2 pounds of tall wheat and 5 pounds of irrigated barley per acre. The barley produced a very strong shoot which penetrated the crust on the soil surface and created a crack for the tall wheat shoot to break through the surface. The continuous furrow crack allowed the comparatively weak crested wheat seedling to break through the surface. In alkaline soils barley makes only a sparse stand of stunted plants about six inches tall with a head about half an inch long. It is not much of a competitor for the moisture required by the grasses. We feel it is important to have both tall wheat and crested wheat grasses present in the stand as they mature at different times. In wet years the tall wheat will out-perform the crested while in dry years the reverse is true. At the present time we have about 5,000 acres of tall and crested wheat grasses, most of which is used as spring range.

Beginning about the middle of June, we send our cows and calves to summer range in the mountains for about four months. In the middle of October the calves are separated from their mothers and wintered separately. In the winter the calves receive the same cheat grass and brush diet as the cows. When spring comes, the calves are placed on our best crested wheat pasture for about two months then sold as stockers, feeders or replacement heifers. At the time of sale the steers weigh about 700 pounds and the heifers about 60 to 70 pounds less. There is a good demand for these yearlings that have wintered on dry cheat grass and brush. They really blossom out when placed on a mountain meadow.

One strange phenomenon we have observed, which is contrary to all texts and teachings, is the miniscule quantity of drinking water consumed by the cattle grubbing for cheat grass under the snow in the winter. In some instances we have observed periods when they have gone for a month or six weeks without a drink of water and without any deleterious effects. We have observed that cattle can travel about 3 or 4 miles for water without any ill effects. It is our opinion that the extra walking eases the calving problem.

We have found that running sheep without overgrazing will increase the amount of new cheat grass the following spring.

We believe their small hooves punch the seed in the ground and till the soil at the same time, thus aerating the soil and preparing a seed bed.

The ecology of the Intermountain West is very fragile and it is therefore important that the timing and kind and level of use be appropriate to the area. Range utilization is a matter of close visual observation. Our experience has been that to maintain the range over a period of years, one must not utilize more than about 60% of the nutritional value of the plants. Our observation has been that when about 15% of the seed stalks remain, approximately 60 to 70% of the grass has been utilized.

Conclusion

Cheat grass is not suitable as a spring range. Grazing it in the spring only results in its deterioration. From observation, we have found that in the average year, grazing in the spring will reduce next year’s crop by about one third. Repeated with time, the range becomes depleted to the point that production becomes very erratic and halogeton replaces the grass. It is this situation that has given cheat grass the reputation for being an uncertain producer. Once the halogeton is established, it takes three to five years of resting in the spring to restore the cheat grass to its former stance.

Cheat grass has been around for a long time and because it is a hearty competitor and an aggressive grower it will be around for many more generations. Cheat grass is one of the few desirable grasses that will invade and flourish in the alkaline soils associated with the marginal rainfall of the Great Basin. It is time that we start thinking about how to manage this nutritious plant to get the maximum economic benefit.

The literature dismisses this plant because it is not a perennial and because it has only a short green-up period in the spring. This is very short sighted. It should not be used as a spring range, but should be reserved as a winter range to reduce or eliminate the feeding of hay to the cattle. We would much prefer to winter our cattle on a cheat grass range than on one of bleached out crested wheatgrass, as the former is not only more palatable, but more nutritious than the crested wheat at this time of the year. Misinformation, so abundant in the literature on cheat grass, should be re-examined and the means for increasing cheat grass production should be objectively investigated by professionals in the field. It obviously has no place in an irrigated pasture or a farm or in an area having 15 or more inches of rain per year.