

WOLF-PLANTS : HOW FINICKY ARE CATTLE ABOUT OLD GROWTH IN STANDING FORAGE?

Dave Ganskopp, Ray Angell, and Jeff Rose

SUMMARY: *Accumulation of wolf-plants in pastures frequently results in waste or incomplete utilization of high quality forage by cattle. The objectives of this research were to determine: whether cattle were aware of small numbers of old stems in standing forage, the seasonality of effects, and the degree that use of contaminated forage by cattle was affected. Cattle were aware of even one cured stem in green crested wheatgrass plants. When grass was green and growing, cattle removed 76 percent less material from plants containing old stems than from uncontaminated plants. Cattle were oblivious to old stems after standing forage had cured. These findings demonstrate that cattle will harvest forage more completely and efficiently if densities of wolf-plants are minimized. Also, grazing can be effectively used to clear pastures of wolf plants if postponed until standing forage has cured.*

When bunchgrasses remain ungrazed throughout a growing season, residual straw and stems begin to accumulate. The result is that both wild and domestic animals are less likely to forage upon these "wolf-plants." If wolf-plant numbers become high in a pasture, selective grazing may result in wasted forage as well as focus undue grazing pressure on the remaining uncontaminated plants.

Research in other regions has shown that cattle forage less rapidly when feeding on plants contaminated with the previous year's stems. Typically cattle forage from the top down on grasses. When grazing plants containing old stems or straw, however, they either reach in from the sides toward the base of the plant or push their noses down through the stems and attempt to selectively remove leafy material.

There were three objectives to this research. These were: determine how much old

material must be present in bunchgrass before cattle exhibit a selective response; determine whether selective responses varied from season to season; and determine whether responses were continuously expressed by cattle as pastures were progressively grazed down.

MATERIALS & METHODS

This research was conducted in 1990 and 1991 on the Northern Great Basin Experimental Range. In 1990 a crested wheatgrass (*Agropyron desertorum* [Fischer ex Link Schultes]) range was subdivided into nine 1.5 acre pastures with electric fencing. Three pastures were sampled when the crested wheatgrass was green and leafy, three when plants were green and seed stalks were flowering, and three in late summer when plants were dormant and all forage was brown. Before cattle turn in, 100 plants in each pasture were selected and randomly assigned to one of five treatments for a total of 20 plants per treatment per pasture. Treatments involved the placement of either 0, 3, 6, 9, or 12 cured crested wheatgrass seed stalks in each plant. Holes were punched in the soil within the crown of each plant with a metal pin and the appropriate number of seed stalks simply dropped into the holes. Five additional plants for each treatment were also augmented with stems and harvested to evaluate treatment effect on forage quality, and the percent of plant material contributed by stems.

Two yearling steers were placed in each of the three pastures where they grazed until roughly 75 percent of all plants in the pasture received some degree of use (4 to 5 days). Steers were removed and treatment plants were evaluated for presence or absence of grazing and, if grazed, the percent of plant weight that had been removed by the steers. Based on the 1990 results, a slightly different design was used in 1991. In 1991 only four 1.7 acre pastures were used with the trial conducted only when plants were green and leafy. Treatments included additions of either 0, 1, 2, or 3 seed stalks to plants, and patterns of plant use by

cattle were evaluated each day over a six day grazing trial. Other aspects of the project were similar to the 1990 efforts.

RESULTS & DISCUSSION

1990 Results. When forage was green and growing cattle made significantly ($P < 0.01$) less use of plants containing cured seed stalks than plants without any dead material (Figure 1). This selective grazing did not occur, however, after crested wheat plants became dormant, and all standing forage was brown.

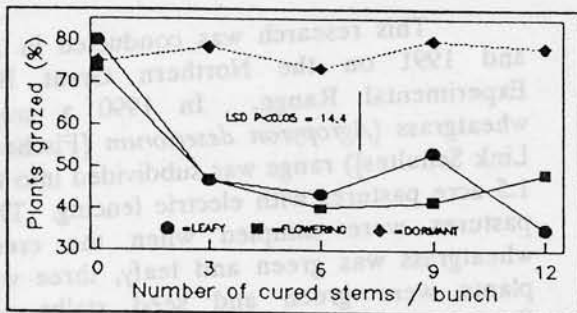


Figure 1

When the forage was green and growing (leafy and flowering) the steers did not discriminate among treatments containing cured stems. That is, they showed the same aversion to plants with three cured stems as they did to those containing 12. With green forage, the probability a plant with no cured seed stalks would be grazed was about 75 percent. The probability of grazing for plants with stems was about 45 percent, regardless of the number of plants present. The overall chance then that a plant with stems would be grazed was about 60 percent of that expected for uncontaminated bunches.

Measures of how much material was removed from plants in the various treatments painted a similar picture. During the leafy and flowering stages of growth approximately 25 percent of the plant's weight was removed from bunches that were free of cured stems (Figure 2). On average, only about 8 percent of the plant's weight was harvested from bunches augmented with stems. This translates to over a 60 percent decrease in amount of material removed from the stemmy plants.

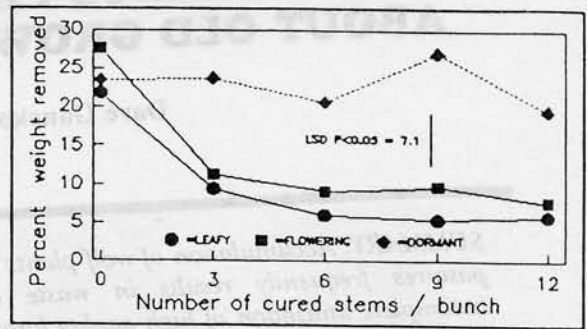


Figure 2

Again, the range in the number of seed stalks present appeared to have little effect. That is, plants with three stems were viewed with the same disdain by cattle as bunches containing 12 cured seed stalks.

In retrospect, our treatments did not have sufficient resolution to establish any lower level of tolerance by cattle for old stems in standing forage. The differences detected in cattle responses among the three stages of growth, however, demonstrated that cattle were not as selective when forage was dormant, and that cattle will most effectively rid a pasture of wolf plants if grazing is postponed until all forage has cured.

1991 Results. The goals of our 1991 efforts were to evaluate cattle reactions to lower numbers of stems (0, 1, 2, and 3 per plant), in hopes of establishing a threshold of response, and to see if grazing behavior changed as pastures were gradually grazed down.

Again measures of number of plants grazed and percent of plant weight removed resulted in similar interpretations. As cured stems were progressively added, cattle grazed fewer of the augmented plants and removed less material from augmented plants that were defoliated (Figure 3). After the first day, 25 percent of the plants with no stems were grazed and only 5 percent of those with stems were grazed. After the 6th day, respective values for these treatments were 95 and 76 percent. Differences among overall treatment means indicated cattle could not discriminate between treatments differing by only 1 stem. Comparisons involving treatments differing by 2 or more stems, however, were significantly different.

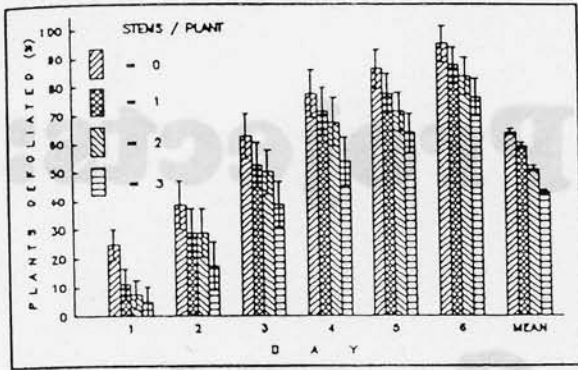
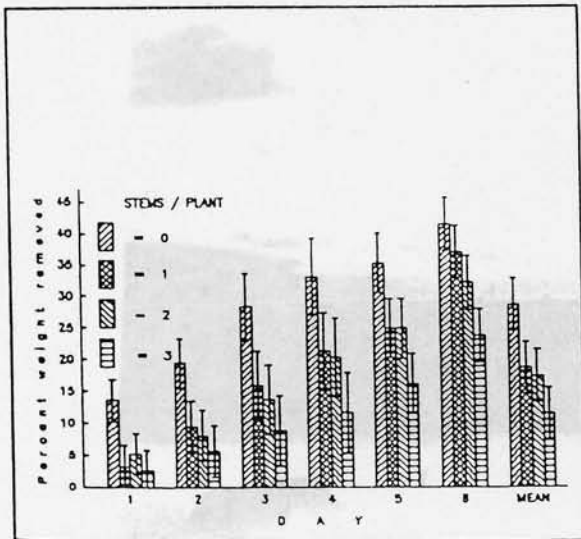


Figure 3

Utilization data implied cattle were aware of even a single cured stem in bunches of crested wheatgrass. With no stems present, roughly 29 percent of plant weight was removed by cattle. Addition of one stem lowered utilization to 19 percent, and three stems reduced it to 11.4 percent (Figure 4). This translates to roughly 35 and 60 percent



reductions, respectively, in amount of herbage removed from the one and three stem

Figure 4

treatments. These reduced levels of utilization initiate build up of even more residual material in bunches, which if not removed, may exacerbate the problem of wolf-plant evolution and even less uniform use of forage in subsequent years.

The mean crude protein content of seed stalks we inserted in the plants was 3.5 percent. When plants were green and

growing this lowered the crude protein content of entire plants by 2 to 3 percent. When forage was dormant and brown, crude protein was reduced by only about 1 percent. This being the case, there was some nutritional advantage to be gained by cattle if they avoided contaminated plants or attempted to selectively graze around the cured stems. Extrapolation of these data to the field suggests that most of the forage in wolf-plants will go unused. Out of 100 wolf-plants we find that 60 of the plants will be grazed and 40 will be ungrazed. This gives us 40 units that are not used by the cattle at all. Of the 60 units that the cattle do forage on, they remove only 40 percent as much material as they would from a clean bunchgrass. This amounts to $.4 \times 60$ or 24 units of grass harvested by the animal and 36 units wasted. The loss therefore is approximately 76 percent of the material contained in wolf-plants.

CONCLUSIONS

Cattle were found to be much more sensitive than anticipated to small numbers of cured stems in green and growing bunches of grass. Even one brown seed stalk in a green plant is enough to reduce the probability that a plant will be grazed and the amount of material that the cow will remove from the plant. This emphasizes the importance of obtaining uniform utilization of forages in pastures to avoid development of wolf plants.

Cattle were insensitive to even high numbers of cured stems after plants had gone dormant. This suggests that livestock grazing can be used to clean up pastures supporting wolf plants if grazing is postponed until all forage has cured. Forage quality of grasses is typically deficient this late in the season (4 to 5 percent crude protein) and a nitrogen supplement may be needed if adequate animal performance is desired under such conditions. Other options for clean-up of wolf plants include mowing, if equipment and terrain allow, or possibly burning. Burning, however, may necessitate deferment of a pasture to allow sufficient fuel build up to carry a fire.