# HIGH DESERT RANCH & FAMILY

Harney County Extension Service, 450 N. Buena Vista #10, Burns, OR 97720, 541-573-2506, Fax 541-573-8387 Spring 2009
http://extension.oregonstate.edu/harney/index.php

Inside Stories Page



## Dustin's Digest....

Lately I've been cringing every time I pick up a newspaper or turn on the evening news. The news is fraught with reports of unprecedented budget shortfalls, historically high unemployment rates, failing icons in the manufacturing industry…I need not go on; we all know the situation. Instead, I thought I would write about something positive for a change. First, David Bohnert and I participated in a meeting a couple of weeks ago sponsored by the Harney County Farm Bureau. The meeting provided a great forum to discuss many of the challenges and opportunities for agriculture in Harney County; certainly well worth the time of those who were able to attend. But what I really wanted to do was recognize Shane Otley, who not only pulled the meeting together, but also has taken an active leadership role in dealing with many of the issues that agricultural producers deal with in Harney County. Oftentimes selfless work goes unnoticed and unrewarded, so I wanted to take the opportunity to thank Shane for all his good work. I also wanted to thank those producers that graciously hosted Reinaldo Cooke and I for ranch visits a couple of weeks ago. We had lots of good coffee, cookies, and conversation and logged many miles under our belts. Reinaldo has been traveling around the state visiting with producers about their needs and his ideas for extension programming. He tells me that the best coffee and cookies are in Harney County. I wish we could have visited with more of you on our tour, but if nothing else, I think we were able to impress upon Reinaldo that Harney County is extensive country.

I wanted to call your attention to a couple of upcoming programs in Harney County. The first is a daylong training on rangeland monitoring on May 12th. The workshop will cover public land grazing permits, upland monitoring programs, monitoring tools and techniques, and interpretation of monitoring data and information. The workshop will be held from 10 am to 3 pm (approximately) at the Diamond School. For those who are interested, we'll also have monitoring toolkits available that can be checked out from the OSU Extension Service that you can use on your ranch and public permits. And no we're not a library; you can keep the toolkits as long as you use them. The morning session will be spent laying the groundwork for establishing a successful monitoring program and, after lunch at the Diamond Hotel, we'll head out into the field for some hands on practice with your monitoring toolkits using some common monitoring techniques.

The second program I wanted to bring your attention to is the Range Field Day on June 24th at the Northern Great Basin Experimental Range. Many of you have likely enjoyed this event hosted by the Eastern Oregon Agricultural Research Center and the OSU Department of Rangeland Ecology and Management in the past. This year includes another informative program with a theme of animal behavior on rangelands. Please see page 15 for a full description of the program.

I hope you all have a great spring and don't hesitate to give me a call, send me an email, or stop in if there is anything that we at OSU can do to assist you in your agricultural efforts.

Dustin Johnson

Harney County Rangeland/Livestock Extension Agent

# Influence of Long-Term Livestock Grazing Exclusion on the Response of Sagebrush Steppe Plant Communities to Fire

**Kirk W. Davies, Tony J. Svejcar, and Jon D. Bates**

**For more information see:** Davies, K.W., T.J. Svejcar, and J.D. Bates. *IN PRESS.* Interaction of historical and non-historical disturbances maintains native plant communities. Ecological Applications

## Introduction

Historical disturbances are often considered a requirement to maintain native plant communities and this has resulted in the reconstruction of historical disturbance regimes to direct ecosystem management. However, some ecosystems have experienced irrevocable changes in environmental conditions and biotic potentials that could potentially alter the response of the plant community to disturbance. For example, climate change or invasive plants may result in different plant community response to disturbance than would be expected under historical conditions.

Livestock grazing of plant communities that did not evolve with large numbers of herbivores is generally considered negative, because livestock grazing was not part of the historical disturbance regime. These plant communities are not expected to be tolerant of livestock grazing pressure (Fleischner 1994, Noss 1994, Belsky and Blumenthal 1997, Jones 2000). In contrast to this assumption, light to moderate utilization by domestic livestock has been demonstrated to have minimal impacts on sagebrush plant communities (Manier and Hobbs 2006, Rickard 1985). However, the influence of grazing or not grazing prior to fire in these plant communities is unexplored.

We evaluated the impacts of grazing and not grazing prior to fire in Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) plant communities. Understanding the impacts of different disturbance patterns on Wyoming big sagebrush plant communities is important because most of these plant communities are grazed by domestic livestock, at risk of burning, and provide valuable habitat for wildlife. With the introduction of exotic annual grasses such as cheatgrass (*Bromus tectorum*), the impact of returning Wyoming big sagebrush plant communities to their historical disturbance regime of periodic fire without domestic livestock conditions is unknown under modern conditions.

## Methods

The study was conducted on the Northern Great Basin Experimental Range (NGBER) in southeastern Oregon about 56 km west of Burns, Oregon. Treatments were: 1) ungrazed unburned, 2) ungrazed burned, 3) grazed unburned, and 4) grazed burned and were applied at three different sites. Ungrazed treatments were implemented with the erection of 2 ha grazing exclosures in 1936. Data collected in 1937 revealed no differences in the density of herbaceous vegetation between inside and outside the exclosure. Cheatgrass was not present inside or outside the exclosures in 1937. The grazed treatments were areas adjacent to the exclosures and had moderate livestock grazing (30-40% of available forage used) until 1990. Native herbivores had access to the exclosures. Prescribed burns were applied in the fall of 1993. Average fine fuel loads were 689 $kg \cdot ha^{-1}$ in grazed treatments and 793 $kg \cdot ha^{-1}$ in ungrazed treatments. Vegetation characteristics were sampled in 2005, 2006, and 2007 (12, 13, and 14 years post-burning).

## Results

*Cover*

The interaction between burning and grazing influenced the cover of all herbaceous functional groups ($P < 0.01$; Fig. 1). Sandberg bluegrass cover decreased with burning and protection from grazing amplified this decrease ($P < 0.01$). Large perennial bunchgrass cover was greatest in the grazed burned treatment and lowest in the ungrazed burned treatment ($P <0.05$). Although generally increased with burning, cheatgrass cover was more than 8.6-fold greater in the ungrazed burned treatment than any of the other treatments ($P < 0.01$). Similarly, annual forb cover, predominantly introduced annual forbs, was greatest in the ungrazed burned treatment (P < 0.05), while perennial forb cover was lowest in this treatment (P < 0.05). Moss cover was lowest in the ungrazed burned treatment and highest in the ungrazed unburned treatment (P < 0.05; Fig. 2). Burning decreased Wyoming big sagebrush cover and increased green rabbitbrush (*Chrysothamnus viscidiflorus*) cover ($P = 0.01$ and < 0.01, respectively). Grazing did not influence sagebrush cover ($P = 0.43$), but slightly increased rabbitbrush cover ($P = 0.05$).

*Density*

Large perennial bunchgrass, cheatgrass and green rabbitbrush densities were influenced by the interaction of burning and grazing (P < 0.01; Fig. 3). Large perennial bunchgrass density was lowest in the ungrazed burned treatment and highest in the grazed burned treatment with an approximately 1.9-fold difference between the two treatments (P < 0.01; Fig. 2). Burning decreased perennial bunchgrass density in the ungrazed treatment but did not influence bunchgrass density in the grazed treatment. Cheatgrass density was 15-fold greater in the ungrazed burned treatment (P < 0.01), than the other treatments which did not differ in density (P < 0.01). Perennial forb density was decreased by burning (P < 0.01), but was not influenced by grazing (P = 0.36). Burning generally increased green rabbitbrush density (P < 0.01); however the increase in density was largest in the ungrazed treatment.

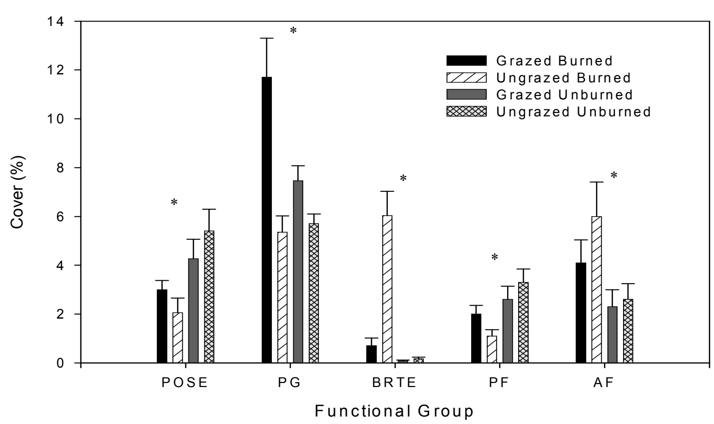


Figure 1. Functional group cover (mean + S.E.) of the treatments averaged over 2005, 2006, and 2007 at the Northern Great Basin Experimental Range. POSA = Sandberg bluegrass, PG = tall perennial bunchgrass, BRTE = cheatgrass, PF = perennial forb, and AF = annual forb. Ungrazed = livestock excluded since 1936, Grazed = moderately grazed by livestock until 1990, Burned = prescribed fall burned in 1993, and Unburned = no prescribed burning. Asterisk (*) indicates significant interaction between grazing and burning treatments for that functional group ($P < 0.05$).

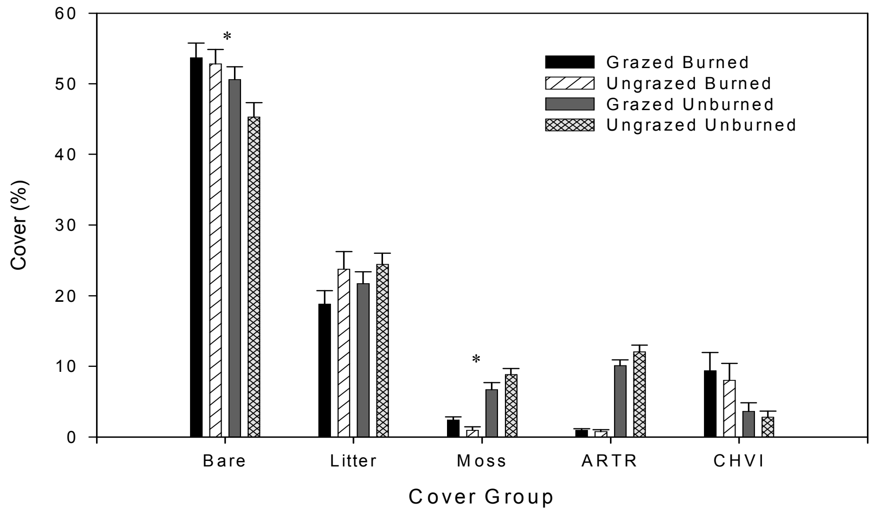


Figure 2. Shrub species, litter, and moss cover and bare ground (mean + S.E.) of the treatments averaged over 2005, 2006, and 2007 at the Northern Great Basin Experimental Range. Bare = bare ground, ARTR = Wyoming big sagebrush, and CHVI = green rabbitbrush. Ungrazed = livestock excluded since 1936, Grazed = moderately grazed by livestock until 1990, Burned = prescribed fall burned in 1993, and Unburned = no prescribed burning. Asterisk (*) indicates significant interaction between grazing and burning treatments for that cover group ($P < 0.05$).

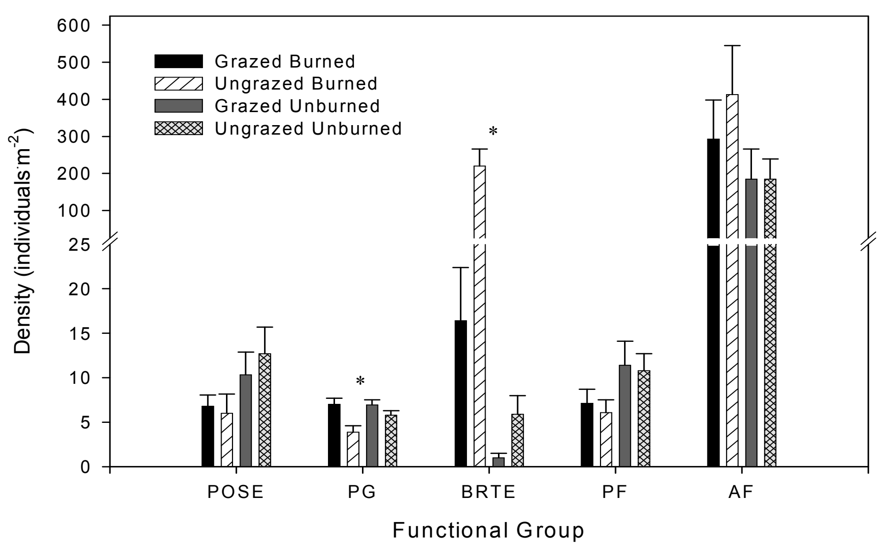


Figure 3. Functional group density (mean + S.E.) of the treatments averaged over 2005, 2006, and 2007 at the Northern Great Basin Experimental Range. POSA = Sandberg bluegrass, PG = tall perennial bunchgrass, BRTE = cheatgrass, PF = perennial forb, and AF = annual forb. Ungrazed = livestock excluded since 1936, Grazed = moderately grazed by livestock until 1990, Burned = prescribed fall burned in 1993, and Unburned = no prescribed burning. Asterisk (*) indicates significant interaction between grazing and burning treatments for that functional group ($P < 0.05$).

*Biomass*

Large perennial bunchgrass production generally increased with burning (P < 0.01; Fig. 4). Bunchgrass production increased more with burning in the grazed compared to the ungrazed treatment (P < 0.01). Burning the grazed treatment increased perennial bunchgrass production 1.6-fold (P < 0.01). Cheatgrass biomass production increased more than 49-fold greater in the ungrazed burned treatment than in the other three treatments (P < 0.01). Perennial forb biomass production decreased 3-fold when the ungrazed treatment was burned (P < 0.01).

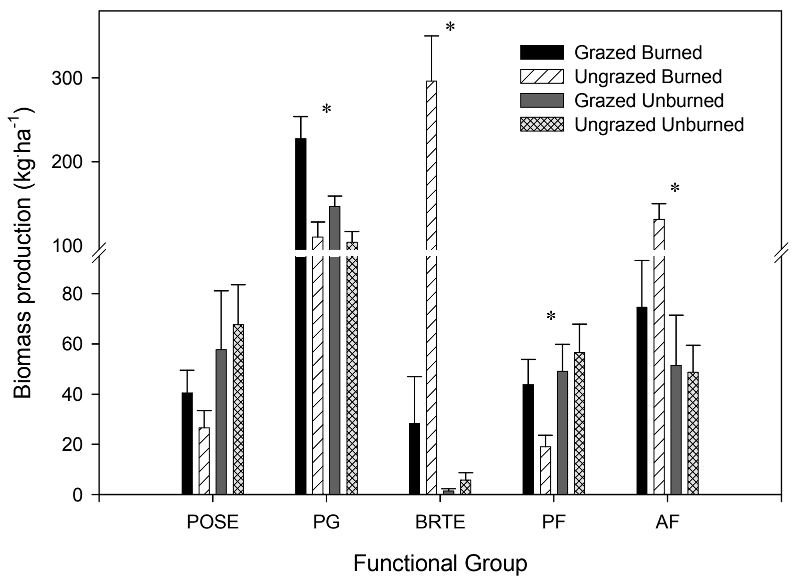


Figure 4. Functional group biomass production (mean + S.E.) of the treatments averaged over 2005, 2006, and 2007 at the Northern Great Basin Experimental Range. POSA = Sandberg bluegrass, PG = tall perennial bunchgrass, BRTE = Cheatgrass, PF = perennial forb, and AF = annual forb. Ungrazed = livestock excluded since 1936, Grazed = moderately grazed by livestock until 1990, Burned = prescribed fall burned in 1993, and Unburned = no prescribed burning. Asterisk (*) indicates significant interaction between grazing and burning treatments for that functional group (*P* < 0.05).

Biomass production of annual forbs increased with burning (P < 0.01). However, the annual forb production was lowest in the ungrazed unburned treatment and highest in the ungrazed burned treatment (P < 0.01). In the ungrazed burned treatment, cheatgrass produced more biomass than all the perennial herbaceous vegetation combined (P < 0.01). Combining cheatgrass and annual forb production reveals that annuals produced 2.8-fold more biomass than perennial herbaceous vegetation in the ungrazed burned treatment (P < 0.01). The ungrazed burned treatment was the only treatment to produce more annual than perennial herbaceous vegetation biomass.

## Discussions

Moderate levels of grazing by livestock in these plant communities increased the ability of the native herbaceous plants to tolerate fire and thus, prevented cheatgrass invasion. The invasion of the ungrazed treatment following fire has probably changed the future disturbance regime of those communities. The invasion of cheatgrass often increases fire frequency due to an increase in the amount and continuity of fine fuels. The invasion of cheatgrass and, subsequently, the altered future disturbance regime will negatively impact sage-grouse, pygmy rabbits, and other sagebrush obligate wildlife species.

Moderate grazing probably mediated the impacts of fire because it reduced the amount of fine fuel. Less fuels, especially around perennial bunchgrasses, probably increased the survival of native herbaceous perennial vegetation. Mortality of perennial bunchgrasses would potentially open the plant community to cheatgrass invasion.

Though domestic livestock grazing was not part of the historical disturbance regime of these plant communities, it may now be needed because of new pressures from invasive plants and climate change. However, individual circumstances will dictate the value of emulating historical disturbance regimes for maintaining native plant communities. In our specific example, the historical disturbance regime of Wyoming big sagebrush plant communities is estimated to have consisted of a 50-100+ year fire return intervals (Wright and Bailey 1982; Mensing et al. 2006) and lacked large herbivore grazing pressure (Mack and Thompson 1982). Emulating this disturbance regime for Wyoming big sagebrush plant communities did not produce the expected effect of shifting the dominance from shrubs to native forbs and perennial grasses. Long-term protection from livestock grazing followed by fire resulted in substantial cheatgrass invasion and a large increase in non-native forbs.

## Conclusions

Preventing grazing in Wyoming big sagebrush plant communities weakened the ability of the perennial herbaceous vegetation to tolerate fire. This could be the result of accumulation of fuels or a loss of adaptations important to tolerating disturbances. Low to moderate livestock grazing appears to be beneficial to the long-term sustainability of Wyoming big sagebrush plant communities and sagebrush obligate wildlife species.

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# Fertilization of Meadow Foxtail Dominated Flood Meadows

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## *Introduction*

Flood meadows are an extremely important forage resource for beef cattle and hay producers. Over 3 million acres of flood meadows exist in the western United States, with these lands producing the majority of winter feed for beef cattle. Snowmelt from surrounding mountains provides annual flooding which typically lasts from April to late June. Initially, these native flood meadows were composed of a mixture of rushes, sedges, grasses, and forbs. Historically, these native plants produced approximately 1.6 ton/acre (Rumburg, 1961), with all of the production occurring during the short flooding period in the spring. Fertilization research with the native meadows suggested that 60 units of nitrogen was the most economical level and could be expected to increase forage yield by approximately 3/4 ton/acre (Angell, 1998). In the earlier work, the source of nitrogen was not critical and the general recommendation was to use the source of nitrogen which gave the lowest cost per pound of nitrogen.

However, in an effort to increase forage yields, an introduced grass species, meadow foxtail, was introduced into many meadows in the western United States. This highly competitive grass has since become the predominate grass species in high-elevation flood meadows throughout the west. Consequently, research was conducted to determine the most appropriate level of nitrogen fertilization to economically increase forage yield.

## *Experimental Procedures*

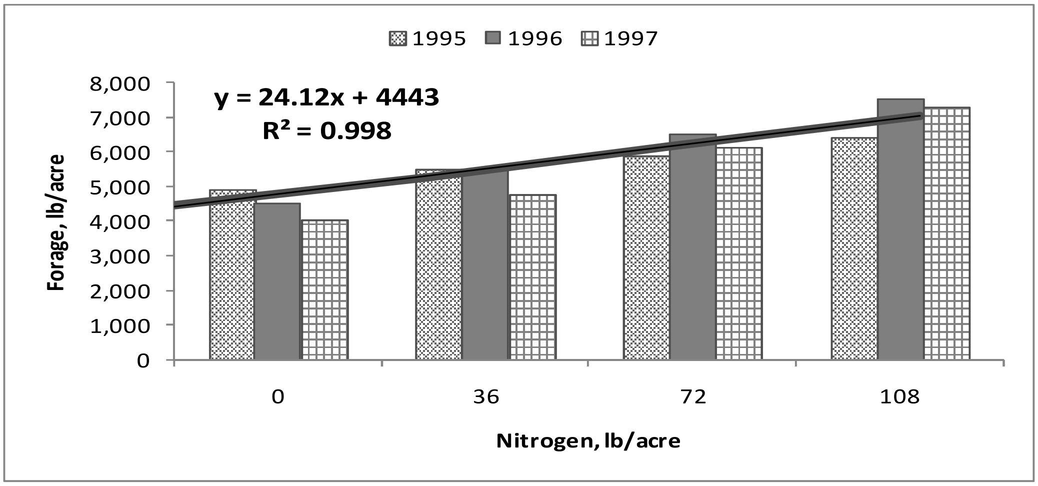
In March of three years (1995, 1996, and 1997), 48 plots within a meadow foxtail dominated meadow were fertilized with 0, 36, 72, or 108 lb of nitrogen/acre, applied as urea during March of each year. Forage yield was determined at three consecutive weekly intervals each year beginning as soon as the ground was dry enough for haying equipment. Initial harvest dates were 17 July 1995, 9 July 1996, and 10 July 1997. On each harvest date, a swather was used to harvest forage. A known length of each windrow was weighed and dry matter determined for estimation forage yield. More specific information concerning the experimental procedures is reported by Angell (1998).

## *Results and Discussion*

### How much does nitrogen fertilizer increase forage yield?

Meadow foxtail responded to nitrogen fertilization with a linear increase in forage yield in each of the three years (Figure 1). On average, the increase in forage production was approximately 24 pounds of forage dry matter/unit of nitrogen. Therefore, if we fertilized with 60 pounds of nitrogen/acre we can expect an increase of approximately 1,440 pounds of forage dry matter ($24 \times 60 = 1,440$) compared with no fertilization.

Figure 1. Dry matter yield of meadow foxtail fertilized at 0, 36, 72, and 108 pounds of nitrogen/acre with urea over three years.




## Does previous year's irrigation influence response to nitrogen fertilizer?

However, the magnitude of response to nitrogen fertilization appeared to be related to previous years growing conditions. For example, the first year of the study (1995) had a good supply of irrigation water but this occurred following a period in which 4 of the previous 5 years were drier than average and no irrigation water was applied to the meadow during this five-year period. In 1995, the increase in forage production due to nitrogen fertilization was only about 50% of that seen in 1996 and 1997, both of which followed a wet, or good, irrigation year. In 1995, we observed a 13.6 pound/acre increase in forage production per unit of nitrogen compared with a response in 1996 and 1997 of 27.8 and 31.0 pounds of forage/acre, respectively, for each pound of supplemental nitrogen. Therefore, it seems from this limited data set that there is a greater response to nitrogen fertilization following a wet year than following a dry year(s).

Table 1 provides estimates, based on the data available, of the expected increase in forage production at nitrogen fertilization levels of 20 to 110 pounds/acre for fertilization following a dry year, a wet year, and the "average" of all (3) years. However, please keep in mind that the response difference between "dry" and "wet" years is based on information collected over a three year period, with only one measurement following a dry period. Therefore, there may be significant annual variation in the magnitude of your observed response to nitrogen fertilization. Nevertheless, we feel that the data does indicate that fertilization with up to approximately 100 pounds of nitrogen/acre will increase forage production in a linear manner, regardless of the previous irrigation season, assuming there is adequate irrigation water.

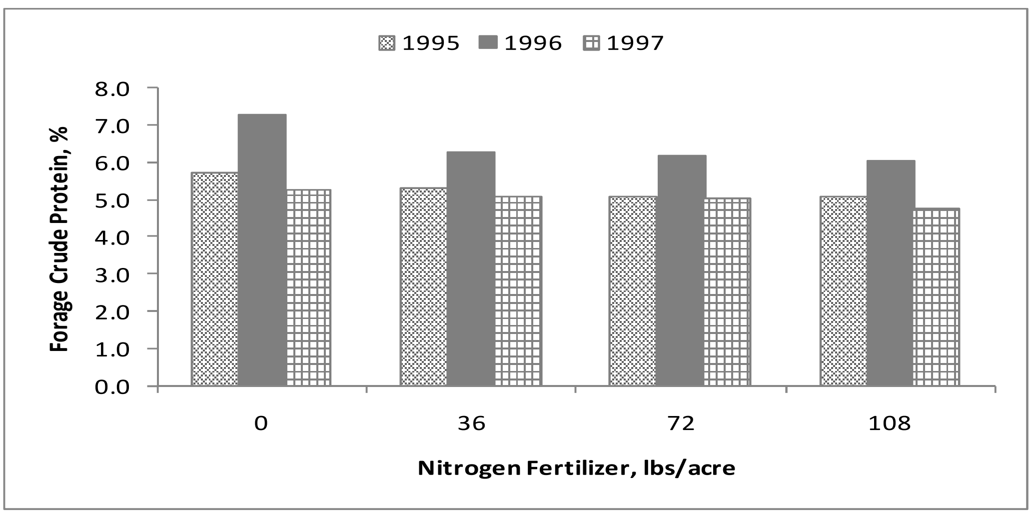
## Will Fertilization Enhance Hay Quality?

Fertilization of Oregon flood meadow did not significantly change the crude protein content of meadow foxtail hay. The absolute value actually showed a decreasing trend with added nitrogen (Figure 2). We attributed this to an increase in the production of stem relative to leaf material. These trends are generally consistent with other studies (reported in Rumberg, 1961), where nitrogen percentage was not increased following nitrogen fertilization. The bottom line seems to be that yield will be significantly increased however hay quality will be similar to unfertilized meadow hay.

Table 1. Increase in forage production that can be expected following a dry year(s), wet year(s), and on average following nitrogen fertilization.

| | Forage Increase, lbs/acre | | |
|---|---|---|---|
| N Fertilizer, lbs/acre | Following Dry Year(s) | Following Wet Year(s) | Average |
| 20 | 272 | 588 | 482 |
| 30 | 408 | 881 | 723 |
| 40 | 544 | 1,175 | 964 |
| 50 | 681 | 1,469 | 1,205 |
| 60 | 817 | 1,763 | 1,446 |
| 70 | 953 | 2,056 | 1,687 |
| 80 | 1,089 | 2,350 | 1,928 |
| 90 | 1,225 | 2,644 | 2,169 |
| 100 | 1,361 | 2,938 | 2,410 |
| 110 | 1,497 | 3,231 | 2,651 |

Figure 2. Crude protein of meadow foxtail fertilized at 0, 36, 72, and 108 pounds of nitrogen/acre with urea over three years.




## When is it economical for me to apply nitrogen fertilizer?

This is the question that we all seem to face, especially with high hay, fertilizer, fuel, and labor costs. Therefore, based on the information presented above, we have come up with some estimated breakeven costs for fertilization with urea or ammonium sulfate at forage values ranging from $60 to $130/ton (Table 2). In addition, the breakeven price of the nitrogen fertilizers is provided based on the overall average, following a dry year, and following a wet year. An example of how to use this table is provided. Let's assume that last year was a wet year with adequate irrigation water. In addition, your local hay market forecast indicates that meadow hay will be selling for $80/ton. Therefore, the breakeven price for urea would be $1,058/ton and for ammonium sulfate it would be $494/ton. This means you could afford to pay up to these amounts for the respective fertilizers (including application costs) and expect to breakeven. If the fertilizer and application costs are greater than these values it does not pay to fertilize and it would be cheaper to purchase the additional hay from someone locally.

Table 2. Breakeven values associated with nitrogen fertilization with urea or ammonium sulfate at forage values ranging from $60 to $130/ton. If fertilizer cost is greater than the value in the table the increased forage production from nitrogen fertilization is not economical.

| | Forage Value, $/Ton | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Fertilizer | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 |
| | **Breakeven Price of Nitrogen Fertilizer, $/ton** | | | | | | | |
| **Average of Years** | | | | | | | | |
| Urea (45% N) Value, $/ton | 651 | 760 | 868 | 977 | 1,085 | 1,194 | 1,302 | 1,411 |
| Ammonium Sulfate (21% N) Value, $/ton | 304 | 355 | 405 | 456 | 507 | 557 | 608 | 658 |
| **Following Dry Year (1995)** | | | | | | | | |
| Urea (45% N) Value, $/ton | 367 | 428 | 490 | 551 | 612 | 673 | 734 | 796 |
| Ammonium Sulfate (21% N) Value, $/ton | 171 | 200 | 228 | 257 | 286 | 314 | 343 | 371 |
| **Following Wet Year (1996-1997)** | | | | | | | | |
| Urea (45% N) Value, $/ton | 794 | 926 | 1,058 | 1,191 | 1,323 | 1,455 | 1,588 | 1,720 |
| Ammonium Sulfate (21% N) Value, $/ton | 370 | 432 | 494 | 556 | 617 | 679 | 741 | 803 |

It is possible to use the three categories in Table 2 to manage the risk/reward status of your fertilizer investment. For instance, if you had used the “average of years” values rather than the “following wet year” values in the example above this would have been a more conservative choice because the breakeven values would have been $868/ton and $405/ton for urea and ammonium sulfate, respectively compared with the $1,058/ton and $494/ton. Likewise, you could use the “following dry year” breakeven values as a worst case scenario ($490/ton and $228/ton).

If you would like to discuss this article or simply would like to talk cows, do not hesitate to contact Ron at 775-738-1721 (torellr@unce.unr.edu), Dave Bohnert at 541-573-8910 (dave.bohnert@oregonstate.edu), or Ray Angell 541-573-8936 (raymond.angell@oregonstate.edu).

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# Does disposition affect reproductive performance in beef cattle?

**By Reinaldo Cooke, Oregon State University Beef Extension Specialist**

Oregon beef producers typically consider disposition as a selection/culling criteria for cattle. Disposition is characterized as the animal's reaction to common handling procedures and contact with humans, and can be assessed by different methods. At the EOARC in Burns, three methods are used to characterize the disposition of the research cowherd:

**Chute score:** Observation of animal behavior when restrained in the chute. This score ranges from 1 to 5 (very calm to very agitated, respectively).

**Exit score:** The speed at which the animal leaves the chute is measured. Following that, velocities are ranked and animals are scored from 1 to 5 (slowest to fastest, respectively).

**Pen score**: Animal response to human presence in the pen after leaving the chute. This score also ranges from 1 to 5 (calm to aggressive behavior, respectively).

After all measurements are assessed, an overall disposition score is assigned to each animal, which is a combination of 1/3 of each individual measurement and is also referred to as “disposition score”. A greater disposition score is reflective of a cow with a poor disposition. Animals with poor disposition are usually under a considerable amount of stress, which may significantly affect the animal's physiology. Blood concentrations of hormones associated with stress, such as cortisol, are usually increased in animals with poor disposition.

Some researchers have reported negative impacts of stressful situations, such as transportation and excessive heat conditions, on cattle reproduction. This effect can be attributed to the altered physiology of stressed animals. However, few controlled research studies have associated disposition with reproduction in beef cattle, although many field observations have related poor disposition with impaired reproductive performance. The negative effects of stress and disposition on reproduction can be even more pronounced in cattle maintained at extensive range conditions because of their sporadic interaction with humans and handling procedures.

During my graduate program at the University of Florida, we tested an initial hypothesis that cattle disposition would be improved through acclimation toward human presence and also to the handling and management procedures of a common beef cattle operation. Since cattle in Florida have a high Brahman-influence, which often exhibit excitable disposition, and reproductive performance is one of the most important factors for the overall efficiency of cow-calf enterprises, it was our interest to investigate how cattle disposition affected cowherd reproductive ability. Therefore, two studies were conducted to evaluate the effects of disposition and acclimation on the reproductive performance of mature cows and developing heifers. The results of these studies are summarized in this article.

**Study 1** - Effects of disposition and acclimation to human handling on reproductive development of Brahman-crossbred heifers. This study was conducted over 2 years (2006 and 2007). Growth, puberty attainment and pregnancy rates of 80 developing Braford and Brahman x Angus heifers were assessed (40 heifers each year). After weaning (August), half of these heifers went through an acclimation process, whereas the other half remained within normal production conditions. Acclimation consisted of bringing heifers to the cowpens three times per week during a one month period. Disposition scores and blood samples of heifers from both groups were collected prior to and at the end of the acclimation period. Puberty attainment was monitored monthly. As a result of this research, heifers from the acclimated group were observed to have a decreased average daily gain compared to non-acclimated heifers (1.1 vs. 1.3 lbs/day, respectively). We attribute this response to the additional exercise that acclimated heifers were exposed to during the frequent walking to and from the working facility. This is likely the reason for the difference since both groups were provided similar pastures and supplements. Despite the slight decrease in body weight gain, heifers from the acclimated group reached puberty at least 1 month sooner than non-acclimated heifers. Further, after the acclimation process, acclimated heifers had decreased mean chute score (1.3 vs. 1.8) and blood cortisol concentrations (37.8 vs. 50.5 ng/mL) compared to non-acclimated cohorts. From this experiment, we concluded that acclimation to human handling improved disposition and enhanced the reproductive development of growing Brahman-crossbred heifers.

**Study 2** - Effects of disposition and acclimation to human interaction on reproductive performance of mature Brahman-crossbred cows. A similar 2 year study was conducted with Braford and Brahman x Angus mature cows. Over 2 years, disposition scores and blood samples were collected from 400 cows after weaning (August). From August to January, half of these cows were subjected to an acclimation process, whereas the other half remained within normal production conditions. For cow acclimation, the same technician interacted with the cows twice weekly by walking among them and offering a small amount of range cubes. The amount of range cubes offered was too little to impact the cows nutritionally (0.2 pounds/ week). On January, prior to the beginning of a 90-d breeding season, disposition scores and blood samples were collected a second time to determine treatment effects. As a result, there were no differences between treatments for disposition scores, cortisol concentrations and pregnancy rates. However, when analyzing data combined from both treatment groups, cows that became pregnant during the study had better disposition scores at the beginning of the breeding season compared to cows that did not become pregnant (2.25 vs. 2.50 for pregnant and non-pregnant cows). From this experiment, we concluded that cow disposition significantly affected reproductive performance; however, the acclimation procedures imposed to cows in this experiment did not have the expected effect.

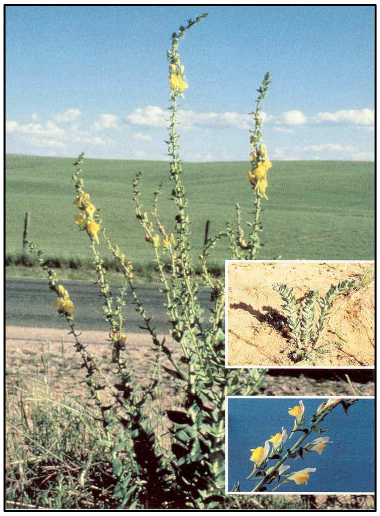
In conclusion, we determined that disposition affects reproductive performance of beef females, and acclimation to human handling can be an alternative to alleviate these detrimental effects, particularly for replacement heifers. However, these results were obtained with Brahman-crossbred cattle. Therefore, similar studies will be conducted this year at the EOARC – Burns, to determine the effects of disposition and acclimation procedures on reproductive function of Angus-influenced heifers and cows. For questions regarding this and other research and extension education efforts, please contact us at http://oregonstate.edu/dept/EOARC/ or (541) 573-8900.

# WEED WATCH:

**A QUARTERLY COLUMN FOCUSED ON WEED PREVENTION AND CONTROL IN HARNEY COUNTY**

Compiled by: Dustin Johnson, OSU Extension and Jesse Barnes, Harney County Weed Control

## DALMATIAN TOADFLAX



**Growth Habit:** Perennial, often over 3 ft. tall, erect.

**Leaves:** Light green, alternate, broad, heartshaped, clasping the stem.

**Stems:** Branching, light green, smooth and leafy.

**Flowers:** Snapdragon type, bright yellow, tinged with orange, to 1½" long spur, born in upper leaf axils.

**Roots:** Vigorous, deep and extensive, creeping roots.

**Seeds:** Numerous, irregularly angled.

**Other:** Spread by seed, creeping root, and root fragments.

### Control Methods

Chemical

- chlorsulfuron (Telar)

  Rate: 1 to 1.33 oz/acre

  Time: Apply late flower or in fall (September 1 to snow fall) .

  Remarks: Use a penetrating surfactant. Spray to wet. Best results are achieved when applied as a tank mixture with Tordon 22k (rate described below).

  Caution: Apply only to noncropland.

- picloram (Tordon 22k)

  Rate: 2 qts/acre **spot treatment**

  Time: Apply late flower or in fall (September 1 to snow fall) .

  Remarks: May require annual treatment for 2 to 3 years.

  Caution: Tordon is a restricted-use herbicide. See label for grazing restrictions. At 2 qts/ acre, apply only as a spot treatment not to exceed 25% of a landowner's acreage in any particular watershed in a single season. .

Mechanical

- Pulling small infestation of Dalmatian toadflax by hand can be an effective way of control, especially if established in a sandy or moist soil. Pulling must continue for 5-6 years to remove all root fragments, and lateral roots should be followed and removed from the soil. Any root fragments left in the soil will sprout new plants. The site should be revisited for many years (10-15 years) to assure the removal of seedlings produced from dormant seeds as well.

- Mowing is largely ineffective at controlling toadflax as it does not affect the root stocks or the buried seeds.

Grazing

- Sheep may suppress stands of Dalmatian toadflax and limit seed production. In Montana, preliminary results of field trials indicated that 35 to 45 percent of Dalmatian toadflax foliage was stripped including the terminal 6 to 10 inches of the plant stems when ewes and lambs were placed in a hilly rangeland area of moderate to heavy infestations. Sheep continued to consume Dalmatian toadflax populations even though other forages were present. Further long-term research is needed to determine the effectiveness of grazing for Dalmatian toadflax control.

Biological

- Eight insects have been introduced and approved by the USDA-APHIS-PPQ for release as biocontrol agents for both Dalmatian and yellow toadflax in the United States with varying success. The toadflax stem-mining weevil (*Mecinus janthinus*) has been successfully established and proven very effective in Harney County. As with most biocontrol agents, *Mecinus janthinus* takes approximately 3 to 5 years to establish a population large enough to provide noticeable evidence of control. Releases of *Mecinus janthinus* area available locally; contact the Harney County Weed Control Office @ 573-8385.

Fire

- Fire is largely ineffective at controlling toadflax as it does not affect the root stocks or the buried seeds, often reduces competition from desirable vegetation, and stimulates growth of Dalmatian toadflax.

Integrated Management Summary

- Management of Dalmatian toadflax must focus on both reducing the rate of vegetative spread and reducing seed production. Successful management requires integrating as many control tactics as possible. Dalmatian toadflax has high genetic variability, and local populations can respond differently to control actions, especially herbicide treatments. Successful control can be obtained by pulling, or killing the plants with herbicide before toadflax seed production begins. Since the plant also spreads through vegetative propagation, and the seeds can remain dormant for up to ten years, this process must be repeated every year for at least ten years to completely remove a stand. Competitive perennial grasses and forbs should be planted to utilize water and nutrients that would otherwise be readily available to toadflax.

References

Beck, K. G. 2003. *Biology and Management of the Toadflaxes.* Colorado State University Cooperative Extension Natural Resources Series, No. 3. 1114. http://www.ext.colostate.edu/pubs/natres/03114.pdf [20 Aug 2008].

Peachey, E., D. Ball, R. Parker, J. P. Yenish, D.W. Morishita, and P. Hutchinson, compilers. 2008. Pacific Northwest Weed Management Handbook. Oregon State University, Corvallis. 420 pp.

# Range Field Day

June 24, 2009

Oregon State University's Range Field Day is a cooperative effort between the OSU Department of Rangeland Resources and the Eastern Oregon Agricultural Research Center (EOARC).

This year's Range Field Day will feature presentations and field demonstrations by OSU, ARS, and USFS scientists.

The morning session begins at 9:00 am at the Northern Great Basin Experimental Range. Featured presentations include interactions between cattle and wolves, interactions between deer, elk and cattle, riparian grazing, pre and post fire cattle distribution, and cattle temperament and production.

The afternoon session will include demonstration of cattle temperament assessment techniques using the facilities at the NGBER. The afternoon will also include a tour and discussion of post fire grazing behavior and vegetation recovery.

**Agenda:**

Morning Session: Northern Great Basin Experimental Range Meeting Room

9:00 – 9:15 Introductions and Program Updates

*Dr. Tony Svejcar, USDA-Agric. Research Service – Burns, OR*

*Dr. David Bohnert, OSU Eastern Oregon Agric. Research Center*

9:15 – 9:45 "Cattle and Wolf Interactions"

*Dr. Pat Clark, USDA-Agric. Research Service – Boise, ID*

9:45 – 10:15 "Cattle, Deer, and Elk Interactions"

*Dr. Marty Vavra, USDA- Forest Service, PNW Research Station*

10:15 – 10:30 Break

10:30 – 11:00 "Riparian Grazing"

*Dr. Doug Johnson,, OSU Dept. Rangeland Resources*

11:00 – 11:30 "Pre and Post Burn Cattle Distribution"

*Dr. Dave Ganskopp, USDA-Agric. Research Service – Burns, OR*

11:30 – 12:00 "Cattle Temperament and Performance"

*Dr. Reinaldo Cooke, OSU Extension Service – Burns, OR*

12:00 – 1:00 Lunch (free of charge)

Afternoon Session: Northern Great Basin Experimental Range Working Facilities & Pastures

1:00 – 2:00 "Demonstration of Cattle Temperament Assessment Techniques"

*Dr. Reinaldo Cooke, OSU Extension Service – Burns, OR*

2:00 – 3:00 "Post-fire Cattle Distribution and Vegetation Recovery: Tour and Discussion"

*Dr. Dave Ganskopp, USDA-Agric. Research Service – Burns, OR.*

*Dr. Jon Bates, USDA-Agric. Research Service – Burns, OR.*

**Directions:** From Burns, proceed west on Highway 20 approximately 35 miles. Turn left onto Placidea Butte Road and travel about 4 miles to the Northern Great Basin Experimental Range Headquarters.

**Contacts:** For further information, please contact the Eastern Oregon Agricultural Research Center office staff: 541-573-8900.

***OSU Harney County Extension Service***

***High Desert Ranch & Family Newsletter***

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**CALENDAR:**

**MAY—** 12TH—RANGELAND MONITORING PROGRAM. LOCATION: DIAMOND SCHOOL. TIME 10 A.M. CONTACT: DUSTIN JOHNSON 573-2506.

**JUNE—** 24TH—EASTERN OREGON AGRICULTURAL RESEACH CENTER RANGE FIELD DAY. LOCATION: GREAT BASIN EXPERIMENTAL RANGE ( 35 MILES WEST OF BURNS, OR ) TIME: 9 A.M. CONTACT EASTERN OREGON AGRICULTURAL RESEARCH CENTER OFFICE STAFF AT 541-573-8900.

25TH - 27TH, 2009—PACIFIC NORTHWEST SECTION SOCIETY FOR RANGE MANAGEMENT SUMMER FIELD WORKSHOP IN JOHN DAY, OREGON. CONTACT: LYNEE BREESE AT JLBREESE@CRESTVIEWCABLE.COM