

Smooth Brome: A tolerable invader?

Hello ladies and gentlemen, my name is Tim Bedell and I am a junior at Soroco High School in Oak Creek Colorado. Oak Creek is located in Routt County of the semi-arid Rocky Mountains of Northwest Colorado. Routt County receives most of its precipitation in the form of snow during the winter with little rain during the spring and summer. Due to this shortage of precipitation during Routt County's short growing season that averages 90 days; producers often utilize smooth brome. *Bromus Inermis*, commonly known as smooth brome, is a cool season perennial grass that was introduced to the US in the 1880's and currently grows almost all over North America. Smooth brome is highly palatable before seeding in the fall. However, it becomes less palatable after it goes to seed due to the buildup of lignin after the plant matures. It is highly palatable for cattle, sheep, and elk which is why ranchers in Northwest Colorado often bale smooth brome for hay. However, smooth brome is also invasive and can quickly crowd out native grasses which leads to a decrease in biodiversity. An invasive plant species is defined as one that is non-native to the ecosystem and whose introduction is likely to cause environmental harm (U.S. Forest Service 2000). Smooth brome is beneficial to cattle producers in the West Slope foothills of northwestern Colorado who need to graze their cattle on rangeland while their pasturelands are growing hay. On the other hand its invasive nature threatens native rangelands but we've found it can be managed in order to allow native plants to grow and in turn benefit the range land as a whole. So, let's discuss some of the advantages, disadvantages, and overall impact that smooth brome has on range sites.

Compared to other introduced grasses, such as Timothy, smooth brome is somewhat drought tolerant and provides good feed for livestock and wildlife (RBLM, 2017). During drought years it is beneficial for ranchers to graze smooth brome on their dry land ecological sites as it requires less water than other introduced grasses. Native grass species are more drought tolerant however many of the native grass species of the Rocky Mountains in Routt County do not produce as much seed as smooth brome (Ogle 2000). Indian ricegrass is a native grass that is highly palatable for livestock and wildlife. However, Indian ricegrass, being a bunchgrass, won't withstand summer-long grazing like smooth brome due to its strong rhizomatous growth form. Its rhizomatous growth holds together the soil and prevents erosion from high winds which is why smooth brome is sometimes used in conservation projects where the soil has been disturbed. Western Wheatgrass is another native grass that grows in Routt County. Western Wheatgrass is very drought tolerant and moderately palatable for livestock and wildlife but doesn't have the same production capabilities of smooth brome (Meccage 2011). According to Kansas State University, well managed smooth brome can yield from 300-1000 lbs of seed per acre. In comparison Western Wheatgrass only yields 75-150 lbs of seed per acre (USDA 2000). Producers need to maximize the productivity of their rangelands as their pasturelands are often growing hay. In order to do this producers often incorporate smooth brome on their rangelands to increase forage for livestock. smooth brome is used because other introduced grasses aren't as drought tolerant. Smooth brome is a cool season grass which makes it suitable to grow in the short growing season of the Rocky Mountains. Producers need a grass that can grow fast and withstand cold temperatures even into June and possibly July. Smooth brome thrives in the semi-arid mountains of Routt County. In general smooth brome can be advantageous for producers where it has invaded and dominates the native plant community,

because it provides satisfactory forage quality and quantity for cattle, sheep, and wildlife while being more drought tolerant than other introduced grasses (Jepson, 1997).

Smooth brome is invasive and can quickly take over an ecological site. This can lead to a decrease of biodiversity and a decrease of ecosystem functioning. This can be detrimental to forage production as a single disease could wipe out the monoculture of smooth brome. Native plant species are vitally important to ecological sites as they provide forage and shelter for wildlife and livestock, habitat for pollinators, soil stability, and soil health. Native plants evolved on ecological sites and are very resilient to drought. Healthy rangelands are important to wildlife as they provide forage in the form of abundant grasses, forbs, and shrubs. Rangelands also sequester carbon from the atmosphere helping to mitigate climate change. Rangelands provide open space for humans to enjoy while enabling producers to graze their livestock and thus supporting their livelihoods. The rangelands where I live have been dominated by smooth brome for decades much to the detriment of the health of the ecosystem. Ranchers have adapted their grazing strategies to be able to take advantage of this situation.

On my family's operation we utilize smooth brome, in order to provide enough forage for our cows and calves during the period that typically follows the end of winter before we can move them to our irrigated meadows. We utilize a method of twice over grazing in order to control the smooth brome and prevent it from becoming dominant. We prefer to utilize smooth brome seed over other non-native grasses for the reasons previously discussed. On our dryland pastures that are accessible to a tractor, we also bale smooth brome for winter feeding. One method we use to counter the invasive characteristics of smooth brome when seeding or reseeding we use Manchar smooth brome because of its moderate sod forming nature in comparison to Lincoln smooth brome's aggressive sod forming. We use smooth brome as a

percentage of the mix with other introduced, but less invasive grasses such as meadow brome, orchard grass, fescue, and sometimes perennial ryegrass. On my family's operation we utilize minimum or no till methods when reseeding our pastures. Smooth brome is quite prominent on ecological sites in Routt County and thus is difficult to get rid of. Some management techniques can include prescribed fire, high intensity short duration grazing, and chemical application. However, a combination of these proves to be the most effective way to manage smooth brome.

A combination of high productivity and drought tolerance makes smooth brome a good choice for producers in the Rocky Mountains of Northwest Colorado. However, smooth brome is an invader and should be managed as a cool season forage component with the native plants on our rangeland. Native grass species are more drought tolerant than smooth brome however many of the native grass species of the Rocky Mountains do not produce as much seeds as smooth brome does on invaded rangeland. Producers in Routt County utilize smooth brome on invaded rangeland due to its hardy nature, high productivity, and drought tolerance. Thank you all for your time and hopefully you found this informative and interesting. Do the judges have any questions?

Works Cited Page

Bittman, S., & Simpson, G. M. (1987). *Soil water deficit effect on yield, leaf area, and net assimilation ...* Soil Water Deficit Effect on Yield, Leaf Area, and Net Assimilation Rate of Three Forage Grasses: Crested Wheatgrass, Smooth Bromegrass, and Altai Wildrye.

<https://access.onlinelibrary.wiley.com/doi/abs/10.2134/agronj1987.00021962007900050003x>. Accessed 21 January 2024.

Cook, J. L., Brummer, J. E., Meiman, P. J., & Gourd, T. (2012). *Forage Guide - Colorado State University Extension*. Colorado Forage Guide.

<https://sam.extension.colostate.edu/wp-content/uploads/sites/2/2016/07/forage-guide.pdf>. Accessed 21 January 2024.

Eck, H. V., Martinez, T., & Wilson, G. C. (1981). *Tall Fescue and smooth bromegrass. I. Nitrogen and water ...* - ACSESS. Tall Fescue and Smooth Bromegrass. I. Nitrogen and Water Requirements.

<https://access.onlinelibrary.wiley.com/doi/abs/10.2134/agronj1981.00021962007300030015x>. Accessed 21 January 2024.

Gabbert, B. (n.d.). *Why prescribed fire - U.S. National Park Service*. Why Prescribed Fire? <https://www.nps.gov/ngpfire/Documents/Why%20Prescribed%20Fire.pdf>.

Accessed 21 January 2024.

Howard, Janet L. 1996. *Bromus inermis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available:

<https://www.fs.usda.gov/database/feis/plants/graminoid/broine/all.html>. Accessed on 21 January 2024.

Kane, J. (2023, December 9). *Prescribed fire*. Encyclopædia Britannica.

<https://www.britannica.com/science/prescribed-fire>. Accessed 21 January 2024.

Meccage, E. (2011). *Dryland and irrigated perennial forage research at NARC*. Dryland and Irrigated Perennial Forage Research at NARC - MSU Extension Animal and Range Science | Montana State University.

https://animalrangeextension.montana.edu/forage/dryland_irrigated_forage_NARC.html.

Accessed 21 January 2024.

Mills, B. (2022, August 22). *Match Maker: The right hay for your livestock - AGCO farmlife*. AGCO FarmLife - The home for AGCO customers and their stories.

<https://myfarmlife.com/livestock/match-maker-right-hay-your-livestock/>. Accessed 21

January 2024.

Mullenix, K. (2018). *Interpreting a forage analysis for beef cattle*. Interpreting a Forage Analysis for Beef Cattle. [https://www.aces.edu/wp-content/uploads/2019/02/ANR-](https://www.aces.edu/wp-content/uploads/2019/02/ANR-2466.pdf)

[2466.pdf](https://www.aces.edu/wp-content/uploads/2019/02/ANR-2466.pdf). Accessed 21 January 2024.

N/A. (2000). *Bromus Inermis* Leyss. *smooth brome*. USDA plants database.

<https://plants.usda.gov/home/plantProfile?symbol=BRIN2>. Accessed 28 November 2023.

N/A. (2007). *Smooth brome-the silent invader of native areas*. Energy.gov.

<https://www.energy.gov/lm/articles/smooth-brome-silent-invader-native-areas>. Accessed 21 January 2024.

Ogle, D. G. (2000). *Plant Guide - Western native seed*. Western Wheatgrass .

<https://www.westernnativeseed.com/plant%20guides/passmipg.pdf>. Accessed 15 January 2024.

Roberts, C., & Kallenbach, R. L. (2008). *Smooth bromegrass*. University of Missouri Extension.

<https://extension.missouri.edu/publications/g4672#:~:text=The%20forage%20quality%20of%20smooth,harvested%20in%20the%20boot%20stage>. Accessed 27 November 2023.

Sheaffer, C. C., Peterson, P. R., Hall, M. H., & Stordahl, J. B. (1992). *Drought effects on yield and quality of ... - Wiley Online Library*. Drought Effects on Yield and Quality of Perennial Grasses in the North Central United States.

<https://access.onlinelibrary.wiley.com/doi/abs/10.2134/jpa1996.0556>. Accessed 21 January 2024.

Smooth Brome. Rocky Mountain Biological Laboratory. (2017, November 29).

<https://www.rmbl.org/smooth-brome/#:~:text=Smooth%20Brome%20grows%20well%20in,outcompetes%20native%20wildflowers%20over%20time>. Accessed 21 January 2024.

USDA NRCS National Plant Data Team. (2000). *USDA Plant Profile Phleum pratense L. timothy*. USDA plants database.

<https://plants.usda.gov/home/plantProfile?symbol=PHPR3>. Accessed 21 January 2024.

U.S. Forest Service. (2000). *Invasive Plants*. Forest Service Shield.

<https://www.fs.usda.gov/wildflowers/invasives/index.shtml>. Accessed 23 December 2023.

YouTube. (2023). *Thinning Out Smooth Bromegrass Invasion*. *YouTube*. Retrieved January 21, 2024, from <https://www.youtube.com/watch?v=Cukdrcugg-A>. Accessed 21 January 2024.