



Targeted Grazing Strategies for Kentucky Bluegrass Control

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November 2021

If Kentucky bluegrass invasion is a problem in your pastures, fall is the time to make a management plan for targeted grazing in spring. A fall pasture inventory of not only forage production, but also range condition and health - including plant species composition - is important to make a grazing plan for next season. Introduced or tame grass species invasion is a key indicator of an unhealthy native rangeland. When taking plant species composition into account, note if your pastures are mainly filled with native grasses or if they are heavily invaded with tame grasses, such as Kentucky bluegrass. For example, if you estimate that a pasture is 70% invaded by Kentucky bluegrass and the remaining 30% is composed of native plant species, a management strategy such as targeted grazing should be utilized to increase overall rangeland health and productivity.

Kentucky Bluegrass (*Poa pratensis*) Characteristics

Kentucky bluegrass (often called “junegrass” by ranchers) is a perennial, cool-season introduced grass that originated from Eurasia. The grass can be identified by an open, pyramidal shaped seed head with whorled branches and mostly basal, slender leaves with a distinct, double midvein (often described as “railroad tracks” or “skis”) that come to a pointed keel (Figure 1). Although Kentucky bluegrass needs a large amount of water to grow, it can be found in nearly all ecosystem types throughout South Dakota. The plant is extremely rhizomatous and can create a thick mat of sod, which

can be useful in areas such as lawns and golf courses; however, it is because of this that Kentucky bluegrass causes a problem on native rangeland – the thick mat of sod is difficult for native perennial species to penetrate.



Figure 1: Kentucky bluegrass on a South Dakota rangeland. Note the slender leaves and pyramidal shaped seed head.

Kentucky Bluegrass Impacts on Native Rangelands

Because the grass is such a strong sod-former, it can outcompete many native plants and take over rangelands, creating a concern for overall diversity of plant species in pastures. When pastures are composed of large percentages of invasive grasses such as Kentucky bluegrass, they become homogeneous and lack ecosystem services including loss of pollinator species and wildlife habitat. Recent reports (USDA – Natural Resource Conservation Service 2018 Invasive Plant Species Report) demonstrate that Kentucky and Canada bluegrass percentages on private rangelands have dramatically increased from 2004 to 2015 as shown in Figures 2A and 2B.

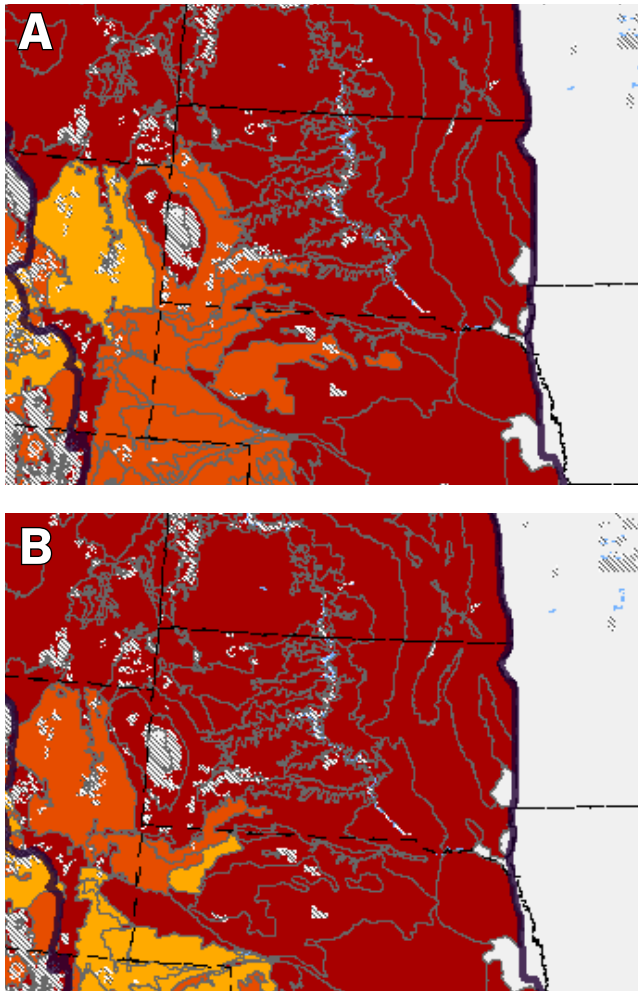


Figure 2: A) 2004- 2010 Non-federal rangeland where Kentucky and Canada bluegrass are present. B) 2011-2015 Non-federal rangeland where Kentucky and Canada bluegrass are present. Note the increase in parts of western South Dakota from 5-20% in 2004- 2010 (A) to over 20% in 2011-2015 (B). Source: USDA – Natural Resource Conservation Service 2018 Invasive Plant Species Report.

Kentucky bluegrass also lacks consistent levels of nutrition for livestock throughout the growing season. The grass is an early maturing cool-season plant, meaning that not only is it one of the first grasses to green up in the spring, but it is also one of the first grasses to go dormant during the warmer summer months when warm-season grasses are actively growing. If moisture is sufficient in the fall, Kentucky bluegrass often experiences a second green-up period when nutrients and palatability increase compared to its dormant state (Figure 3).

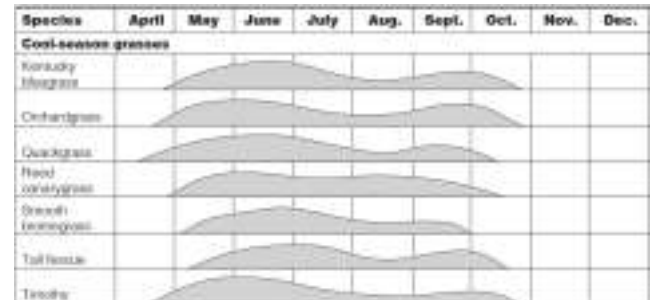


Figure 3: Seasonal growth patterns of cool-season grasses, including Kentucky bluegrass. Source: University of Wisconsin, Pastures for Profit: A guide to rotational grazing.

When the plant goes into dormancy, nutritive quality drops rapidly, making it relatively unpalatable for grazing livestock. If livestock de-select for Kentucky bluegrass and it is not grazed, dry matter will build up and create a thick thatch (>0.5" of litter) that is composed of litter or layers of dead plant material on top of the soil (Figures 4 and 5). This thick thatch layer created by Kentucky bluegrass is problematic because:

- it prevents germination and regrowth of desired native plant species, mainly warm-season grasses, by slowing the warm-up of soil and limiting light penetration,
- the abundance of Kentucky bluegrass roots within thatch makes it very competitive for moisture, and
- precipitation can “bounce off” a thick thatch layer preventing it from reaching the soil surface and infiltrating, thereby reducing available soil moisture for desired native plant.



Big bluestem

Kentucky bluegrass



Big bluestem

Kentucky bluegrass

Figure 4: (A and B) An example of livestock deselecting Kentucky bluegrass and selecting a more palatable native grass, big bluestem. The big bluestem shows significant grazing utilization, while the Kentucky bluegrass is untouched and allowed to build up a thick thatch layer of litter. Source: Jessalyn Bachler.

The thick thatch layer is exacerbated by the dense root mat that Kentucky bluegrass creates in the top layer of soil from rhizomes and degraded plant material as shown in Figure 6, further decreasing water infiltration rates.

Seasonal forage production is another concern for pastures invaded with Kentucky bluegrass. Kentucky bluegrass is poor yielding in terms of total annual pounds per acre; whereas healthy, native pastures generally yield higher. For example, in MLRA 60A (west central South Dakota) on a loamy overflow site that is healthy and in the reference state with native grasses, such as big bluestem, green needlegrass and western wheatgrass present, average yield for the site is around 2,800 pounds per acre for total annual forage production. If the same site is in a heavily invaded



Figure 5: Thick thatch layer (>3") on top of the soil created by dead plant material from Kentucky bluegrass. Source: Jessalyn Bachler.

state due to Kentucky bluegrass sod, the total annual forage production drops to around 1,000 pounds per acre. The low yield of Kentucky bluegrass is due to the plant's short growth form and thin, mainly basal leaves. Because of the low growth form and low growing points on the grass, it can withstand heavy grazing, compounding problems associated with grazing out desired native plants.



Figure 6: Dense root mat created by Kentucky bluegrass. Note the extensive rhizomes in the sod layer that connect several Kentucky bluegrass tillers. Source: Jessalyn Bachler.

Controlling Kentucky Bluegrass through Targeted Grazing

Managed grazing is a fundamental component in controlling Kentucky bluegrass on native rangelands. A rotational grazing plan paired with adaptive management promotes a healthy, diverse native plant community that deters the invasion of unwanted plant species. In contrast, season-long overgrazing generally harms palatable native plants and promotes unpalatable invasive species. If pastures are composed of 25% or more Kentucky bluegrass, you will likely need more than a rotational grazing system to manage the invasive species.

Many studies have shown that targeted grazing of Kentucky bluegrass in early spring while it is in active growth (green-up) can decrease the stand of the plant. Timing of grazing Kentucky bluegrass is critical to control it; this needs to be while the plant is green and actively growing, as early as possible during the two-leaf stage. The goal is to graze Kentucky bluegrass as soon as it breaks dormancy to set it back, and then remove grazing pressure from that pasture as soon as native grass plants start to break dormancy; timing this can be tricky as every spring is not the same. The exact length of time to target graze the Kentucky bluegrass to manage it in the spring is largely dependent on climatic variables such as timing of the last frost and temperature, day-length and spring moisture. By the time native grasses have broken dormancy and are

actively growing, livestock should be rotated off the invaded pasture to allow the native plants to express themselves fully (to the 3-4 leaf stage before being grazed) and out-compete the now harmed Kentucky bluegrass.

Grazing intensity is another factor that can influence Kentucky bluegrass control. When target grazing Kentucky bluegrass, stocking rates should be increased to create a short duration, high intensity grazing pattern. Targeted grazing Kentucky bluegrass should be intense, or mob style, to have the greatest positive impact. Utilization rates should be high, trying to take up to 80% or more of the plant to harm it and set it back.

Creating a Kentucky Bluegrass Management Plan

The first step in creating a grazing plan to decrease Kentucky bluegrass abundance in your pastures is to conduct a pasture inventory. This should be done during the fall to plan for targeted grazing in the spring. Create a plan by answering these questions:

- Is there a presence of Kentucky bluegrass on your ranch?
- If so, what pastures is it prolific in?

Once you have identified which pastures contain Kentucky bluegrass, estimate what percentage of each pasture is invaded. There are a few different ways you can do this:

- Visually (e.g. on-ground estimations or photo points)
- Mapping (e.g. several apps are available such as Google Earth, ArcMap or OnX)
- Rangeland monitoring methods (e.g. clipping or line-point intercept)

After a complete inventory has been conducted, decide which pastures are high priority for Kentucky bluegrass control. If there is over 25% Kentucky bluegrass in a pasture, a targeted grazing plan should be put into place in that pasture for spring. List the pastures in order from the most Kentucky bluegrass to the least. You will notice that native pastures that have typically seen overuse and early grazing in the spring and summer before they were ready to be grazed (typically the 3-4 leaf stage for native range grasses), are likely to have more Kentucky bluegrass; these are the pastures that need targeted grazing the most to control the invasion.

- Most affected: Pasture _____
- _____
- _____
- _____
- _____
- Least affected: Pasture _____

To control Kentucky bluegrass, graze the pasture that is most affected/has the highest amount of Kentucky bluegrass the earliest. If you only notice only one area of the pasture is invaded with Kentucky bluegrass, consider cross fencing the area to truly “target” Kentucky bluegrass. Next, create a high-stocking rate grazing system with a once-through pattern to control Kentucky bluegrass. Make it your goal to take up to 80% of the Kentucky bluegrass, being careful not to be on the pasture with active grazing when native grasses break dormancy. As soon as the native grasses break dormancy and are in active growth, end your targeted grazing system of Kentucky bluegrass. If you proceed to graze when the native grasses are actively growing, you will inadvertently hurt them and instead allow the Kentucky bluegrass a chance to regrow.

Conclusion

Kentucky bluegrass is problematic on native rangelands due to its short period of active growth, poor forage yield and competitive nature against desirable native plants. Managing Kentucky bluegrass without causing harm to the native plant community can be a challenging balancing act, especially if there is not a targeted grazing plan in place. To properly control Kentucky bluegrass, a management plan should be created the fall prior to implementing a targeting grazing system in the spring.

If you are unsure if Kentucky bluegrass is present in your pastures or know of a presence and need help creating a management plan, contact your local range specialist: [Jessalyn Bachler](#) (Lemmon), [Pete Bauman](#) (Watertown), [Krista Ehlert](#) (Rapid City) and [Sean Kelly](#) (Winner).

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