



David Little Livestock Range Management Endowment

AT THE UNIVERSITY OF IDAHO

2019 Project Progress Report:

Investigating seasonal changes in the nutritive value of invasive grass species to aid in their control using targeted grazing on Idaho Rangeland

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The widespread invasion of annual grasses, including cheatgrass (*Bromus tectorum* L.) and medusahead (*Taeniatherum caputmedusae* L.), is one of the major threats to sustainable rangeland use in Idaho. Therefore, there is an urgent need for management strategies to control these invasive grasses on rangeland. Targeted grazing could be used to maintain the health and function of rangelands. Because cheatgrass and medusahead require dead litter that is laying down for them to establish and dominate, grazing could be a powerful tool in controlling their spread (Perryman et al., 2018). However, unless grazed early in the season (spring/early summer), cattle tend to avoid cheatgrass and medusahead possibly in part because of their low nutrient composition and digestibility. Although there are reports that cattle graze an increasing amount of these invasive grasses in fall, possibly as a result of the moisture received during this period, it is not clear whether this occurs as a result of changes in nutrient composition and/or digestibility. Understanding the factors that could explain the increase in the grazing of cheatgrass and medusahead in fall is key to developing targeted grazing strategies that can increase the health and function of Idaho rangelands by reducing these species. Therefore, we investigated the changes in nutrient composition and digestibility of cheatgrass and medusahead harvested on Idaho rangeland as the season changed from summer, to fall, and then winter.

Objective: Investigate the effect of changing season (summer, fall, and winter) on nutrient composition (including crude protein, total digestible nutrients, and fiber) and digestibility of cheatgrass and medusahead harvested on Idaho rangeland.

Cheatgrass and medusahead samples were collected in the Reynolds Creek watershed in June 2018 (summer), September 2018 (fall), and January 2019 (winter). After collection, samples were transported to the laboratory, ground, and analyzed for dry matter (DM), crude protein (CP), neutral detergent fiber (NDF), and total digestible nutrients (TDN) using standardized methods (AOAC, 1995). Dry matter and fiber (NDF) digestibility were evaluated in the laboratory by incubating the collected samples together with rumen fluid that was collected from beef cattle. This mimics what happens in the rumen of cattle that consume the forages. Briefly, on the day of incubation, 1.5 g of each of the forage samples was added to 2 measurement glass vials. Rumen fluid that was collected from 2 ruminally-fistulated beef cows was added to the vials containing the forage samples. Vials were then incubated at 39°C for 24 h. After incubation, what remained

(residues) were weighed and analyzed to determine the amount of dry matter and fiber that disappeared/was digested by the rumen microbes.

To complete the study, cheatgrass and medusahead samples that were harvested in the Reynolds Creek watershed in June and September 2018, and January 2019 were dried, ground, and analyzed (nutrient composition and digestibility) in Dr. Chibisa's ruminant nutrition laboratory in the Animal and Veterinary Science Department on campus.

Cheatgrass harvested in summer contained a greater amount of crude protein (CP) than medusahead [14.1% (Figure 1) vs. 10.6% (Figure 2)]. However, for both grasses, there was a dramatic decrease in the CP content in fall and winter (Figure 1 and 2). In both seasons (fall and winter), the CP content averaged 3.9%

