

Integrated management of ventenata infested rangelands using herbicides and fertilizers

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Introduction

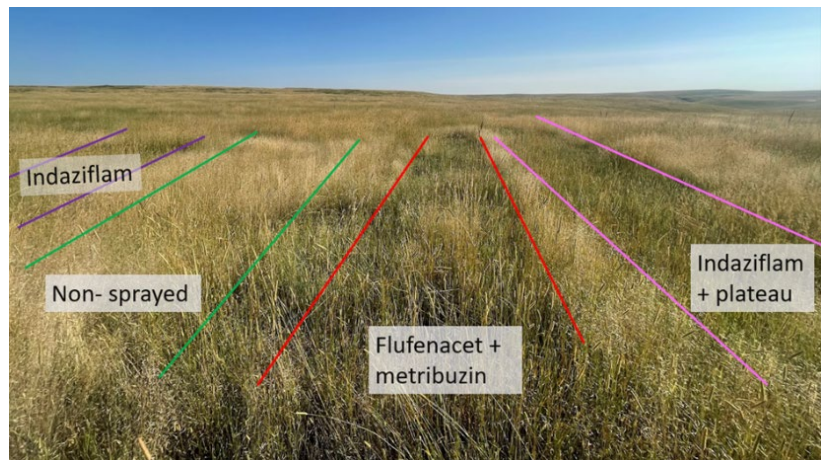
Montana ranchers want high productivity forage, but this can be decreased by invasive plants. The invasive annual grass ventenata (*Ventenata dubia*) is found in pastures and rangelands where it can cause a decline in forage production. Herbicides with active ingredients indaziflam, imazapic, and flufenacet + metribuzin are used to manage ventenata in range and pasture. In these systems, it is hoped that removing ventenata will allow for recovery and growth of desired perennial forage grasses. The added use of fertilizer should promote the growth of perennial grasses, and those that contain micronutrients could be especially important for healthy rangeland soils. We combined the use of herbicides with both macronutrient (nitrogen (N)-phosphorus (P)-potassium (K)) and micronutrient (Nutrafix[®]) fertilizers to determine if these treatment combinations reduced ventenata while also increasing perennial grasses.

Methods

Our study was conducted at three sites in western Montana (Cascade and Sanders Counties). We had four herbicide treatments: non-sprayed, indaziflam (Rejuvra[®], 5 oz/A), indaziflam + imazapic (Plateau[®], 6 oz/A), flufenacet + metribuzin (Axiom[®], 4 oz/A) and three fertilizer treatments: non-fertilized, macronutrient 40 lbs/acre, micronutrient 25 lbs/acre. We applied the fertilizers, indaziflam, and flufenacet + metribuzin pre-emergent in August 2022, and indaziflam + imazapic post-emergent in October 2022. We sampled canopy cover of ventenata and all species for two years (2023-2024). Biomass of ventenata and perennial grasses was sampled in the final year (2024).

Results and Management Implications

All herbicide treatments reduced ventenata cover to less than 1% the first year post-treatment. In the second year, ventenata increased to 6% in the flufenacet + metribuzin treatment which was similar to cover in the non-sprayed control (11%). Indaziflam and indaziflam + imazapic treatments maintained ventenata control, both at less than 2% cover. Fertilizer treatments did not impact ventenata cover. Ventenata biomass was highest in the non-sprayed and flufenacet + metribuzin treatments and lowest in the indaziflam and indaziflam + imazapic treatments. Perennial grass cover and biomass was not impacted by herbicide treatments two years post-treatment. We did not expect the herbicides to decrease perennial grass cover, but we hoped perennial grasses would increase due to removal of ventenata. Fertilizer treatment also did not affect perennial grass. Our study suggests that indaziflam and indaziflam + imazapic were effective herbicides to control ventenata, with effects that lasted longer than flufenacet + metribuzin. However, ranchers may not see an increase in forage in response to ventenata control even with the addition of fertilizer treatments, at least in the short term.



Study site in Cascade County in 2023, first year post-treatment. Lines are drawn along plot sides with treatments indicated by labels. Lack of ventenata is visibly noticeable in the sprayed treatments relative to the non-sprayed and alley ways between treatments. Photo: Lilly Sencenbaugh, Montana State University.

This research was supported by a grant from Western Sustainable Agriculture Research and Education (WSARE) and the Montana Noxious Weed Trust Fund.