Kansas Agricultural Experiment Station Research Reports

Volume 10
Issue 5 *Western Kansas Agricultural Research*

Article 6

2024

Vegetation and Animal Production in Pastures Sprayed for Western Ragweed Control

Keith Harmoney
Kansas State University, kharmone@ksu.edu

John Jaeger
Kansas State University, jrjaeger@ksu.edu

Jacob Hadle
Kansas State University, hadle@ksu.edu

Recommended Citation

Harmoney, Keith; Jaeger, John; and Hadle, Jacob (2024) "Vegetation and Animal Production in Pastures Sprayed for Western Ragweed Control," *Kansas Agricultural Experiment Station Research Reports*: Vol. 10: Iss. 5. https://doi.org/10.4148/2378-5977.8603

K-STATE Research and Extension

2024 WESTERN KANSAS AGRICULTURAL RESEARCH

Vegetation and Animal Production in Pastures Sprayed for Western Ragweed Control

K. Harmoney, J. Jaeger, and J. Hadle

Introduction

Western ragweed (*Ambrosia psilostachya*) is a common native forb found throughout Kansas native rangelands and in some seeded pastures. Western ragweed can form dense colonies over time from growth of lateral creeping rootstalks with multiple buds that can initiate new growth and form an upright stem and plant. Past research has shown that western ragweed does not compete with native grass production until ragweed contributes over approximately 35% of the forage dry matter of a pasture area. Cattle have utilized western ragweed in past long-term historical grazing trials. In a previous long-term trial at Hays, KS, western ragweed was the most common forb found in light and moderately stocked pastures. Frequency of western ragweed was greatest in pastures with light stocking rates, and frequency of western ragweed declined by nearly 50% in moderately stocked pastures because of animals utilizing the western ragweed. In heavy stocking rate pastures, western ragweed was found in only trace amounts because of greater animal use. However, producers still question if cattle utilize western ragweed and achieve adequate gains in pastures with high western ragweed populations. Therefore, we conducted a grazing trial to determine if controlling western ragweed in pastures improved stocker animal gains compared to pastures with no ragweed control.

Experimental Procedures

Eight study pastures averaged 35 acres in size and mostly consisted of limy upland ecological sites. Pastures were grouped in pairs to form a replicate, and one pasture of each replicate was treated with dicamba in June of 2021 at 6 oz/a to control western ragweed shortly after animal stocking. In both 2021, the year of spraying, and 2022, the year after spraying, high percentage Angus and Angus crossbred steers and heifers were stocked at 0.9 AUM/a for the typical season-long stocking period of May 1 through October 1. Stocking entailed 11 or 12 lightweight heifers per pasture in two replications, and 11 or 12 lightweight steers per pasture in two replications, depending on pasture size and initial animal size each year (avg. 495 lb/hd over the two years). Steer and heifer body weight was collected in May at the start of the grazing season, in mid-July at mid-season, and again in October at the end of the grazing season. Animals were corralled at dusk in pens to stand overnight without food or water and were weighed at sunrise the next morning to collect a shrunk body weight for each weigh period. Standing available herbage biomass was collected from pastures at the grazing season midpoint in July, and again at the end of the grazing season in October by clipping 10 samples from a 2-ft^2 frame along a transect in each pasture and sepa-

rating western ragweed from grasses. Furthermore, western ragweed plant density was measured within 10 frames measuring 2-ft^2 along each transect at the start of grazing in May, at the midpoint in July, and at the end of grazing in October. Western ragweed was also clipped from within five frames measuring 2-ft^2 along each transect every two weeks from the midpoint of grazing in July to the end of grazing in October to quantify the accumulated growth of western ragweed during the last half of the grazing season. The nutritive value of both the grass and western ragweed samples from unsprayed pastures was evaluated each year. Growing season precipitation (April-September) of the study area was 19.5 inches in 2021 and 12.6 inches in 2022.

Results and Discussion

Western ragweed densities in the study pastures for the year prior to the study (2020) were very high, were not different between pasture treatment groups, and averaged 11.1 plants/ft^2. After dicamba was applied to half of the pastures in 2021, western ragweed control was successful. Ragweed density was much lower in sprayed pastures compared to unsprayed pastures averaged over both the 2021 and 2022 growing seasons (0.8 vs. 4.0 ragweed plants/ft^2, respectively). Western ragweed plants that did survive in sprayed pastures were substantially injured and stunted, and essentially stopped growth and desiccated prior to the end of the first growing season. On a per acre basis, available western ragweed yield and percentage of total yield were greater in unsprayed treatments in both July and October (Table 1). Western ragweed yield increased linearly as the late grazing season progressed (Fig. 1) in 2021, but not during the drought year of 2022. Meanwhile, available grass yield and total pasture yield were not different between spray treatments in July or October. Both crude protein and total digestible nutrients of the western ragweed were greater than the grass component in the unsprayed pastures in both July and October averaged over the two grazing seasons (Table 2).

Grazing animals from both spray treatments had similar weights when placed on pasture in May, averaging 495 lb/hd (Table 3). Animals in sprayed and unsprayed pastures had similar early season gains and late season gains, therefore total season gain was also similar between spray treatments. Animals averaged 682 lb/hd when removed from pasture in early October (Table 3).

Western ragweed is often viewed as a weedy forb in Kansas rangelands. Past research has shown that dense stands of ragweed can contribute up to 35% of pasture dry matter before affecting grass growth and yields. In the current study, ragweed production was greater in unsprayed pastures at the end of the grazing season, but ragweed production had no effect on grass yield or total pasture yield. Western ragweed also had no effect on stocker animal gains during the early or late grazing season. Although the spray treatment used to control western ragweed in this study was an ultra low-cost treatment, the money spent to control the ragweed became an added production cost with no significant financial return.

Implications

Western ragweed populations may vary from year to year according to weather patterns. In the current instance, the naturally occurring reduction in western ragweed density from the prior year in unsprayed pastures resulted in ragweed populations that were not

great enough to produce differences in pasture yields or animal gains. Unless western ragweed composition in pastures nears the 35% level of previous research, producers will likely experience little benefit from spraying for western ragweed alone in pasture.

Table 1. Western ragweed, grass, and total available dry matter in July and October of 2021 of pastures sprayed for western ragweed control or left unsprayed. Also shown is western ragweed as a percentage of the total dry matter composition.

	July				October			
	Ragweed	Grass	Total	Ragweed	Ragweed	Grass	Total	Ragweed
	------ Dry matter lb/a ------			%	------ Dry matter lb/a ------			%
Sprayed	*4	1727	1731	*0.3	*0	1749	1750	*0.0
Unsprayed	*94	1676	1769	*5.2	*206	1531	1737	*14.0

*Indicates values in a column are significantly different between spray treatments at P ≤ 0.10.

Table 2. Grass and western ragweed nutritive value traits at mid-July and October sampling dates averaged over the 2021 and 2022 grazing seasons

		July	October
Crude protein	Ragweed	*11.6	*11.9
	Grass	*6.8	*7.4
Total digestible nutrients	Ragweed	*67.5	*67.0
	Grass	*48.5	*46.5

*Indicates values in a column are significantly different between vegetation components at $P \leq 0.05$.

Table 3. Animal weights and animal gains averaged over the 2021 and 2022 grazing seasons in pastures sprayed for western ragweed control or left unsprayed

	Animal weights			Animal gains		
	May	July	Oct	Early	Late	Total
	---------- lb/hd ----------					
Sprayed	495	609	682	114	71	189
Unsprayed	494	602	681	107	81	188

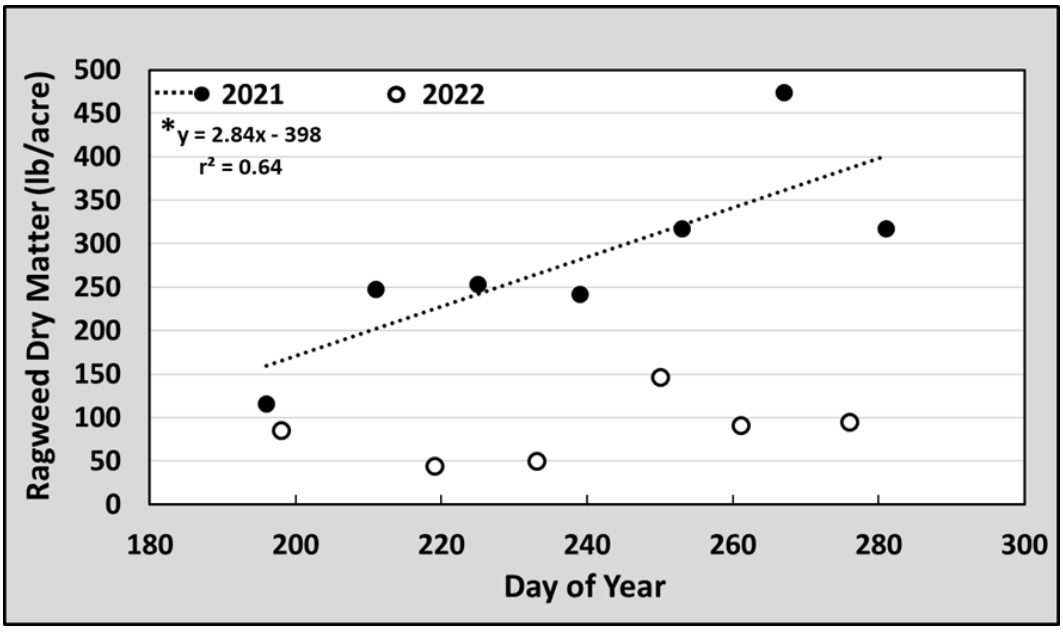

Figure 1. Western ragweed dry matter accumulation in unsprayed pastures during the last half of the grazing season in 2021 and 2022. *Denotes a significant linear equation at the $P < 0.05$ probability level.