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Vegetation and Animal Production in Pastures Sprayed for Western Ragweed Control

Keith Harmoney and John Jaeger

Introduction

Western ragweed (*Ambrosia psilostachya*) is a common native forb found throughout Kansas native rangelands and in some seeded pastures. Over time, western ragweed can form dense colonies 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 animals utilized 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 pasture improved stocker animal gains compared to pastures with no ragweed control.

Experimental Procedures

The 8 pastures in the study 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 at 6 oz/acre shortly after animal stocking to control western ragweed. High percentage Angus and Angus crossbred steers and heifers were stocked at 0.9 AUM/acre 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. Steer and heifer body weights were 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 separating 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 5 frames measuring 2-ft^2 along each transect every 2 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.

Results and Discussion

Western ragweed densities in the study pastures during the year prior to the study 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 (1.2 vs. 4.5 ragweed plants/ft^2, respectively). Western ragweed plants that did survive in sprayed pastures were substantially injured and stunted, and essentially stopped growth and were desiccated prior to the end of the season. On a per acre basis, available western ragweed yield, grass yield, and total yield was not different between spray treatments in July at the mid-season (Table 1). However, western ragweed yield increased linearly as the late grazing season progressed (Figure 1). In October, at the end of the season, available ragweed yield was greater in unsprayed pastures compared to sprayed pastures (317 lb/acre vs. 0 lb/acre, respectively), as was total ragweed dry matter as a percentage of total dry matter available (14.4% vs. 0%, respectively; Table 1). Meanwhile, available grass yield (1976 lb/acre) and total yield (2135 lb/acre) were not different between spray treatments in October.

Grazing animals from both spray treatments had similar weights when placed on pasture in May, averaging 453 lb/hd (Table 2). Animals in sprayed and unsprayed pastures had similar early season gains and late season gains. Total season gain (211 lb/hd) was also similar between spray treatments, and animals averaged 664 lb/hd when removed from pasture in early October (Table 2).

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	3	1725	1728	0.2	*0	2003	2003	*0.0
Unsprayed	117	1703	1820	6.6	*317	1950	2268	*14.0
Average	60	1714	1774	3.4	159	1976	2135	7.0

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

Table 2. Animal body weight and body weight gain during the 2021 grazing season in pastures sprayed for western ragweed control or left unsprayed

	Animal weights			Animal gains		
	May	**July**	**October**	**Early**	**Late**	**Total**
	------------------------ lb/hd ------------------------					
Sprayed	453	573	665	92	120	213
Unsprayed	454	573	663	90	119	209
Average	453	573	664	91	120	211

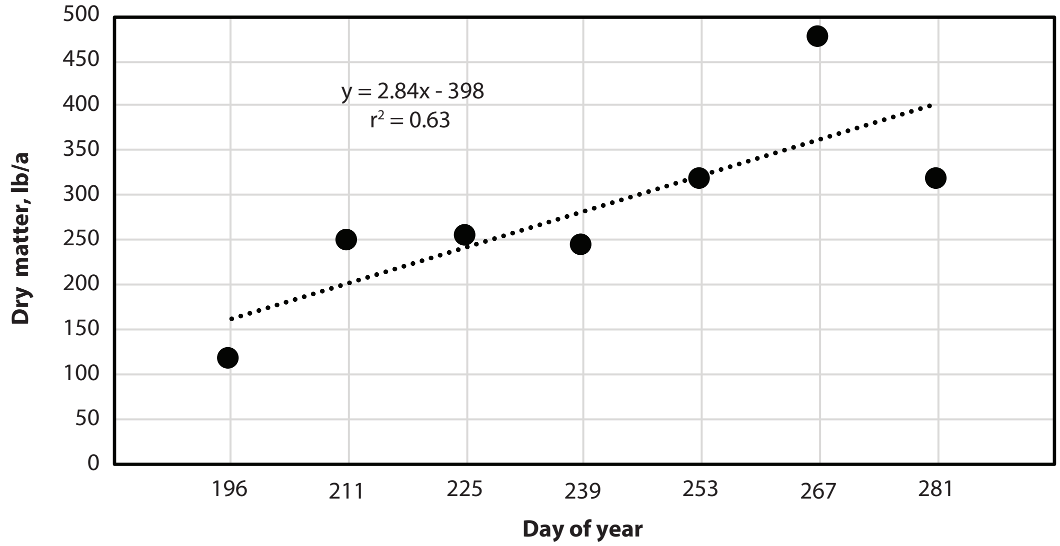

Figure 1. Western ragweed dry matter accumulation in unsprayed pastures during the last half of the grazing season in 2021.