

Forage Kochia Seeding into Rangeland, Carter County, MT

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Objective: Improve forage quality in existing rangeland stand
County: Carter County, MT
Average Annual Precipitation: 13 - 14 inches
MLRA: 58AE, Sedimentary Plains
Dominant Soil Type: Varney loam
Elevation: 3400 ft
Site Preparation: Harrow rangeland in 2012, light disk spring 2013
Planting Date: April 2013
Planting Method: Drill seeded
Previous Site History: Native plant community with low grazing pressure
Herbicide: None
Irrigation: None
Grazing: Wildlife only
Monitoring Dates: Sept 2013, Oct 2014, Oct 2015 and Aug 2018



Fig. 1. Forage kochia is excellent browse for livestock and wildlife.

Scientific Name	Common Name	Cultivar	lbs PLS/acre
<i>Bassia prostrata</i>	Forage kochia	Immigrant	0.25

Introduction: This project tested interseeding forage kochia into a native rangeland in southeastern Montana to improve forage quality. Forage kochia is a half-shrub with a deep tap root and extensive fibrous root system. It lives for 10 to 15 years and readily re-establishes from seed. Forage kochia, a native to Eurasia, provides excellent forage for livestock and wildlife due to its high crude protein values (7 – 14%). It maintains its high crude protein and forage quality into the fall and winter. The best fall and winter nutritional benefits occur when forage kochia is grown with dormant grasses. Forage kochia has been also found to compete well against cheatgrass, an exotic annual weed.

Forage kochia establishes best when seed is broadcast or drilled seeded onto a soil surface which have been lightly disturbed by harrowing or spread directly onto snow. In this project, the grassland was lightly harrowed in the fall and lightly disked in the spring immediately before drill seeding. This light disturbance opened the site to increase the seed-to-soil contact. The full stand rate is 2 lbs PLS/ac, and seed should be pressed into soil at shallow depths ($\frac{1}{16}$ to $\frac{1}{4}$ inch). This project seeded at 0.25 lbs PLS/ac into the mature grassland plant community with adequate soil moisture (Table 1). The site was evaluated for species establishment and density (number of plants/ft²) over time.

Results:

The seeding had good to fair stand and vigor rating for the first five years following seeding (Table 2). Five years after seeding, the canopy cover of forage kochia was approximately 5% and stand density was 0.1 plants per square foot. The seed production was low and plant height ranged from 4 to 12 inches tall. Wildlife utilization was high on the forage kochia which probably impacted its ability to produce seed and spread throughout the site. A future consideration is to increase the seed rate to increase its cover and density on the site.



The native grassland community recovered well from the light harrow and disk disturbance. The winter and spring of 2018 had above average moisture which benefited the grassland plant community but also the annual weedy grass Japanese brome (*Bromus japonicus*). At the time of evaluation, Japanese brome was approximately 25% canopy cover of the grassland; however, the forage kochia was surviving and doing well with the weed infestation.

Table 2. Forage kochia evaluation ratings by year for 2014, 2015, and 2018.

Year	Stand	Vigor	Ability to Spread	Seed Production	Height (Inch)	Notes
2013	Good	Good	Good	Good	8	
2014	Good	Fair	Fair	Low	12	
2015	Fair	Fair	Fair	Low	6	Number of plants increased
2018	Fair	Fair	Fair	Low	4 - 12	

Summary:

- Light harrow and disking for site preparation was beneficial for establishing forage kochia.
- Forage kochia established well in the mature native grass community.
- A higher seeding rate may increase forage kochia canopy cover and density in future seedings.
- Wildlife use is high on this palatable and nutritious plant species.



Fig 3. A drill row of forage kochia five years after seeding, August 2018. It is surviving well in the annual grasses.

