



# Rangeland Seeding into Crested Wheatgrass, Garfield County, MT

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**Objective:** Increase late season green and winter forage and demonstrate two seeding techniques

**County:** Garfield County, MT

**Average Annual Precipitation:** 10 - 14 inches

**MLRA:** 58A, Northern Rolling High Plains, North Part

**Dominant Soil Type:** Lonna-cambeth silt loam

**Elevation:** 2900 ft

**Site Preparation:** one glyphosate treatment

**Planting Date:** May 2013

**Planting Method:** drill seeded, 18 inch row spacing with forbs and grasses in alternate and crosshatch (perpendicular) rows

**Previous Site History:** Crested wheatgrass rangeland

**Herbicide:** glyphosate applied once before seeding

**Irrigation:** none

**Grazing:** wildlife, livestock in 2016

**Monitoring Dates:** Oct 2013, Aug 2015 and Aug 2017



Fig. 1. Switchgrass, a warm season grass, had the best establishment and persistence of seeded species.

**Introduction:** The site was crested wheatgrass (*Agropyron cristatum*) rangeland that was degraded from several years of drought. Prior to seeding, the site was sprayed with glyphosate (Roundup) at 32 oz/ac

Table 1. Seeded species and their seeding rate.

Scientific Name	Common Name	Cultivar	lbs PLS/acre
<i>Bassia prostrata</i>	Forage kochia	Immigrant	2
<i>Bouteloua curtipendula</i>	Sideoats grama	Pierre	4.5
<i>Panicum virgatum</i>	Switchgrass	Forestburg	3
<i>Psathyrostachys juncea</i>	Russian wildrye	Bozoisky	5
<i>Onobrychis vicifolia</i>	Sainfoin	Delaney	34

to remove the crested wheatgrass. The glyphosate treatment did not have lasting control and crested wheatgrass re-established to 50% canopy cover by 2017. There was also trace amounts of field brome (*Bromus arvensis*). Soils were variable and created patchy vegetation cover. In 2013, five species were seeded using 18 inch row spacing either in alternate or crosshatch rows of forbs and grasses. Grasses were seeded with each forb species in both alternate and crosshatch rows, except sideoats grama was only seeded in alternate rows with each forbs (Table 1). Deer, antelope and rabbits utilized the site and livestock grazed lightly in 2016.

**Results:** Regardless of the seeding technology (alternate row or crosshatch) and the combination of species seeded together, seeded species had relatively consistent canopy cover, density and plant characteristics in 2017. Switchgrass and forage kochia had the highest cover and biomass five seasons after seeding.

*Switchgrass*, a warm season grass, had good initial stand establishment and vigor, and by 2017 it was 75% canopy cover in seeded rows (Table 2). It had not expanded from the seeded rows and had moderate seed production - which may have been a result of drought conditions. Five seasons after seeding, switchgrass was getting wolfy and livestock grazing was recommended (Fig 1, 3)



Fig. 2. Forage kochia five years after seeding.



*Forage kochia* was slow to establish but by 2017 averaged 18% cover, had abundant seed production, was spreading from the seeded rows, and had a variety of age classes present (Fig 2, 3). Forage kochia provides excellent forage due to its high crude protein values and will supplement the nutritional value of crested wheatgrass in fall and winter. *Sainfoin*, the other forb seeded, had good initial establishment especially in the crosshatch rows, but was heavily grazed by wildlife and did not persist until 2017. The 2015 evaluation noted sainfoin growth and production was limited by herbaceous competition.

*Sideoats grama*, a warm season grass, had fair stand establishment, low canopy cover (6%), and robust plants that were not producing seed. *Russian wildrye*, a cool season grass, is known for slow establishment. It had poor stand establishment, low density and cover, and was uncharacteristically small statured in 2017. The short-stature sideoats grama, and slow establishing Russian wildrye, may have been affected by crested wheatgrass competition.

**Table 2.** Seeded species evaluation ratings for 2013 and 2015, and average of all seeded plots 2017.

Species	2013 Stand	2013 Vigor	2015 Stand	2015 Vigor	2017 Density (plants/ft <sup>2</sup> )	2017 Cover (% row)	2017 Height (in)
Forage kochia	Poor	Poor	Poor	Good	0.25	18	15
Sideoats grama	Fair	Good	Fair	Good	0.1	6	7
Switchgrass	Good	Good	Good	Good	1.4	75	4
Russian wildrye	Failure	Failure	Poor	Fair	0.1	3.5	5
Sainfoin	Good	Good	Poor	Poor	0	0	0

**Summary:**

- Switchgrass had the best stand establishment, the highest canopy cover, and good height / production of the seeded grasses.
- Forage kochia was slow to establish but after five growing seasons had 18% canopy cover, robust plants, and was reproducing.
- Sideoats grama and Russian wildrye did not establish well and may have been impacted by crested wheatgrass.
- Sainfoin is not recommended where wildlife grazing pressure will affect its persistence.
- Additional pre-seeding control of crested wheatgrass with glyphosate may have improved establishment and canopy cover of the slow establishing and short-stature grass species.



**Fig 3.** Switchgrass and forage kochia crosshatch (left) and alternate rows (right) with re-established crested wheatgrass, 2017.

