



Paradox Resources LLC,

8/20/2020

Weed mitigation-

Paradox Resources will be deferring to the mitigation plan established by the Colorado State University Extension's plan on noxious weed mitigation, specifically the management plan for diffuse and spotted knapweed. Please see attached documentation with highlighted herbicide per acre. All paradox field staff will also receive training on early detection and management of invasive species to ensure that staff are frontline to noxious weed prevention on Paradox sites. Paradox will follow the CSU weed mitigation plan for both spring and summer protocols to establish a well-managed weed mitigation routine and prevent infestations. Paradox will be consulting with local experts to ensure plan is followed and successful and will be receiving training on early detection and mitigation from CSU and the San Miguel County Weed Manager.

<https://extension.colostate.edu/topic-areas/natural-resources/diffuse-and-spotted-knapweed-3-110/>

CSU EXTENSION DIFFUSE AND SPOTTED KNAPWEED.

Management

Diffuse and spotted knapweed can be managed similarly. They are readily controlled with herbicides. However, the weeds will reinvade unless cultural techniques are used.

Chemical control. Research conducted at Colorado State University indicates that Tordon 22K (picloram), Milestone (aminopyralid), Transline (clopyralid), Curtail (clopyralid + 2,4-D), or Banvel/Vanquish/Clarity (dicamba) control diffuse knapweed. Tank mixes of Banvel/Vanquish/Clarity plus 2,4-D at 1 pt + 2 pt/A or Banvel/Vanquish/Clarity control diffuse knapweed. Refer to Table 1 for rate and timing recommendations.

Herbicide	Rate (Product/A)	Application timing	Comments
Tordon	1 to 2 pints	Spring at rosette to mid-bolt growth stages; or fall	Use higher rates for older or dense stands

Milestone	5 to 7 fl oz	Spring at rosette to bolting growth stages; or fall	Use higher rate for older or dense stands
Transline	0.67 to 1.33 pints	Spring after all shoots have emerged, rosette to early bud growth stages; or fall	Use higher rate for older or dense stands
Curtail	2 to 3 quarts	Spring after all shoots have emerged, rosette to early bud growth stages; or fall	Use higher rate for older or dense stands
Banvel, Vanquish, or Clarity (dicamba)	1 to 2 pints	Spring rosette growth stage; or in fall	Use higher rate for older or dense stands



Figure 5. Spotted knapweed flowers; note dark-tipped bracts and lack of long terminal spine on



Figure 6. Diffuse knapweed on left, spotted knapweed on right.

Tank mixes of Banvel/Vanquish/Clarity plus 2,4-D at 1 pint + 2 pints/A or Banvel/Vanquish/Clarity plus Tordon 22K at 1 to 2 pints + 0.5 to 1 pint/A or Tordon plus 2,4-D at 0.75 pint + 2 pints/A all control diffuse knapweed. These tank-mixes may save money and reduce grass injury resulting from higher use rates of a single herbicide. Adding 2,4-D to a tank mix, however, with very selective herbicides such as Tordon, Milestone, or Transline, broadens the spectrum of activity and may result in increased injury to desirable native forbs (broadleaf plants) and shrubs, which are important components of the plant community to resist re-invasion by weedy forbs (broadleaf weeds like diffuse and spotted knapweed).

Spotted knapweed and diffuse knapweed generally occupy the same areas in Colorado, so the same herbicide treatments can be applied. Weed scientists at Montana State University indicate that Tordon controls spotted knapweed for two to three years, but the weed will invade the area unless other management techniques are used. Milestone also is very effective to control spotted knapweed and Transline, Curtail, and Banvel/Vanquish/Clarity also control spotted knapweed and these herbicides too should be coupled with cultural control.



Figure 7. Winter dispersal of tumbling diffuse knapweed caught in pasture fence.