

# Rangeland-Pasture Recommendations

## Diffuse knapweed Identification and Management

Diffuse knapweed (*Centaurea diffusa*) is a non-native biennial forb that reproduces solely by seed. A biennial is a plant that completes its lifecycle within two years. During the first year of growth, diffuse knapweed appears as a rosette in spring or fall. During the second year in mid to late spring – the stem bolts, flowers, sets seed, and the plant dies. Once the plant dries up, it breaks off at ground level and becomes a tumbleweed allowing seeds to be dispersed over long distances. A prolific seed producer, diffuse knapweed can produce up to 18,000 seeds per plant. Therefore, the key to managing this plant is to prevent seed production.



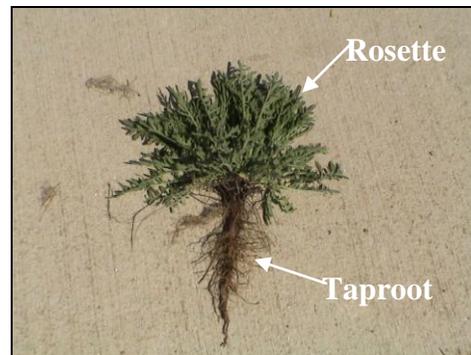
Diffuse knapweed can grow 1 to 3 feet tall, and is diffusely branched above ground. This gives the plant a ball-shaped appearance and tumbleweed mobility when broken off. Leaves are small, and are reduced in size near the flowering heads. Flowers are mostly white, sometimes purple, urn-shaped, and are located on each branch tip. Bracts that enclose the flowerheads are divided like teeth of a comb, and are tipped with a definite slender spine. Upon drying, the bracts become rough,

rendering them injurious to the touch. You can expect to see flowers from July through August. Seed set usually occurs by mid-August.

Diffuse knapweed tends to invade disturbed, overgrazed areas. It may also be found on rangeland, roadsides, riparian areas, and trails. It is a tough competitor on dry sites and rapidly invades and dominates disturbed areas.

Once established, diffuse knapweed outcompetes and reduces the quantity of desirable native species such as perennial grasses. As a result, biodiversity and land values are reduced, and soil erosion is increased.

On the backside of this sheet are diffuse knapweed management recommendations. If you have any questions, please contact the Weld County Public Works Dept., Weed Division at (970) 304-6496, ext. 3770. Please visit our website [www.weldweeds.org](http://www.weldweeds.org).



**Recommended management methods:**

**Cultural** – Establishment of selected, aggressive grasses can be an effective cultural control of diffuse knapweed. Contact your local CSU Extension office or Natural Resources Conservation Service office for seed mix recommendations.

**Mechanical** – Mowing the above-ground portion of the plant, before seed set may be an effective way to reduce seed production. Mowings should be followed by a fall herbicide treatment. Pulling can be effective on smaller infestations, but must be done repeatedly.

**Biological** – Biological control agents, such as the seed head weevil (*Larinus minutus*) and the gall-forming fly (*Urophora affinis*), are two of several species that are effective at controlling large infestations. When used together, these insects provide fair to good control. Expect to wait at least 3 to 5 years for the agents to establish significant populations and achieve optimum management results. Biocontrol agents can be obtained at no charge from the Colorado Department of Agriculture’s Insectary. Please call 970-464-7916 or go to [www.palisadeinsectary.com](http://www.palisadeinsectary.com) for more information.

Diffuse knapweed is more likely to be grazed by sheep. The plants must be green and succulent and the only forage available in order for sheep to graze it.

**Herbicides** – The following are recommendations for herbicides that can be applied to range and pasturelands. Always read, understand, and follow label directions. The herbicide label is the LAW!

Herbicide	Rate	Application Timing/Comments
2,4-D Amine	1 qt./acre or 1 oz/gal water	Spring/fall rosette – before flowering stalk lengthens. DO NOT apply when outside temperatures will exceed 85 degrees. Add non-ionic surfactant @ 0.32 oz/gal water or 1 qt/100 gal water.
Curtail	2 qts./acre or 2.0 oz/gal water	Spring rosette to pre-bud stage and/or fall rosette. Add non-ionic surfactant @ 0.32 oz/gal water or 1 qt/100 gal water.
Clarity	1 qt./acre or 0.75 oz/gal water	Spring rosette – before flowering stalk lengthens and/or late fall treatment of rosettes. DO NOT apply near or under trees and/or shrubs or when outside temperatures will exceed 85 degrees.
Milestone	5 to 7 oz/ acre	Apply to plants in the spring rosette stage and/or to dormant plants in the fall. If the plants are in the bud stage add 2,4-D at 32 oz/acre. It is permissible to treat seasonally dry wetlands and transitional areas between upland and lowland sites. DO NOT rotate to a broadleaf crop within 1 year of application. Add a non-ionic surfactant @ 0.32oz/gal water or 1 qt/100 gal water.



The seedhead gall fly, *Urophora quadrifasciata*, is one of many biocontrol agents available for release to control diffuse knapweed.

## Additional Diffuse Knapweed Non-Chemical Control Information

Diffuse knapweed response to treatments may be impacted by environmental conditions and the type of treatment utilized.



Grazing control: Diffuse knapweed seed production can be reduced when grazed during the bolting stage for 10 days, wait 14 days then graze for an additional 10 days. Although grazing diffuse knapweed can reduce seed production, **grazing can also cause diffuse knapweed to become a short-lived perennial**. When grazing is stopped, populations often return to their former levels.

Pulling or Digging: Pulling or digging requires a commitment of at least 12 years to ensure that removal of new seedlings and re-growth is done before they reestablish. Years one to three of a pulling or digging program will involve intensive removal. During year's four to six, there should be a decrease in diffuse knapweed numbers and the work will be noticeably easier. Pulling or digging of diffuse knapweed is best done in the spring during the rosette or early bud stage, before the flowers appear. Hopefully, the soils will be moist to allow for easier removal. The roots can extend a few feet into the soil. It is important to pull or dig up the entire taproot. Otherwise, the diffuse knapweed may re-grow. Keep in mind that some workers may suffer from allergic reactions while touching diffuse knapweed and inhaling pollen.

Mowing: Diffuse knapweed is persistent. Mowing leaves part of the plant untouched. This part of the plant will still produce flowers. The plant will just be shorter than the mower height and will act more like a perennial plant than a biennial plant. In some cases, diffuse knapweed densities may increase after a single mowing.

Burning or Flaming: Normal fires are typically not long enough or hot enough to destroy diffuse knapweed seeds. A monitored controlled burn can potentially help control diffuse knapweed if the fire has adequate intensity. It is not easy to find good fuel circumstances to carry a continuous fire that will cause significant injury to the diffuse knapweed without hurting the beneficial vegetation occurring in the infestation. Diffuse knapweed



is not very flammable and most areas do not contain enough fuel necessary for the fire. This results in low temperature fires with patchy and irregular burns. Even if the surface area of the plant is killed, diffuse knapweed can often re-grow from its root reserves.

A propane-fueled weed burner can be utilized to quickly burn the foliage of young diffuse knapweed rosettes. The flame sears the plant, raises the temperature of the cells, this causes the cells to rupture. The diffuse knapweed plant will then dehydrate and expire within a few hours. Flaming is done on green plants; not on dead foliage. Plants can be seared at any time before flowering. Flaming can be useful in clearing small areas.