

WATCH OUT *for* Knapweed

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Invasive weeds are non-native plants that invade ecosystems and replace native plants. Noxious weeds are usually invasive and designated by State law as priority plants that require control by landowners. These weeds can reduce grazing land and impact wildlife habitat. Early detection and quick response is critical to slow spread and protect weed-free areas. The purpose of this bulletin is to provide early control methods for spotted, diffuse, and Russian knapweed (*Centaurea maculosa*, *C. diffusa*, and *Acroptilon repens*). Contact your county weed coordinator or Extension agent for management of large infestations.

Spotted knapweed is a taprooted perennial, diffuse knapweed is a taprooted biennial or short-lived perennial, and Russian knapweed is a rhizomatous perennial (all contained in the Sunflower Family). These knapweeds are native to Eurasia and may have been introduced to North America in contaminated seed. They have solitary (spotted and Russian) or clusters of 2 to 3 (diffuse) urn-shaped flowers at the ends of branches. Flowers range from whitish-pink with spines on the bracts (diffuse) to pinkish-purple with spots on the bracts (spotted) to purple with paper-like bracts (Russian). Rosette leaves are lobed and leaves are alternate on mature stems. Mature plants can reach 2 to 4 feet tall with 1 or more stems.

Habitat

The knapweeds typically invade disturbed areas, such as roadsides, waste areas, and pastures. A colony is established and plants invade adjacent undisturbed areas. Russian knapweed reproduces by adventitious buds. This allows rapid spread into closed grasslands, covering a 40 square-foot area within a couple of years. Knapweeds are not restricted to any particular soil but Russian prefers clayey soil and diffuse and spotted prefer light to coarse-textured soils.

Biology and spread

Diffuse and spotted knapweed reproduce solely by seed, producing up to 18,000 and 25,000 seeds per plant, respectively. Seeds can remain viable in the soil up to 8 years. Spotted knapweed plants have an average life span of 3 to 4 years while diffuse knapweed plants usually die after reproduction. The seed heads of diffuse knapweed remain closed until the plant dries up and breaks off at ground level. Dead diffuse knapweed plants act like tumbleweeds, with seeds dispersed over long distances. A Russian knapweed plant can produce up to 1,200 seeds that remain viable in the soil for 2 to 3 years. This weed does

not produce as many seeds as diffuse and spotted knapweed because reproduction is primarily vegetative. Depending on elevation of the site, knapweeds usually flower mid-summer and seed during early fall.

Knapweed seeds are dispersed along roads, railways, and waterways. Seeds can be transported by water, wildlife, livestock, vehicles, and construction equipment. Knapweed seeds are also dispersed to new sites in mud on boots and impure materials like mulch, forage and feed grains, crop and grass seed, top soil, and gravel. Diffuse knapweed seeds spread by tumbling in the wind.



Photo by J. Story

Spotted knapweed impacts rangeland productivity and diversity. It is spreading towards eastern Montana grasslands. Anticipate invasion of this region and locate new plants early as they invade to stop spread. Look for plants along roadsides where it frequently establishes to invade adjacent grasslands.

Early control methods

Young Russian knapweed seedlings may be hand-pulled before an extensive root system develops. Small patches should be treated with an appropriate herbicide. Follow-up applications will be necessary to impact the root system. Diffuse and spotted knapweed can be hand pulled at any growth stage, as long as site or soil conditions permit removal of the entire root crown. New or very small patches can be eradicated through hand pulling, but only if repeated several times per year for as many years as additional plants appear. The first pulling should be in late spring, the second in summer, and the third just before seed production in mid to late July. Small patches are usually more successfully eradicated with herbicide treatments.

Herbicide selection and timing should be advised by your county weed coordinator and application must follow label directions. Applications of 2,4-D alone are not very effective. Roots may rapidly sprout new growth and repeated applications are usually required. But this herbicide may be the only cost-effective choice near water. Effective herbicide treatments on sites distant from surface or ground water follow. Include surfactants to improve herbicide performance.

- Clopyralid + 2,4-D (Curtail®) applied at a rate of 2 to 4 quarts/acre before flowering.
- Clopyralid + triclopyr (Redeem®) applied at a rate of 1 quart/acre during rosette to early flower or to fall regrowth.
- Dicamba (Banvel®) applied at a rate of 1 to 2 pints/acre plus 2,4-D at a rate of 1 quart/acre.
- Picloram (Tordon®) applied at a rate of 1 to 2 pints/acre plus 2,4-D at a rate of 1½ pints/acre for spotted and diffuse knapweed.
- Picloram applied at a rate of 2 to 4 pints/acre plus 2,4-D at 1 quart/acre for Russian knapweed.
- Aminopyralid (Milestone®) applied at a rate of 5 to 7 ounces/acre for spotted and diffuse knapweed during active growth.
- Aminopyralid applied at a rate of 4 to 6 ounces / acre for Russian knapweed during bud to flower stage and dormant plants during fall.

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Photo by S. Dewey (USU)



Photo by C. Roache

The bracts of diffuse knapweed have a rigid, terminal spine with pairs of shorter, lateral spines (above). The bracts of Russian knapweed are papery with a transparent tip (left).

Prevent knapweed spread and colonization by locating and eradicating new plants and patches. The key to eradication is 100% control to prevent reproduction. Prevent invasion by using weed-free mulch, forage and feed grains, crop and grass seed, top soil, and gravel. Monitor sites for new weeds where at-risk material was used. Revegetate disturbed areas with native grasses and maintain healthy and competitive native plant communities. Encourage outdoor users to clean equipment, remain on trails, and report new invasions.