Russian knapweed

Acroptilon repens (L.)

Family: *Asteraceae* (Sunflower).

Other Scientific Names: *Centaurea repens*.

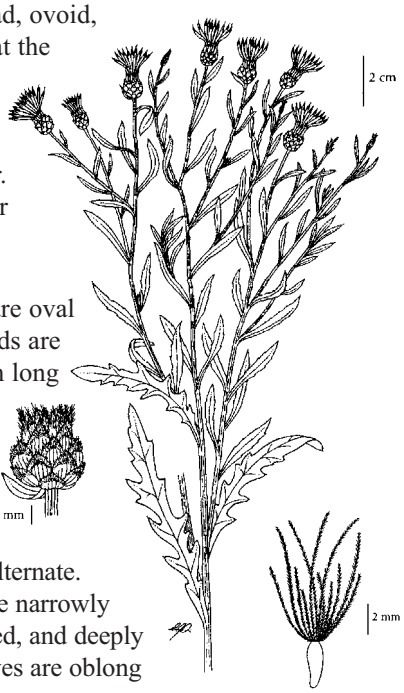
Other Common Names: Turkestan thistle, mountain bluet, creeping knapweed.

Legal Status: Regional Noxious: North Okanagan.

Identification

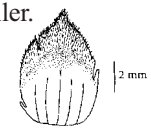
Growth form: Perennial forb.

Flower: The flower heads of Russian knapweed are urn-shaped, solitary, and composed of disk flowers only (Zimmerman 1996). Floral bracts are broad, ovoid, entire, and greenish at the base, with papery, finely hairy edges. Flowers are numerous, all tubular. The petals are pink or purple, turning straw coloured at maturity.



Seeds/Fruit: Seeds are oval and compressed. Seeds are greyish or ivory, with long white bristles (pappus) at the tip when young, but these fall from the seed as it matures.

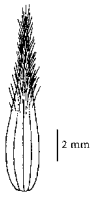
Leaves: Leaves are alternate. Lower stem leaves are narrowly oblong to lance-shaped, and deeply lobed. The upper leaves are oblong and toothed and become progressively smaller. Rosette leaves are lance-shaped, tapering at both ends with the broadest part at the tip.



Stems: Mature plants are 0.45–1.0 m tall. The stems are erect, thin, stiff, branched, and when young are covered with soft, short, grey hair (Zimmerman 1996).

Roots: Russian knapweed's well-developed root system functions as the major means of propagation and spreading. The roots are easily recognizable by their black or dark brown colour and presence of small, alternately arranged scale leaves, which support buds in their axils (Zimmerman 1996).

Seedling: The cotyledons (seed leaves) are oval. The first true leaves are alternate and lanceolate with shallow toothed or smooth edges. The surface of the leaves looks greyish green but is not hairy.



Similar Species

Exotics: Russian knapweed can be distinguished from other knapweeds by the pointed papery tips of the floral bracts.

Natives: Many native members of *Asteraceae* resemble knapweed in the rosette stage.

Impacts

Agricultural: Reduces yield and quality of cereal crops and is toxic to horses. Plant extracts have been shown to be inhibitory to growth of other plants.

Ecological: Russian knapweed forms dense stands that can displace native species and reduce forage production (Whitson 1999). Once established, the plant extends in all directions and can cover an area of 3.6 m^2 within 2 years (Watson 1980). Russian knapweed contains allelopathic compounds that inhibit the growth of competing plants (Stevens 1986). Tests conducted with alfalfa (*Medicago sativa*), barnyard grass (*Echinochloa crusgalli*), and red millet (*Panicum miliaceum*) revealed it inhibited root elongation of grasses and broad-leaved plants by 30% when the polyacetylene compound is at a soil concentration of 4 parts per million (Stevens 1986). This allelopathic effect, combined with dense vegetative reproduction, allows Russian knapweed to colonize and dominate new sites quickly.

Human: No information available.

Habitat and Ecology

General requirements: Russian knapweed occurs in southern BC east of the Coast-Cascade mountains in low- to mid-elevation grasslands and forests. It commonly grows along roadsides, riverbanks, irrigation ditches, pastures, clear-cuts, cropland, and disturbed habitats. It is not restricted to any particular soil but does especially well in clay soils. Selleck (1964) observed that infestations increased in dry locations but decreased in moist locations due to competition with perennial grasses.

Distribution: Russian knapweed is found in the south of the province east of the Coast-Cascade Mountains (Douglas et al. 1998), particularly in warm valley bottoms (Powell et al. 1994). It is considered a major problem in the Okanagan agricultural reporting region and is present in the Kootenay, Okanagan, Thompson, and Peace River areas.

Historical: Introduced from Eurasia, probably as a contaminant in crop seed.

Life cycle: Russian knapweed has an extensive root system and low seed production and is very persistent. It is a strong competitor and can form dense colonies in disturbed areas. Russian knapweed spreads by rhizomes and seed. Shoots emerge early in spring. All shoot development originates from root-borne stem buds (Watson 1980). Buds arise adventitiously at irregular intervals along the roots. Plants form rosettes and bolt in late May to mid-June, depending on locality. The plant flowers from June to October (Zimmerman 1996).

Mode of reproduction: Primarily vegetatively; possibly by seed.

Seed production: A single plant may produce 1,200 seeds/year.

Seed bank: Seeds may remain viable 2–8 years (Carpenter and Murray 1998).

Dispersal: Knapweed seeds are often spread in hay and on vehicle undercarriages.

Hybridization: No information available.

Management

Biocontrol: *Subanguina picridis* (nematode) has been experimented with as a biocontrol agent in BC and Colorado but is not available for general distribution.

Mechanical: Cutting or removal of the above-ground portion of the plant reduces the current-year growth and may eliminate seed production, but it will not kill Russian knapweed. Cutting several times before the plants bolt stresses Russian knapweed plants and forces them to use nutrient reserves stored in the root system. The plants that re-emerge are usually smaller in size and less vigorous. Once plants have bolted, there are no more buds on the roots capable of reproduction until buds begin to form again in mid-August to September.

Fire: No information available.

Herbicides: Picloram is considered the most effective herbicide for Russian knapweed regardless of application time (Duncan 1994). Clopyralid is also effective and has little or no impact on many other forbs. Whitson (1999) found that combinations of picloram, clopyralid, and 2, 4-D were effective for managing Russian knapweed in Wyoming at the bloom or seed stage. Benz et al. (1999) found that clopyralid + 2,4-D treatment of Russian knapweed in the late bloom stage followed by autumn seeding of a bunchgrass and a sod-forming grass was the most effective management method. Consult the most recent edition of BC Ministry of Agriculture, Food and Fisheries Crop Production Guides for specific recommendations. **Before applying herbicides, read the label for full use and precautionary instructions.**

Cultural/Preventive: Maintain perennial native communities, and minimize disturbance and seed distribution.

Integrated Management Summary

A combination of cutting and herbicides can be used to manage Russian knapweed. In the autumn, apply picloram to plants that have re-emerged. Repeated applications may be required for several years to exhaust the soil seed bank. The most effective method of control for Russian knapweed is to prevent its establishment, maintaining vigorous perennial plant communities. Seed disturbed sites to perennial grasses to provide competition.

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