

Spotted, Diffuse, and Squarose knapweeds (*Centaurea sp.*)

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Hand pulling and digging of knapweed infestations has been shown to be an effective treatment method, especially for small infestations and all Diffuse knapweed infestations (CDFA Encycloweedia website, Carpinelli 2003, Dirlik et al 1998, Engeland 1988, Waldo 2001).

Engeland (1988) states that areas of severe knapweed infestation can be best treated using a group of people working a few hours daily over a period of several weeks. This strategy has been effectively used in many areas, but perhaps nowhere as successfully as by the Salmon River Restoration Council (SRRC) and their partnership with the Klamath National Forest. The SRRC is an excellent model to follow for using volunteer labor to effectively remove and eliminate invasive species without herbicides. The SRRC has been winning the war against knapweeds using manual efforts. The SRRC is happy to not only share their model, but also to help teach recruitment and training of workers. SRRC information can be found on the web at <http://www.srrc.org/>.

Using native perennial grasses and forbs is effective for providing competition for knapweed seedlings and prevent spread and reinvasion (Beck 2005, Dirlik et al 1998, Waldo 2001). “A two-year study of four grasses – Paiute orchardgrass, Covar sheep fescue, Critana thickspike wheatgrass, and Ephriam crested wheatgrass – found that the greater the biomass produced by the grass, the more it reduced the number of diffuse knapweed seedlings” (Mauer et al 1987).

Prescribed burns, followed by aggressive re-seeding efforts, can reduce knapweed infestations (CDFA Encycloweedia website, Waldo 2001). Timely mowing is also a feasible control method for knapweeds, as it will reduce seed production (CDFA Encycloweedia website, Mauer et al 1987, Waldo 2001). The same can be said regarding grazing, as goats and sheep have shown to control spotted knapweed (Beck 2005, Carpinelli 2003, Dirlik et al 1998, Waldo 2001).

Many experts recommend the use of biological controls for managing knapweeds. It is feasible for use on larger infestation sites. Several biological control agents have been established in the U.S. to attack knapweeds. Only two, the bronze knapweed root borer (*Spenoptera jugoslavica*) and the banded gall fly (*Urophora affinis*), are currently established, effective, and used for control of diffuse and spotted knapweeds, and both are compatible for dual release (Beck 2005, CDFa Encycloweedia website, Carpinelli 2003, Dirlik et al 1998, Mauer et al 1987, USDA-APHIS 1994). In drier climates, the knapweed flower weevil (*Larinus minutus*) has shown itself to be a very effect control of diffuse and spotted knapweeds in Oregon and Washington (Waldo 2001).

Some experts warn against herbicide use on knapweeds as it only provides temporary control, not preventing germination from seeds in soil, needing long-term re-treatments, and due to the cost being prohibitive for larger infestations (CDFA Encycloweedia website, Mauer et al 1987, USDA-APHIS 1994).

References

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