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Biology and Management of Spotted Knapweed in Michigan

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Spotted Knapweed Ecology

Spotted knapweed (*Centaurea stoebe* subsp. *micranthos*) is an invasive plant native to Southeastern Europe. During the 20th century it spread throughout the western U.S., where it is a major rangeland weed. More recently, it has become increasingly abundant in the Midwestern U.S. In Michigan, it can occur as near-monocultures in disturbed habitats, particularly on well-drained soils. It has also been shown to invade intact native plant communities such as dry prairies, oak-pine barrens, and open dunes.

Spotted knapweed in flower. Photo courtesy Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

The presence of spotted knapweed can reduce native plant diversity, which in turn impacts wildlife and ecosystem functioning. Infestations of knapweed can increase runoff and soil erosion, which could potentially impact water quality. Spotted knapweed does, however, provide an important source of nectar and pollen for honey bees. For this reason, it is important that control of knapweed in Michigan happens in conjunction with the restoration of native nectar-producing plants. For more information see: Native Plants and Ecosystem Services

Spotted knapweed rosette. Photo courtesy Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Description

The invasive form of spotted knapweed is a short-lived perennial plant. During its first year, it forms a short rosette of deeply lobed basal leaves. In years following, it sends up a taller flowering stalk, ranging from 6 to 36 inches in height. The flowers are pink to purple in color. Beneath each flower is a head with dark spots, from which the plant gets its name. Knapweed seeds cannot blow more than a few meters from the plant, so they rely on animals, people, or vehicles to travel long distances.

Control Methods

Prevention: The most effective method of control is to remove early colonizing individuals before they can set seed by and pulling and/or spot spraying of herbicides. See the Midwest Invasive Species Information Network for more information on how to report spotted knapweed outbreaks near you.

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Cultural: Mowing can be an effective method of controlling spotted knapweed. It is important that the plants are cut while they are flowering, but before they have a chance to produce seed. Prescribed fire can kill adult plants, reduce the number of viable seeds in the seedbank and help establish native plants that are adapted to fire. Burning in mid to late spring is the most effective. However, knapweed alone does not carry fire well, so seeding with grasses prior to burning can be helpful. Grazing with sheep and goats has been shown to reduce knapweed but can also limit establishment of desirable species.

Chemical: Several herbicides[1] are available for control of spotted knapweed in different situations. Each of the following herbicides target broadleaf plants but they have varying levels of selectivity and differing use restrictions. Consult the label before purchasing or applying any herbicide Where knapweed occurs in stands with desirable vegetation consider the use of more selective herbicides containing the active ingredient clopyralid (sold under the trade names Transline, Curtail) or aminopyralyid (Milestone SH). Where less selective control is required consider use of 2,4-D, dicamba (Banvel) or picloram (Tordon).

Lesser knapweed flower weevil, *Larinus minutus*. Photo courtesy Laura Parsons, University of Idaho, PSES, Bugwood.org

Biological Control: Five species of insects have been introduced into Michigan for biological control of spotted knapweed. The seedhead flies (*Urophora affinis, U. quadrifasciata*) were introduced in the 1980's and cause damage to the developing seeds. Since 2007, two flower weevils (*Larinus minutus, Larinus obtusus*) were introduced that eat developing seeds as larvae and feed on stems and leaves as adults. The last is a root boring weevil that feeds on the roots and vegetation of knapweeds (*Cyphocleonus achates*). All have been extensively tested to assure host specificity.

References

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Knapweed root weevil, *Cyphlocleonus achates*. Photo courtesy Laura Parsons, University of Idaho, PSES, Bugwood.org

[1] Reference to commercial products or trade names does not imply endorsement by MSU Extension or bias against those not mentioned.