



"Driven to Excellence"

## Spotted Knapweed (*Centaurea stoebe*) Biological Control

A biological control can be an effective component of an integrated vegetation management strategy. To accomplish this, the target plant is reunited with its natural insect controls which reduces the invasive species population.

Spotted knapweed can colonize vast acreages by outcompeting native species by exuding a toxic chemical from its roots. Infestations of spotted knapweed can decrease forage, wildlife habitat, plant diversity, and recreational quality. Spotted knapweed is native to Eurasia and lacks insects and diseases in North America that can naturally keep this species in check. After extensive tests, Seedhead weevils (*Larinus minutus* and *Larinus obtusus*) and Root boring weevils (*Cyphocleonus achates*) were found to be an effective biological control for spotted knapweed.

### Seedhead weevils

Seedhead weevils lay their eggs in knapweed flowers and the larvae consume the developing spotted knapweed seed. Adult seedhead weevils overwinter in the plant litter on the ground at the base of spotted knapweed plants. In the late spring and early summer, adults emerge to feed on the foliage, mate and lay their eggs in the knapweed flowerhead. The eggs hatch in three days and the larvae consume the material in the seedhead for about four weeks. Then the adults pupate and emerge to feed on foliage before burrowing in their overwintering sites.



(Minnesota Department of Agriculture)



(Minnesota Department of Agriculture)

### Root boring weevils

Root boring weevils are highly effective biological control agents because they weaken or kill existing knapweed plants. From mid-summer through early fall, adult females lay eggs on the soil surface at the base of knapweed plants. After hatching, the larvae burrow into the roots where they feed and develop over the winter, spring, and early summer. The developing larvae in the roots use precious plant resources and damage the roots. As a result, the plant is weakened or killed. Adults will emerge from the damaged roots in the mid to late summer to feed on the foliage, mate, and start the cycle again.

# Spotted Knapweed (*Centaurea stoebe*) Biological Control

Using a biocontrol for spotted knapweed management

1. Assess the site. An infestation of spotted knapweed needs to be approximately 1 acre or larger. Sites should not be disturbed or mowed.
2. Obtain weevils. Weevils are free to obtain from the County Agricultural Inspector (CAI) or the Minnesota Department of Agriculture (MDA). Seedhead weevils are widely distributed in Minnesota, so they are only released at sites where they are not already present. Root weevils are collected and distributed from July through early September.
3. Release weevils. Document the site before the release with a picture and where the weevils were released on site.
4. Monitor the site. Changes in the site will not be immediate. Monitor the site for seedhead weevils in July and root weevils in July-September, although root weevils can be hard to spot. It takes years for the population of spotted knapweed to decrease substantially. Report progress to the CAI or MDA.



Rock Leaf Water Environmental can:

- Assess sites for the presence of spotted knapweed
- Assess if invaded sites would be a good fit for biological control
- Communicate with CAI and/or MDA to acquire weevils
- Release weevils
- Monitor release sites for the presence/absence of weevils
- Monitor spotted knapweed populations over time
- Communicate progress with CAI and MDA

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