

How to Evaluate and Introduce Noxious Weed Biological Controls (Bugs) in Montana



Cyphocleonus achates

Root-boring Weevil

Internet photo by Steve Van Vleet

This guide is developed from the Newmont North America Exploration Limited experience in forming a biological weed control program for spotted knapweed in Lewis and Clark County. This guide is shared as information only to help others in evaluating if biocontrol makes sense on your project site, and if so, how to put a program together to introduce weed destroying bugs to your site.



Step 1: Identify your target weed

The first concern is to correctly identify the target weed and to ensure the density of the weed in that location. Some weeds, especially of the knapweed family, are very similar in growth pattern, flower and structure. While some potential predators of the knapweed will feed on various species of knapweed, others are **very** host specific. A good site should contain a dense, healthy community of mature weeds to provide a consistent food source and habitat for the various stages of the host specific insect. Generally speaking, a site that has the ability to grow a healthy crop of weeds will be a good site for a release. Since biological control is essentially in its infancy (approximately 20 years), little is known as to cold tolerance, specific elevation caps, and other climate controls for the particular insects at your release site.



Step 2: Determine which bug species to introduce and how to acquire your bugs

To determine which species to introduce, call an expert and discuss your target weed, the density of the target and the climate at the target location. You are encouraged to place a call

to Jim Story at the Western Ag Research Station (see contact number below). Jim is the foremost expert in Montana with over 30 years of experience in researching biological agent controls. Other good sources of information are your local County Weed Boards, Montana Department of Agriculture, Montana Department of Natural Resources and Conservation, and the United States Department of Agriculture- APHIS Department. In addition to the gathering of information, these and other agencies listed below are potential sources to either purchase or acquire insects for your program:

Public Agencies

- Western Ag Research Center (Corvallis, MT), Linda White (406) 961-3025
- Montana Department of Agriculture (Helena, MT), Tonda Moon (406) 444-5400
- MSU Extension coordinator (Helena, MT), Dave Burch (406) 447-8372
- USDA APHIS Department (Helena, MT), Jay Cole (406) 449-5210
- Lewis & Clark County Weed Board (Helena, MT), Larry Hoffman (406-8372)
- Montana DNRC (Helena, MT), Dan Dobler 444-9726

High School Insectaries

- Augusta High School (Augusta, MT), Katy Meyers (406) 498- 5236
- Whitehall High School (Whitehall, MT), Todd Breitenfeldt (406) 287-3862

Wholesale and Retail Sales

- Weedbusters Biocontrol, Missoula, MT (800) 289- 6656
- Planet Natural, Bozeman, MT (406) 251- 4261



Step 3: Target preparation

Plan the release according to the advice of the experts according to the plant type, health of the plant and last chemical control application. This may require you to wait a year from the last chemical application. The maturity of your target plant (juvenile plant or adult plant) does not dictate the release date to introduce the insects. The release date is dictated by the maturity of the insects to be introduced. Only adult insects are introduced, and they can be introduced to new target plants before bloom, full bloom, or after the bloom. The maturity of the insects therefore determines which season to release the bugs: spring, summer or fall. A release in the middle of a Montana winter is likely a no-go.



Step 4: Bug shipment and release

Transporting of your adult insects can be a primary source of failure. They should be shipped express and in a dry chilled cooler. Attention needs to be made to prevent drowning or heat exhaustion. The insects need to be released as soon as practical (preferably the day of receipt) and according to the instructions of the insectaries. In the case of the root-boring weevil for spotted knapweed, the ideal release would be accomplished on a sunny and warm afternoon. Releases should all be made within a small radius of a marked release point. The close spaced release encourages competition for a host plant and helps the insects to easily locate a mate and to complete their annual life cycle.



Step 4. Marking your release point

Ensure you release point is marked so you can measure success of your release. Put a post in the ground, paint a rock, or place another obvious indicator for your site. Try not to use a small shrub or 'middle of the field' approximation for this important spot or something that will walk away.



Step 5. Monitor your bugs and share your story

Monitoring is a key component of any successful biological program. Direction of migration, efficacy and insect densities for potential future harvesting and relocation can be derived from adequate monitoring procedures. The monitoring procedure to be used for spotted knapweed control near Lincoln for monitoring of the root boring weevil and the lesser flower(seed head) weevil are based on four transects, beginning at the previously marked release point and extending out sixty feet along the cardinal points of the compass. A portable quadrant, built from PVC pipe (1/2 inch or 3/4 inch diameter), one foot by two feet, will be used to delineate the monitoring area within the micro plot. Sampling distances will be at ten foot intervals along each transect, however this can be tightened up to suite the samplers needs. This would also be an opportune time to monitor vegetation to determine the quantitative rate of reduction of the target weed species and return rate of native grasses, forbs and shrubs. Monitoring efforts should coincide within the ten week adult stage of insects, generally occurring from mid June to

mid September. During this time, both male and females are on or near the flower of the host plant, actively searching for a mate and are easily visible for your monitoring pleasure. Collected sampling data should be recorded during each sampling session. A sample monitoring log is included as a guide.

Numerous resources are available to initiate a successful biological control program; Montana State University along with associated extension agencies, Montana Department of Agriculture, Montana Department of Natural Resources and Conservation and USDA APHIS Departments. These resources have been very generous with their time and sharing research data. The Montana Weed Control Association, a state wide organization is also an exceptional resource providing annual meetings covering such topics as biological controls, successes and failures of state wide programs, new invaders and noxious weed identification. Definitely, a must do, for any noxious weed control coordinator.

Good luck with your biological control program and feel free to “bug” us after the presentation.

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