

Implementing a Bio-control Program for Leafy Spurge

About bio-control

Bio-control uses the natural enemies of leafy spurge (*Euphorbia esula*) to control and reduce its population. In Manitoba, the flea beetles of the *Aphthona* genus have shown the most success in controlling leafy spurge. It is the *Aphthona* larvae that do the most damage by feeding on the roots of leafy spurge plants, causing them to weaken and become more susceptible to other controlling agents such as disease, grazing and herbicides. Bio-control is useful in areas where landowners may be limited by the type of control (e.g. herbicides).

The most effective beetle for you

In Manitoba, effective leafy spurge flea beetles include the black spurge beetle (*A. lacertosa*), the brown dot spurge beetle (*A. cyparissiae*) and the black dot spurge beetle (*A. nigriscutis*). The black dot and brown dot spurge beetles are nearly indistinguishable and have similar site requirements. They prefer full sun and do well in sandy-loam soils. Releasing them in areas containing green needle grass is a good indicator of a suitable release site. The black spurge beetle prefers heavier clay-loam soils and will tolerate some shade and moisture.

Collect and release

Look for beetles between 10:00 and 6:00 on warm to hot sunny days with little wind. Flea beetles like to perch on grass and spurge in the sunlight. Use a standard sweep net to sweep the top half of the vegetation to capture them. If you can collect two or more flea beetles per sweep, you can harvest the site.



A. nigriscutis



A. lacertosa

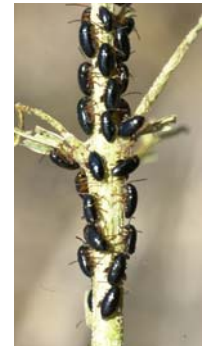
The beetles start to emerge around the third week of June and disappear by the beginning of August. You will want to harvest the beetles before mid-July in order to ensure you collect them before the females lay their eggs. Release your beetles as soon as possible, preferably the same day as they were collected. If you are just going a short distance, transport them in your sweep net. Otherwise, pack them in paper or cardboard containers 1/3 to 1/2 filled with leafy spurge vegetation. Seal them with tape and place them in a cooler containing ice. Take care that the containers do not become wet, or come in direct contact with the ice. Keep the beetles at 4 to 7°C (40 to 45°F) until you can release them.

A minimum of 1,000 beetles is recommended per release, more if they are available. Proper site selection is critical. Choose an area in full sun, avoiding sites that collect moisture or have a tendency to flood in the spring. South-facing slopes make ideal release points. Release them in a group towards the edge of moderately dense leafy spurge infestations (approximately 60-90 stems per square metre); do not sprinkle them through the patch. Given time, the beetles will move their way into the more heavily infested areas.

Monitoring

Remember to monitor your release sites every year. It does not take much time, and if you get a population explosion, you will want to take advantage of it to move your beetles to new sites.

Look for a “halo” of thinning or dead canes, stunted leafy spurge plants and delayed flowering around the release site. This is symptomatic of larval activity and indicates establishment of your populations. As well, beetles should be visible on the plants.



A. lacertosa on leafy spurge stem

Integrated Pest Management (IPM)

It is important to note that biological control is slow and may not work for everyone. It may be several years before you see any effects. Also, while the flea beetles will help reduce the density of the leafy spurge at the site, they will not eradicate it. You will want to contain and control the leafy spurge while the beetles establish themselves. Using IPM techniques will allow you to complement the work being done by the flea beetles.

Careful herbicide application helps to contain leafy spurge around the site perimeter. Beetles can also be combined with a managed, or multi-species grazing program, as long as the sheep or goats leave enough leafy spurge for the adult beetles to feed upon.

Resources

Leafy Spurge Stakeholders Group: <http://www.brandonu.ca/rdi/leafyspurge.html>

Team Leafy Spurge: <http://www.team.ars.usda.gov/>

Local Weed Supervisor

Local MAFRI Office

Multi-Species Grazing of Leafy Spurge

Benefits of multi-species grazing

Multi-species grazing is the practice of using two or more livestock species in the same grazing system. Where cattle and horses will not consume leafy spurge (*Euphorbia esula*), sheep and goats will. Sheep or goats can be added to an existing herd without large reductions in cattle or horse stocking rates as the different animals use different forage resources in the pasture. Goats will preferentially graze leafy spurge, while sheep will graze it after becoming accustomed to its taste. Sheep overlap the diet of cattle by 20 to 40%, and goats overlap by only 5 to 20%.

With proper management, in 3 to 5 years, leafy spurge can be reduced by as much as 90%. *Implementing grazing is the only control that is revenue-neutral or even revenue generating.*

Stocking rates

Studies have shown that continuous grazing will give the quickest reduction in leafy spurge, although rotational grazing is also effective. Stocking rates will depend upon:

- Length of grazing season
- How much you are willing to reduce your cattle or horse herd
- Amount of bush (sheep and goats will make up a good portion of their diet in woody browse if it is available)
- Amount of leafy spurge in the pasture

A good place to start would be from 1 to 3 infested acres per sheep or goat. Stocking rates should be based on actual infested acreage rather than on total pasture size to minimize grass consumption by sheep. As leafy spurge decreases, the number of sheep or goats will also need to be decreased as they will start to overlap the diet of your cattle or horses.

Fencing

Thoroughly research the variety and prices of fencing, as it will likely be one of your biggest investments. Existing cattle fencing will have to be modified to hold sheep or goats. Types of fencing to consider include closely spaced barbed wire, electric fencing, woven wire, and high-tensile fencing. Each variety has its advantages, so the fencing investment will depend on your needs. Doing it right the first time will save you the trouble and cost of “patch jobs” later.

Predator control

Guardian dogs, llamas and donkeys have all been effectively used as guard animals against predators. These animals live full-time with the herd or flock to head off any attacks and are well worth the investment. Other options may include the use of full time herders who live at the site in the summer.

If you aren't willing to buy your own...

Look for a producer who will rent or lease his or her livestock. If you are lucky, you may even find someone willing to provide sheep or goats free for the summer. There are benefits for both parties, as the sheep or goat producer gets forage for the livestock, and you get leafy spurge control.

IPM

Multi-species grazing is an excellent tool to combine with other management tools such as biological control or herbicides. Research has shown that using a combination of herbicides and grazing produces better results than either alone. For example, animals may be grazed from mid-May to mid-August, and then removed to allow some re-growth of the spurge before it is sprayed.

Resources

Manitoba Sheep Association: www.mbsheep.ca/

Manitoba Goat Association: www.manitobagoats.ca

Team Leafy Spurge: www.team.ars.usda.gov/

Local MAFRI Office



Cattle and goats



Sheep grazing leafy spurge