



## Managing Leafy Spurge Flea Beetle Releases in South Dakota

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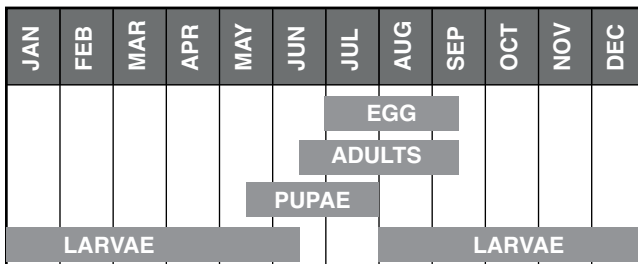
The leafy spurge flea beetle (*Aphthona* species) has been an effective means of controlling leafy spurge in South Dakota since the mid-1980s. Of the six *Aphthona* flea beetle species approved and released for controlling leafy spurge, only the *A. nigricutis* and *A. lacertosa* have had significant effect. This group of flea beetles are host-specific to the leafy spurge plant, thereby making them an ideal biological control choice. The flea beetles typically take 3 to 5 years to establish and impact leafy spurge infestations. Once established, the adult flea beetles can be collected with sweep nets and moved to other leafy spurge infestations.

The leafy spurge flea beetle has a one-year life cycle. Adults will emerge from the soil in early- to mid-June. These adults will live for about 45 to 65 days, at which time they mate and the females lay eggs. Although adults feed on the leaves and stems of the leafy spurge plants, it is the newly hatched larvae feeding on roots and root hairs that do the most damage. Larvae hatch about 14 to 19 days after the eggs are laid. The larvae will then spend the rest of the summer and early fall feeding on the leafy spurge root system.

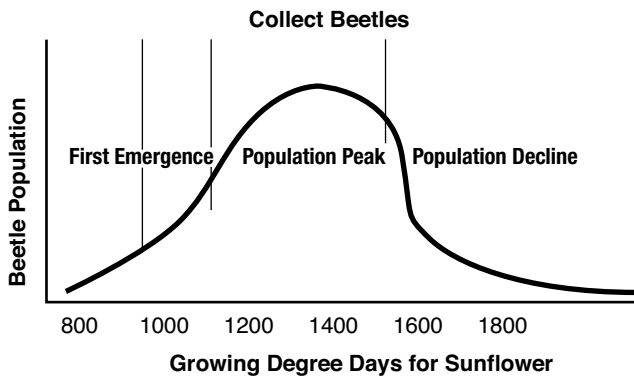
Soil type and texture has a lot to do with the success of a flea beetle release. Flea beetles prefer clay- and loam-type soils. The leafy spurge roots tend to be concentrated close to the soil surface. Sandy soils tend to prevent the plant from forming shallow roots, which are more favorable and accessible to newly hatched larvae. In areas of the state that have sandy soils, it may take more patience to get a successful release site established. As the larvae develop, they do move deeper into the soil to feed on the larger root buds and newly developing shoots. Another site selection point to consider is to release in areas that are well drained and are not prone to standing water or flooding. Also consider southern slopes, as flea beetles are sun-loving insects. *A. lacertosa* or the black flea beetle can tolerate some shade and relatively moist conditions. Leafy spurge density contributes to release site success. A spurge density of 60–90 stems per square yard is needed to support a release of 1500 to 3000 flea beetles.

The flea beetle larvae overwinter in its final larval stage and remain dormant until early spring. The larvae pupate for a 1- to 2-week period and emerge as an adult, starting the cycle over as a new generation. Adult emergence is dependant on heat units. North Dakota State University has developed a graph that can be used to predict adult emergence using the growing degree day (AGDD) units for sunflower. The (AGDD) is based on 44°F.

Flea Beetle Life Cycle



Collection of the flea beetles can begin as soon as the adults are detected on the spurge plants. Collection should be completed before about mid-July in order to prevent the disturbance of the females that may have already laid their eggs.



- Scout when AGDD approaches 1000
- Collect at about 1200
- Female egg laying begins to decline at 1600

The release site needs to be managed. The most critical period to keep disturbances at a minimum is during the adult-mating and egg-laying stage of the life cycle. Pastures certainly can be grazed before or after this critical period. When a site has a release, the area should have a border treatment of an herbicide to keep the leafy spurge infesta-

tion from spreading. The combination of bio-control and herbicides can be used as long as the herbicide treatment is in the fall and works with the life cycle of the insect for the least amount of disturbance. Do not use insecticides in or around the flea beetle release area.

Always remember to mark your new release site. Steel posts work well, or take a GPS reading so the site can be monitored. Taking a before-and-after photo is a good idea to document the success of a release.

Monitoring a site will enable you to determine if the flea beetle release is established and successful. Watch for larval activity on the leafy spurge plants. The most noticeable will be dead plant canes and the formation of dead spurge plant circles or craters. You should also see adult activity in June and July. If you can sweep the release area and get 1 to 2 adults per sweep or 500 adults in five minutes of sweeping, you should have a viable release area.

Leafy spurge flea beetles can be acquired through organized county or state collection days. Information about these collection efforts can be obtained through the South Dakota Department of Agriculture or the local County Weed and Pest Program.

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