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A LITTLE BIT COUNTRY
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Flea Beetle Offers Alternative to Leafy Spurge Control

Although leafy spurge has lost its status as the number one weed threat in North Dakota to Canada thistle, it remains a serious impediment to the livestock sector of the state's agricultural economy. Although herbicides are effective, they are often not cost effective. In fact, approximately 40 percent of the leafy spurge infested rangeland has a carrying capacity below the herbicide cost break-even point. Thus all areas of the state, including Williams County, have turned to using biological agents as an alternative.

Biological control of leafy spurge was initiated in the mid 1980's. To date, 12 species of insects have been released in North Dakota for control of leafy spurge, and eight have become established. Five of the eight established insects are flea beetles, which have reduced the leafy spurge density more than any other agent.

The first flea beetle released was *Aphthona flava* in 1986. This flea beetle has established only at a few sites in the state and occurs at densities too low to be effective. In 1988, a mixed population of *Aphthona czwalinae* and *Aphthona lacertosa* were released near Valley City. By 1995, the majority (greater than 90 percent) of this mixed population was *A. lacertosa* and will be referred to as such. Two additional flea beetles, *Aphthona cyparissiae* and *Aphthona nigrisctis*, were released the following year. *Aphthona abdominalis* was released in 1992 but has not yet contributed to leafy spurge control in the state. *A. lacertosa* and *A. nigriscitis* were established in almost every county in North Dakota by 1996 and have become the major biocontrol agents used for leafy spurge control.

Adults mate and feed on leafy spurge tissue while the larvae do most of the damage by feeding on the roots,

Research at North Dakota State University found flea beetle establishment was best on silt loam, silt clay loam, clay loan, clay soils with an organic matter content of 6 to 9.5 percent. Flea beetles were least productive in fine sand to loamy fine sand soils with an organic matter content of 1 to 3 percent. In addition, the release area needs to be well drained and not subject to frequent prolonged flooding or standing water, which will kill the larvae.

Initial releases have been most successful on south-facing slopes, although good success has been achieved on western and eastern slopes as well. On north facing slopes, *Aphthona* spp. requires a longer period to establish at high enough numbers to control leafy spurge. Flea beetles establish best in moderate densities of leafy spurge (60 to 90 stems per square yard) with minimal grass cover and thatch. Establishment in dense leafy spurge stands is often difficult.

Although *Aphthona* adults feed on leafy spurge foliage, the major damage to the plant occurs when the larvae feed on the roots.

The adult flea beetles are generally collected and redistributed from mid June to early July. Total accumulated growing degree day (AGDD) for sunflower can be used as a guide to determine when to begin scouting for adult flea beetles. The adults need to be relocated to new sites before egg laying by females begins to decline. This is about the time when AGDD reaches 1600 or more.

Over the years the Williams County Weed Board has been active in establishing nursery sites. When possible, it has allowed landowners to draw from these locations to establish new breeding areas.

Unlike herbicides, flea beetles do not provide predictable, consistent levels of control. It may take several years to establish populations high enough to severely reduce leafy spurge plant density.