

Lygus Bugs

in sugarbeets

Mark Boetel, Research and Extension Entomologist
NDSU Department of Entomology

Phillip Glogoza, Extension Specialist
University of Minnesota Extension Service

Justin Knott, Plant Protection Specialist
North Dakota Department of Agriculture



▲ **Figure 1. Adult tarnished plant bug on sugarbeet leaf.**

Lygus bugs have long been recognized as pests of sugarbeets grown for seed production in North America. Three lygus bug species, the tarnished plant bug (*Lygus lineolaris*), pale legume bug (*Lygus elisus*) and Western tarnished plant bug (*Lygus hesperus*), have been documented as injuring beets grown for sugar processing. Damaging infestations of tarnished plant bug (TPB) first were observed in eastern North Dakota and western Minnesota sugarbeet fields in 1998. Since then, the insect has caused economic losses for many area producers due to yield reductions and control costs.

Description

Adult TPB (Figure 1) are about 0.25 inch long and half as wide. Their flattened bodies are tapered slightly toward the head and more so toward the hind end. They have a pair of long, tapered antennae, slightly protruding eyes and a four-segmented needlelike beak. Body colors vary from tan or pale green to mottled reddish brown or dark brown. Adults have a prominent triangular plate on their backs between the wing bases. Two sides of the triangle are yellowish white, giving adults a characteristic V-shaped marking on their backs.

Lygus nymphs (Figure 2) are pale to yellow green and very small (only 0.04 inch long) during the first few days after hatching. Older nymphs are larger (0.06 to 0.20 inch) and usually bright green. Last-stage nymphs can be mottled and occasionally more tan. Lygus nymphs often are mistaken for aphids due to their color and rounded body shape. Up to four black spots appear on their backs as they progress through later development stages. A centrally located scent gland opening, which looks like a spot, is on the back of the abdomen in all lygus nymphs. The scent gland and spots help confirm that they are lygus bugs. Nymphs can move quickly on the plant. They sometimes drop to the ground beneath the sugarbeet canopy when disturbed, making identification and counting difficult.

Biology and Life History

Lygus bugs overwinter as adults in leaf litter and other plant debris in field margins, shelterbelts, ditch banks, fence rows and other protected areas. Rising spring temperatures prompt the adults to become active in mid-April to late May, and mating occurs soon thereafter. Females lay eggs by inserting them in petioles and stems of actively growing plants (mostly weeds in the spring). Eggs hatch into tiny nymphs in one to three weeks, depending on air temperatures. This begins the first true generation of the season. Nymphs cannot fly. They usually remain on the plants from which they hatched. Nymphs feed on plants and develop through five instars before turning into adults. In North Dakota and Minnesota, lygus bugs typically take four



◀ **Figure 2. Newly hatched and late-instar lygus nymphs.**

to six weeks to complete a generation and produce two to three generations per year. Adults are mobile and readily take flight when disturbed. Their mobility allows for short-range movement within fields and longer, field-to-field flights. Adults are quick to move from a field to find a more suitable host for feeding and egg laying when the original habitat becomes unsuitable due to stress or injury (from flooding, drought or frost), or as host plants dry down after reaching physiological maturity.

More than 300 plant species, including several weeds and about 50 cultivated crops, can serve as lygus bug hosts. Weeds in North Dakota and Minnesota sugarbeet production areas that commonly harbor lygus bugs include redroot pigweed, common lambsquarters and kochia.

Third-generation lygus adults typically infest sugarbeet fields late in the growing season (mid- to late August) after a reservoir host crop (such as alfalfa or canola) is harvested or other hosts become less suitable for feeding. Sugarbeet fields adjacent to these hosts can be at elevated risk for lygus infestation. Extended periods of warm,

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dry weather also can lead to lygus population increases and subsequent movement of adults into sugarbeet fields.

Damage

Adults and nymphs damage sugarbeet plants by feeding on petioles of new and emerging leaves near the crown with piercing-sucking mouthparts. Feeding begins with the insects injecting plant-toxic saliva that “pre-digests” plant tissue. They then suck up the resulting fluid and plant sap. Females also damage plants by depositing eggs in petioles.

Plant Injury and Symptoms

Symptoms of recent feeding injury include new leaves wilting and curling, and blackened exudate seeping from feeding sites on leaves and petioles (Figure 3).

Occasional leaf tip yellowing and browning (Figure 4.) appears to be an indirect result of lygus feeding injury. Often only a few plants in a field will show this symptom. Frequency of its occurrence may be variety-specific.

Older feeding sites appear as raised necrotic scars as shown (Figure 5). Yield impact is believed to be largely due to late-season development of new leaves from crowns in response to feeding injury. Carbohydrates are depleted from storage roots to produce new leaves, resulting in stored sucrose reductions.

Management

Cultural practices: Effective management of small-seeded broadleaf weeds from early spring to midsummer may help reduce lygus buildups. Burning weedy field margins and roadside ditches in the fall may help because it destroys lygus overwintering sites.

Chemical control: Foliar insecticides are the most common tool to manage lygus bugs in sugarbeets. Insecticide preharvest intervals require careful consideration because these pests

▶ **Figure 3. Lygus injury to petioles and new growth with leaf curling and seepage of black exudate.**



▲ **Figure 4. Leaf tip yellowing and necrosis following lygus bug feeding injury to sugarbeet petioles.**



▲ **Figure 5. Healed lygus feeding scar on sugarbeet petiole.**

typically infest beets late in the season. Use caution when tank mixing foliar insecticides with certain fungicides labeled to control cercospora leaf spot because of the potential for crop injury and significant yield loss with some combinations.

Scouting: Careful field scouting helps determine the need for an insecticide application. Scouting involves randomly selecting and examining plants from top to bottom, including the ground surface immediately below the canopy. Adults usually will be on outer leaves. Most nymphs will be on newer leaves and petioles, especially near the crown. Lygus adults that leave a plant selected for sampling should be included in counts if they are positively identified. At least 50 to 100 plants should be sampled in a field to estimate an infestation, although more samples per unit area will provide a more accurate assessment. Sampling should represent the whole field and not just field edges.

Treatment threshold: Treatment with an insecticide is advisable if the infestation exceeds one TPB per plant (nymphs or adults) and if the field is three weeks or more from harvest. Insecticide recommendations are available in the “Insect Control” section of the Sugarbeet Production Guide or the North Dakota Field Crop Insect Management Guide (publication E-1143). Both are available at county Extension offices or the NDSU Agriculture Communication office. Online versions of these resources are at www.sbreb.org/Production/production.htm and www.ext.nodak.edu/extpubs/plantsci/pests/e1143w1.htm.

Photo credits: Jack Kelly Clark and UC Statewide IPM Program (Fig. 2.), Mark Boetel (Fig. 3), Justin Knott (Fig. 4), and Robert Dregseth (Fig. 5).

Reference: Knott, J.O. 2005. Bionomics of the tarnished plant bug in the northern Great Plains. M.S. Thesis. North Dakota State University, Fargo. 68 pp.

For more information on this and other topics, see: www.ag.ndsu.edu



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