

Lygus: Various Species Monitoring Protocol

Host Plants:

A wide range of hosts including alfalfa, canola, lentils, potato, strawberries, flax, vegetable crops, fruit trees and weeds such as stinkweed, wild mustard and lamb's-quarters.

Identification, Life Cycle and Damage:

Adult: In western Canada, four species *Lygus lineolaris* (tarnish plant bug), *L. borealis*, *L. elisus* and *L. keltoni* have been observed. Tarnish plant bug is the most economically important lygus bugs on the prairies (Figure 1). Adults are about 5 mm long and 2.5 mm wide. They vary in color from pale green to reddish brown and have a distinct triangle or “V” shaped mark on the back. Adult lygus bugs overwinter under litter, debris or plant cover in shelterbeds, headlands and field margins. In the spring adults become active and feed on early-growing plants. They mate and move to crops for feeding and egg laying.

They start laying eggs mid May in southern prairies and in mid June in the Peace river region. Eggs are inserted individually into the stems and leaves of host plants. Egg laying usually lasts 3 weeks but may continue for up to 7 weeks.



Figure 1: *L. lineolaris* Adults- 1-5 days

Eggs: Eggs are slightly curved and approximately 1 mm long.

Nymphs: There are five nymphal instars. Young nymphs are light green and wingless (Figure 2). Older nymphs develop black dots on the top of the thorax and abdomen.

Wing buds are evident in the fourth and fifth instars. Hot dry weather favors build up of lygus populations. There are two generations per year in the southern prairies, but only one in the northern areas.



Figure 2: Nymphs- 1-5 days

Lygus bugs have piercing-sucking mouthparts and physically damage the plant by puncturing the tissue and sucking plant juices. The plants also react to the toxic saliva that the insects inject when they feed. Lygus bug infestations can cause alfalfa to have short stem internodes, excessive branching, and small, distorted leaves. They feed on buds and blossoms and cause them to drop. They also puncture seed pods and feed on the developing seeds causing them to turn brown and shrivel.

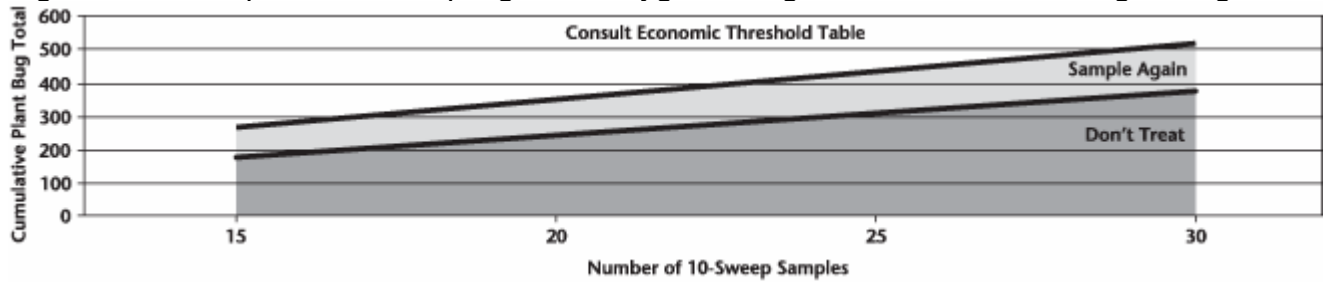
Monitoring

Begin monitoring canola when it bolts and continue until seeds within the pods are firm. Since adults can move into canola from alfalfa, check lygus bug numbers in canola when nearby alfalfa crops are cut.

Start monitoring at the bud stage. Sample the crop for lygus bugs on a sunny day when the temperature is above 20°C and the crop canopy is dry. With a standard insect net of 38 cm diameter, take ten 180° sweeps. Count the number of lygus in the net.

Repeat the sampling in another 14 locations. Samples can be taken along or near the field margins. Calculate the cumulative total number of lygus and then consult the sequential sampling chart (Figure 3). If the total number is below the lower threshold line, no treatment is needed. If the total is below the upper threshold line, take more samples.

Figure 3. Sequential Sampling for Lygus Bug at Late Flowering Stage



If the total is on or above the upper threshold line, calculate the average number of lygus per 10-sweep sample and consult the economic threshold table.

Table 3. Lygus Bug Economic Threshold

Application Costs Number of Lygus Bugs at Different Canola Crop Stages

\$/ha	\$/ac	Bud	End of Flowering Pod Ripening					
			14	12	10	20	17	15
22	8.90		16	13	11	22	18	16
24	9.70		17	14	12	24	20	17
26	10.50	No economic threshold available	18	15	13	25	22	19
28	11.35		19	16	14	27	23	20
30	12.15		21	17	15	29	25	21
32	12.95							
Canola Price								
\$/tonne			220	260	300	220	260	300
\$/bu			5.00	5.90	6.80	5.00	5.90	6.80

Economic Threshold

The economic threshold for lygus bugs in canola covers the end of the flowering and the early pod ripening stages. Once the seeds have ripened to yellow or brown, the cost of controlling lygus bugs may exceed the damage they will cause prior to harvest, so insecticide application is not warranted.

Consider the estimated cost of spraying and expected return prior to making a decision to treat a crop. **For example, if an application will cost \$26/ha (\$10.50/ac) and the expected return is \$260/tonne (\$5.90/bu), the threshold level is an average of 14 bugs per 10-sweep sample. An economic threshold for lygus bugs in canola at the bud stage has not been established.**

If soil moisture levels and rainfall are high at flowering, plants likely will be able to compensate for damage caused by lygus bug populations well above economic thresholds and control may not be necessary. If the plants are under moisture stress during this time they are unable to compensate for most of the feeding injury. Spray using the economic thresholds above.