

Western Conifer Seed Bug

Leptoglossus occidentalis Heidemann

Hemiptera: Coreidae

Bates, S. L.; Borden, J. H. 2005. Life table for *Leptoglossus occidentalis* Heidemann (Heteroptera: Coreidae) and prediction of damage in lodgepole pine seed orchards. *Agricultural and Forest Entomology* 7: 145-151.

Objective: To predict damage caused by *L. occidentalis* on harvested seed yield in lodgepole pine seed orchards in British Columbia.

Abstract: Western conifer seed bug, *Leptoglossus occidentalis* Heidemann, feeds on developing seeds within the cones of lodgepole pine, *Pinus contorta* var. *latifolia* Engelm. Feeding damage by *L. occidentalis* represents a significant economic loss for seed orchards in British Columbia as lodgepole pine seed is valued at \$1,000-5,000 per kg (Strong et al. 2001). In this study the authors estimated that one *L. occidentalis* per tree early in the season will result in approximately 310 seeds lost to feeding damage at harvest. This damage reflects feeding by both a founding bug and the expected offspring. In the absence of any predation or parasitism, approximately 434 seeds per tree lost to feeding damage can be expected at harvest. This damage prediction is based on the population dynamics of the bug over the season as well as feeding studies conducted by Bates et al. (2002). Adult male and female *L. occidentalis* can damage 1.4 and 2.0 seeds per day, respectively (Bates et al. 2002).

Sampling Procedure: Early in the season when nymphs are present, beat lodgepole pines thoroughly using a beat stick and a tray or a drop cloth. Sample as much of the canopy as possible. Examine the tray or drop cloth and count the number of *L. occidentalis* nymphs and adults present. The authors did not suggest a minimum number of trees to sample, but the density of *L. occidentalis* within an orchard should be averaged over a sufficient number of randomly selected trees. Managers must use their experience and the estimated size and value of the expected seed crop to decide if the expected seed loss produced by 0.5 to 2.5 bugs per tree early in the season warrants control measures (see Fig. 1 in original publication).

The authors recommend sampling throughout the season as adult populations, and associated seed losses, may rise quickly late in the season. Sample for *L. occidentalis* nymphs and adults as described above, but count male and female adults separately. The damage prediction for seed loss due to adult feeding late in the season is based on the numbers of adults present and days to harvest, but not the effect of potential offspring. Use Table 6 (refer to original publication) to predict the number of damaged seeds per tree based on the developmental stage, sex, density of bugs per tree, and the number of days remaining to harvest. Again, managers must use their experience and the estimated size and value of the expected seed crop to decide if the predicted seed loss warrants control measures before harvest.

Notes: Refer to the original publication for Figure 1 and Table 6, which could not be reprinted here due to the immoderate charges requested by the publisher for copyright clearance.

The authors noted that first instar *L. occidentalis* were difficult to sample as they tended to be tossed into the air rather than drop onto the tray or drop cloth when trees were beaten. *Leptoglossus occidentalis* occurs throughout western North America but appears to be spreading into eastern Canada and the U.S. Damage predictions established for *L. occidentalis* in western Canada may not be applicable for *L. occidentalis* in its newly expanded range in eastern North America.

References:

- # Bates, S. L.; Lait, C. G.; Borden, J. H.; Kermode, A. R. 2002. Measuring the impact of *Leptoglossus occidentalis* (Heteroptera: Coreidae) on seed production in lodgepole pine using an antibody-based assay. *Journal of Economic Entomology* 95: 770-777.
- Strong, W. B.; Bates, S. L.; Stoehr, M. U. 2001. Feeding by *Leptoglossus occidentalis* (Hemiptera: Coreidae) reduces seed set in lodgepole pine (Pinaceae). *Canadian Entomologist* 133: 857-865.