Elm Leaf Beetle

Pyrrhalta (=*Xanthogaleruca*) *luteola* (Müller)
Coleoptera: Chrysomelidae

Lawson, A. B.; Dahlsten, D. L. 2003. Implementation of a citywide monitoring program to base treatment decisions on elm leaf beetle abundance. Journal of Arboriculture 29: 34-41.

Objective: To evaluate the operational feasibility of a monitoring program for *P. luteola* on urban elms.

Abstract: Elm leaf beetle, *Pyrrhalta* (=*Xanthogaleruca*) *luteola* (Müller), is one of the most important pests of urban elms, *Ulmus* spp., in the U.S.A. and Canada. English (*U. procera* Salisbury) and Siberian elms (*U. pumila* L.) are more susceptible to damage by *P. luteola* than other elms. Larvae injure the host tree by skeletonizing leaves. Dahlsten et al. (1994) developed a monitoring program that successfully predicted damage to elm from estimates of *P. luteola* egg mass density, but it had not been tested operationally. The program was evaluated in Sacramento, CA, from 1995 to 1999.

During the 5-year program, an average of only 11.3% of susceptible elms needed treatment, compared to the previous practice of treating all susceptible elms on a calendar basis. The monitoring program worked very well for the first and second generations of *P. luteola*, but not for the third generation. This was due mainly to low sample sizes and an inability to make accurate predictions of damage due to an extended oviposition period compared to the first two generations. Further research is needed to determine the threshold for the third generation.

The monitoring data fit the model of Dahlsten et al. (1994) well and thus were included in the model. The optimal damage threshold was subsequently raised to >27% of tips infested for the second generation. No increase in the damage threshold of the first generation was necessary. Managers may use a threshold of 30% elm branch tips infested with egg masses for both the first and second generations to simplify monitoring for this pest. Treatment decisions can be based on the mean infestation in a stand rather than from individual trees. Overall, the monitoring program in Sacramento reduced pesticide usage by 90% citywide with savings of approximately $62,000 per year. This monitoring program, with its adjusted damage thresholds, is useful for area-wide management of *P. luteola* in California.

Sampling Procedure: Select English elm, Siberian elm, and their hybrids for sampling. Sampling in Sacramento was reduced to 20% of the susceptible elm species at the end of the evaluation program. See our reviews of Dreistadt et al. (1991) and Dahlsten et al. (1994) in this volume for information on sampling *P. luteola*, including when to sample and the number of branch tips and percentage of trees to sample in an area. Briefly, monitor degree-day accumulation above the threshold temperature of 11°C beginning March 1 (Dreistadt et al. 1991). Densities of first and second instars

peak around 700DD in northern California (Dreistadt et al. 1991), so begin looking for egg masses before then.

Take 16 branch terminals, each 30-cm long, from each tree using pole pruners. Take 2 branches from the inner canopy and 2 branches from the outer canopy in each cardinal direction. Note the presence of any egg masses on the samples. Consider treatment options when 30% of the sampled branch tips are infested with egg masses during the first or second generation of *P. luteola*. If a tree is found with an infestation near the treatment threshold, sample adjacent elms to delineate the area of infestation. Treatment decisions can be based on the mean infestation within a stand or on the mean infestation on individual trees.

Notes: English elm, Siberian elm, and their hybrids were included in this study. Caution should be used when implementing this monitoring program for other species of elm. A threshold of 20–30% infested branch tips can be used with caution for the third generation of *P. luteola*, but additional work is need to verify the appropriateness of this threshold.

References:

Dahlsten, D.L.; Rowney, D.L.; Tait, S.M. 1994. Development of integrated pest management programs in urban forests: the elm leaf beetle (*Xanthogaleruca luteola* (Müller)) in California, USA. Forest Ecology and Management 65: 31-44.

Dreistadt, S. H.; Dahlsten, D. L.; Rowney, D. L.; Tait, S. M.; Yokota, G. Y.; Copper, W. A. 1991. Treatment of destructive elm leaf beetle should be timed by temperature. California Agriculture 45: 23-25.

Figure

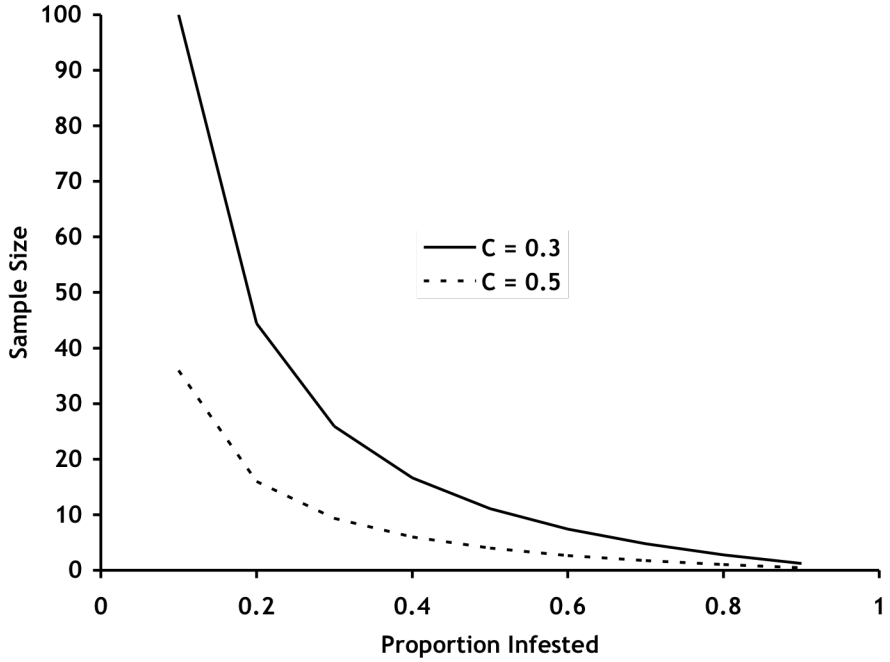

Fig. 2. Sample sizes needed at two levels of precision (*C*) to estimate the proportion of 30-cm branch terminals infested with eggs.

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