

Gypsy Moth

Lymantria dispar (Linnaeus)

Lepidoptera: Lymantriidae

Kolodny-Hirsch, D. M. 1986. Evaluation of methods for sampling gypsy moth (Lepidoptera: Lymantriidae) egg mass populations and development of sequential sampling plans. *Environmental Entomology* 15: 122-127.

Objectives: To evaluate the precision and costs of several sampling procedures; and to develop sampling plans for estimating *L. dispar* egg mass (GMEM) density with constant-precision levels.

Abstract: The gypsy moth was introduced into Medford, Massachusetts in 1869, and is now a major defoliator of hardwoods throughout the northeastern USA and Canada. Defoliation results in reduced growth, decreased vigor, and extensive tree mortality. Plots of 100-m², 400-m², 10-prism BAF, and 20-prism BAF were evaluated in relation to their efficiency for sampling gypsy moth egg masses in 14 oak, *Quercus* spp., woodlots in Maryland. The reliability of each sampling method varied with egg mass density. There was no significant difference in precision between 10 and 20 BAF plots. However, the 20 BAF plot required 40% less time to survey than the 10 BAF. An analysis of cost and precision showed that 100-m² plots were superior to the other sampling methods throughout the range of egg mass densities evaluated. The total number of new egg masses per plot was determined and compared to three sequential sampling plans. Sampling was continued until a decision was met, and populations were classified relative to three critical densities as either 50, 617, or 2469 egg masses per hectare.

Sampling Procedure: Sampling 100-m² plots was found to yield greater precision per unit sample time than the 400-m² or BAF plots. Therefore, sequential sampling plans were developed based on this sample unit.

Establish 100-m² plot centers randomly within the woodlot to be sampled. Count and record all new egg masses, and consult one of the three sequential sampling plans based on three different critical values for classifying densities as either less or greater than 50, 617, 2,469 egg masses per hectare (Table 4). Continue sampling a minimum of three times or until a decision is met. If the observed total falls outside the critical values, a decision to treat or not to treat is made.

Note: Site and stand characteristics associated with other geographic locations may alter the relationships observed in this study.

Table:

Table 4. Sequential sampling table for classifying GMEM infestations relative to three critical densities.

No. of samples	Cumulative GMEM										
	<50		>50		<617		>617		<2469		>2469
5	---	C	13	C	---	C	71	C	39	C	211
10	---	O	20	O	8	O	118	O	135	O	365
15	---	N	26	N	27	N	161	N	237	N	513
20	---	T	32	T	48	T	202	T	342	T	658
25	---	I	37	I	70	I	242	I	449	I	801
30	---	N	42	N	93	N	282	N	558	N	942
35	---	U	46	U	117	U	320	U	669	U	1081
40	---	E	51	E	141	E	359	E	780	E	1220
45	---	S	55	S	166	S	396	S	892	S	1358
50	---	A	59	A	191	A	434	A	1005	A	1495
55	---	M	63	M	216	M	471	M	1118	M	1632
60	---	P	67	P	242	P	508	P	1232	P	1768
		L		L		L		L		L	
		I		I		I		I		I	
		N		N		N		N		N	
		G		G		G		G		G	

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