

Douglas-Fir Cone Gall Midge

Contarinia oregonensis Foote

Diptera: Cecidomyiidae

Miller, G. E. 1986. Distribution of *Contarinia oregonensis* Foote (Diptera: Cecidomyiidae) eggs in Douglas-fir seed orchards and a method for estimating egg density. *Canadian Entomologist* 118: 1291-1295.

Objectives: To examine the distributions of *C. oregonensis* eggs within and among trees, and to develop an egg population sampling technique.

Abstract: The Douglas-fir cone gall midge, *Contarinia oregonensis* Foote, is a serious pest of Douglas-fir, *Pseudotsuga menziesii* (Mirb.) Franco, seed in forests and seed orchards of western North America. Efficient sampling procedures for estimating egg densities of *C. oregonensis* were developed from data collected in Douglas-fir seed orchards on Vancouver Island, Canada, 1978-1981.

Aspect, conelet density per branch, conelet position from branch tip, or conelet length and color did not influence the oviposition preferences of *C. oregonensis*. However, egg density was positively correlated with the total number of conelet scales in all orchard-years ($P < 0.05$). The optimum sampling pattern was to sample one conelet on 120 trees from the mid-point of the cone-bearing portion of the crown. Sampling required a processing time of up to 120 h, depending on the egg densities encountered.

Sampling Procedure: Collect one conelet from each of 120 trees to provide an estimate of the average number of eggs per conelet with a standard error of 10% and a confidence of 90%. Dissect, count, and record the number of eggs. The following recommended sample sizes are also provided and adjusted for crop size:

Number of producing trees	50	100	200	500	1000
Number of sample trees	18	40	76	80	93

In Douglas-fir seed orchards in British Columbia, normally ≤ 90 samples are required involving a sampling time of up to 90 h when egg densities are high, because of the limited number of cone-producing trees in any one year. Conelets can be stored at 0°C for 2-3 months and retain their suitability for egg counts.

Notes: The effectiveness of this technique in non-orchard situations is unknown. Consult our review of Miller (1986) for more details concerning damage predictions resulting from *C. oregonensis* infestations.

References:

- *Miller, G. E. 1986. Damage prediction for *Contarinia oregonensis* Foote (Diptera: Cecidomyiidae) in Douglas-fir seed orchards. *Canadian Entomologist* 118: 1297-1306.