ENTOMOLOGY

Laboratory Tests of 1-(4-Chlorophenyl)-3(2,6 difluorobenzoyl) Urea on Survival of Western Hemlock Looper.—Because of the controversy over the effectiveness of this pesticide, we decided to test it against western hemlock looper larvae [*Lambdina fiscellaria lugubrosa* Hulst.]. The compound, a 25% a.i. wettable powder, is commonly called pH 60-40 or Dimilin. Dimilin disrupts the synthesis of chitin in arthropods and fungi. Insects that ingest Dimilin form a thin integument which bursts under turgor pressure during moulting, thus exposing the larvae to dessication and death. Furthermore its toxicity to higher life forms is low, e.g. LD50 for rats is 10,000 mg/kg.

The test material, used as a water suspension at various concentrations, was applied to drip point to 3- to 4-year-old potted hemlock trees as a fine spray. The trees had flushed before spraying and continued to grow thereafter. Ten second- or fourth-instar field-collected larvae were released on each tree after spraying. Each dose and larval instar were represented by five such replicate trees. The infested trees were kept in the laboratory. Larvae, parasitized or lost, were not included in the results. Thus, each dose was represented by 40-50 larvae.

Residual effectiveness of the spray, up to 3 weeks after application, was tested by spraying five replicate trees with a single dose at weekly intervals and releasing fourth-instar larvae on these trees 1 week after the last treatment; the larvae were subjected to 1-, 2- and 3-week-old spray. Trees were kept outside during the pre-infestation period.

Mortality of the larvae was recorded every 3-4 days. The experiment was terminated when all larvae had either died or pupated.

The results show that all doses caused total mortality of second-instar larvae, wheras some fourth-instar larvae exposed to low doses survived the moult to next larval instar and pupated (Table 1). Fourth-instar larvae appeared more vigorous than second-instar larvae following exposure to the test material. Duration of larval survival after treatment was not clearly related to dosage, except among the fourth-instar larvae. Longer average survival of fourth-instar larvae exposed to lower doses is due to the fact that some lived long enough to pupate, contributing to increased duration of average survival (Table 1). Difference in the average duration of survival between second- and fourth-instar larvae after treatment was related to the length of their stadid (8 and 16 days, respectively, at 21°C). Differences in defoliation between treated and controlled trees were not measured quantitatively, but they were visibly obvious.

TABLE 1

Effect of Dimilin on the survival of second- and fourth-instar western hemlock looper larvae

	2nd instar		4th instar	
Dose*	% Survival	Average days to death	% Survival	Average days to death
Control	31	22.3	63.6	18.2
5 PPM	–	–	5.0	16.6
10 PPM	0	7.1	4.3	13.2
40 PPM	0	7.1	0	10.5
160 PPM	0	6.6	0	10.1
640 PPM	0	6.3	–	–

* PPM active ingredient.

TABLE 2

Residual effectiveness of 10 PPM Dimilin against fourth-instar western hemlock looper larvae

Age of deposit	% Survival	Average days to death
1 week	0	14.0
2 weeks	0	12.6
3 weeks	0	15.1

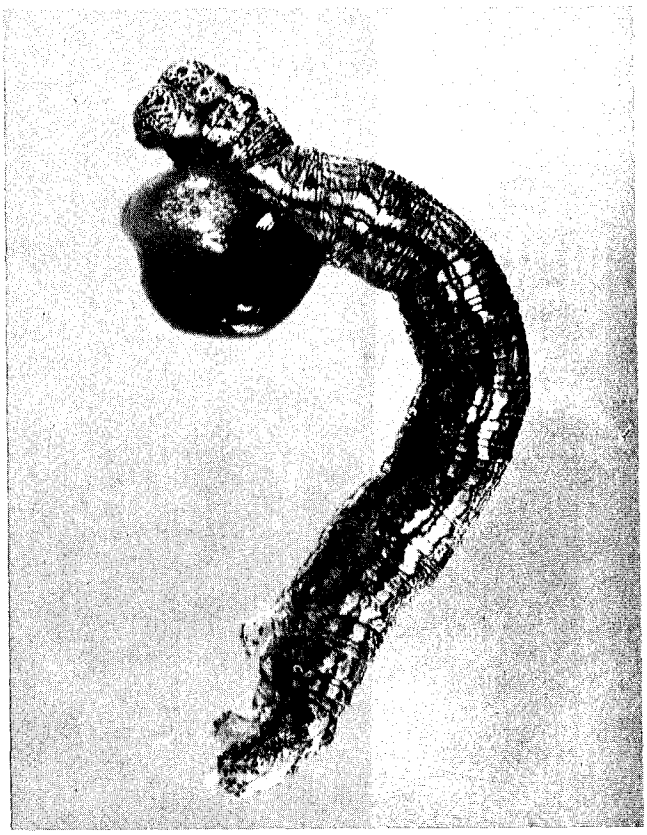

Figure 1. Hemlock looper larva with burst integument due to Dimilin treatment.

Dimilin applied as a single dose of 10 ppm remained fully effective for 3 weeks and caused total mortality of the fourth-instar larvae (Table 2). Mortality of larvae resulted from bursting of their integument (Fig. 1). Usually the breaks in the integument are not as obvious as the one shown, but are easily located by the haemolymph that oozes out through the rupture.

Dimilin appears to be effective against western hemlock loopers. It is more desirable than commonly used pesticides because of its low toxicity to non-arthropod forms of life. Present results warrant field trials.—T. S. Sahota and R. F. Shepherd, Pacific Forest Research Centre, Victoria, B.C.

Aerial Application of a Nuclear Polyhedrosis Virus to Control European Pine Sawfly.—A nuclear polyhedrosis virus of the European pine sawfly [*Neodiprion sertifer* (Geoff.)] was imported into Canada from Sweden in 1949. The virus was field tested by spraying from ground equipment in 1950 and 1951 and from an aircraft in 1952 (Bird, Can. Entomol. 85: 437-446, 1953). Since then, the virus has been sprayed from the ground by the staff of the Canadian Forestry Service, Ontario Ministry of Natural Resources and private growers to control small infestations of European pine sawfly in plantations.

A build-up of this sawfly was noted in Sandbanks Provincial Park, on Quinte Island, Prince Edward County, in 1974 and it was decided in consultations between Mr. K. B. Turner