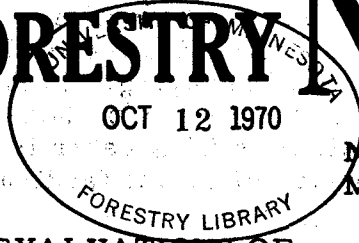




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PRELIMINARY FIELD EVALUATIONS OF ENDRIN AND DIELDRIN FOR CONTROL OF THE LARCH SAWFLY

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The problems involved in achieving control of larch sawfly (*Lygaeonematus erichsonii* /Hartig/) populations have been reviewed by Butcher and Eaton 3/. This review brings out the fact that many larvae have already cocooned before others have begun feeding and are susceptible to chemical control, thus reducing the potential importance of any spray application. Whether the 70% mortality achieved through aerial spraying in 1949 is sufficient, in combination with existing natural controls (parasites, predators, and climatic factors), to reduce an injurious population to a non-injury level has not been clearly demonstrated 3/. Nevertheless, the low dosage levels of Endrin and Dieldrin, as compared with DDT, necessary for control of many injurious insects suggested their application to forest insect problems where ease of formulation and shipping and economy are important considerations.

The aerial spraying reported here was done on July 10, 1952. Frass (excrement) collecting cones were placed on July 9 and first collections were made on July 11. This means that, in plots treated with Endrin (400 acres) and Dieldrin (200 acres) at the rate of 0.1 pound actual Endrin or Dieldrin in 1.5 gallons of No. 2 fuel oil per acre, the sawfly larvae fed undisturbed for twenty-four hours as compared with forty-eight hours in the check plot. This accounts for the relatively small difference in frass production in treated and control plots on July 11 as seen in the following table.

Chemical and rate of application	Average number of milliliters of frass deposited per 2-sq.-ft. collecting tray (10 cones per treatment)			Average number of larvae found per 3-sq.-ft. collecting tray (10 cones per treatment)		Average number of cocoons collected beneath 2 trees per 20-minute search (10 collections per treatment)
	July 11	July 14	July 21	July 11	July 14	September 11
Endrin (0.1 lb/acre)	54.3	12.5	1.0	130.9	24.3	20.5
Dieldrin (0.1 lb/acre)	52.5	15.1	1.0	63.7	31.8	40.0
Control	90.6	144.0	70.7	6.1	20.8	68.0

- 1) Cooperative work between the Office of the State Entomologist and the Division of Forestry, Minnesota Department of Conservation.
- 2) Forest Entomologist, Office of the State Entomologist, Minnesota Department of Agriculture, Dairy and Food.
- 3) Butcher, J. W. and C. B. Eaton, 1952. The Larch Sawfly Epidemic in the Lake States. Surveys and Spraying Experiments in 1949 and 1950. USDA. Bur. Ent. & Pl. Quar. E-841.

The magnitude of the frass volume differences between the check and Endrin and check and Dieldrin plots, as computed from table data, are impressive - 91 percent and 89 percent respectively on July 14. This is a better measure of the population reduction that occurred due to spraying than are the July 11 figures. The increase of frass volume in the check plot during the July 11-14 interval, as contrasted with the sharp frass volume decline in the treated plots for this same period, illustrates the effects of spraying. There was 78 percent more frass produced in the check plot than in the Endrin or Dieldrin plots over the July 11-21 period. This difference would be still greater if the July 11 Endrin and Dieldrin figures did not include 24 hours of larval feeding that took place before the insecticides were applied.

Larvae, whether alive or dead, were collected from all trays on the date shown. Although frass records in the table show a comparable reduction in larval feeding after application of Endrin and Dieldrin, differences in the numbers of larvae collected on July 11 appear great. This could be due to a more rapid knock-down on the part of Endrin rather than an over-all difference in total kill.

The cocoon figures recorded were compromised by (1) cocooning that took place before spraying was carried out, and (2) by differential effect of rodent predation in the various plots. Since this form of predation is very likely density-dependent (e. g., more cocoons are destroyed when they are more abundant and more readily encountered) it is not possible to compare the check and sprayed plots on this basis with assurance.

It can be concluded that Endrin and Dieldrin appear promising enough for control of the larch sawfly to warrant further trials of these insecticides.