CHEMICAL CONTROL OF THE ASPEN LEAF MINER, PHYLLOCNISTIS POPULIELLA CHAM. (LEPIDOPTERA: GRACILLARIIDAE)

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In British Columbia and the Yukon Territory the aspen leaf miner, *Phyllocnistis populiella* Cham. recently has occurred in great numbers throughout the range of trembling aspen, *Populus tremuloides Michx.*

The labyrinthine mines made by the larvae cause the leaves to take on a silvery appearance. Every year inquiries are received from property owners who are concerned about the unsightly effects on aspen trees used as ornamentals or for shade. The control tests described here were aimed at providing home owners with a method of protection. The long-term effect of the leaf miners on trees has not been assessed, although unpublished reports from Idaho and Wyoming attribute deaths of aspen trees to heavy infestations over several years.

In spring, when the aspen buds open, the moths deposit eggs on both upper and lower leaf surfaces. Oviposition continues until leaves reach approximately two - thirds full size. The developing larvae mine the upper and lower epidermis, and after attaining full size in 4 or 5 weeks, they spin cocoons. Ninety per cent of the mining occurs in the third or final mining instar which lasts 4 or 5 days. The fourth instar does not mine. The pupal stage lasts about 2 weeks. New adults are frequently seen in June, July, and August, resting on trees and shrubs; soon afterwards they disappear to hibernate. There is one generation per year.

Trunk applications of a systemic poison were tested first. The possibility that the newly-hatched larvae might be easily killed with minute quantities of material, and the ease of applying insecticide to the trunk suggested that such a method might be ideal for home owners, who ordinarily lack adequate spray equipment. When it became evident that the trunk applications were not effective foliage sprays were tried.

Procedure and Results

1. Trunk Applications

On April 12, 1961, as buds were opening at 1700 feet elevation at Larkin, B.C., Rogor[3] emulsion (containing 30 per cent active ingredient[4] or three lb. per Imperial gallon) was brushed on to 10 aspen trees 4-10 inches d.b.h. picked at random. A total of 3.5 oz. of this material was used on the 10 trees. Ten untreated trees were marked for a check.

Two weeks later, in the same area, a felt band soaked with one oz. of Rogor was wound on the trunk of three trees. In addition, one-quarter-inch holes were drilled to a depth of about 2 inches in the trunk of 3 trees and one ounce of Rogor emulsion injected with a syringe. Assessments were based on examinations of 200-1000 aspen leaves from each treatment.

Results are shown in Table 1. The only method that showed promise of control was injection of the material into drilled holes. The kill achieved by this method was much higher than indicated under "third instar mines" in Table 1. Since many larvae were already in the third instar at the time of treatment, the proportion surviving to cocoon gives a truer picture of the kill, which was over 80 per cent. Injected trees sustained

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[3] Also known as Dimethoate.

[4] Methyl dimethyldithiophosphorylacetamide.

TABLE 1.—Effect of Rogor emulsion on **Phyllocnistis populiella** Cham. in trembling aspen at 1700 ft. elevation, Larkin, B.C. Material applied to trunks by various methods, April, 1961.

Treatment	Percentage leaf surfaces affected		
	All mines	3rd instar mines	Cocoons
Painted in 6-in. band	80	68	21
Banded with treated felt	70	70	29
Injected into ¼ in. holes	74	38	3
Untreated	63	62	20

some injury from the insecticide, resulting in blanching of the leaves. Lower dosages applied just before bud-burst should be tested.

TABLE 2.—Effect on 150 leaves (300 surfaces) of Thiodan and Rogor sprays on **Phyllocnistis populiella** Cham., in trembling aspen at 3000 ft. elevation, Vernon, B.C. Three 4-foot trees sprayed with 2 oz. of each material in 1 gal. water. 24 May, 1961.

Treatment	Infestation after 33 days		
	Surfaces infested at spraying	Surfaces with signs of survival to 3rd instar or beyond	Cocoons
Thiodan	264	52	7
Rogor	268	31	6
Untreated	284	243	163

2. Spray Applications

When trunk applications failed, spray tests were conducted at a higher elevation, where tree and insect development was less advanced. On May 24, 6 four-foot high infested saplings at 3000 feet elevation near Vernon, were sprayed to the point of dripping with a compressed-air hand sprayer. Three of the trees were treated with 2 oz. of Thiodan, and 3 with 2 oz. of Rogor, in one gallon of water.

As shown in Table 2, both materials gave excellent control. By June 26, 33 days after treatment, treated trees were markedly greener and had grown considerably taller than untreated trees, which suggests that the leaf miners may reduce growth significantly.

The control obtained is not surprising. Reports from other areas show that closely related species are easily controlled with a number of materials. Ayoub (1960) reported that *Phyllocnistis citrella* is readily controlled on citrus trees in Saudi Arabia with sprays containing any one of the following materials: parathion, malathion, heptachlor, dieldrin, DDT, or "Gamma Isomer." In Italy, De Bellis (1960) reported that good control of *Phyllocnistis suffusella* was obtained on poplars by spraying infested leaves with parathion, malathion, Diazinon, demeton, Rogor , or a mixture of parathion and DDT.

References

Ayoub, M. Al-S. 1960. **Phyllocnistis citrella Stainton,** a main citrus pest in Saudi Arabia. **Bull. Soc. Ent. Egypte,** 44: 387-391.

De Bellis, E. 1960. Control tests against **Phyllocnistis suffusella** Z. **Pubbl. Cent. Sper. Agric. For. Roma,** 4: 225-231.