

25-foot levels. The number of exit holes, dead beetles, and progeny were recorded. The following table shows the results of mortality counts taken on the trees three weeks and two months after treatment.

TABLE I.—Showing the effect of a 20 per cent fuel-oil emulsion spray against *Dendroctonus monticolae* Hopk. on lodgepole-pine trees.

Treatment	Per Cent Mortality	
	Three weeks after treatment*	Two months after treatment
Chlordane 65% emulsion.....	25.7	77.6
DDT 25% emulsion.....	17.1	75.6
Ethylene dibromide (Technical Grade).....	20.8	35.6
Orthodichlorobenzene (Technical Grade).....	3.5	23.4
Control.....	11.1	18.7

* Based on mortality counts taken from 1 square foot of bark from each tree at the 3-foot level.

From the accumulated data obtained from the laboratory and field experiments, certain points of similarity became evident. In both the field and laboratory experiments, chlordane and DDT gave consistently higher mortality counts than did ethylene dibromide or orthodichlorobenzene at corresponding concentrations. In addition, both DDT and chlordane exhibited residual toxicity which resulted in a higher total mortality of the mountain pine beetle progeny. It was also noted that DDT and chlordane gave excellent control of *Ips interpunctus* (Eich.) and *Pityogenes carinulatus* (Lec.) adults but poor results against the larvae and pupae.

A field experiment was also initiated in the Windermere Creek area using the newer systemic insecticides Systox and Pestox III. This experiment was set up to determine the feasibility of controlling the adults and progeny of the mountain pine beetles in the bark of lodgepole-pine trees by chemical injection of the insecticides. Treatment of the nine infested trees was carried out on August 24 two weeks after the initial period of beetle attacks. A 2-inch girdle was cut 2 feet above the ground and the bark removed to expose the cambium. Concentrates of the chemicals were applied to the trees by attaching 1½-inch strips of insecticide-saturated cotton around the exposed sapwood. The point of application was made approximately 2 feet from the ground to avoid the deep furrows in the trunk below this level and at the same time to leave sufficient bark area to check for downward translocation of the insecticide. Details of the analysis will not be known until next spring, but to date preliminary laboratory tests indicate that Pestox III and Systox are toxic to *Dendroctonus monticolae* Hopk. and *Ips interpunctus* (Eich.).—A. P. Randall.

Cephalosporium Canker of Western Hemlock.—A stem canker of oppressed western hemlock was found at Powell River and on Turnour Island, British Columbia. The occurrence of this canker in two widely separated locations where hemlock reproduction has been closely inspected suggests that

the disease may be fairly general in distribution. The canker occurred on trees 1 to 4 inches D.B.H. and more than one canker was usually found on an infected stem. Characteristically the canker is elliptical, with a length of from 2 to 6 inches. Occasionally two or more cankers had fused longitudinally to produce an irregular, elongate canker up to 2 feet in length. In the early stages, the bark on the cankers is slightly depressed and resinosis is a conspicuous feature. In later stages resinosis is absent and infected bark is noticeably depressed.

A species of *Cephalosporium* was consistently isolated from the canker. Inoculations made on young western hemlock using this fungus produced cankers in five months.

Infection apparently takes place in nature through branch stubs. It is possible that initial infection occurs in living branches and that the fungus subsequently spreads to the bark of the main stem. Although branch cankers have not been observed in nature, branches artificially inoculated with *Cephalosporium* developed well-defined cankers. Although the fungus may remain alive in the dead bark of cankers for as long as nine years, no trace of fruiting has been observed in nature. Conidia, however, are produced abundantly in culture. A canker of balsam fir caused by a similar organism has been reported from Minnesota, but so far this canker has not been found in the Prairie Provinces.—W. B. G. Denyer.

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