CONTACT AND RESIDUAL TOXICITY STUDIES OF FENITROTHION AGAINST TWENTY ONE SPECIES OF FOREST INSECT PESTS

Project CC-006

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Laboratory studies with fenitrothion against a number of species of forest insect pests are continuing since 1966. The results have been presented in a number of reports published, either by the species or given in annual summary reports, and some results are unpublished. The purpose of this report is to consolidate under one cover results of contact and residual toxicity studies carried out to date. This report presents data on fenitrothion arranged chronologically as required by the department, various firms and other agencies from time to time. The LD_{50} values and the residual toxicity studies are summarized in Tables 1 and 2 respectively. The details of methods and materials and comparative studies with other insecticides are presented in references cited.

TABLE 1 - CONTACT TOXICITY OF FENITROTHION TO VARIOUS FOREST INSECT PESTS TESTED UNDER LABORATORY CONDITIONS FROM 1966-1972

	Insect Stage	LD_{50} $\mu g/cm^2$ (48 hr)	Fiducial Limits (95%)	Reference
		1966		
Swaine jack-pine sawfly	IV instar	0.026	0.021 - 0.029	Nigam 1970a
Black-headed jack-pine sawfly	IV instar	0.040	0.037 - 0.042	Nigam 1970a
Larch sawfly	IV instar	0.101	0.096 - 0.108	Nigam 1970a
		1967		
Forest tent caterpillar	III instar	0.154	0.128 - 0.183	
		1968		
Ambrosia beetle	Adult	0.138	0.119 - 0.160	Nigam 1969b
European pine sawfly	IV instar	0.046	0.036 - 0.056	Nigam 1970b
Spruce budworm	V instar	0.332	0.288 - 0.376	Nigam 1969a
Spruce budworm	VI instar	0.428	0.371 - 0.486	
Jack-pine budworm	VI instar	0.401	0.349 - 0.454	Nigam 1970c
		1969		
Sitka spruce weevil	Adult	0.231	0.197 - 0.267	
Eastern hemlock looper	III instar	0.249	0.218 - 0.276	
Western hemlock looper	III instar	0.220	0.176 - 0.259	
Green-striped forest looper*†	III instar	93% Mort. @ 5.605 $\mu g/cm^2$		Nigam 1971b
Mountain-ash sawfly	IV instar	63% Mort. @ 0.242 $\mu g/cm^2$		Nigam 1969c
		1970		
Red-headed pine sawfly	IV instar	0.016	0.012 - 0.019	Nigam 1971a
		1971		
White pine weevil*	Adult	100% Mort. @ 0.673 $\mu g/cm^2$		
Native elm bark beetle*	Adult	100% Mort. @ 0.168 $\mu g/cm^2$		
Filament bearer looper	III instar	0.481	0.388 - 0.568	
White-marked tussock moth	III instar	0.348	0.243 - 0.491	
Gypsy moth	III instar	1.179	1.014 - 1.353	
		1972		
European snout weevil*‡	Adult	100% Mort. @ 0.112 $\mu g/cm^2$		Nigam 1972
Western false hemlock looper	III instar	0.421	0.377 - 0.477	
Spruce budworm*	Adult	100% Mort. @ 0.484 $\mu g/cm^2$		Nigam 1972

* No LD_{50} available. Figures show maximum mortality for minimum dosage.

† Results shown are for 72 hours

‡ Insects from area sprayed with Methoxychlor and Malathion.

TABLE 2 - RESIDUAL TOXICITY OF FENITROTHION (SUMITHION®) AGAINST VARIOUS SPECIES OF INSECT PESTS DURING 1970, 1971 & 1972

Year	Insect Species	Tree Species (Host)	Conc. of Insec. %	Rate of Appli-cation GPA	Days After Treat-ment	Corrected Percentage Mortality (hours after insect addition) 24	48	72	Weather Data for Test Period Aver. or Total
1970	Spruce Budworm (SBW)	Balsam Fir	2	1	0	40.6	70.2	85.8	Temp. 67°
					1	44.0	71.0	85.5	Dew Pt. 53°
					3	9.5	41.0	57.7	Rain 0.03"
					5			66.7	Sun 69.1 hrs
					10			44.7	
1971	Larch Sawfly (LSF)	Larch	1	1	0	100.0	100.0	100.0	Temp. 67°
					1	61.0	83.9	88.9	Dew Pt. 54°
					3	35.6	62.7	88.9	Rain 3.55"
					5	85.0	100.0	100.0	Sun 313.2 hrs
					10	18.3	28.3	43.3	
					15	1.7	0.0	0.0	
					20	0.0	1.7	1.8	
1972	Spruce Budworm (SBW)	Balsam Fir	2	1	0	74.3	79.3	95.4	Temp. 59°
					1	28.2	38.7	43.7	Dew Pt. 44°
					3	11.1	17.2	28.9	Rain 0.89"
					5	0.0	8.3	7.3	Sun 71.5 hrs
					10	7.7	9.8	23.7	
	Spruce Budworm (SBW)	White Spruce	2	1	0	37.4	66.7	68.2	Temp. 59°
					1	10.9	37.0	43.2	Dew Pt. 44°
					3	3.5	4.3	8.7	Rain 0.89"
					5	13.2	10.7	4.3	Sun 71.5 hrs
					10	3.5	12.9	19.0	

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