ably was introduced into southwestern British Columbia on nursery stock imported from infested areas. In the Interior it apparently had a similar introduction. Steps taken to prevent further spread included a voluntary industry quarantine on the movement of *Abies* spp. logs outside of the infested areas, and federal and provincial quarantines preventing the sale or movement of *Abies* nursery stock into or within the Province. This action should reduce the long-range spread of the aphid, leaving only natural spread by wind and possibly birds to contend with. Surveys to detect spread on ornamentals in other interior areas prior to the present legislation are necessary. Spraying or felling of such trees is recommended; if spread into natural stands far removed from the existing major infestation is detected, similar direct control measures may be advisable.

Reference

Harris, J. W. E., D. H. Ruppel, S. J. Allen, and D. G. Collis. 1964. The balsam woolly aphid, **Adelges piceae** (Ratz.) in British Columbia. Infor. Rept. For. Ent. and Path. Lab., Victoria, B.C.

PROTECTING LARCH LOGS FROM *TETROPIUM VELUTINUM* LECONTE WITH LINDANE EMULSION

D. A. ROSS AND N. J. GEISTLINGER[1]

ABSTRACT

At Trinity Valley, British Columbia, a 1% emulsion of lindane applied on 12 June 1967, protected freshly felled **Larix occidentalis** Nuttall from attack by **Tetropium velutinum** LeConte. The same concentration, applied to infested logs on 14 August reduced damage but was too late to satisfactorily prevent larval penetration of the wood.

Introduction

Ross (1967) noted the importance of the western larch borer, *Tetropium velutinum* LeConte, as a wood borer in logs of western larch, *Larix occidentalis* Nuttall. As with *Monochamus,* injury by *Tetropium* may be prevented by removing recently dead trees or logs from the forest before the beetles oviposit, or by utilizing timber before larvae in the bark enter the wood. Various authors including Becker (1959), and Ross and Downton (1966), have shown that lindane emulsion protects logs from wood-borer attack, although its effectiveness had not been tried specifically against *Tetropium.* In 1967 the spray was used A to prevent oviposition by *Tetropium velutinum* and B to reduce damage of the wood by larvae.

Methods

Three 14-inch d.b.h. western larch at Trinity Valley were felled on 12 June 1967, and cut into 30 logs, each 4 feet long. Ten randomly selected logs for Treatment A were placed in the forest about 100 feet from the remaining 20.

Treatment A. On 12 June a 1% lindane emulsion[2] was applied with a hand sprayer to the point of runoff on all sides of each log in the group of 10.

Treatment B. On 14 August every second remaining log was removed 100 feet and sprayed with 1% lindane. The remaining 10 logs served as controls. By this time, numerous larvae had penetrated the wood.

In both treatments and in the control, individual logs were spaced 10 feet apart parallel to an east-west line.

Foot-long sections of the treated and control logs were peeled in mid-October 1967, and the numbers of

[1] Forest Entomology Laboratory, Department of Forestry and Rural Development, Vernon, B.C.

[2] Lindane powder mixed with xylol and an emulsifier in water.

Tetropium larval entrance holes, and the living and dead larvae under the bark were counted.

Results

Table 1 shows the average and range in numbers of *Tetropium velutinum* larval entrance holes in treated and control larch logs in October, 1967.

Woodpeckers had drilled holes into, and scaled bark off most of the logs given Treatment B or no treatment. Forty-five per cent of the 197 *Tetropium* larvae that were under the bark but had not penetrated the wood of the logs of Treatment B were dead: 20% of the 98 larvae under the bark of the control logs were dead.

TABLE 1—Influence of Treatment on Western Larch Borers in Larch Logs.

Treatment and Date 1967	No. **Tetropium** entrance holes per sq ft	
	Average	Range
A. Lindane 1%—June 12	0	—
B. Lindane 1%—Aug. 14	4.5	3.0 - 10.9
Control	8.4	5.3 - 12.3

Discussion

The absence of living or dead *Tetropium* larvae, the absence of galleries in the wood, and the presence of larvae in the control logs indicate the effectiveness of Treatment A in preventing damage to western larch logs.

Treatment B was applied too late to prevent damage by some larvae, but did reduce overall damage.

The presence of a larger number of larvae under the bark of logs treated on 14 August than in the control logs may have been the result of selectivity by woodpeckers. However, it was more likely due to the effect of the poison which probably killed or weakened some larvae that otherwise would have penetrated the wood.

There was a greater proportion of dead *Tetropium* larvae under the bark of logs receiving Treatment B (45% mortality) than in the control logs (20% mortality), indicating that the poison had killed some of the larvae under the bark. Unfortunately woodpeckers had removed many larvae from the infested logs making data on living and dead *Tetropium* inconclusive.

There were no bark beetles, Scolytidae, in any of the samples receiving Treatment B, as there were in a similar trial to control *Monochamus* in pine (Ross and Downton, 1966). Bark beetle galleries in some instances would presumably have permitted better penetration of the poison into the bark.

Acknowledgements

We thank E. D. A. Dyer and A. C. Molnar for editing the manuscript.

References

Becker, W. B. 1959. Further tests with BHC emulsion sprays to keep boring insects out of pine logs in Massachusetts. **Jour. Econ. Ent. 52(1):**173-174.

Ross, D. A., and J. S. Downton. 1966. Protecting logs from long-horned wood borers with lindane emulsion. **Forestry Chron. 42:**377-379.

Ross, D. A. 1967. The western larch borer, **Tetropium velutinum** LeConte, in interior British Columbia. **J. Entomol. Soc. Brit. Columbia. 64:**25-28.