

OVERWINTERING OF CAGED *Rhyacionia buoliana*  
(SCHIFFERMULLER) AT VERNON, B.C., IN 1965-66

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INTRODUCTION

The European pine shoot moth, *Rhyacionia buoliana* (Schifferrmuller), is established in exotic pines in southern coastal British Columbia and since 1961 has occurred in small numbers on imported exotic pines in the Okanagan-Kamloops region. Only one specimen has been taken from a native tree, a mature ponderosa pine, *Pinus ponderosa* Lawson and Son, on the Department of Agriculture of Canada Experimental Station at Summerland. As it is believed that the shoot moth may become a pest in the interior forests of the Pacific Northwest, surveys have been intensified and in some regions quarantines and control measures have been implemented. An attempt has also been made to determine the ability of the European pine shoot moth to overwinter successfully in the North Okanagan Valley, at Vernon, in the range of lodgepole and ponderosa pines.

During the summer of 1963 one pair of moths was caged with a small ponderosa pine; eggs were laid and at least two hatched. The larvae bored into the base of the needles, but none were found in May 1964. The ability of the insect to overwinter in British Columbia was further investigated in 1965 and is reported here.

METHODS

On 26 May 1965, several hundred tips of mugho pine infested with European pine shoot moth were collected on the campus of the University of B.C. in Vancouver. Adults from the collection, reared in the insectary at Vernon, were introduced to caged

young ponderosa pine trees, and to sleeve cages on a mature ponderosa pine tree. Arthropods in the cages were destroyed before the moths were introduced, to eliminate predators of the shoot moth and to avoid confusion with damage caused by other insects. The cages were removed in September to permit complete exposure of the twigs to winter conditions and replaced early in April before larval activity began.

*Large cage.* Seven ponderosa pine trees 4 to 5 feet in height were transplanted at Vernon in April 1965, and late in May the trees were covered with a portable cage 12' x 12' x 6'. The cage was a wooden frame covered with factory cotton with several screened panels to improve ventilation. A pitched canvas roof over the cage shed heavy rainfall and provided shade. Shortly before the eggs hatched, the screens were covered with transparent plastic to prevent escape of the larvae.

Pairs of moths, the male 1-2 days older than the female, were maintained overnight on June 10 in fifty separate small cages that were furnished with water and a pine twig. The next afternoon the females were introduced to the large cage; June 11-19, twenty males were released in the cage and on July 9, three females and two males.

*Sleeve cages.* The sleeve cages 6 feet long and 2½ feet in diameter, were made of a cylindrical wire frame covered with nylon screen. These cages were slipped over individual branches of a mature ponderosa pine with two pairs of moths in each.

RESULTS

*Large cage.* By 22 July numerous European pine shoot moth larvae had

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become established, evidence being holes in the needle bases and frass and pitch masses on the twig ends. One larva, believed to be *Rhyacionia*, was observed on a silken thread the same day. Ants were numerous within the large cage and may have destroyed some of the shoot moth eggs and larvae.

In September 1965, six of the seven trees tested had evidence of larval feeding. The number of damaged twigs per tree was: 16, 6, 6, 3, 3 and 2. Two trees with nine infested twigs, and the larvae, died. From the 27 infested twigs on the other four trees, nine pupae were recovered, all from twigs above the snow line.

*Sleeve cages.* No larvae established themselves in the twigs.

## DISCUSSION AND CONCLUSIONS

The lowest temperatures in the Vernon area during the overwintering period in 1965-66 occurred near the end of December. On December 29 the temperature was  $-2^{\circ}\text{F}$  and on January 5 it was  $-4^{\circ}\text{F}$ . Green (1962) showed that in Ontario a temperature of  $-4^{\circ}\text{F}$  could kill 45% of the larvae in November but only 7% in mid-February. He demonstrated that temperatures below  $-22^{\circ}\text{F}$  completely destroyed larval populations.

The successful overwintering of 9 larvae on twigs above snow level indicates that *Rhyacionia buoliana* can survive winter temperatures in the North Okanagan Valley as low as  $-4^{\circ}\text{F}$ .

## Reference

- Green, G. W. 1962. Low winter temperatures and the European pine shoot moth, *Rhyacionia buoliana* (Schiff.) in Ontario. *Can. Ent.* 94: 314-336.

## EDITORIAL NOTES

In its sixty-year life this society has never been so hard-hit by deaths as it was in 1966. Three of our most revered members, two of them Honorary Members, have now gone. Even though they died full of years and honour we feel the loss, and the gaps they leave will be hard to fill.

Several inquiries have been received concerning a suitable memorial for the late Prof. Spencer. The Alumni Annual Giving Society of the University of British Columbia is sponsoring an annual lectureship, to be known as the Spencer Memorial Lectures. The intention is to invite world figures in entomology to speak at the University at some convenient time during the academic year. A committee has been struck under the chairmanship of Dr. G. G. E. Scudder.

In the near future the A.A.G. will ask for donations from former students and friends of Prof. Spencer.

At the annual meeting on 18 March, 1966, in Vernon, it was decided to change the name of this publication from Proceedings to Journal. It has long since ceased to be a true proceedings in that presidential addresses and the proceedings and transactions at meetings were not reported. Since contributions to the publication are fully reviewed it is fitting that this policy be recognized by the change of name.

The next issue of the Journal will go to press within four months from the spring meeting, in accordance with a motion passed at the meeting of 18 March, 1966. Contributors are asked to submit their manuscripts by or before that time.