

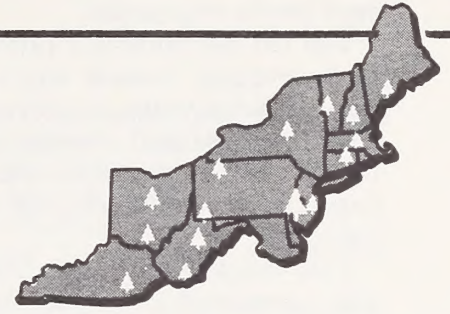
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PRELIMINARY TEST OF BOOBY-TRAPPING FOR CONTROL OF TWO CERAMBYCIDS

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Abstract. Small aluminum "boats" containing cotton saturated with lindane were glued to elytra of female red oak borers and locust borers and the beetles released into cages or onto trees. Males attempting to mate with booby-trapped females contacted the insecticide and died. However, females also became contaminated in mating attempts and soon died.

Keywords: red oak borer, locust borer, insecticide

INTRODUCTION

The idea of using "booby-trapping" for insect control was proposed by Smith (1963), Whitten and Norris (1967), and Morgan (1967). Masner et al. (1968) proposed a similar technique. The idea of booby-trapping is to release females or males that carry insecticide or chemosterilant and thus kill or sterilize potential mates of the released insects.

For insecticide treatment, it is necessary to have an insecticide-resistant strain of insects so that the treatment does not kill those carrying the booby-traps. Developing resistant strains can usually be accomplished within a few generations; however, the task is time

consuming with insects that have long life cycles.

The red oak borer, *Enaphalodes rufulus* (Haldeman) and locust borer *Megacyllene robiniae* (Forster), both primary borers, have long life cycles. The red oak borer has a 2-year life cycle with an economically important generation only in odd years throughout most of the beetles' range (Hay 1974). The locust borer has a 1-year life cycle. While both of these species can be reared artificially, a generation requires 7 to 8 months for the red oak borer (Galford 1974) and about 3 months for the locust borer (Wollerman 1969).

However, both cerambycids have potential for control by booby-trapping, because peak

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male emergence occurs 1 to 2 weeks before peak female emergence.

The red oak borer is a prime candidate for booby-trapping because adults occur only in odd-numbered years. Adult activity lasts only about 6 weeks and average populations are 12 to 24 beetles per acre. Also, the adults are large and easily handled for affixing booby-traps.

This paper reports on preliminary studies with female beetles carrying insecticide-treated booby-traps.

MATERIALS AND METHODS

The red oak borers used in this study were artificially reared (Galford 1974). The locust borers were collected in late September from goldenrod flowers, *Solidago* spp.,. Female beetles were cooled in a refrigerator to facilitate their handling. Small pieces of cotton wadding were cut to fit inside small aluminum combustion boats (#29-410, Coleman Instruments Corp. Maywood, IL).¹ The cotton was glued inside the boats with contact cement. Next, the bottoms of the boats were dipped in contact cement and they were laid on their sides to dry until the cement became tacky.

The beetles were removed from the refrigerator and the boats were glued onto the elytra just behind the thorax. The beetles were then released in well-ventilated containers until the glue dried.

An eye dropper was used to saturate the cotton with 0.1 ml of a 20 percent lindane solution. Ten female red oak borers and six female locust borers were prepared. The red oak borers were tested as follows: Each female red oak borer was released singly in 1-liter plastic bucket, the sides and bottom of which were lined with filter paper to enable the beetles to crawl around without falling.

¹The use of trade, firm, or corporation names in this publication is for the information and convenience of the reader. Such use does not constitute an official endorsement or approval by the U.S. Department of Agriculture or the Forest Service of any product or service to the exclusion of others that may be suitable.

Three male beetles were introduced into each bucket and a perforated lid was placed on top. After 24 hours beetle mortality was recorded.

Treated female locust borers were released singly on trees in a black locust plantation. Small trees were selected so that the treated females could be easily observed and any males contacting them could be collected. Any male beetles that made contact with or attempted to mate with treated females were collected and placed in individual jars. After 24 hours male mortality was recorded.

RESULTS AND DISCUSSION

All 30 of the male red oak borers were dead or near death after 24 hours; however, so were the females. The aluminum boats were intended to prevent the insecticide from contacting the females. However, male beetles attempting to mate contaminated the booby-trapped females with insecticide. Not all the locust borer males attempted to mate with the females they encountered. When their antennae contacted the boats before the body of the female, they were apparently repelled by the odor of the insecticide and moved away. The boats were apparently too large for the locust borer females and greatly reduced the body area a male could contact. This is important because males recognize females by touch.

Eleven male locust borers that made contact with the six released females were collected. Nine of the 11 males died within 24 hours. The other two males appeared unaffected. Three other males made contact with the females but escaped. All six treated females fell from the trees within 30 minutes and soon died.

While the test results show that females can be successfully booby-trapped, it also demonstrates the necessity of using insecticide-resistant strains. If effective chemosterilants for cerambycids could be found, they would greatly enhance control by booby-trapping.

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