U. S. Forest Service Research Note SE- 44 July 1965

A SIMPLE REARING TECHNIQUE FOR OBTAINING EGGS OR YOUNG LARVAE OF THE SOUTHERN PINE BEETLE

In two earlier notes we described techniques that utilized pine bolts for rearing the southern pine beetle (Dendroctonus frontalis Zimm.) and the coarse writing engraver (Ips calligraphus Germ.) (Clark and Osgood 1964a, 1964b). This note presents a simple technique for maintaining a constant, easily accessible source of southern pine beetle eggs or larvae. It is a modification of a technique developed for western bark beetles by Smith[1] and has been used successfully for 2 years.

The first inch or so of bark at one end of a 14-inch bolt, 1 to 3 days old, is shaved as smooth as possible, leaving one-eighth to three-sixteenths of an inch of bark (fig. 1). If necessary, any remaining deep crevices in the shaved bark may be filled by painting on hot paraffin. To encourage gallery making, 6 to 12 evenly spaced notches are cut in the edge of the shaved end, thus exposing more cambial area. This end is then wiped with paper toweling or sawdust to remove sticky pitch and a chamber is constructed over it out of heavy paper, masking tape, and 3- to 4-mil polyethylene sheeting. To prevent the escape of beetles, a single strand of baling wire is twisted around the masking tape, thereby pressing the paper collar tightly against the bark.

Six to 10 pairs of beetles are introduced into this chamber through a $\frac{1}{2}$-inch slit in the polyethylene; the slit is closed with masking tape. All light is excluded from the chamber by a heavy cloth which inhibits attempts to escape and also apparently stimulates gallery making. After the galleries are started, usually in 2 to 3 days, the chamber is removed to prevent excess moisture and mold. The bolts are kept upright in a rearing room maintained at diurnal temperatures of 82° and 72° F. and 40 to 60 percent relative humidity. After 6 to 12 days, the outer bark is thinned by shaving or chipping, the inner bark on each side of the gallery is carefully dissected away commencing at the notches, and the eggs or larvae are removed with a moistened camel's-hair brush.

Eggs or larvae not used immediately can be kept in a petri dish on moist filter paper to prevent desiccation. Larvae should not be stored for more than an hour, however, because injuries may occur.

If some larval injuries or losses can be tolerated, larvae may be collected less laboriously through the use of a Berlese funnel. A simple funnel is made by suspending a 25-watt incandescent bulb over an 8- to 10-inch funnel, the end of which projects into a 100 ml. beaker containing a few folds of moistened filter

[1] Personal communication from Dr. Richard Smith, Pacific Southwest Forest and Range Experiment Station, U. S. Forest Service, Berkeley, California.

Southeastern Forest Experiment Station - Asheville, North Carolina
U.S. Department of Agriculture - Forest Service

or tissue paper. Strips of infested inner bark containing larvae are placed on a wire mesh disk in the funnel and the larvae collected frequently from the beaker. More elaborate funnels are described by Peterson (1955) or Clark et al. (1959).

For maximum yield, bark moisture should be between 50 to 60 percent (wet weight). The maximum yield to date has been 253 larvae per pair of adults.

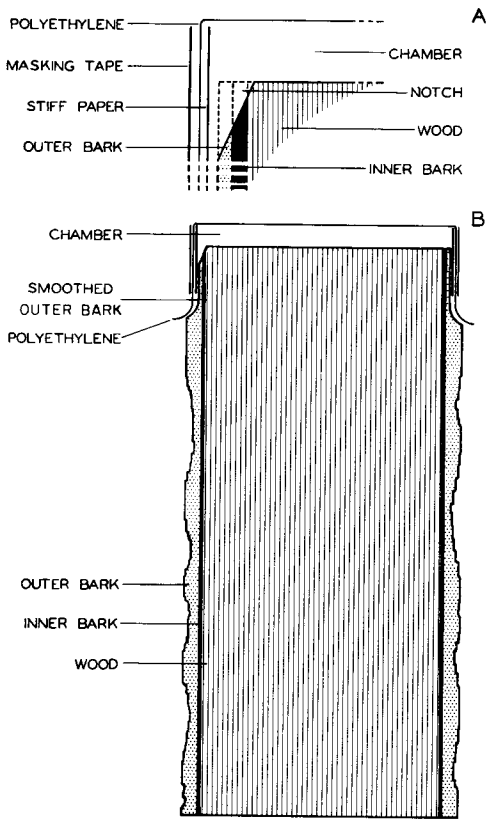

Figure 1.--Bolt rearing technique for obtaining eggs and young larvae of bark beetles.

A, enlarged diagrammatic cross section through a notch to show components.

B, cross section of entire bolt.

LITERATURE CITED

Clark, Edgar W., and Osgood, Eben A., Jr.
1964a. Mass rearing the southern pine beetle and the coarse writing engraver. Southeast. Forest Expt. Sta., U. S. Forest Serv. Res. Note SE-30, 4 pp.

_____ and Osgood, Eben A., Jr.
1964b. A simple laboratory technique for rearing Ips calligraphus. Southeast. Forest Expt. Sta., U. S. Forest Serv. Res. Note SE-31, 3 pp.

_____ Williamson, A. L., and Richmond, C. A.
1959. A collecting technique for pink bollworms and other insects using a Berlese funnel with an improved heater. Jour. Econ. Ent. 52(5): 1010-1012.

Peterson, A.
1955. A manual of entomological techniques. 367 pp. Ann Arbor, Michigan: Edward Bros., Inc.

Edgar W. Clark, Principal Insect Physiologist
Forestry Sciences Laboratory, Durham, N. C.