

AMBROSIA BEETLE

GUIDELINES TO

- POPULATION ESTIMATES NEAR DRY LAND LOG-STORAGE AREAS
- DAMAGE HAZARD ASSESSMENT

by J.A. Chapman



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AMBROSIA BEETLE

Side View

Top View

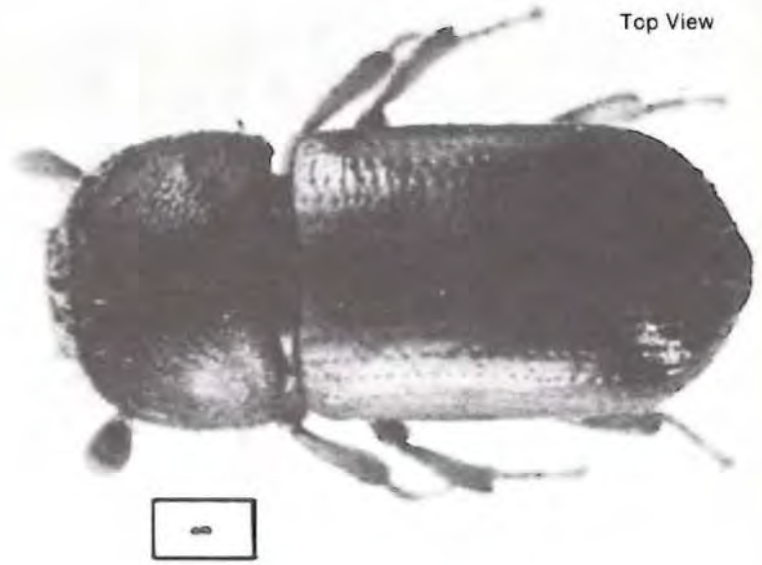


Fig. 1: Inserts show normal size of beetle.

Ambrosia beetles cause enormous losses annually in coastal British Columbia forests, creating major problems for the forest industry. They cause degrade in lumber and plywood (Cover) by burrowing into the sapwood of logs, in felled-and-bucked, on rights-of-way, in booms, and in dry land sorting and storage areas.

Much of the damage, however, can be prevented by having a low inventory of the most susceptible fall-felled logs, by rapid movement of logs through the sorting and storage areas, or by using a water misting system.

The problem is most acute around areas where logs are sorted and stored unprotected, from April through September. Here the beetles attack and produce broods which, when mature, leave the logs during July and August to overwinter nearby; the following year, a greater mass of beetles returns to attack new logs in storage. The cycle is repeated; the beetles multiply; the overwintering populations build up and severe log damage occurs each year. As dry land log-sorting increases, the danger of damage by ambrosia beetles also increases.

This booklet helps to identify the insect and its overwintering sites; it offers guidelines for sampling overwintering beetle populations and for evaluating samples in relation to potential damage hazard.

Fig. 2: Overwintering beetles on old stump.

The Insect

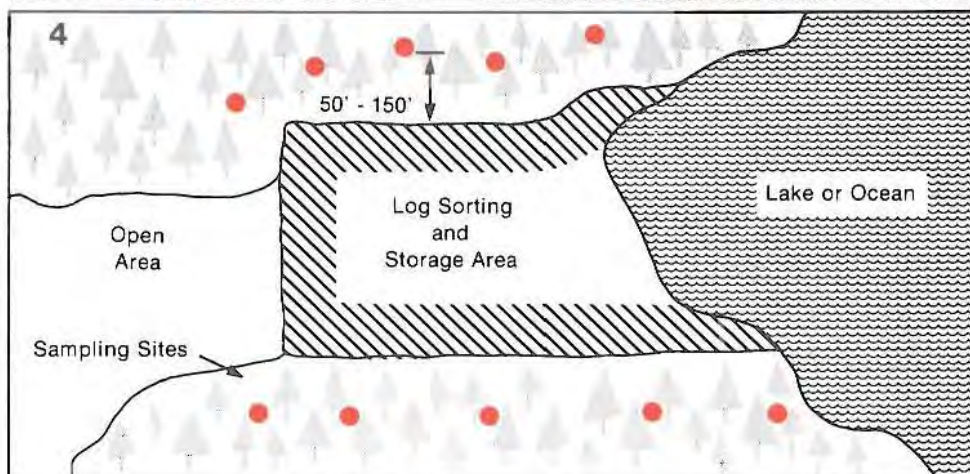
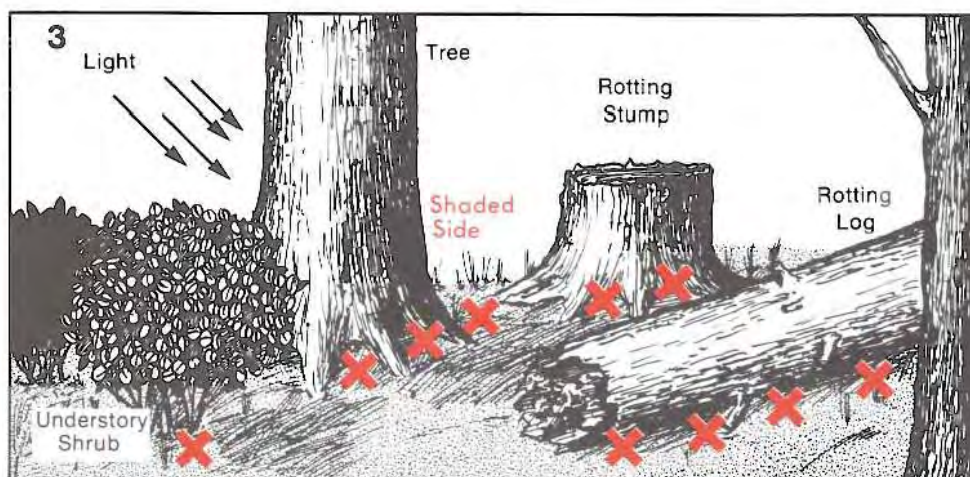
The striped ambrosia beetle, *Trypodendron lineatum* (Oliv.), causes the most damage. It is a small, shiny, dark-brown beetle, about 1/8-inch long (Fig. 1). The common name originates from the two pale indistinct longitudinal stripes along its wing covers. Logs are attacked during April, May or June; the time of first attack depends on when warm weather (above 60°F) occurs. Piles of white boring dust on the bark surface are



evidence of beetle attack. After penetrating the wood, the beetles spend 6 to 10 weeks in the logs while their broods develop. During July and August, surviving parent beetles and young beetles leave the brood logs and fly into overwintering sites in adjacent forest stands, where they remain until the following spring.

Overwintering Sites

The overwintering sites are chosen primarily because the beetles seek decreasing light as they fly into the nearest stand of timber. They concentrate in the darker zones away from openings, between 50 and 150 feet from the stand edge, depending on stand density and form. For protection, they crawl into the litter (duff) above the mineral soil, especially between tree root crotches, in rotten stumps or logs (Fig. 2), or in bark of standing trees. They prefer the most shaded locations, such as the dark side of tree bases, or stumps and logs (Fig. 3).



Sampling Populations of Overwintering Ambrosia Beetles

The litter in the stand may be sampled for ambrosia beetles any time from October until the following March. The samples should be taken from the shaded locations previously mentioned. The recommended procedure is as follows:

- Select a minimum of 10 sampling sites in the nearest stands (Fig. 4), 50 to 150 feet in from the stand edge. These should be at approximately 200-foot intervals along the stand edge.
- Collect 10 pints of litter, one from each of 10 most suitable

hibernating spots (Fig. 3) around each sampling site. Combine the 10 pints of litter from each sampling site in a plastic bag; there will be 1 bag from each of the sites mentioned in a) above. The bags of litter may be stored several days or even weeks if kept at 32°F.

- Screen the litter from each bag separately through a coarse screen, breaking up rotted wood and eliminating cones and solid wood fragments.
- Spread screened litter in a layer $\frac{1}{2}$ to $\frac{3}{4}$ -inch deep in a warm pan, not exceeding 100°F. A simple arrangement is two nesting pans, the bottom one containing water, heated from below (Fig. 6). The water temperature can be easily controlled and provides uniform heat over the surface of the upper pan. An

Fig. 3: Overwintering sites. Collect litter from indicated areas. (X)

Fig. 4: Sampling sites (*) in forest around a log-sorting and storage area.

illuminated magnifier above the pans aids in detecting the beetles.

- Remove and count the beetles walking about on the litter (Fig. 5). Within 10 to 15 minutes, most ambrosia beetles in the sample will have become active and can be easily seen.
- Make a hazard assessment based on Table I. If any one of the samples indicates a high hazard, significant damage to logs in the sorting and storage area can be expected. If the hazard rating is medium, damage can be expected because even a few attacks

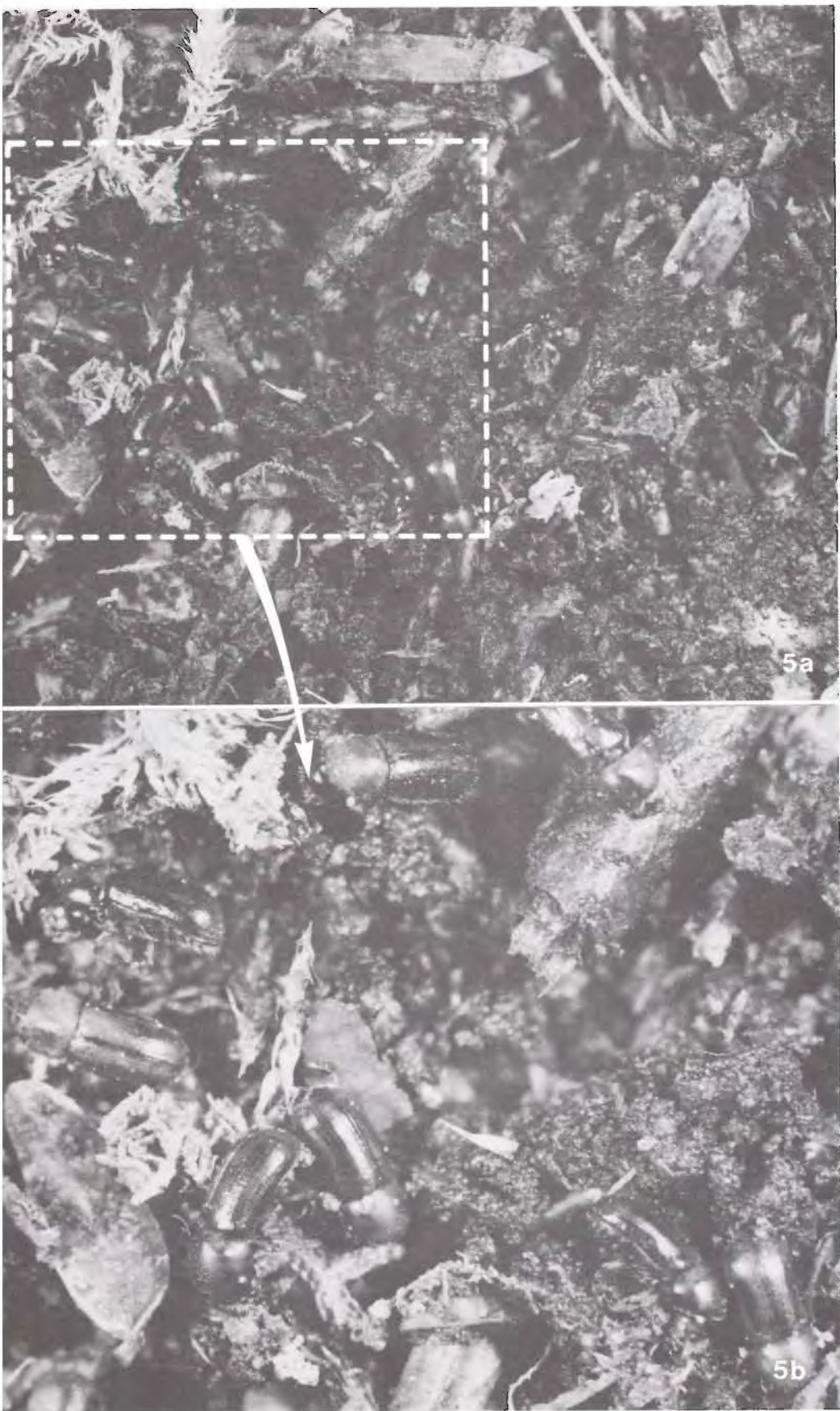


Fig. 5: Ambrosia beetles in forest litter. At least seven beetles appear in the outlined area (5a).

cause degrade. Procedures mentioned in the introduction should be implemented to reduce damage. If all samples indicate a low hazard, damage is less likely to be serious. However, repeat sampling is warranted in following years to detect changes in the hazard, especially at newly developed log-sorting areas or if length of log storage increases.

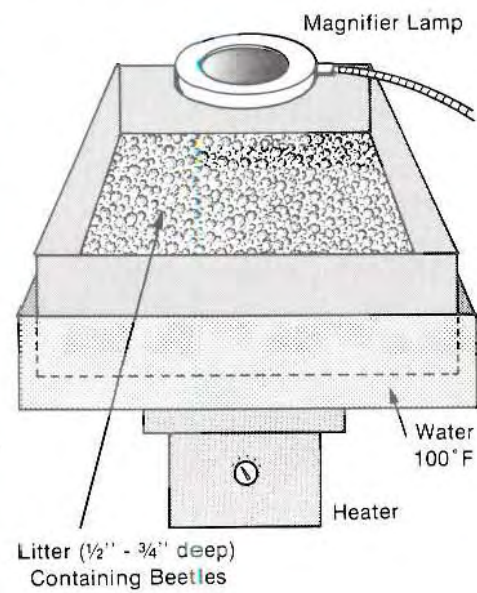


Fig. 6: Double pan for sorting beetles from litter.

Table I.
Guide to hazard rating from number of ambrosia beetles found overwintering in litter.

Number of Beetles in Sample (10 pints of litter)	Hazard Rating
0 - 1	Low
2 - 50	Medium
51 or more	High

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Ambrosia Beetle

(Addendum to Guidelines to population estimates near dry land log-storage areas by J.A. Chapman (BC-X-103))

A simplified procedure for sampling overwintering populations of the ambrosia beetle Trypodendron lineatum (Oliv.)

W. W. Nijholt

Associated with greater use of dry land sorting and storage of logs in British Columbia is the danger of increases in ambrosia beetle populations and in the consequent risk of value loss to lumber through de-grade. Guidelines for estimating populations and assessing damage hazards near dry land log-storage areas were developed by J.A. Chapman (1974), using a double-pan method. This method is reliable and useful but depends on the availability of equipment, and it requires continuous attention.

An alternative procedure is therefore suggested for sampling overwintering populations of ambrosia beetles, especially when large numbers of samples are involved. This procedure takes advantage of the photopositive reaction of the beetles. Hence, it should be used only during the period of early November to late March when, after warming, the beetles become active and attracted to light.

PROCEDURE

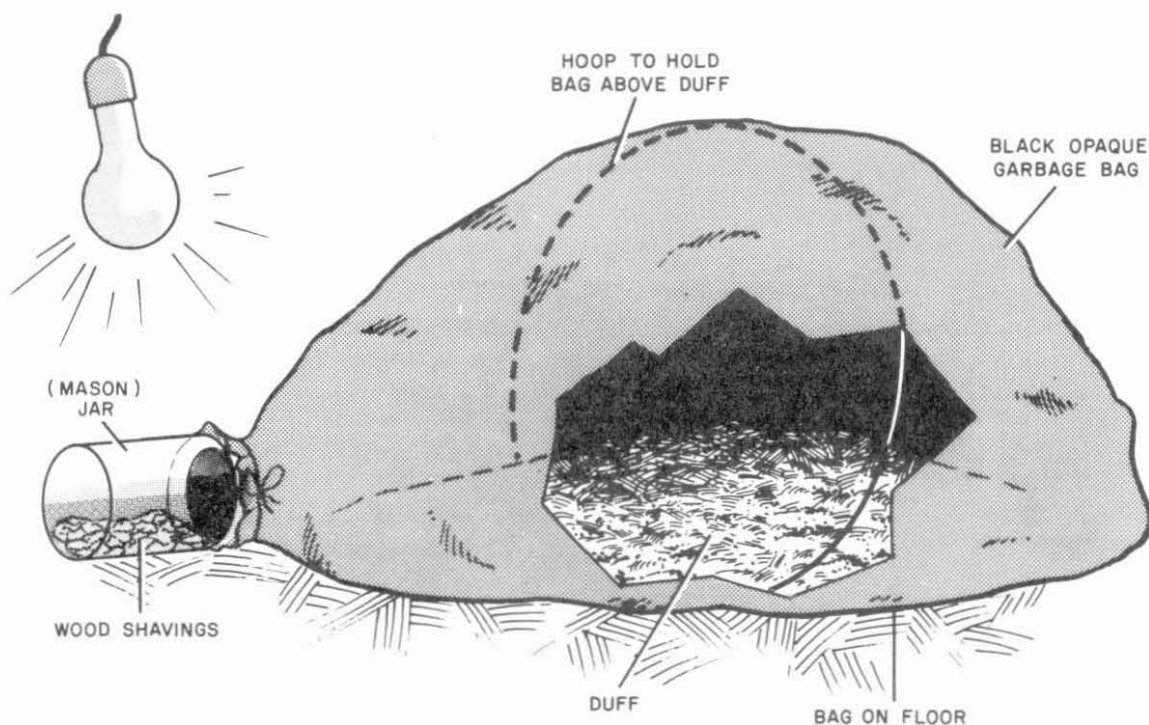
1. Put each sample into a black opaque plastic garbage bag; place a clear (Mason) jar, containing a layer (about 3 cm) of moss or wood shavings, within the open end and tie with string or an elastic band, ensuring that the beetles cannot escape. Label all bags as to sample origin.

2. Insert a piece of wire or other stiff material into each bag to hold the plastic away from the duff.
3. Place the bags in a room at 21-27°C (70-80°F) and suspend a light above the jars at a distance so that the contents of the jars do not become too hot.
4. Empty the jars every 24 hours and count the beetles; in this way, the progress of emergence can be observed.

The emergence period depends largely on the time of year and on the temperature of the duff when placed in the bags. However, the beetles should normally emerge in about 5 days if the duff is collected after the beginning of November. A double check can be made by extending this period or by using the double-pan method on some of the samples to see if all beetles have emerged.

Reference:

Chapman, J.A. 1974. Ambrosia beetle. Guidelines to population estimates near dry land log-storage areas and damage hazard assessment. Can. For. Serv., Pac. For. Res. Cen. Inf. Rep. BC-X-103.



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