Powderpost beetles in timber

protecting timber, buildings and furniture

Timber borers 1

Wood-boring insect pests that attack seasoned timber can cause significant, structural damage to property. Preventative measures are less expensive that treatment, so property owners need to understand what to look out for as well as best-practice in timber management.

Powderpost beetles and anobiid beetles are the most significant borer groups found in Queensland.

Powderpost beetles belong to the subfamily Lyctinae in the family Bostrichidae. They are so named because their larvae can reduce susceptible timber to a fine flour-like powder (Figure 1).

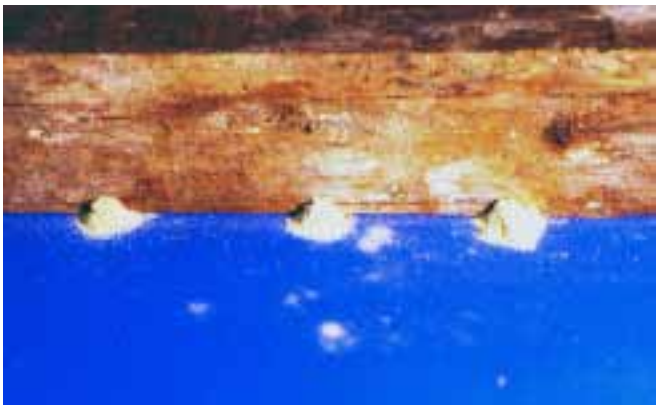

Figure 1. Larvae of powderpost beetles can reduce susceptible timber to a fine flour-like powder.

Description

Adults are up to 7 mm long, dark-brown, shiny, flattened, elongate insects (Figure 2). They have a distinct head and the terminal segments on their antennae have a clubbed appearance. Larvae are cream-coloured with brown head and jaws and 3 pairs of small jointed legs. On hatching, they are about 0.5 mm long and straight-bodied but later become C-shaped.

Biology and life cycle

Powderpost beetles are pests of the sapwood of certain hardwood timber species. Species display minor differences in appearance, habits and longevity. The following describes the life cycle and habits of our most common lyctine species, *Lyctus brunneus*.

After mating, the female beetle seeks a suitable place for egg-laying and bites the wood, leaving a series of grooves on the surface. These tasting marks may serve to determine whether the timber contains starch, the essential larval dietary requirement, and they also expose wood pores for subsequent egg-laying. Using her egg-laying apparatus (ovipositor) she lays in the open pores of the sapwood. Each female may lay a total of 70 eggs, with a usual limit of 3 eggs in any pore.

Figure 2. Adult powderpost beetle *Lyctus brunneus*.

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Eggs hatch after about 14 days and larvae feed on the starch in the sapwood until fully grown. Tunnels usually follow the grain of the wood and only the larval stage destroys timber. The development period for larvae varies from 2 to 12 months depending on temperature, humidity and the supply of starch in the sapwood.

Fully-grown larvae tunnel towards the wood surface and excavate small oval cells where pupation takes place. Two to 3 weeks later, mature beetles begin to emerge through the surface of infested timber, each making a round hole (1–2 mm diameter) as it emerges. Unlike the damage of ambrosia beetles, these exit holes have no staining around their margins. Small piles of frass associated with the emergence holes may collect on the surface of infested timber or fall nearby. Emerging adults push a small amount of frass out, but larvae moving within the sapwood also cause frass to continue to fall from emergence holes and from cracks in the timber. After emergence, the mature beetles mate and egg-laying begins. Re-infestation of timber is common and may continue until the food resource is completely utilised, usually within 4 to 5 years of felling.

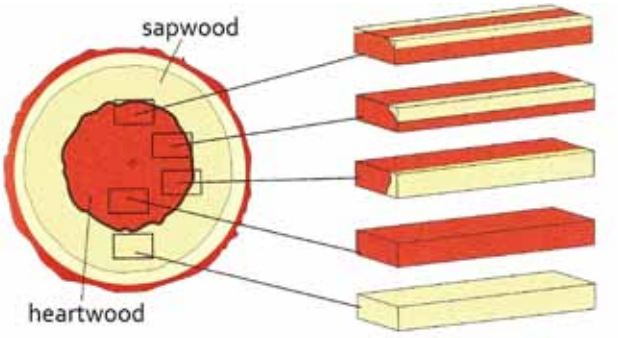

Figure 3. Various sapwood-heartwood configurations can be found in sawn timber.

Damage

Lyctine beetles attack only the sapwood (Figure 3) of certain hardwoods and do not attack softwoods. Three conditions govern susceptibility: moisture content, pore size and starch content.

Wood with about 15% moisture content is most suitable for larval development. Only hardwoods have pores and lyctines attack only the sapwood of hardwood species with pores larger than the diameter of the ovipositor of the female. Susceptible timber species must also contain enough starch to nourish the developing larvae. The heartwood of hardwoods is never infested, although adults may emerge through it.

Coniferous woods (softwoods) have different food reserves and cell structure and therefore are not susceptible.

Most attacks take place at the saw-mill, in logs or sawn timbers that are drying. Evidence of infestation may not become apparent until the timber is in-service and adults begin to emerge. Infested timber contains numerous galleries packed with fine powdery frass. The whole of the infested area may be reduced to powder leaving only a shell of wood on the outside, perforated by emergence holes. Small piles of frass may be found where a gallery has broken the surface or where an adult beetle has emerged. The frass is smooth and floury (not gritty) when rubbed between the fingers. Infestation may occur anywhere in the structure where susceptible timber has been used (for example, in subfloor areas, living space, roof space, or in furniture and artefacts). In new houses, emergence holes may appear in the lining materials (for example, in plasterboard and panelling) and joinery. Such holes are made by adults emerging from the hardwood framing beneath.

Economic species

Of the species found in Queensland, *Lyctus brunneus* is the most destructive and commonly encountered. Others include the small powderpost beetle *Lyctus discedens*, *Lyctus planicollis*, *Lyctus parallelocollis* and *Tristaria grouvellei*. The Malayan powderpost beetle *Minthea rugicollis*, which was often found in rainforest hardwoods imported from South-East Asia, is now established in Queensland.

Management

In the tropical and subtropical climates of Queensland attack by powderpost beetles on susceptible timber is almost inevitable. Consumer legislation placing constraints on the sale and use of such timber exists in New South Wales.

Timber can be immunised by treating with appropriate preservatives, and there is a guide to the Australian Standards series dealing with timber and timber preservation. In addition to timber immunisation, lyctine attack is prevented by using non-susceptible timber or by removing the sapwood from susceptible species.

No single treatment for lyctine attack is suitable in all circumstances. The following options are available:

- In most circumstances no control measures are required because the damage is not of structural significance. For example, damage to a section of a fence paling may be of little consequence. Exit holes in plasterboard, overlying a small section of infested sapwood in the framing material, can be easily filled to restore the original appearance. However, emergences may continue for a year or longer, depending upon the amount of sapwood available for infestation. Where appearances are important, control measures may be required. For example, damage in floors or panelling may be of consequence. If lyctine damage is found in a building more than 5 years old, control measures are not usually necessary, because supplies of susceptible material should have been exhausted.
- In some cases removing infested sapwood from affected timber may be easy. For example, sapwood can be chiselled from an infested hardwood post in a pergola.
- Replacing affected timber with non-susceptible material may be a practical option. For example, an infested floorboard, windowsill or table leg can be replaced to remove the infestation.
- Items of furniture can be disinfested by fumigation. Small items, like carved souvenirs, are disinfested by placing them in a freezer for a week or so.

Neither fumigation nor freezing provides protection against re-infestation; however, the article can be protected by restoring the finish or by applying paint, varnish or wax polish to all exposed surfaces soon after treatment.

If further lyctine damage cannot be tolerated and other control options have been rejected, a registered residual insecticide should be used. Treatments are sprayed or brushed on to the affected parts of unfinished timber surfaces. All exposed faces of susceptible sapwood should be treated. The insecticide should be diluted in oil or water, although oil-based treatments are preferred because better penetration and persistence will be achieved. Water-based treatments leave most of the insecticide on the surface of seasoned timber.

Emergence through water-based insecticide may continue for many months, but most adults will be killed as they wander over the treated surface. Immature lyctines may survive beyond the treated zone, but their emergence as adults through oil-based insecticide is unlikely. Emergence can continue through non-host materials concealing sapwood surfaces, for example, through the lining attached to ceiling battens. Both oil-based and water-based treatments provide protection from re-infestation, but additional treatment may be required depending on the persistence of the insecticide and the site of infestation. For example, hot conditions in the roof space may reduce the persistence of the chemical. Access to infested roof timbers is often difficult. In some cases, fumigation may be warranted, but protection against re-infestation is also required.

Note: In weather-exposed situations, sapwood is also susceptible to fungal decay.

Summary

Powderpost beetles attack only the sapwood of certain hardwoods and do not attack softwoods. In the tropical and subtropical climates of Queensland attack by powderpost beetles on susceptible timber is almost inevitable. The development period for larvae varies from 2 to 12 months. Re-infestation of timber is common and may continue until the food resource is completely utilised. Prevention of powderpost beetle attack is better than cure. No single treatment for powderpost beetle attack is suitable in all circumstances. A range of options is available.

Authors

BC Peters, J King and FR Wylie

Source

Peters, BC, J King, & FR Wylie. (1996) *Pests of Timber in Queensland*. Queensland Forestry Research Institute, Department of Primary Industries, Brisbane, 175 pp. Available from the Queensland Government Bookshop: www.bookshop.qld.gov.au

More information

Standards Australia HB 164-2002 – Wood and wood preservation – A complete guide to the AS/NZS 1604 Standards series, distributed by SAI Global Ltd.

DEEDI Business Information Centre: 13 25 23

Website: www.dpi.qld.gov.au

Information current October 2010

Information current August 2009