Oak pinhole borer

Platypus cylindrus (Coleoptera : Curculionidae)

The oak pinhole borer, *Platypus cylindrus* is the only indigenous member of the subfamily *Platypodinae* and one of the few 'ambrosia beetle' species found in Britain. Ambrosia beetles, although wood borers, are not wood feeders: the adults bore into wood and introduce into their tunnels 'ambrosia' fungi which grow on the tunnel walls and serve as the main source of food for the adults and larvae.

P.cylindrus is an insect that in recent years has changed its status from rarity to pest. Listed in the 1987 British Red Data Books under the category 'rare', following the hurricane of 1987 it quickly took advantage of an abundance of breeding material and favourable conditions in southern England. Beetle numbers increased rapidly and in the early 1990's reports of damage to sawlogs rose dramatically. Numbers have never returned to pre-hurricane levels and *P.cylindrus* continues to be a problem both at the felling site and in the timber yard. This may be a consequence of a continuing supply of breeding material in the form of weakened oaks suffering from 'oak dieback and decline'.

P.cylindrus appears to establish only in trees that are severely stressed or already dead and is not itself responsible for killing trees.

Life cycle

Adult *Platypus cylindrus* beetles are 6-8mm long, rather rectangular in shape, and are pitchy-brown to almost black in colour.

Adult beetle on oak timber, cut to show tunnels in cross- section

Sporadic emergence of mature beetles has been reported to occur throughout the year, but it is thought that only beetles emerging from June to the end of September are able to survive and breed successfully.

The adults are at their most active between mid-July and mid-September when the males can be found boring into logs and stumps. They appear to be strongly attracted by the smell of fermenting sap, some logs seeming more attractive than others.

The male excavates the first few centimetres of a gallery, which a female will enter and then re-emerge with the male to mate on the bark surface.

Piles of fibrous frass mark entry points of Platypus cylindrus adults.

After mating the two beetles re-enter the tunnel, this time the female going first, the male following behind. It is his job to push out all the bore dust that will now be produced by the female and subsequently her offspring.

Tunnelling proceeds, quite rapidly, in a radial direction. At this stage the bore dust produced is typically fibrous, pale in colour and composed of manyshort pieces about 0.15 – 0.18mm long. When heaped in bark fissures the fibres have the appearance of piles of wood wool and this can differentiate *P.cylindrus* activity from other wood borers that tend to produce granular frass.

Spores of ambrosia fungi are introduced into the tunnel on the body of the beetle. The fungi quickly become established on the walls and form a thick layer that provides nourishment for the adult beetles and the developing larvae.

The female usually lays her first eggs about four weeks after entry and continues to lay further batches at irregular intervals throughout her 2-3 year life. When tunnels are started in late August or September the first eggs may not be laid until the following spring. The female continues to extend the gallery system throughout her life-time and eventually a branched system is created that can reach up to 1.8m in length.

Eggs hatch after 2-6 weeks into yellowish-white, legless larvae. As they grow they pass through 4 or 5 growth stages (instars), moulting their skin between each stage. The later instars, particularly the final one, have strong gouge-like mandibles, which are used to extend the tunnel system. Larvae tunnel more slowly than adults and although they ingest wood during tunnelling, they still depend on fungi for their nourishment.

Unlike the fibrous bore dust produced by the adult beetles, that produced by the larvae is granular and cannot be distinguished from bore dust of other ambrosia beetles such as *Trypodendon* spp. Fully grown larvae excavate small chambers, inside which they pupate.

Newly hatched adults feed on the fungi and emerge without further boring.

The life cycle, from egg to adult, usually takes two years (occasionally one year) and more than one generation of *P.cylindrus* may utilise a single gallery system.

Damage

As its common name suggests, the oak pinhole borer prefers oak but will readily attack other hardwoods, notably sweet chestnut and beech, the latter particularly when some fissuring of the bark has occurred. It is also known to breed in ash, elm and walnut. At first the tunnels (galleries) are confined to sapwood and if logs are converted within the first year of attack, heartwood penetration will not have occurred.

Mass attack of sweet chestnut showing numerous piles of white, granular bore dust

However, in suitable material, adults and larvae will go on to bore deeply into the heartwood causing extensive degrade over a 3-4 year period. Galleries are 1.6mm in diameter, round and regular in cross-section and free from bore dust. Frequently the surrounding wood is stained black or brown by the ambrosia fungi. In early infestations, the tunnels run across the grain but later, branches run in any direction.

Timber with pinholes caused by *P.cylindrus* is not weakened significantly, but the appearance of final products will be spoiled, especially in the case of veneers and high quality structural timbers.

Once the beetle has established in timber, early conversion to accelerate the drying process, perhaps combined with kiln drying, is the only option to prevent further activity. Conversion into planks, removal of wane and sapwood and dehumidification will all result in reductions in the moisture content of the wood. Debarking will accelerate drying but is not thought to prevent attack. Once the moisture content falls below 30-40% beetle activity is minimal, but it will not cease altogether until the moisture content reaches 25% or less. At this point the ambrosia fungi, on which the beetles depend, can no longer survive in the tunnels.

Once beetles have tunnelled into logs they cannot be controlled successfully with insecticide. Chemical treatment is, therefore, only of value in protecting uninfested logs where, with careful timing, it can be used to deter the entry of beetles.

Protection

Recommendations are based on the biology of this insect and availability of approved products. They have not been evaluated under field conditions.

Platypus bore holes in oak heartwood with dark staining caused by ambrosia fungi

Normal Harvesting

While spraying logs at the felling site is currently permitted (see Appendix 1, overleaf), a more desirable and environmentally friendly means of protecting logs is by managing the harvesting operation in relation to the biology of the beetle.

- Avoid harvesting from June to September, i.e. during the time the adult beetles are flying and colonising logs.
- Remove timber from the forest as quickly as possible. Logs can be attacked within days of cutting.
- Carry out regular inspections. Even outside of the functional beetle flight period, it is advisable to carry out regular inspections for signs of attack since warmer winter and spring temperatures may increase the chances of beetles surviving and breeding successfully.

In the yard

If logs are being air seasoned to produce high value timber, great care needs to be taken as wood left in the round may remain susceptible to attack for up to 3 years and debarking is not thought to prevent attack.

- Do not move infested timber into yards during the flight period of the beetle.
- Do not allow old branchwood and firewood that may contain *P.cylindrus* to accumulate.
- Inspect stored logs regularly. Any logs with bore dust need to be converted as soon as possible to accelerate the drying process, minimise further degrade and reduce the risk of spread.
- Spray high value logs in May and again in mid July with any of the chemicals listed in Appendix 1, following the guidelines listed there. This treatment is to kill adult *P.cylindrus* as they attempt to bore into the logs. At yards where there is a danger of infestation, logs may need to be sprayed every May and July for three or four years following on from the original felling date.

Salvaged Timber

There is no way of preventing entry of beetles into severely weakened or dead standing trees, so timber from salvaged trees needs to be treated with extreme caution.

- Inspect carefully for signs of infestation (not always easy to spot) i.e. frass in bark crevices, entry/exit holes approx.1.6mm in diameter.
- Avoid taking material that may be infested into the yard during the main flight period of the beetle.
- Take steps to reduce the moisture content as quickly as possible.

In addition to *P.cylindrus*, standing oaks in poor health are at risk of being infested by other secondary wood boring insect pests, notably:

Agrilus pannonicus, the flat headed borer

A. pannonicus can be a significant secondary pest in oak trees already suffering from dieback. *A. pannonicus* confines its activity to the cambium and outer sapwood and so can seriously disrupt transport of water and nutrients in the vessels, adding to the stress on the tree. This can accelerate decline. Signs of infestation are characteristic D-shaped exit holes through the bark and, sometimes, tarry patches on the bark surface.

Xyloterus domesticum

Another ambrosia beetle, this species makes pinholes similar to those of *P.cylindrus* but it is rarely of economic importance because its tunnelling activity is confined to the sapwood. The bore dust produced by *X. domesticum* is always granular.

Longhorn beetles

These include various species of the family Cerambycidae. They tend to attack trees only in the later stages of decline. The large exit holes are usually oval in cross section.

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Appendix 1

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Chemicals with current Chemicals Regulation Directorate (CRD) approval for use on cut logs

As the status and availability of chemicals may change always check the manufacturer's label to ensure that there is approval for the use intended.

The following products, for professional use only, have current CRD approval for application to cut logs as a preventative treatment against adult beetles.

The insecticides should be applied by the method and at the rate recommended for use against ambrosia beetles by the Manufacturer's on the label, paying particular attention to aspects of safety and prevention of pollution.

Chemical	Marketing Company	Active ingredient	Type
Forester	Fargro Ltd	cypermethrin	Synthetic pyrethroid

Agriguard Chlorpyrifos	Agriguard Ltd	chlorpyriphos	Organophosphate*
Alpha Chlorpyriphos 48 EC	Makhteshim-Agan (UK) Ltd	chlorpyriphos	
Ballad	Headland Agrochemicals Ltd.	chlorpyriphos	
Chlobber	AgChemAccess Ltd	chlorpyriphos	
Clayton Pontoon	Clayton Plant Protection (UK) Ltd	chlorpyriphos	
Cyren	Headland Agrochemicals Ltd.	chlorpyriphos	
Dursban WG	Dow AgroSciences Ltd	chlorpyriphos	
Equity	Dow AgroSciences Ltd	chlorpyriphos	
Govern	Dow AgroSciences Ltd	chlorpyriphos	
Parapet	Dow AgroSciences Ltd	chlorpyriphos	
Pirisect	Agriguard Ltd	chlorpyriphos	

*****Health monitoring may be appropriate under Control ofSubstances Hazardous to Health (COSHH) regulations when using organophosphorus pesticides

Before using any pesticide product always read the manufacturers instructions on the label (including any accompanying leaflet) carefully and apply the product for the use, and at the rate and by the method recommended, paying particular attention to all aspects of safety.

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Revised April 2010