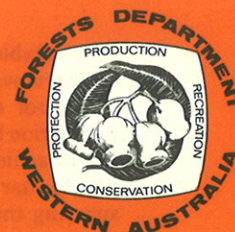




INFORMATION SHEET

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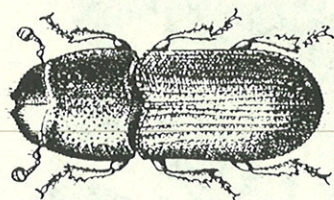
IPS BARK BEETLES Pests of Pines

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Bark beetles, which belong to the family *Scolytidae*, mine between the bark and the wood of the branches and the main stem, engraving both layers with characteristically shaped galleries. The species of great importance in Western Australia is *Ips grandicollis*, native to the eastern and south-eastern states of the U.S.A. and Canada, where it attacks a number of pine species. It was first noticed in Western Australia in the early 1950s and was probably imported in timber or logs either from the U.S.A. or from South Australia, into which state it was imported from America in the early 1940s. In America it is known as a southern or five-spined pine engraver.

Mature ips beetles are small, from 2.5 to 4.5 mm in length, hard, cylindrical and dark reddish brown to black in colour. The rear end of the body is shovel shaped with five small spines on each side.



The rear end of ips appears truncated as if it has been abruptly cut off and is hollowed out above. The declivity bears a number of spines along the margin. Other bark beetles with which it might be confused are not hollowed out and have rounded wing covers at the rear end.

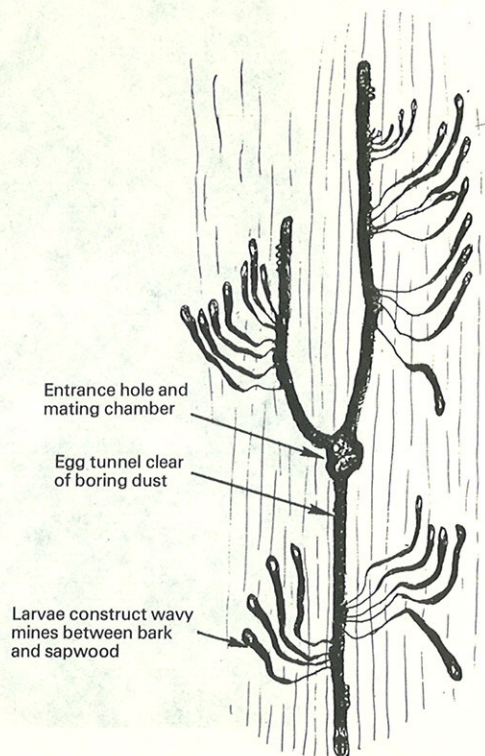
Attack of pine logs or susceptible trees is initiated by the male beetle, which bores through the bark to the sapwood surface. There a nuptial or mating chamber is produced, the resulting light brown sawdust (or frass) being ejected through the entrance hole in the bark. This frass contains a chemical stimulant (or pheromone) produced by the male beetle, which has an odour attractive to other beetles, both male and female. It is thus known as an aggregating pheromone because it attracts numbers of beetles to a particular tree or log, so that further attack and breeding will take place.

Female beetles thus find the males and mate with them in the nuptial chamber. Three or four females may mate with one male and each then produces a gallery up or down the stem, in the sides of which fifty or sixty eggs are laid singly in small niches and covered with frass. The typical initial gallery system of this species is therefore H or Y shaped and 10 to 12 cm long from top to bottom. The eggs hatch in about one week and the white legless larvae tunnel out in the inner bark away from the main gallery. In summer conditions they are full grown in three or four weeks; cold conditions delay development. The full-grown larva pupates in a special cell at the end of its gallery. About a week later the pupa changes into a soft-skinned yellowish beetle which darkens as its skin

hardens. The young beetles emerge through holes in the bark similar to those by which their parents entered, giving the bark surface the appearance of being peppered with "shot-holes". During the summer, the life cycle takes from four to five weeks and during a typical season, extending from September to May, there may be five or six generations. During the winter, adults, larvae and pupae hibernate beneath the bark of attacked logs and trees.

Ips has spread from the Perth area to most pine plantations in the south-west. During the summer, there is usually a build-up of populations in plantations where tree felling is taking place. Logs may be attacked within twenty-four hours of felling. In the long, hot, dry summer, of Western Australia, by February or March the prevailing drought conditions often result in a lowering of the sap pressure and thus a reduction in the resistance of the trees to insect attack. Ips attack of such susceptible trees sometimes occurs in plantations where a population increase has followed recent tree felling. Heavy attack results in the ring-barking of the trees which will lead to their death within a few months.

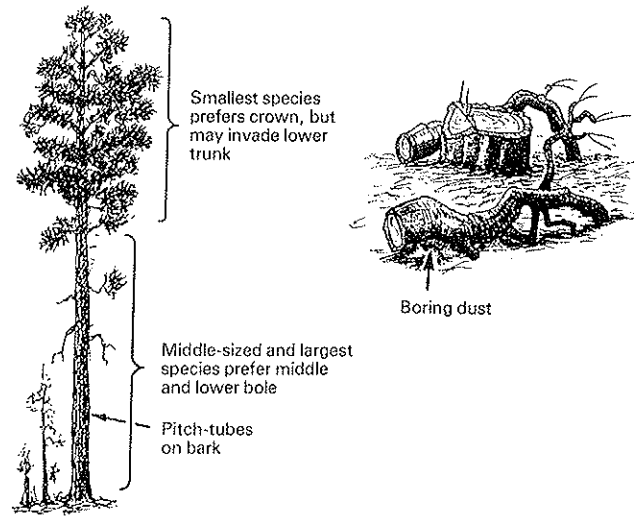
Ips attack of pine logs causes only superficial damage to the wood surface, but the development of the sap staining fungus which follows the insect attack, produces



Gallery pattern on inner bark surface

considerable visual degrade. This may be reduced by early removal of logs from plantations after felling.

Control of attack by the reduction of the beetle population breeding in the discarded tops of felled trees, can be achieved by (a) debarking the logs, (b) burning the logs to char the bark and kill the insects beneath, or (c) spraying them with an insecticide such as 0.5 per cent Lindane emulsion in water. These methods are expensive and time-consuming. Alternatively, attack may be prevented by improving the vigour of standing trees through the reduction of competition for available soil-water in summer droughts. This may be achieved by the selective felling of young seven to eight year-old plantations during the winter months when no increase in the ips population will occur in the felled trees.



Exit holes of adults make outer bark appear to be peppered with "shot holes".

Three species of ips may attack at the same time or work separately. They normally live in logging slash, stumps and trees that have been damaged by fire or lightning. During dry periods beetles kill pines.

