Boll. Zool. agr. Bachic.
Ser. II, 31 (1): 93-95

30 June 1999

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A method to test the efficacy of insecticides on wood borers

Abstract - A method for testing activity of insecticides against wood borers is proposed.

Riassunto - *Un metodo per valutare l'attività di insetticidi sui tarli del legno.*
Viene illustrato un metodo di laboratorio per saggiare l'attività di formùlati insetticidi da impiegare contro i "tarli del legno".

Key words: Wood borers, Anobiidae, insecticides, test method.

It is not easy to test in laboratories the efficacy of insecticides on wood borers. An official European laboratory method to be employed only on larvae of House Longhorn Beetle (*Hylotrupes bajulus* L.) was finalized by CEN (EN 46, 1988). This test utilizes the wood of Scotch Pine (*Pinus sylvestris*). The most common woodborers are, however, Anobiidae; they have a very long development cycle (e.g. *Anobium punctatum* (Degeer) needs 3 years approximately from egg to adult) (Busvine, 1966). These insects, as some Curculionidae and Bostrichidae attack many types of wood, with different texture.

The breeding in laboratories doesn't supply large quantities of insects; it's no possible to know exactly the real colonization and the stage of development if naturally infested wood is used. Furthermore, the holes in the wood are the sign of the exit of the adults. The insecticides can be applied with a brush or with an injection in a hole; the results are evaluated after a long time and after many replications. In fact, it is possible that the treatment is carried out on wood considered infested, but maybe not colonised by the wood borers at that moment.

To avoid this inconvenience and to confirm the presence of wood borers an X-Ray examination of the wood before the treatment is necessary. Another X-Ray examination is necessary at least a week after the test, to verify if the wood borers have been killed.

This method needs complex and expensive equipment.

To solve this problem, we have realized an easy method, which gives good results in a short time. The method is based on pieces of wood (6.5x3x3 cm) with a series of holes, obtained with a drill of 3 mm, as in Fig. 1.

An horizontal hole end to end of the same size is made at the bottom of the piece of wood (at 0,2 cm from the surface) where the product for the test is injected.

In the wood we have artificial and vertical "cells", which have the bottom 2, 4, 6, 8, 10 mm far from the horizontal hole. The larvae or the adults of the insects to be tested are put in these "cells" with food.

The texture of the wood can interfere with the absorption of the products; so it is better to use different woods.

We suggested the use of Kauri Pine (*Agathis australis*), Mahogany (*Swietenia* spp.), Oak (*Quercus robur)*, and Spruce (*Picea* spp.).

For the test we used a substitute of *A. punctatum*, that is *Prostephanus truncatus* (Horn), "the Large Grain Borer". This beetle is typically xylophagous; in these last years it has become particularly harmful to stored maize (Bell & Watters, 1982).

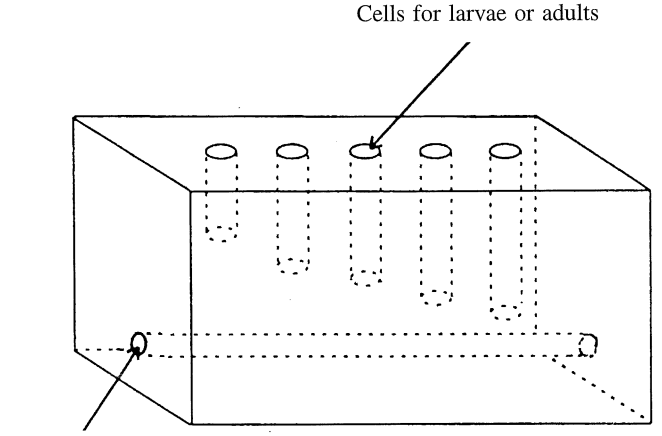

Fig. 1 - Scheme of a piece of wood used for the tests with a series of holes obtained with a drill.

Prostephanus truncatus is easily bred on stored maize. At 30 ±1°C and 60 ±5% r. h. it needs about 30 days to complete a generation.

To carry out the test the larvae and the adults are taken from infested kernels and are transferred to the cells in the wood with corn flower as food.

After 24 hours the survival of the insects is controlled.

Following this the cells are closed with corks in polyethylene and the wood is treated as explained above. If the insecticide is injected in the horizontal hole, this is closed with corks at both ends after the treatment.

The efficacy is verified after 24, 48 hours and after 7 days, comparing the mortality with an untreated sample.

The test must be repeated 4 times for every type of wood and the data is statistically elaborated.

During our experiences, we often verified that the non treated insects are able to make a hole in the wood within 24-48 hours, in particular in soft wood Kauri Pine and Spruce (Fig. 2).

It is possible to verify if the activity is due to the a. i. or to the solvents used in the product.

Obviously, in general the activity is faster in soft woods and in the holes which have the bottom 2 or 4 mm far from the horizontal hole.

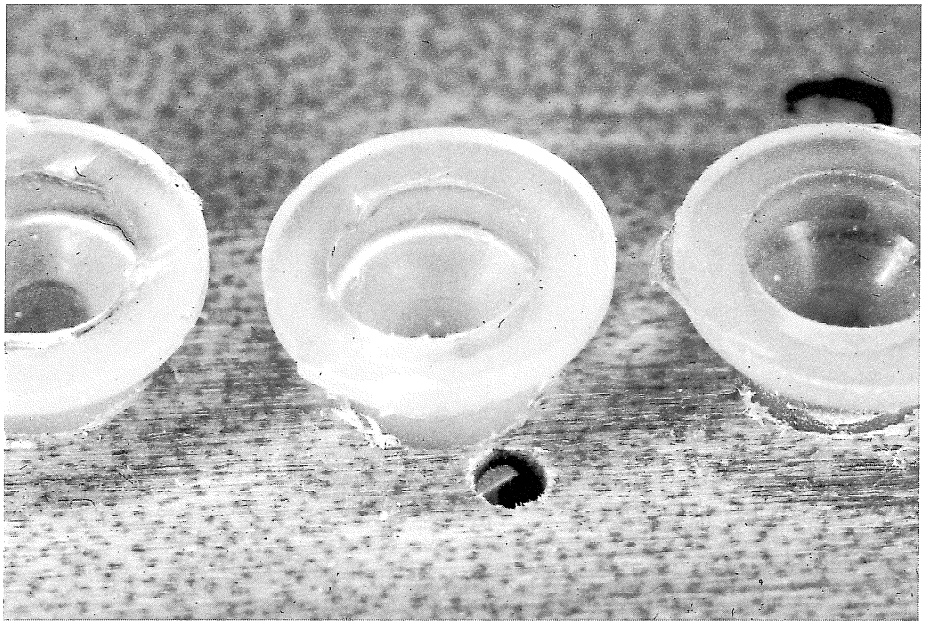

Fig. 2 - Hole made by *Prostephanus truncatus* in the wood, when the tešted insecticide is not active.

This proposed method gives good results in a week and we think that it's possible to recommend for official tests with insecticides against wood borers.

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Accepted 20 April 1999