Termite hazard mapping

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Introduction

An important part of determining the durability of timber is to understand the hazard it will face in service. Before the Forest and Wood Product Research and Development Corporation funded project 'Design for Durability', there was no uniform measure of termite hazard across the country. Some localised termite surveys had been conducted. For example, termite incidence in Melbourne (1), Perth (2), and Sydney (3). Also, maps of each termite species were available (4), and while these provide guidance they indicate termite species distribution rather than hazard or termite pressure. The aim of this contribution was to determine the hazard faced by buildings in Australia to wood-feeding termites, as influenced by location and house construction type.

Methods

A 'Termite Tally' survey was conducted through CSIRO's Double Helix science club, producing data for 4194 buildings, from 248 students. Data for a further 145 houses were obtained by a CSIRO phone survey, targeting areas under-represented in the Double Helix data. An additional survey was conducted through an email survey to 'CSIRO All', resulting in 783 responses. Therefore, the total data set was 5122. A verification study of the Termite Tally survey was also undertaken to obtain an indication of the reliability of the data collected.

Results

The mean house age was 30 years, and the mean occupancy duration was 11 years. Lowest mean house age occurred in Darwin (result of Cyclone Tracey). Timber was the most common framing material in Victoria, Tasmania, Queensland, NSW and the ACT. Masonry framing materials predominate in WA, SA and NT. Steel alone accounted for only 5% of house framing, with the highest proportion in the NT. Timber is the most common flooring material in Tasmania, Victoria, NSW and the ACT. Concrete floors are most common in the NT, Queensland, SA and WA. Mixtures of floor type (timber and concrete) are more common than mixtures of frame type. The dominant factor affecting termite incidence inside houses was house age. The occurrence of termites inside a house was not significantly affected by house construction type (timber, masonry, concrete, steel or their combinations) (see Table). Termite eradication was most successful by soil or wood treatment. Least success was obtained by ignoring the problem, followed by simply disturbing the affected area. Termites inside houses were most often found in walls, flooring, house stumps, architrave and skirting boards, joists, bearers and window frames. Termites were less common in roofing timbers. Termites outside were most often found in wood piles/branches, live and dead trees, fencing, sleepers, dead tree stumps, and the garden shed. Termite presence was most often noticed by the damage caused to timber, followed by mud tube construction. A verification survey of Double Helix students showed that more than 95% of houses were targeted at random in relation to their construction type and termite history. The

ability to distinguish termite activity was also high, although obviously less than for trained specialists. Of 109 'termite' samples sent to CSIRO for identification, 106 were in fact termites. The relative information gathered was used to develop a termite hazard map. An agro-ecological map provided by The Agriculture Working Group on Ecologically Sustainable Development was used as the framework upon which the termite incidence data was applied. Maps illustrating termite incidence inside and outside were produced. From these maps was constructed a tentative termite hazard map for Australia. The hazard map suggests that the most important factor determining termite distribution is temperature, followed secondly by rainfall. Vegetation and soil type appear to play a more minor role within the dominant effects of temperature and moisture.

Table 1. Risk of Termites to House According to Frame Type

Frame type	Sample size	% sample	Average age of house (years)	% termite inside	% termites inside adjusted to 30 y house
Timber	3445	69.2	29.4	17	17*
Masonry	1071	21.5	34.6	18	16*
Steel	249	5.0	12.1	10	17*
Steel + masonry	7	0.1	27.7	0	Not detn
Timber + masonry	177	3.6	33.6	22	21*
Timber + steel	26	0.5	31.4	32	Not detn
Timber + steel + masonry	5	0.1	70.0	40	Not detn

*Not significantly different. Not detn = not determined due to low sample number.

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