

Metaxyl and mancozeb, however, did not inhibit the growth of either *F. solani* or *F. oxysporum* (Table 1, Figures 3, 4). Both fungi challenged with these fungicides grew as well as the control and produced macro- and micro- conidia.

The experiment shows that low concentrations of thiabendazole and benomyl can inhibit growth of *F. solani* and *F. oxysporum* *in vitro*.

Field experiments are presently being carried out, with application of thiabendazole and benomyl as soil drenches.

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A NOTE ON THE NATURAL DURABILITY OF SOME MALAYSIAN TIMBERS

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The first series of tests on the natural durability of Malaysian timbers were started in 1918 at a site known then as the Weld Forest Reserve, Kuala Lumpur (Foxworth & Wooley 1930). The tests were continued but on a new site in the Forest Research Institute Malaysia (FRIM), and the results were published by Jackson (1957) and Mohd Dahlan and Tam (1985). There were a number of ongoing trials which had not been completed at the time of the last publication and this note presents the results of those ongoing trials up to December 1991.

The description of the existing test sites, known respectively as the upper and lower graveyards was given by Jackson (1957). Procedures in selecting and preparing test stakes, methods of stakes installation and assessment and the durability classification employed were also given in the same report. Basically, the tests involve planting of stakes (600 mm long and 50 mm square) of the various timber species in trenches about 450 mm deep with 150 mm of the stakes above ground. Assessment of the stakes is carried out at six monthly intervals. After each assessment, the average service life of a particular species is estimated, i.e. when all the test stakes have been destroyed, and placed under respective durability classes which are defined as follows:

Table 1. Natural durability rating of some Malaysian timbers

No.	Timber	Species tested	No. of stakes used	Stakes destroyed				Average service life (y)	Durability classification
				First group		Last group			
				No.	(y)	No.	(y)		
1.	Berangan	<i>Castanopsis malaccensis</i>	28	2	1.0	2	6.0	2.9	III
2.	Chengal	<i>Neobalanocarpus heimii</i>	40	1	6.0	4	21.0	15.9	I
3.	Gerutu	<i>Parashorea densiflora</i>	12	1	1.5	1	7.0	2.7	III
4.	Kasah	<i>Pterygota horsfieldii</i>	8	6	1.0	2	2.0	1.3	IV
5.	Kungkur	<i>Pithecellobium splendens</i>	30	1	0.5	2	5.5	2.6	III
6.	Lelayang	<i>Parishia insignis</i>	20	20	0.5	-	-	0.5	IV
7.	Limpaga	<i>Cedrela sureni</i>	20	8	2.0	5	3.0	2.4	III
8.	Mempening	<i>Quercus argentata</i>	10	2	2.0	1	11.5	4.8	III
9.	Mengkulang	<i>Heritiera javanica</i>	20	1	0.5	3	5.0	2.2	III
10.	Meranti, light red	<i>Shorea teysmanniana</i>	30	14	0.5	2	2.5	1.1	IV
11.	Meranti, white	<i>Shorea henryana</i>	102	1	2.0	2	7.5	3.7	III
12.	Samak	<i>Adinandra villosa</i>	12	12	0.5	-	-	0.5	IV

- I. Very durable: a service life of over 10 years
- II. Durable: a service life of 5 to 10 years
- III. Moderately durable: a service life of 2 to 5 years
- IV. Non-durable: a service life of up to 2 years

The natural durability rating of 12 timber species which have been assessed to date is given in Table 1. The species are arranged in alphabetical order based on their trade/common names (Wong 1982).

Chengal (*Neobalanocarpus heimii*) is the only timber species which is found to be durable, having an actual service life of 15.9 years. Mohd Dahlan and Tam (1985) estimated the service life of this species as 14.9+ years, where the + sign indicates that the test on this species was still in progress; it was concluded in this note. The majority of the other timber species are classified as moderately durable which include the timbers from *Castanopsis malaccensis* (2.9 years), *Cedrela sureni* (2.4 years), *Heritiera javanica* (2.2 years), *Parashorea densiflora* (2.7 years), *Pithecellobium splendens* (2.6 years), *Quercus argentata* (4.8 years) and *Shorea henryana* (3.7 years). The remaining four species (*Adinandra villosa*, *Parishia insignis*, *Pterygota horsfieldii* and *Shorea teysmanniana*) are classified as non-durable under the conditions of the test. Test stakes of *A. villosa* and *P. insignis* were found to be destroyed after six months of installation. Almost all failures recorded were due to the combined attack of termites and wood rotting fungi of which the former was more pronounced.

It should be noted that the durability classification presented here only provides a general comparison of the relative natural durability of the timber species concerned. When this classification is used, factors such as size of timber, the type of service conditions and the proportion of sapwood to heartwood should be taken into consideration.

The average service lives given in the classification are applied strictly to stakes having a dimension of 50 mm square cross-section. For stakes of this size, where they have a larger surface area per volume exposed, the rate of destruction by the wood destroying organisms is faster than that of a full size timber. Timbers used externally not in contact with ground, a condition when termite attack is excluded, will generally have a much longer life span. When timber containing a higher proportion of sapwood is utilized for a job, a shorter average service life than that is given in the classification would be expected as sapwood of most timbers is non-durable.

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