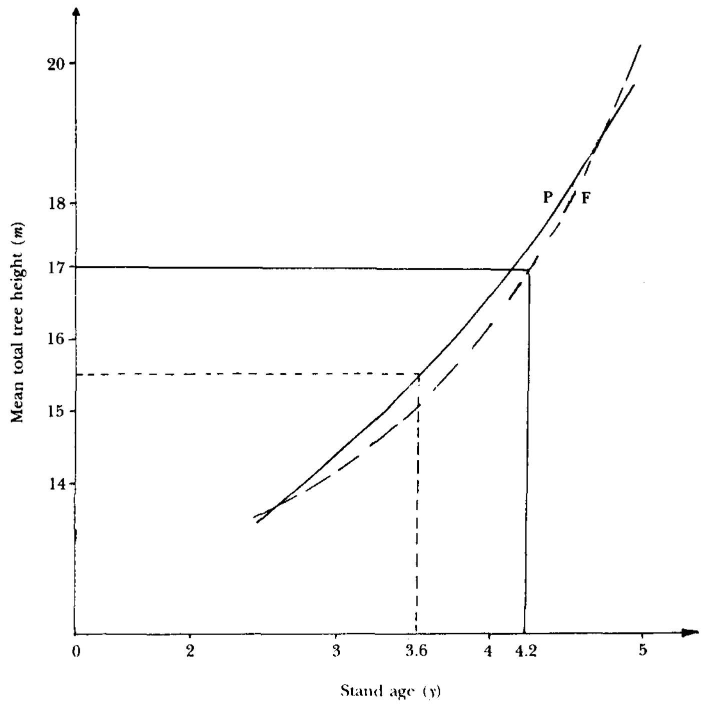

Figure 2. Relationship between mean height and age for potential crop trees (F) and for mixed population (P)

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ABNORMAL ROOTING IN *ACACIA MANGIUM* TREES

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Acacia mangium is one of the main species used in the Compensatory plantation project in Peninsular Malaysia. The species shows good performance in the early growth. Nevertheless, the species is prone to heart rot infection when wounded (Lee *et al.* 1988). During a field study in the Kemasul plantations in Pahang, Peninsular Malaysia, I observed a peculiar rooting habit inside the stem. Even though this phenomenon has been reported for other species elsewhere, for temperate trees (Kubikova 1975) and tropical trees (Dickinson & Tanner 1978), that in *A. mangium* was different - the incidence occurred in young trees and it was located high above the ground.

I observed two 7-*y*-old trees with holes in the stems that seemed to originate from wounds. When the trees were felled, spliced and examined, it was discovered that the central portion of the stems were already decayed, and were filled with water. Among the decayed wood material was a root mass (Figure 1). The roots originated from new bark outlining the inner surfaces that separated the cambium from the decayed wood. Some of the roots formed nodules. A similar observation was made in a 5-*y*-old tree (Figure 2).

Figure 1. Cross section of a heartrotted 7-*y*-old *A. mangium* tree showing the abnormal root mass that fills the rot cavity to extract the available nutrients

Figure 2. Longitudinal section of a heartrotted 5-*y*-old *A. mangium* tree with abnormal roots originate from the new bark outlining the inside of rot cavity

Such an abnormal rooting habit of the species is interesting from the ecological point of view. It indicates the ability of the tree to grasp at an opportunity to extract essential substances from any available source, even within itself. Easy rooting capability of this species as indicated in this phenomenon could be of a survival strategy of this pioneer species.

During wood decay processes in living trees, many microorganisms are involved: bacteria, yeasts, streptomycetes, non-hymenomycetous fungi, and basidiomycetes (Shigo & Hillis 1973). In addition, N-fixing bacteria were also reported to participate and play a significant role in the wood decay processes and might provide a source of nitrogen for the wood decay fungi to colonise a substrate with high C/N ratio (Harvey *et al.* 1989). Nutrients released as a result of decay processes of heartwood in the living stem of *A. mangium* and other tropical species are reabsorbed by the abnormal roots. Janzen

(1976) hypothesised that decayed heartwood of tropical trees was of an adaptive trait to provide a source of mineral supply to the trees.

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RESEARCH NOTE ON SOME PHYSICAL AND MECHANICAL PROPERTIES OF *MACARANGA HOSEI*

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Macaranga (family Euphorbiaceae) is a genus of small to medium sized trees found in the Old World tropics, from west Africa to Fiji, but strongly centred in Malesia. The species are common pioneers, and are among the earliest plants to succeed when the forests are opened extensively. The *Macaranga* are common along logging tracks, clear felled areas or on burnt sites. However, some of the species do occur as relatively big trees in peat swamp and lowland dipterocarp forests. Although *Macaranga* are common, they have not been extensively exploited as timbers in the past, because they are comparatively soft timbers. Nevertheless, with the increasing diversification in the use of tropical timbers, this common tree has a potential. Furthermore, it is a vast resource.

The timber of *Macaranga* has not been examined extensively for its physical and mechanical properties. An opportunity presented itself when a *Macaranga hosei* from the peat swamp at Ulu Langat, Banting, Selangor, Peninsular Malaysia, was felled for comparative tests on fungicides (Muller-Lindenhof 1988). The tree had an overall height of 24 *m*, and a dbh of 31 *cm*. The straight, oval bole was branch-free up to 7 *m*. The age could not be determined.

One hundred and twenty samples were randomly taken and tested according to ISO 3130 (1975) for moisture content. The green density was also assessed. Thirty samples were tested for Modulus of Elasticity (MOE), Modulus of Rupture (MOR), Compression || and Janka Hardness (radial as well as tangential) according to ASTM 143-1973.

The results for density green, density oven dry and initial moisture content (mc) are given in Table 1.