In order to obtain the maximum production in quality and volume, it is essential to enforce correct cutting practices (M. Omar 1981, Ueda 1981).

In this paper, a preliminary study on the effect of various rates of felling intensity (0, 40, 60 and 80%) on *Gigantochloa scortechinii* natural stand were analysed. The study was carried out at Chebar Forest Reserve, at Nami, Kedah, Peninsular Malaysia (Figure 1). The annual monthly rainfall distribution from April 1988 to April 1989 is as shown in Figure 2. The study was done from September 1988 until March 1989. The annual mean maximum temperature is 32.3°C and the mean minimum is 21.9°C. All these values are for within the forest reserve.

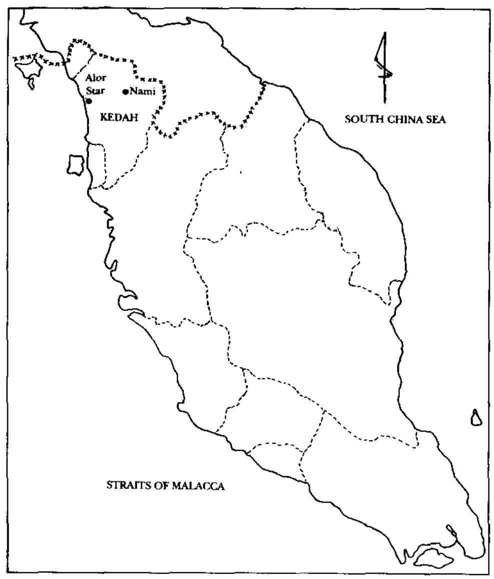

Figure 1. Study location

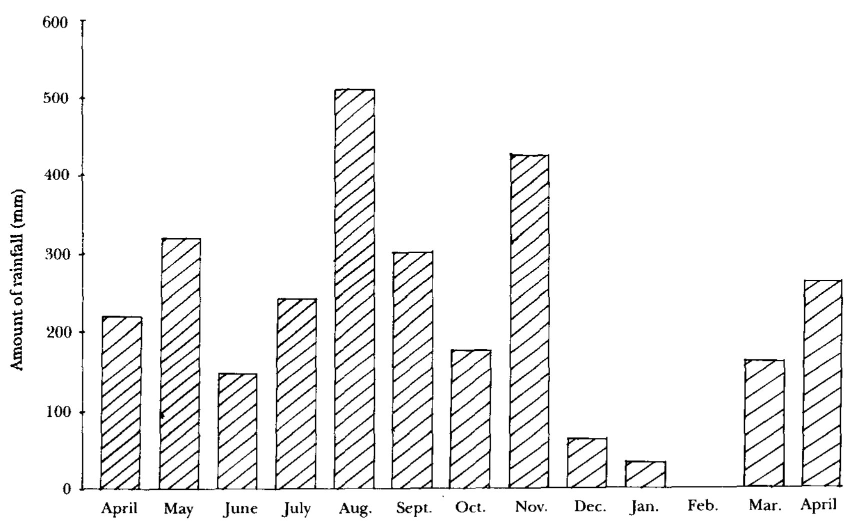

Figure 2. Rain fall distribution pattern at Nami, Kedah, from April 1988 to April 1989

A hectare area containing *G. scortechinii* natural stand was chosen for the experiment. The experimental area was divided into two replicates (0.5 *ha* each). Each replicate was divided into 12 plots, each plot consisting of eight clumps. Each clump had at least a minimum of eight mature culms. Thus, there was a minimum of 96 clumps for each replicate.

Four harvesting intensities of 0, 40, 60 and 80% were randomly assigned to each replicate. A felling intensity of, for example 40% means 40% of the total culms in each clump in the assigned plot were felled.

The felling was done in September 1988. Six months later, the number of shoots that sprouted and the basal area were measured. Only mature stems of 3 *y* or older were selected for felling. The culms that were felled were well spaced within the clump. The culms in the periphery were not cut. The culms were cut at a height of about 15 to 20 *cm* from the ground using a small chain saw. All malformed, diseased or otherwise useless culms were also removed.

Duncan Multiple Range Test (DMRT) was used in this case to compare between treatment means of various felling intensities. The result for basal area using DMRT showed no significant difference between the four types of felling rates in terms of total increment ($P<0.01$; $F = 0.3523$). This is also similar for the total increment in the number of shoots sprouted. There is no significant difference between the four types of felling rates in terms of total increment ($P< 0.01$; $F = 0.84544$). The study indicates that the rate of felling intensity has no effect on *G. scortechinii* regrowth.

Acknowledgements

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BOOK REVIEWS

MACKENZIE, J.J. & EL-ASHRY, M.T. (Eds.) 1989. ***Air Pollution's Toll on Forests and Crops.*** Yale University Press, New Haven and London (A World Resource Institute Book). 376 pages.

The book's title raises expectations, but fulfills them only partly: with the exception of one article on forest decline in the United States. In an introductory chapter, MacKenzie and El-Ashry summarize the contents of later chapters. The following chapters discuss forest damages in central Europe (R.F. Huettl), western United States (P.R. Miller), southeastern United States (R.I. Bruck), northeastern United States (A.J. Johnson/T.G. Siccama), crop losses in the United States (W.W. Heck), economic measures of impacts of air pollution on health and visibility (L.G. Chestnut, R.D. Rowe), and possible policies to reduce damages (MacKenzie/El-Ashry).

The quality of the contribution is very uneven. While the contributions by Huettl, Miller and Heck provide compact and useful surveys of forest damage in the United States, it would have benefitted from rigorous editing. Instead, the reader is annoyed by endless details of individual experiments with the inconclusive evidence that, yes, there is accelerated forest decline, but no, there is no evidence that this has much to do with air pollution. And yes, anyway, it's probably all due to ozone, at least in the United States.

Practically all of the work reported is descriptive: record (visible) damages as a function of immission load and find a statistically significant correlation. Huettl, Miller and Heck hint at the systemic nature of trees and ecosystems and their response to pollutants, but do not follow that line of argumentation: "Ozone inhibits photosynthesis, this impairs production of photosynthate; there is also evidence that photosynthate partitioning is affected". The logical question now would be how this affects the overall energy balance, and whether this would not be enough to cause decline and dieback - even for very small chronic loads - because of the inherent eigendynamics of the system. What is missing - as in other publications of this kind - is the use of plant-physiological process models to put everything in perspective and to permit reasonably reliable estimates of dynamic response to pollution stress.

The chapter on economic measures of health and visibility has little relationship to the rest of the book and should have been omitted. It is a nuisance with its unreflected assumption of future-discounts, and its discussion of willingness-to-pay as a measure of pollution severity. Sustainability does not allow discounting the future, and dollar values of willingness-to-pay for better visibility exceeding the annual income of people in developing nations mock any idea of international environmental protection and social justice.

This is one of those books that you would not want to have taking up space in your personal library, but you might not object if your colleague bought it for central library from his own funds.

Hartmut Bossel
University of Kassel, West Germany

ANNOUNCEMENTS

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DATE: MAY 3 - 7, 1991

VENUE: COLOGNE, GERMANY

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JOURNAL OF TROPICAL FOREST SCIENCE

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LONGMAN, K.A. & JENIK, J. 1974. *Tropical forest and its environment.* Longmans, London. 196 pp.

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Footnotes should not be used except for changed addresses or to identify the corresponding author if different from the first-named.

Abbreviations, symbols, units and Greek letters should be identified the first time they are used.

Acknowledgements should be brief.

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