Abstract of thesis entitled

PROPAGATING NATIVE TREE SEEDLINGS FOR FOREST REHABILITATION IN HONG KONG, CHINA

Submitted by

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for the degree of Master of Philosophy
at The University of Hong Kong
in October 2006

Planting nursery-grown native tree seedlings has become a popular reforestation method for biodiversity conservation during the last decade. Propagating high quality seedlings has become an important task. However, there is a general lack of knowledge of how to propagate native seedlings in the tropics, including Hong Kong. Because of the high diversity of tropical native tree species, local studies cannot be avoided. The aim of this study was to investigate the growth responses of seedlings to different growth container types, shading intensities, irrigation and fertilizer application frequencies in the nursery. The ultimate aim was to identify cost-effective nursery treatments for the production of high quality native tree seedlings for Hong Kong and South China.

The growth responses of 6 native tree seedling species grown in root trainers and traditional polystyrene bags for 9 months were compared. Only *Litsea glutinosa* and *Schefflera heptaphylla* showed significantly less root coiling in root trainers than in polystyrene bags. Root trainers are thus recommended for the propagation of these two species only. Given that seedlings for hillside reforestation are normally raised for 18 months in the nursery, the duration of the current study may not be sufficient to assess the other four species tested.

Four different fertilization frequencies were compared for 5 of the 6 species in

the previous experiment. The results show that *Lithocarpus hancei* and *S. heptaphylla* would only need to be fertilized every 9 weeks. Applying fertilizer every 6 weeks seemed to be more suitable for *L. glutinosa* and *Zanthoxylum avicennae*. Less frequent fertilization was recommended for *Gordonia axillaris*.

For shading requirements, *Lithocarpus hancei*, *Litsea glutinosa* and *S. heptaphylla* grew equally well under full sunlight and shade. *G. axillaris* and *Z. avicennae* tended to grow better under full sunlight.

Finally, the results of the irrigation experiment show that *G. axillaris* and *Z. avicennae* did not require daily irrigation but *Lithocarpus hancei*, *Litsea glutinosa* and *S. heptaphylla* would grow better when frequent irrigation was provided. The results seem to fit in with the natural growing habit of these tested species. *G. axillaris* and *Z. avicennae* are both very common in shrublands and young forests in Hong Kong which are mostly very exposed and dry.

S. heptaphylla, *Z. avicennae* and *G. axillaris* have been identified in previous studies in Hong Kong as potential framework species for reforestation. They would thus need to be required for larger scale propagation in Hong Kong. The results of the current study can be used to optimize the nursery requirements of these species and also show that the growth responses to the different treatments were species specific. Any attempt to make generalizations may be risky. This reinforces the belief that species specific evaluations are needed for large scale propagation of any species.