

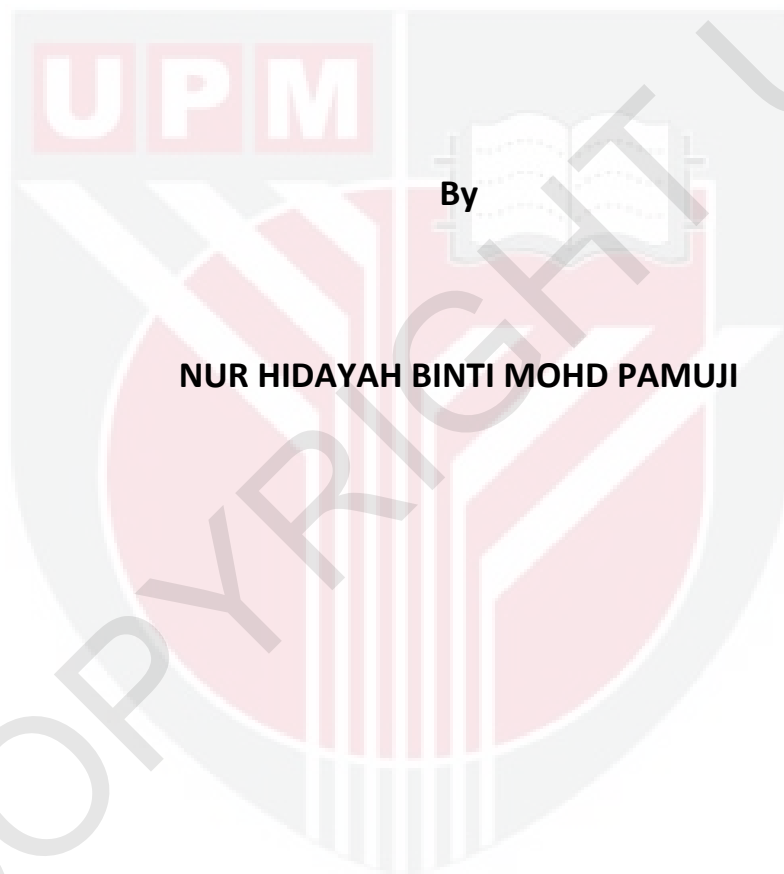


GROWTH PERFORMANCE AND SUITABILITY OF *Pterocymbium javanicum* (MELEMBU) AS A SHADE TREE

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**GROWTH PERFORMANCE AND SUITABILITY OF *Pterocymbium javanicum*
(MELEMBU) AS A SHADE TREE**



By

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**Project Report Submitted in Partial Fulfillment of the Requirements
For the Degree of Bachelor of Forestry Science in the
Faculty of Forestry
Universiti Putra Malaysia**

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DEDICATION

SPECIALLY AND SINCERELY DEDICATED TO

My supervisor

Assoc. Prof. Dr. Mohd Zaki bin Hamzah

My beloved parents

Mohd Pamuji bin Rimon

Hamidah binti Samijan

My dearest friends

Farah Wahida binti Jasni

Maizatun Nadiah bin Mahadi

Husna Izzati binti Hasanuddin

Noraznida binti Darus

Nursuhaili binti Subahi

Alyani Izzareena binti Maskin

Thank you for your never ending support

ABSTRACT

Pterocymbium javanicum is one of the native and fast growing species of Malaysia. A trial plot was established at Ladang Ragut 3, Puchong, Universiti Putra Malaysia to evaluate the growth performance and the suitability of *P. javanicum* as a shade tree. This study was conducted within the period of six months, and the data was collected every three months after weeding activity. The parameters such as height, diameter, crown depth and crown width were recorded. The environmental factors that have been monitored were light intensity, temperature and relative humidity, to evaluate their effect on the growth performance of the species. The T-test study showed that there were no significant mean differences ($p>0.05$) in the growth parameters of *P. javanicum* between Plot 1 and Plot 2. In addition, weeding treatment did not have any significant effect on the growth performance of *P. javanicum*. Based on the characteristics of the species, it is concluded that the species is not suitable as a shade tree.

ABSTRAK

Melembu (*Pterocymbium javanicum*) adalah salah satu spesies asli yang mempunyai pertumbuhan cepat di Malaysia. Kawasan kajian telah dijalankan di Ladang Ragut 3, Puchong, Universiti Putra Malaysia untuk menilai prestasi pertumbuhan dan kesesuaian Melembu (*P. javanicum*) sebagai pokok pembekal naungan. Kajian ini dijalankan dalam tempoh enam bulan dan data yang dikumpulkan setiap tiga bulan selepas aktiviti merumput. Parameter seperti ketinggian, diameter, kedalaman silara dan lebar silara direkodkan. Faktor persekitaran yang telah dipantau adalah keamatan cahaya, suhu dan kelembapan relatif untuk menilai kesan-kesan terhadap kadar pertumbuhan spesies ini. Ujian T sampel bebas menunjukkan perbezaan min yang tidak ketara ($p > 0.05$) untuk parameter pertumbuhan Melembu (*P. javanicum*) antara Plot 1 dan Plot 2. Tambahan pula, rawatan silvikultur tidak mempengaruhi prestasi pertumbuhan pokok Melembu (*P. javanicum*). Berdasarkan ciri-ciri spesies ini, kesimpulannya ialah spesies ini tidak sesuai sebagai pokok naungan.

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APPROVAL SHEET

I certify that this research project entitled “Growth Performance and Suitability of *Pterocymbium javanicum* (Melembu) as A Shade Tree” by Nur Hidayah binti Mohd Pamuji has been examined and approved as a partial fulfillment of the requirements for the degree of Bachelor of Forestry Science in the Faculty of Forestry, University Putra Malaysia.

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LIST OF ABBREVIATIONS

SFM	Sustainable Forest Management
AGR	Absolute Growth Rate
FAO	Food & Agriculture Organization
ITTO	International Tropical Timber Organization
FSC	Forest Stewardship Council
UNEP	United Nations Environmental Program
IPCC	Intergovernmental Panel on Climate Change
NWFP	Non Wood Forest Product

CHAPTER 1

INTRODUCTION

1.1 Background

Peninsular Malaysia was covered by 44 percent of natural forest (Appanah, 1999). Since tropical rainforest have been recognized as the richest ecosystem of structure and species diversity (Whitmore, 1998) tree or function as stabilisation of the soils and climate, regulation of water flows, give a shade and shelter, and habitat for pollinators also as natural predators of agricultural pests. According to that, forest management will be the important things to the natural forest. Forest management is the process of planning and implementing practices for the stewardship and use of forests and other wooded land to meet specific environmental, economic, social and cultural objectives (FAO, 2016) Natural and planted forest management were focused on achieving sustainable forest management (SFM) in the aspects of social, economic and environmental because it is important to provide a steady flow of resources and income, also preserving forest cover, biodiversity and ecosystem integrity (Sayer *et al.*, 1995). SFM becomes the most important things in forest management. SFM means the environmentally appropriate, socially beneficial, and economically viable management of forests for present and future generations.

The demand for tropical timber product increase but the forest resources decline gradually due to the forest degradation and the globalization happen. This situation gives the pressure on the natural resources to fullfill the high demand of the timber product. Major causes of forest degradation can be naturally such as insect pest and disease and fire, also man-made such as, overharvesting of industrial wood, fuelwood and other forest products, mismanagement of production forests, overgrazing, air pollution, and extreme climatic events (FAO, 2001). Whereas, according to ITTO (2002) the causes of deforestation was commercial logging activities, shifting cultivation, urbanization industry, natural disturbances like landslide and other form of encroachment.

Since the globalization increases, the forest plantation has the potential to contribute to industrial wood and fiber in the coming decades (Affendy *et al.*, 2009). In Malaysia, the history of forest plantations began with the establishment of selected commercial timber trees such as *Palaqium gutta*, *Tectona grandis* and *Swietenia macrophylla* at several locations such as Kedah and Selangor as early as 1880 (Appanah and Weinland, 1993). Trial planting of native and exotic forest tree species establish in Kepong and other location in Peninsular Malaysia (Selvaraj and Muhammad, 1980). Softwood plantation has been established by using the fast growing species such as *pin*es and *araucians*. Growth of seedlings, saplings and poles generally increased with the intensity of silvicultural treatments.

1.2 Problem Statement

Selection of native tree species for commercial plantation is a continuing challenge and opportunity in tropical silviculture. Lack of information about native tree silviculture and ecological requirement has resulted in a limited usage of these species in plantation (Butterfield and Fisher, 1992). Silvicultural practices can affect quality of forest produces where the wood obtained from forest plantation might be different from that of natural forests (Hashim *et al.* 1989; Zobel and Van Buijtenen 1989). Almost 85 % of wood industrial forest plantation in the tropic has been established with just three genera which are *Pinus*, *Eucalyptus* and *Tectona* (Evans, 1992). In general density of shade trees has a strong influence which can perform the forest proximity effect and enhance natural forest colonization (Chetana and Ganesh, 2011). The tropical forester needs to continue exploring, evaluate and domesticate native tree species for reforestation, especially on degraded lands, where not all the introduced species perform well (Alvarado *et.al.*, 2007).

In this study, *P. javanicum* have been planted at open area and research wants to investigate the suitability of this species as a shade provider, either suitable or not. This is significant for future reforestation and rehabilitation effort, especially in Malaysia. Several studies have emphasized that afforestation in degraded land or agricultural land will ameliorate succession by native species (Teegalapalli *et al.*, 2010). *P. javanicum* is one of the native species that fast growing and can be established and managed within a rotation age of 15 to 25 years. (Hashim *et al.*, 2015).

1.3 Objectives

The objective of the study was to evaluate the growth performance and the suitability of *P. javanicum* species as a shade tree. The specific objectives were to evaluate the effect of weeding treatment on the growth rate performance of *P. javanicum* based on height, diameter crown depth and crown width and also the effect of environmental factor such as light intensity, humidity, and temperature on its growth.



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