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Preliminary Assessment on the Growth Performance of *Dryobalanops beccarii* Dyer Planted under Enrichment Planting Technique at Gunung Apeng Forest Reserve, Sarawak, Malaysia

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Abstract

Reforestation of degraded areas in Sarawak, Malaysia is vital in an effort to conserve the dynamic forest resources in Borneo. A preliminary assessment was conducted in providing the information on the growth performance and survival rate of planted indigenous Dipterocarp species (*Dryobalanops beccarii Dyer*) for reforestation purpose in Sarawak. In this study, reforestation areas which were planted with *Dryobalanops beccarii* under line planting technique were selected. Study sites were established in the reforestation areas (areas planted with *D. beccarii* in the year 2005; DB05 and 2008; DB08). The assessment on the growth performance of planted *D. beccarii* at different age stand was evaluated by measuring the stem diameter, height and survival rate from October 2010 to December 2012. Our findings showed that the survival rate of planted trees in DB05 and DB08 were at 88% and 86%, respectively. For the tree height and stem diameter, the results showed that the tree height and stem diameter in DB05 was 4.9 m and 3.6 cm, respectively. Meanwhile, the assessment on the tree height and stem diameter in DB08 was 1.9 m and 0.9 cm, respectively. The mean annual increment in height (MAIH) and diameter (MAID) of planted *D. beccarii* in DB05 was significantly higher than DB08. High survival rate and substantial growth performance of *D. beccarii* indicated that site edaphic condition such as competition between planted and existing pioneer species of the study area may have affected the survival rate and growth performance of planted *D. beccarii*. Therefore, further studies are required in order to find out the soil-plant relationship of *D. beccarii* as well as other edaphic factors which may affect the growth and survival of *D. beccarii* under line planting technique.

Key words: reforestation, line planting technique, *Dryobalanops beccarii Dyer*, Gunung Apeng Forest Reserve

Introduction

Tropical rainforests are considered as the most productive of all terrestrial ecosystems and they possess the functional roles for biodiversity conservation, world climate amelioration and soil conservation (Whitemore, 1998). In many parts of the tropics, vast forest areas have been impacted by overexploitation of forest resources such as excessive harvesting, shifting cultivation, repeated fire and other disturbances that damages the soil and vegetation. Such exploitation has reached to a degree that severely delays the establishment of forest structure after abandonment.

Reforestation is indispensable to prevent further loss of biodiversity under tropical rainforest ecosystem and restore soil fertility while increasing productivity of poor vegetation stock. As an option, reforestation through plantation forestry by planting high quality indigenous of Dipterocarp is considered as one of the effective way to accelerate recovery of the original ecosystem (Adjers *et al*., 1995; Appanah and Weiland, 1996). Dipterocarp species are the predominant tree species of the upper canopy of rainforests and suitable for reforestation under an artificial planting forestry (Okamura *et al*., 1999). Among the most common Dipterocarp species used for reforestation in Sarawak is *Dryobalanops beccarii* Dyer

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