

RESPONSE OF 1-YEAR-OLD REVOTROPIX PAULOWNIA PLANTED ON RED-YELLOW PODZOLIC SOIL TO DIFFERENT TYPES OF FERTILIZER APPLICATION

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ABSTRACT

Planted forests have long been recognized as an essential way of reducing pressure on natural forests as an alternative source of wood-based resources. Fast-growing species that yield faster tree volume are particularly valuable for sustainable timber production in Sarawak. This study evaluates the growth performance of a potential fast-growing species, RevoTropix Paulownia (RT-Paulownia), planted in a 0.5-hectare plot at Sabal Forest Reserve, Simunjan, Sarawak. Growth parameters such as height and diameter at breast height (DBH) were monitored based on different fertilization treatments, such as NPK chemical fertilizer, organic fertilizer, and without fertilizer (control). The finding on the soil profile description revealed the planting plot to be predominantly clay loam to loam with 10YR color hues and classified as red-yellow podzolic soils. The clay loam soils typically provide optimal conditions for a wide range of tree species. Statistical analysis using the Kruskal-Wallis Test demonstrated a significant impact of fertilizer on growth performance after one year of planting RT-Paulownia at p -value ≤ 0.05 (p -value = 0.0001). Specifically, the application of chemical fertilizer resulted in the highest average increases in height (629.7 ± 132.0 cm) and DBH (7.48 ± 1.61 cm) compared to organic fertilizer (255.2 ± 154.15 cm height, 2.89 ± 1.88 cm DBH) and control (252.7 ± 134.9 cm height, 2.71 ± 1.76 cm DBH). Height and diameter performance increases faster using chemical fertilizer compared to organic fertilizer. In conclusion, optimal soil conditions including proper pH and nutrient availability, are crucial for maximizing the growth potential of this species. The use of appropriate fertilization methods can further enhance soil fertility and promote more productive forest plantations. The findings show that chemical fertilizer demonstrates superior growth outcomes for RT-Paulownia in the study area. This highlights the potential for optimizing forest plantation practices to enhance timber production sustainably, thereby reducing reliance on natural forests as the primary wood source.

Keywords: RevoTropix Paulownia, red-yellow podzolic, growth performance