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ABSTRACT

Recovery of soil nutrient is important for forest rehabilitation in degraded forest, which could be achieved by nutrient input from litter-fall. This study set the hypothesis that there were some tree species providing good nutrient input for faster forest rehabilitation. The objective of this study was to measure nutrient input from litter-fall by 4 different pioneer species (mahogany, teak, acacia, and eucalypt) in Wanagama forest, a rehabilitating forest in central Java Island. During 2 months in dry season, the production rate and decomposition rate of litters were measured at 4 tree stands by litter trap and litter bag, respectively. As a result, highest production rates were observed at acacia site (1.7 t ha^{-1}), followed by teak (1.6 t ha^{-1}), eucalypt (1.4 t ha^{-1}), and mahogany sites (0.8 t ha^{-1}) for 2 months. These values would be higher than data in other months because this research was conducted in dry season when production would be highest: in particular, deciduous teak trees. The highest decomposition rates were shown at mahogany site (33%), followed by eucalypt (31%), acacia (23%), and teak site (14%). Some data disagreed with other reference probably because of experimental limitation; for example, natural extraction (mass loss) of eucalypt oil was considered as decomposition and physical protect of teak leaves with litter bag prevented big leaves from being broken down, which overestimated and underestimated the value, respectively. Nevertheless, these results could clearly show different characteristics among each 4 species. However, nutrient input, calculated with reference of nutrient content in litters, showed all 4 species could provide good nutrient input in some elements: much K and Ca from mahogany, much N, P, and Mg from teak, C, N, and Na from acacia, and C, K, and Na from eucalypt. This founding implied that initial hypothesis may be wrong; instead, all species have some specific advantages and disadvantages in nutrient input.

Keywords: Forest rehabilitation, Pioneer species, Litter production, Litter decomposition