

The Growth Performance of Sago Palms (*Metroxylon sagu* Rottb.) on Peat of Different Depth and Soil Water-table

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ABSTRACT

Under minimal drainage and maintenance on deep peat, about 20% of the 10-15 year-old sago palms produced trunks but none attained maturity. They possess 6-10 fronds and their trunk lengths and diameters are 1-4 m and 41 cm respectively. On deep peat with seasonal flooding, less than 10% produced trunks at 8 years after planting. In contrast, over 80% of sago palms on shallow peat produced trunks at 5-6 years after planting and possess a crown size of 12-15 fronds. They attained maturity at 10-11 years, with trunk lengths and diameter of about 8 m and 47 cm respectively.

INTRODUCTION

It was generally reported that sago palms cultivated on natural deep peat with minimal maintenance require 12-17 years to attain maturity (flowering) but those on mineral soils require only about 8-12 years (Jong 1988, Jong & Flach 1995, Tie et al 1987, Yamaguchi et al 1997). To further understand the above, a comparative study to assess the growth performance of sago palms on acidic peat with known cultivation history and practices was made.

MATERIALS AND METHODS

Sago palms cultivated on (a) deep peat with minimal drainage, (b) deep peat with seasonal flooding and (c) shallow peat was studied on three selected sago farms at Mukah, Malaysia. Growth data like crown size, percentage of trunk-producing palms, trunk length and trunk diameter at 1.2 m above ground level were collected from all the sago palms in three replicated 50 m by 50 m blocks in each of the selected gardens. The date of planting was confirmed with farm owners and the pH of soil water recorded.

RESULTS AND DISCUSSION

In all the three sites studied, the pH of the soil water is around 3.8 to 4.9. The higher pH is found in the flooded field on deep peat where there is moving surface water. Under minimal drainage on deep peat, about 20% of the sago palms produced trunks but none attained maturity 10 to 15 years after these palms were transplanted in the field. They possess 6-10 living fronds and signs of necrosis and desiccation were observed at the older fronds. In general, the leaflets were pale green and non-lustrous and the frond stalks were yellowish-green and dull looking. The trunk lengths of the leader palms vary from 1-4 m and there were very few follower palms (produced from offshoots) attaining the trunk formation stage. The diameters are small, averaging at 41 cm at 1.2 m above ground level, with gradual decrease towards the upper trunk. Sago palms cultivated on deep peat with seasonal flooding which normally occurs between November to March each year has less than 10% of trunks formation rate at 8 years after planting. Majority of the palms remained at the rosette stage, with palm heights varying from 2 to 4 m. Of those trunk-producing palms, the trunks are small and tapering at the upper end. Premature desiccation of older fronds and fracture at the base of dead fronds are common.

In contrast to the above, over 80% of sago palms on shallow peat are able to develop to the trunk formation stage at 5-6 years after field planting. These palms possess 12-15 fronds that are more lustrous and greenish. They attained maturity at 10 to 11 years, with trunk lengths and diameter of about 8 m and 47 cm respectively. More follower palms are produced, forming a larger cluster with 2-3 follower palms in trunk production stage at varying trunk heights.

Despite the low pH in shallow peat, the sago palms grow rather vigorously. Excellent growth of sago palms is also common on mineral acid-sulphate soils of very low pH in Batu Pahat and Rampangi Research Station in Malaysia, as well as along the coastal regions of Riau Province in Indonesia. As such, the sago palm is a crop that is well adapted to extract its nutrient requirements from growth media of very low pH. The poor growth of sago palms on deep peat is more likely caused by the lack of the desired nutrients in the peat strata rather than attributed to the low pH per se. This resulted in initial poor palm establishment and subsequent retarded growth. These retarded palms are eventually out-competed by other trees and weeds under minimal maintenance conditions. Seasonal flooding also caused various undesirable physiological changes (Kozłowski 1984) thereby further impede the growth of the sago palms.

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