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TECHNIQUES FOR SAMPLING OIL PALM ROOTS. II. ROOT AUGER FOR PEAT SOILS

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Root study in peat is important for understanding the oil palm performance under this limiting soil condition. Difficulties arise when studying roots in peat due to its structureless properties. A suitable auger was designed to ease root sampling in peat. The auger enables the extraction of a peat core sample of 10cm diameter by one metre length. Compression of the peat core sample was reduced and root excisions were satisfactory.

INTRODUCTION

Oil palms are increasingly being planted in peat due to the limited supply of mineral soils. Malaysian peat is made up of homogeneous woody residues of vegetation at the bottom of swamps. Growing oil palms on peat presents its unique problems, such as nutrient deficiencies, waterlogging and palm leaning over from poor anchorage (Joseph *et al.*, 1970; Tayeb *et* al., 1982). The water table in peat land is high unless the surrounding area is drained. On drainage, peat shrinks due to oxidation and subsidence. The drying of peat is irreversible and dry peat can restrict water movement and root penetration.

Much research is now being directed to study the performance of oil palms on peat. Oil palm root study is carried out to gain better understanding of the root growth and distribution that could shed some light on ameliorative measure for the problems. However, root study is based on root sampling and therein lies the problem, since no suitable auger is available for sampling oil palm roots in peat.

Several types of augers were tested and found unsuitable for use on peat soils. Difficulties were encountered in retrieving intact core samples during dry periods and in the cutting of oil palm roots. Compression of the core samples often happened when a conventional root auger was pushed into peat. Thus, a new design was needed to ease the sampling of oil palm roots in peat. This report describes the

use of an auger developed for sampling of oil palm roots on peat soils.

MATERIALS AND METHODS

The auger was fabricated from a mild steel pipe 110cm long, 10cm in diameter and 3mm in thickness. It was made in two halves along its long axis with a mild steel handle on as shown in *Figure* I. The single handle was welded on to one pipe half and attached to the other half by using a stainless steel pivoting pin. A sharpened triangular piece of stainless steel (13cm by 14cm by 5cm and lmm thick) was bent and welded to the bottom end of the pipe halves.

The sharpened tips cut the roots as the auger is slowly rotated into the ground. After reaching the required depth, the pivoted end of the handle is pulled upwards to close the

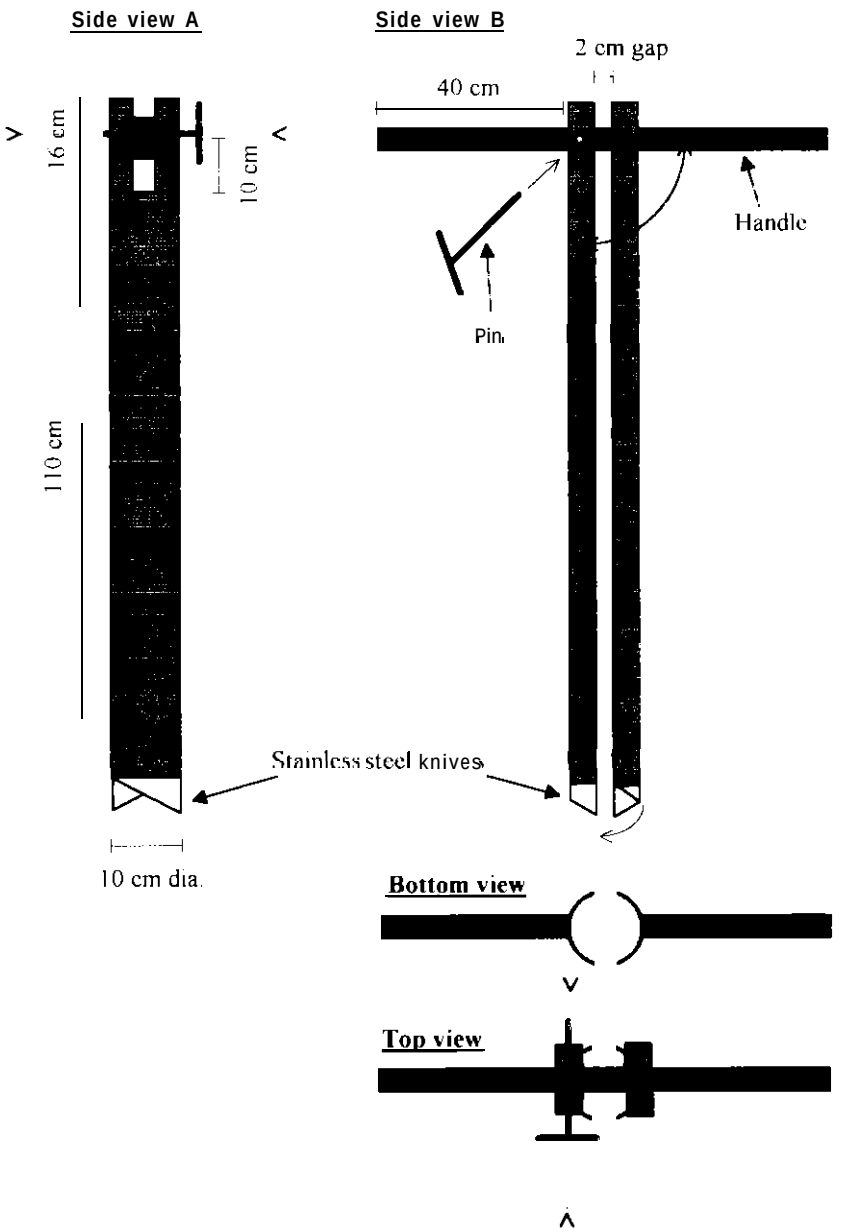

Figure 1. Design of a peat auger

a

b

c

d

e

f

Figure 2. The auger being used for sampling oil palm roots in peat: (a) two persons are required to operate the auger, (b) and (c) the auger being pushed into the ground while rotating it 360°, (d) and (e) the auger being pulled out of the ground, and (f) the auger opened into its two halves to retrive the intact core sample

bottom ends of the auger in a scissor-like action. This retains the core sample as the auger is pulled out of the ground. After retrieval, the auger is laid on the ground and opened into its two halves by removing the pivot pin on the handle. The exposed core sample is then recovered for examination.

RESULTS AND DISCUSSION

The reported auger design was able to cut oil palm roots cleanly and retain the core sample in both wet or dry conditions. A core of 10cm diameter by lm length can be extracted for studying the peat profile and distribution of oil palm roots.

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