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29/11/2005

VARIATION OF STEM TAPER WITH DIFFERENT AGES IN *Tectona grandis* L.f. (Teak)



BY

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183315
2005

ABSTRACT

Taper is the rate of change of diameter over a specified length along the tree stem, which varies not only by species but also by diameter at breast height, tree height and other tree parameters. Taper is important for the foresters to predict the upper stem diameters especially in volume calculations. Although it is difficult to find taper studies in Sri Lanka, studies have been carried out in Canada and New Zealand (Hewage, 2002).

The main objective of the current study is to find out the variation of stem taper with different ages of *Tectona grandis L.f* (Teak). Three plantations (22 year, 27 year and 35 year) were selected in block 01 of Kotagoda teak plantation in Ampara Forest Division for this purpose by selecting different ages in same site, it is assumed that the site difference is not significant. The selection of sample plots were carried out randomly within the sub blocks separately. Data were collected from twelve 0.05 ha circular plots and each tree was measured for total height, dbh, sectional diameters at 5m and 10m along the stem. These were used to estimate the parameters for the selected equation originally constructed for Douglas fir in Coastal Central Colombia by Kozak *et.al.* (1969). Furthermore in this study, separate models were constructed with different parameter sets with the similar basic model structured for three different ages of teak. These three models were tested to find whether they significantly vary from each other. Then finally an attempt was made to construct a common model with new parameters to apply for all age gradations simultaneously by pooling the data. These tests revealed that, the different models constructed were not sensitive for different ages, and therefore it can be recommended to use the common model for the prediction of upper diameters or the taper for teak irrespective of their age gradation.

Finally a sensitivity analysis was carried out for the re-calibrated models developed in 1969 by Kozak *et.al.* for Douglas fir and in 2002 by C. Hewage for Caribbean pine. The results indicated the high sensitivity proving that the inability of using the models constructed for different species to predict the stem taper of some other species.

CONTENTS

	Page
LIST OF TABLES	<i>iii</i>
LIST OF FIGURES	<i>iv</i>
ACKNOWLEDGEMENT	<i>v</i>
ABSTRACT	<i>vii</i>
CHAPTER 1 : INTRODUCTION	01
1.1 Objectives of the study	03
CHAPTER 2 : REVIEW OF THE LITERATURE	04
2.1 The importance and the history of forest plantations	04
2.2 Teak (<i>Tectona grandis</i>)	05
2.2.1 Commercial value of Teak	05
2.2.2 Site Condition	06
2.2.3 Dimate	06
2.2.4 Teak as Timber	06
2.2.5 Quelition and utilization of taek	07
2.2.6 fruits and flowers	08
2.2.7 Bark and root	09
2.2.8 Wood waste	09
2.3 Tree characteristics	09
2.3.1 Height	09
2.3.2 Diameter	10
2.3.3 Cross sectionan area	11
2.3.4 Sectional height and upper end diameter	11
2.3.5 Tree volume	12
2.3.6 Log volume by direct measurement	13
2.4 Effect of form factor and taper in trees and logs	14
2.5 Variation in taper	16
2.6 Taper equations form predicting yield.	17
CHAPTER 3 : MATERIALS AND METHODS	20
3.1 The study area	20
3.1.1 Slope Correction	23
3.1.2 Trees on border of sample plots	23
3.2 Measurements taken	23
3.2.1 Lower diameter	23
3.2.2 Measurement of upper diameter	23
3.2.3 Total height and series of sectional heights along the stem	24
3.3 Selected equations to predict upper stem diameter	24
3.4 Calculations	25
3.4.1 Estimation of stem-number density	25
3.4.2 Estimation of mean height	25
3.4.3 Estimation of mean dbh	26
3.4.4 Estimation of dominant height	26
3.4.5 Estimation of basal area	26
3.4.6 Estimation of parameters	26
3.5 Construction of common model for all age groups	27
3.6 Testing the sensitivity of the estimated parameters in the new model	28

CHAPTER 4 : RESULTS	30
4.1 Summary of data collected	30
4.2 Parameter estimation	30
4.3 Residual analysis	32
4.4 Distribution of standard residuals versus fitted values	32
4.5 Quantitative test residuals	33
4.6 Construction of the common model	34
4.6.1 Distribution of normal residuals versus fitted values for the common model	35
4.7 The sensitivity of the model used	36
CHAPTER 5 : DISCUSSION	38
CHAPTER 6 : CONCLLUSION	41
CHAPTER 7 : RECOMMENDATION	42
REFERENCES	43