

USE OF INTERNODAL LENGTH IN THE GROWTH STUDIES OF CHIR PINE (*PINUS ROXBURGHII*).

by

Raja Walayat Hussain

and

M. Afzal Cheema.

Introduction:—Increment borings (diameter) and internodal growth (height) are being made use of in growth prediction studies and in the construction of the yield tables using calculus and regression techniques(2, 5). Curtis (2) estimated the rate of height growth i.e. $\frac{dH}{dT}$ through regression techniques by measuring each of the last six internodal lengths by grouping them into diameter classes. He subsequently utilized it in obtaining the current rate of volume growth in the preparation of yield tables of Douglas fir.

Though at present the nature of the growth predictions and growth statistics provided in the yield tables is periodical in our forestry practices (1, 3) a time may come when we would like to have precise annual growth statistics. In this connection an exercise was carried out in chir forests to see whether the periodic mean annual height growth could be a real substitute for the current annual height growth or not.

Basic data:—The sample trees used in the preparation of site index curves (4) and many others from the yield plots were utilized for this study. Data were collected on 138 trees (D. B. H. 4" to 28") from Siran and 147 trees (D B H 1" to 34") from Hari-pur forest divisions respectively. Internodal lengths for the last five years of each sample tree were measured to the nearest inch for each year separately.

Analysis of data:—The trees were grouped into 1" diameter classes. Internodal length data for each of the past five years constituted 'treatment' and number of trees in each diameter class constituted 'blocks' or 'replications' for the purpose of analysis for variance. Only those diameter classes which contained four or more trees were considered for the analysis. This limit was considered necessary since the 'degree of freedom' for error should not ordinarily be less than ten, for valid results. Thus only 126 trees from each of the divisions were utilized in the study. Diameter-wise distribution of trees for both the localities alongwith the significance or otherwise of the 'ANOVA' for internodal length are shown in the table given below:—

TABLE
SHOWING DISTRIBUTION OF TREES ACCORDING TO DIAMETER CLASS
AND RESULT OF ANALYSIS FOR INTERNODAL LENGTH DATA OF
CHIR PINE.

Diameter class (inches)	S i r a n		H a r i p u r	
	No. of Trees	Significance of internodal length	No. of Trees	Significance of internodal length
3	..	..	9	N. S.
4	..	..	10	S.
5	4	N. S.	5	N. S.
6	..	..	5	N. S.
7	6	N. S.	4	N. S.
8	7	N. S.	6	N. S.
9	9	N. S.	6	N. S.
10	13	N. S.	8	N. S.
11	11	N. S.	5	N. S.
12	12	N. S.	6	N. S.
13	11	N. S.	7	N. S.
14	10	N. S.	9	N. S.
15	9	S.	5	N. S.
16	10	N. S.	..	..
17	7	N. S.	9	N. S.
18	4	N. S.	5	N. S.
19	..	..	4	N. S.
20	5	N. S.	5	N. S.
21	..	..	6	N. S.
22	..	..	4	N. S.
23	4	S.	..	..
25	4	N. S.	4	N. S.
26	..	..	4	N. S.

N.S.—Non-significant:

S.—Significant at 5 per cent level.

Results and discussions—The results tabulated above indicate that there is no significant difference in individual years height growth in chir pine. The periodical mean annual (on the basis of quinquennial measurements) height increment can therefore be utilized for current annual increment.

LITERATURE CITED.

1. Champion H. G., et al .. 1929 Indian Forest Record Vol. XIII Part. X. Yield tables for blue pine (*Pinus excelsa* Wall.)
2. Curtis, R. O. .. 1965 A study of gross yield in douglas fir. A dissertation for Doctor of Philosophy. University of Washington.
3. Howard, S. H. .. 1926 Indian Forest Record Vol. XII Part V. Yield and volume tables for Chir (*Pinus longifolia*).
4. Hussain, Raja Walayat and I. A. Qazi. 1972 Site index curves for chir pine (*Pinus roxburghii*). Under publication.
5. Stage, Albert R. 1960 Computing growth from increment cores with point sampling. Journal of Forestry Vol. 58 No. 7 pp : 531—533