

**ABSTRACT OF M.Sc. THESIS TITLED 'FOREST PLANNING
WITH PARTICULAR REFERENCE TO FORECASTING AND
MODEL SELECTION AS EXAMPLD BY GROWTH MODELS'.**

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Planning, dicision-making and forecasting are closely linked in proper management of a forest. One important aspect of forecasting is growth prediction. It may be based on graphical techniques or on mathematical models. Generally the latter is preferred for its objectivity and precision of estimate calculated by statistical methods. Often the predictive models are developed using regression analysis techniques.

In forestry, non linear models are preferred over linear models for growth prediction as the former provide sound bases for formulation of general hypotheses expressing the underlying laws of growth, and yield realistic estimates when extrapolated beyond the range of the data. However, being complex in nature such models cannot be fitted easily to the data without special computer routines for their solution.

The study of height growth prediction is based on height and age data collected from 28 sample plots of hybrid poplar laid in four irrigated plantations in Pakistan with 123 annual measurements covering ages ranging from 2 to 12 years.

Six curvilinear growth models namely Quadratic, logistic, Modified Weibull, Schumacher, Chapman-Richard and Gompertz were used to prepare site index curves showing the productive potential of sites. Height was used as the dependent variable and age as independent variable since height is considered to be a better indicator of site than other parameters.

Two models viz the Quardratic and the Logistic were dropped after a preliminary analysis of results obtained by using BMDP computer routines. Later on the Modified Weibull model was screened out from futher study because of its unsatisfactory fit to individual plot data. The remaining three models viz the Schumacher, the Chapman-Richard and the Gompertz were subjected to further tests by changing the values of the parameters and by imposing constraints. The three models gave similar estimates and seem to be equally applicable to this data set and, perhaps, to studies of a similar nature.

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