A short glimpse about the university of Freiburg

UNIVERSITY OF FREIBURG
Germany

Established: 1457 AD

Faculty:

In the middle ages there were 4 faculties
namely: Theology, Law, Medicine, and Philosophy

Currently there are 11 faculties:

1. Faculty of Theology
2. Faculty of Law
3. Faculty of Economics and Behavioral Sciences

Continued faculty:

4. Faculty of Medicine
5. Faculty of Philology
6. Faculty of Humanities
7. Faculty of Mathematics and Physics
8. Faculty of Chemistry, Pharmacy and Earth Science
9. Faculty of Biology
10. Faculty of Forest and Environmental Sciences
11. Faculty of Applied Sciences

Under each faculty there are several institutes

10. Faculty of Forest and Environmental Sciences

Under this faculty there are 13 institutes. These are :

1. Institute of Soil Science and Forest Nutrition

2. Institute of Forest Utilisation and Work Science

3. Institute of Forest Botany and Tree Physiology

   Chair of Forest Botany
   Chair of Tree Physiology

4. Institute of Forest Economics

1. Department of Forest Economics and Forest Management Planning
2. Department of Remote Sensing and Landscape Information System

5. Institute of Forest and Environmental Policy

6. Institute of Forest Zoology

7. Institute of Cultural Geography

8. Institute of Physical Geography

9. Institute of Hydrology

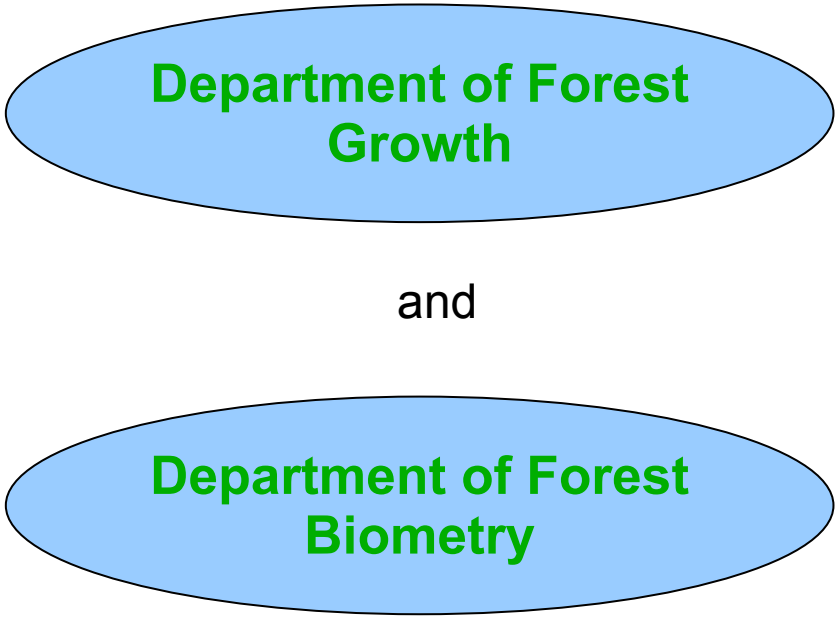
10. Institute of Landscape Management

11. Meteorological Institute

12. Institute of Silviculture

13. Institute of Forest Growth

Institute of Forest Growth has two departments:



Under the department of Forest Growth

Research is being carried out in **three** major aspects

1. Ecological Bases of Forest Growth:

Tree growth responses to **site conditions**
like soil, climate, weather, immission, nutrition and water supply

and **of biotic interactions**
in allmost all type of forests

2. Controlling Forest Growth.

Tree growth responses to:

genetics

growing spaces (spacing, thinning including self-thinning and final cut) pruning

fertilization

melioration on growth, quality and mortality of trees in forests

Development of decision tools for controlling growth while paying special attention t

ecological (biological diversity)

economic (creating value, minimizing risks)

and social aspects

3. Methods of Forest Growth Research.

Development of methods for quantitative analysis and prognosis of growth

reactions of trees to environmental changes

Where I work?

in the aspect of **controlling forest growth** (growing spaces and pru

at the Institute of Forest growth under the the faculty of

Forest and Environmental Sciences

Welcome to Applied Period Presentation

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Work Topic

Management of Broadleave Forest for producing high quality timber

Why?

Now a days timber production seems to be non-profitable. To make it profitable we need to reduce management cost and to produce high quality timber

objectives:

- to know about the factors that affect timber quality
- to know how to develop a diameter growth model
- to know how to improve timber quality through management practices
- to know how to reduce management cost

In order to reduce management cost

work is concentrated only on crop trees (not on all trees)

Factors affecting timber quality:

Size: height, diameter
(minimum height could be obtained from almost all trees)

Shape: straight or non-straight

Knot: with or without knot.

Physical properties: this is not under this study

Diameter:

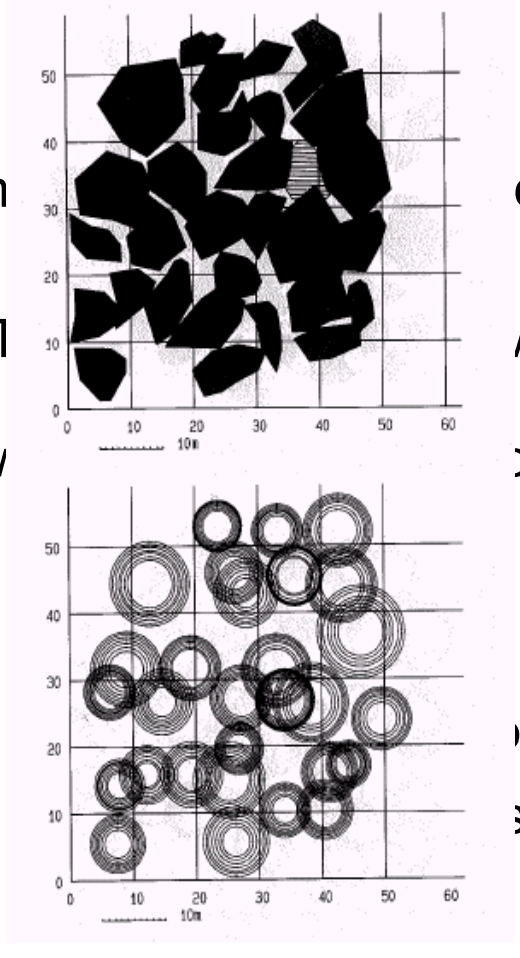
Timber quality largely depends on stem diameter (dbh) for many uses

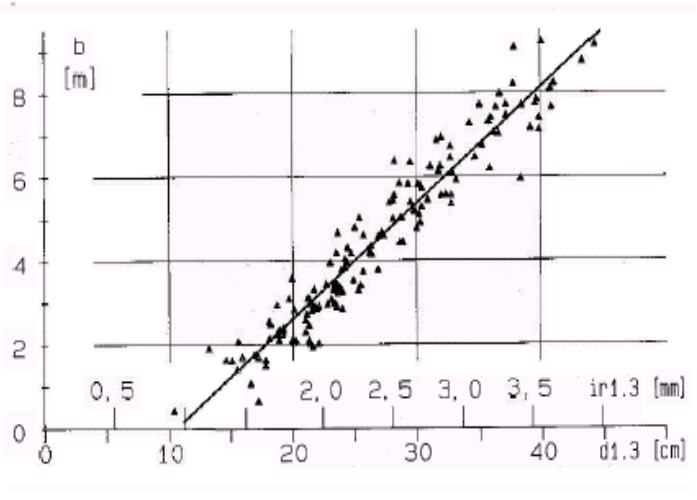
and

stem d by crown width (crown area) (greatly) and by ag

T idth l

w own w es tree age





videc a

s can uction time.

But the question is:

How much space should be provided at specified age?

Regarding this question we need to determine
the relationship between crown width and stem diameter

The equation for the relationship:

$$\text{crown width} = a + b_1(\text{dbh}) + b_2(\text{age}) \quad \text{------ (i)}$$

Value of a, b_1 and b_2 will be determined for the equation ----(i)

This equation is developed for a particular species in a particular site quali

Once the equation for one species is developed one can decide
management prescriptions for producing quality timber

Method of determining the value of a, b_1 and b_2

Sample plots will be selected considering tree age and diameter class and site quality

measurements on crown width, age and diameter

will be taken from each tree in sample plots

Value of the co-efficients (**a, b_1 and b_2**) will be determined by multiple regression analysis using collected data from sample plots

Knot and Shape:

Knot and Shape greatly influence the timber quality

knot free and straight bole are more valuable

than with knot and/or non-straight bole

Management practice:

Management objective:

to produce knot free straight timber (bole) of desired diameter with minimum cost

Species in forest: various species like

wild cherry,

sycamore mapple,

oak,

ash,

beech etc.

Production period:

May vary from species to species

Desired stem diameter:

Also vary from species to species and with objectives

Following table describes desired stem diameter and required crown width for various species

Species	Production period (years)	Dbh (cm) (Depending on objective)	Crown width (m) (Depending on objective)
Wild Cherry:	70	50	12
Oak	180	60	15
Sycamore Mapple:	120	60	15
Ash:	70	60	15
Beech	120	60	15

Management system:

selective cut at different time (according to production period of each species

Management:

-Divide total forest area into production circle according to species like Cherry production circle, Ash production circle etc.

-Divide each production circle into production unit according to production period

Regeneration:

- for natural regeneration seedlings can be obtained naturally
- for artificial regeneration seedlings can be planted maintaining species composition and initial spacing

Straight and Clear (knot free) bole development:

Clear bole could be developed by self or artificial pruning

Length of clear bole is an important factor for developing required ultimate crown width.

Bole length may be 30% to 70% of total height.

With the increase of bole length ultimate crown width decreases

and hence reduce diameter growth that produce smaller diameter timber

How much will be the bole length?

it depends on the objective of desired stem diameter

Contd. (Clear bole development:)

In case of applying artificial pruning

no. of crop trees per ha will be determined before applying first pruning

It depends on the desired stem diameter,
required crown width, species composition, and canopy closure

Then selection of straight trees as crop trees will be done

Application of artificial pruning to the crop trees will be started

In case of self pruning selection of crop trees could be done just before starting crown development

Self pruning:

Crown development

After attaining desired bole length crown development will be started

Reducing competition:

Felling down competitors around crop trees for crown development by several phases considering the equation (i) (each phase after 10 years) (first phase should be after attaining desired length of clear knot free bole). After completing 3 or 4 phases reducing competitors may not be needed. Because sufficient crown for attaining maximum diameter may be developed by this period.

Competition could be reduced by observing crown of crop trees. When the crow of crop trees will be at competition with neighbour trees then competitors will be felled for reducing competition and simultaneously space for crown developmen for crop trees is provided.

Final cut and regeneration:

At the end of production period crop trees will be felled

and ensure regeneration of crop tree seedlings

Thank you very much

----------for your attention