

المحاضرة الأولى

Forestry

Lecture1: Introduction

By:

Ahmed Jawad Kadhim

Introduction

- ▶ Tree life is closely associated with welfare, prosperity and general appeal of country. Trees not only provide our timber needs; their functions are manifold. they offer shelter from man and his livestock: they help protecting to soil and maintain its fertility environment for better crops. The presence or absence of forests in watersheds is of decided influence on the quality, quantity and distribution of water and stream flow. Windbreaks and shelter-belts of trees make an trees add greatly to the scenic beauty of settlements and the surrounding landscape the dreary dustiness of many a township and village has been changed to attractiveness by systematic planting. whereas planting of trees in areas of sustained rainfall and temperate climate is perhaps not difficult, success of reforestation measures is not easily achieved in the adverse environment of a hot climate and low rainfall.

Introduction

- ▶ According to FAO's reports at 1995 the total area of the forest land are 3454 million hectares, and this equal approximately % of total dry land of the earth. Tree percent of the world's forest is artificial forest, while 97 percent of it is natural forest.





Definition of basic terms related to forestry

- ❑ **Forest:** A complementary biotic unit at distinct area with special ecosystem contains trees, shrubs, grasses. Weeds other vegetative covers wild animals and insects. And the forest characterized with Biocenose Balance.

Definition of basic terms related to forestry

- ❑ **Trees:** are land plants with wood stem that have the power to grow steadily larger over long spans of years. Individual trees can reach 55m in height.
- ❑ **Shrub:** A woody plant, its height not more than 8 meter in mature stage i.e. Rhuv coriaria

Definition of basic terms related to forestry

- **Silviculture** : the art of producing and tending of a forest the application of the knowledge of silvics in the treatment of a forest theory and practice of controlling forest establishment, composition, and growth.

Definition of basic terms related to forestry

- ❑ **Savanna:** is a type of vegetation consisting predominantly of grasses, which are usually burnt annually. Savanna occurs widely throughout the tropics. especially in the less humid areas

Definition of basic terms related to forestry

- **Stand:** An aggregation of trees or other growth occupying a specific area and sufficiently uniform in composition (species) age conditions as to be distinguishable from the forest or other growth in adjoining arrangement , and areas

Economic Importance of forest

► The wood is an important natural source of forest, besides of non-wood products which were used in many industrial factories, and this natural resource differ from other resources i.e. oil, minerals in:

1. It can be reproduced by the stands.
2. It can be regenerated by growth of trees after cutting
3. Nothing instate of it.

Economic Importance of forest

▶ The economic importance of forest can be classified to:

A. **Direct profits:** which consists

1. Wood
2. Secondary materials i.e. paints, gums, cork, seeds
....etc.
3. Provide working opportunities.

Economic Importance of forest

B. Indirect profits: which consists

1. Protective importance
 - a. Soil conservation
 - b. Watershed management.
 - c. Wind break for vegetation protect.
2. Civilization benefits: it is the filter for the toxje gases in the world.
3. Social and humanity benefits.
4. Recreation importance.



Thank you

المحاضرة الثانية

Forestry

Lecture2: Forest Classifications

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Forest Classifications

1. Classification depending on the resource of forest:
 - a. Natural forest: It is the forest that produced from the fallen seeds of trees, or from coppice. This type of forest may be:
 1. Virgin forest.
 2. Managed forest.
 - b. Artificial forest: this type of forest rises by human activities.

Forest Classifications

2. Forest classification according to methods of reproduction:
 - a. High forest: seeds is the origin of this forest, it consist most of the conifers except sequoia forest.
 - b. Low forest: is this coppice forest which rises by asexual methods.
 - c. Combined or Middle forest is the forest composed of the two types mentioned above.

Forest Classifications

3. Forest classification depending on the age:
 - a. Even-aged forest: a term applied to forest in which relatively small age differences exist between individual trees. The maximum differences in age permitted in an even-aged-forest is usually up to 20% of the rotation age.
 - b. Uneven-aged forest: a term applied to forest in which there are considerable differences in age of trees and in which three or more age classes are represented, some of them in seedling stages others in pole stage or in mature stage.

Forest Classifications

4. Forest classification according to the kinds of trees present in it:
 - a. Pure forest: this type of forest consists of trees of same species.
i.e. forest of *Pinus brutia*.
 - b. Mixed forest: forest consist of different kinds of tree species and they will mixed in different ways like row, groups patches or individual.

Forest Classifications

5. Forest classification depending on arms or purposes:
 - a. Productive or Commercial forest it may be for timber production or for gum, rattan production....etc.
 - b. Protective forest: the arm of this type of forest may be to protect soil erosion or for avalanches protection.
 - c. Multipurpose forest.

Forest Classifications

6. Forest classification according to dominant species in it:
 - a. Gymnosperm or conifers like pinus or abies tree.
 - b. Angiosperm or broad leave forest like onk trees and fagus trees.

Forest in the world

A. It can be classified depending on the climatic conditions inter:

1. Main kinds (species):

a. Deciduous tropical forest 50%.

b. Temperate zone forest 15%.

2. Secondary kinds (species):

a. Bamboss forest.

b. Gallery forest i.e. Salix, Populus..etc.

Forest in the world

B. Classification depending on seeds type:

1. Angiosperm forest.

- a. Evergreen forest.

- b. Deciduous forest: either in winter or summer

2. Gymnosperm forest



Thank you

المحاضرة الثالثة

Forestry

Lecture3

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Forest In Iraq

A. Plantations

Commendable efforts have been made by Iraqi foresters over the past about 50 years in terms of creating irrigated plantations of several species, notably *Eucalyptus camaldulensis* in the plains of Iraq. By now some of these plantations contain stands as old as 35 – 5 years some of the silvicultural practices applied for the eucalyptus stands are fairly well established, while many others need investigation and work is continuing along the line to find appropriate answers. From the plantations in northern Iraq are :Nineveh. Dibil, Eski-kalak. Namroud and Samrah

Eucalyptus camaldulensis



B. Natural Forests

Natural forests are presented at the north and north-east of Iraq, it's area, approximately predicted (17776 km) which equal to about 4% of the total area of Iraq.

We can classified the natural forest in Iraq according to:

1. Annual precipitation:

- a. Low dry zone forest: 400 – 500 mm per year.
- b. Middle zone forest: 600 – 900 mm per year.
- c. High moisture zone forest: 000 – 1200 mm per year.

2. Dominant species:

- a. Pine forest
- b. Oak forest
- c. Riverine forest

Plant cover and its type

- Green Cover: is the group of plants cover a distinct area, it may be trees, shrubs, Cacti, and succulents.
- Schimper, 1935 classified the plants depending on its height into:
 1. Wood land
 2. Grass land
 3. Desert.

The general classification of plants grown on the earth are:

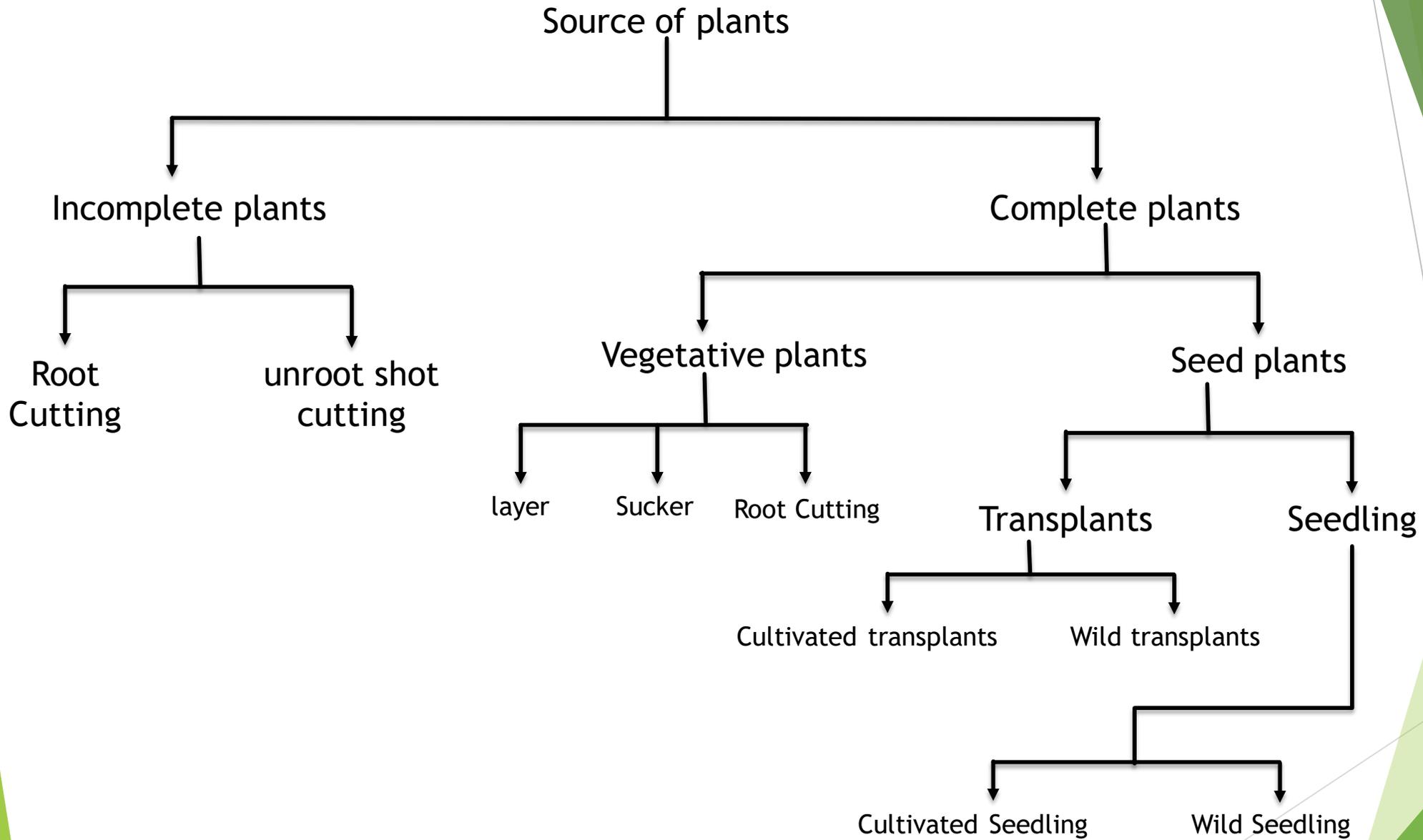
1. Forest
2. Maquious
3. Tundra
4. Savanna and Steppe
5. Desert

Developmental Stages of trees

1. Seedling stage the height of plants not more than 90 cm
2. Thicket or sapling stage: it consist
 - a. Small sapling: the height of plants 90 cm to 3 meters.
 - b. Large sapling:- more than 10 meters
3. Pole stage: the diameter of trees at breast height 10-30 cm.
4. Young stage: 30.60 cm.
5. Mature stage: in this stage the height growth approximately stopped.
6. Over mature stage: in this stage the yield of tree growth begin to decline.

A forestation and Artificial Regeneration

Establishment a forest on treeless area of introducing a species to a forest area in which it does not occur naturally is known a forestation, and a forestation may be done by direct seeding or by planting cuttings or tree seedlings raised in the nurseries.



Differences between Natural and Artificial regeneration

	Natural	Artificial
1.	Occurs without aid of human	Rises with human activities
2.	No cultivation for the earth	Usually cultivated.
3.	Happen gradually and the seedlings grow under protection of trees	There are complete protection for the planted seedlings
4.	It depends on the seed production year of tree species	It does not depend.
5.	The species can not be exchanged	There is ability for exchanging



Thank you

المحاضرة الرابعة

Forestry

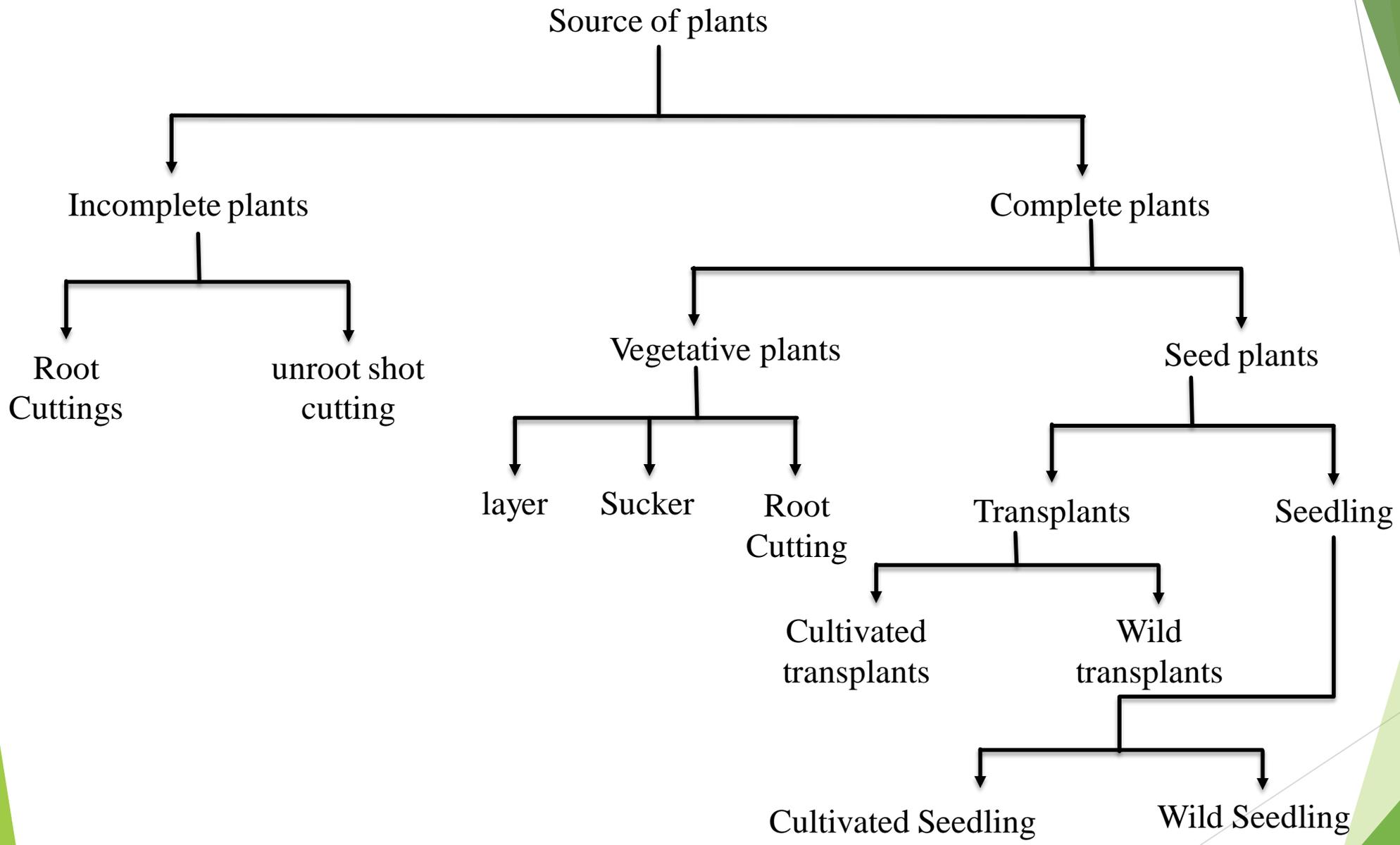
Lecture 4

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A forestation and Artificial Regeneration

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Planting of seedling

▶ **Time of Planting:** It depends on

1. Climatic conditions: like temperature, humidity, light and wind.
2. Seasons: Winter, spring, summer and autumn.
3. Kind of plants: Balled or bare root plants.
4. Condition of work and labour

► **Methods of planting:**

1. Balled plants planting
2. Naked (bare) plants planting.



► **Types of planting:**

1. Planting in normal hole
2. Deep planting.
3. Cone planting.
4. Mound planting.



▶ **Shapes of planting:**

1. **Regular planting:** it may be in three types:

- a. Square
- b. Rectangular
- c. Triangular

2. **Irregular planting**

Pure forest and Mixed forest

- A. **Pure forest:** is the forest which consist one kind of tree species, as forest or Pine forest.

Advantages of pure forest:

1. It can be easily administrated (managed)
2. The natural pruning happen more regularly than mixed forest.
3. Most economical in wood material
4. Artificial storing of logs easy and not cost

Disadvantage of pure forest:

1. It does not utilize from its top and underneath canopy
2. This type of forest can not improve the soil
3. It has less resistance for storm, fire insects, and disease.

B. Mixed Forest: It is the forest composed of more than kind of tree.

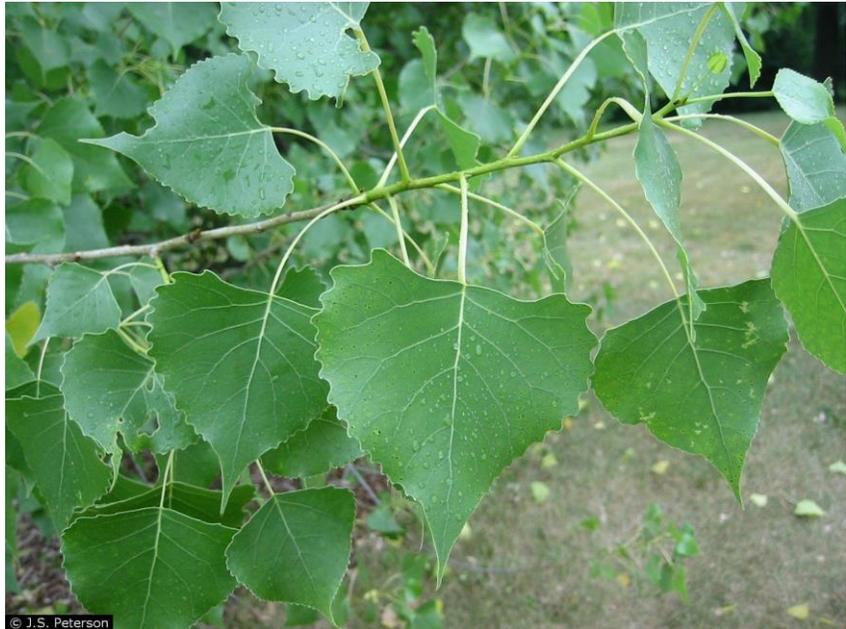
The advantages of pure forest are disadvantages of mixed forest and versa.

Methods of mixing

There are three ways for establishment of mixed forest:

1. Artificial mixing for even- ages it can be done by:
 - a. Mixing with individual trees.
 - b. Mixing with line or alternative strips of trees.
 - c. Patch mixing.
2. Artificial for two ages can be done by mixing tolerant tree species with intolerant species i.e. Thuje orientalis with Pinus brutia.
3. Temporary mixing: it can be done for a distinct purpose as mixing fast growing species (Populus) with slow growing species (Oak trees)

Populus tree





Thank you

المحاضرة الخامسة

Forestry

Lecture 5

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Pruning of trees

Pruning is removal or elimination of branches from trees. Trees must have branches and branches from knots which are the most common defects of wood grown in managed forests. Therefore the control of the growth and elimination of branches is often nearly as important as that applied to the main stem.

Types of pruning:

1. Natural or self pruning: is the elimination of branches by the physical and biotic agencies of the environment.
2. Artificial pruning: removal of branches from chosen parties of stem is increase the quality and value of the crop ultimately harvested.

Tools Employed in forest pruning:

1. Hand and pole saw
2. Edged tools cutting by impact(axes)
3. Pruning shears
4. Clubs
5. Machine

Thinning of trees

Thinning: is cutting made in immature stands in order to stimulate the growth of the trees that remain and to increase the total yield of useful material from the stand.

The fundamental objective of thinning

1. To redistribute the growth potential of the stands to optimum advantage
2. To utilize all the merchantable material produced by the stand during the rotation

Trees classification according to the crown:

- 1. dominant:** trees with crown extending above the general level of the crown cover and receiving full light from above and partly from the side
- 2. codominant :** trees with crowns forming the general level of the crown cover and receiving full light from above but comparatively little from sides

3. Intermediate trees shorter than those in the two preceding classes receiving a little light from above but none from the sides

4. Overtopped trees shorter with crowns entirely below the general level of the crown cover, receiving no direct light either from above or from sides

The selection of the trees to be favored and of those to be cut in thinning is based on

1. The relative position of and condition of the crown.
2. The health of the trees
3. The condition and quality of the bole
4. In mixed stands the choice between species also affects the selection



Thank you