LECTURE - 12

LEARNING OBJECTIVE: TO KNOW ABOUT ECONOMICS OF CULTIVATION-NURSERY AND PLANTING OF

*Acacia catechu.*Willd.

Plate 12.1(a) *Acacia catechu* tree

Plate 12.1(b) Leaves and pods

Botanical name **:** *Acacia catechu* Willd.

Common name **:** Khair, Kath tree, Cutch tree

Family **:** Leguminosae

Sub Family **:** Mimosoideae

Description

- A moderate sized deciduous tree with light feathery crown with crooked brown bole,
- Bark dark brown and red inside
- Branches are glabrous armed with recurved thorns
- The species is distinguished into three distinct varieties viz. *Acacia catechu*, variety catechuoides, variety sundra and variety catechu.

Distribution

- It is found throughout India except in humid and temperate region.
- It is widely distributed between 900-1200 m from Jammu to Assam.

- Variety catechu is found in Sikkim, Tarai, West Begal, Assam and upper Mynmar.
- Variety sundra is found in Indian Peninsular region and parts of Burma.

Climate

- Temperature - Maximum 40°C -50°C; Minimum 1°C
- Rainfall - 500mm to 2000mm
- Altitude - 1200m

Soil

- *Acacia catechu* grows on wide variety of soils such as sandy, gravelly alluviam, loam with varying proportions of sand and clay and black cotton soils.
- It is capable of growing on shallow soils with *murram* or *kankar* on which few other species can grow.

Phenology

- Leaf-fall - January-February
- Leaf renewal - April-May
- Flowering - April to August
- Fruiting - September-October
- Seed collection – October-November, December

Silvicultural characters

Strong light demander, frost and fire hardy, wind firm, browsed by animals.

Regeneration

Natural regeneration

- *Acacia catechu* reproduces naturally through coppice as well as from seed.
- The coppicing power of the trees depends upon their age, vigour, season of cutting and site conditions.
- In its stands of normal growth and stocking, coppicing can be relied upon to regenerate this species. Such stands are worked under coppice system.
- The stocking of the coppice crop, which depends upon the stocking of the natural crop coppiced and the coppicing power of the trees, is generally irregular.

- Coppice regeneration has therefore to be supplemented by artificial regeneration.
- Coppicing cannot be relied upon in selection stands where *Acacia catechu* grows mixed with other species as the light sufficient for the development of coppice shoots dose not reach the ground in such forests.
- Under heavy shade the stools normally do not coppice.
- The stand having over mature trees also cannot be regenerated through coppice because of the weak coppicing power of such tree.
- It has, however, been observed in some areas that the size of the stump does not affect the coppicing power and the stumps up to 60 cm diameter not only coppice well but also produce healthy coppice shoots.
- The growth of crop is faster than that of the seedlings crop; an average girth of about 20 cm and an average height of about 3.4 m can be expected for nine years old coppice.
- Coppice crop, however, requires thinning of stool to reduce the competition which may otherwise very adversely affect the growth rate of coppice shoots.
- Natural regeneration through seed can be expected under favourable conditions only.
- Seeds, are disseminated by wind. Germination takes place with the onset of monsoon rains and the seedlings get established where conditions are favourable for their growth.
- Soil type, drainage, weed competition, shade and grazing are important factors determining the success of natural regeneration through seed.
- Poor drainage coupled with shade results in heavy mortality of the seedlings because such conditions encourage damping-off. Tall and gregarious weeds compete out the seedlings.
- Grazing does not permit any natural regeneration to establish as the seedlings are browsed and killed. Profuse natural regeneration may be expected in areas kept free of grazing.
- It may be totally absent in grazed areas.
- The growth of seedlings in naturally regenerated crops is slow and they often die-back in winter

Artificial regeneration

Acacia catechu can be propagated by one of the three methods, namely (1) direct sowing, (2) planting out nursery raised seedlings and (3) stump planting. Direct sowing is better than stump planting, which is preferred to planting out of entire plants without containers.

i. Line/strip sowing in lines 60 to 90 cm apart, strips 2.5 to 3 cm apart.
ii. Broadcast sowing in weed free area.
iii. Patch sowing by dibbling 2.5 to 3 cm apart.
iv. Potted plants or with ball of earth.

Seed collection and storage

- The seed ripens in November-December or early January
- Seeds are very susceptible to insect attack even when on the trees and the pods should, therefore be collected shortly before the seeds are fully ripe as otherwise most of seed crop may be destroyed by insects.
- The pods are dried in the sun and then thrashed to separate the seed which is properly cleaned, dried in the sun and stored in airtight tin containers. The seed should preferably not be stored for more than 6 to 8 months under ordinary conditions;
- The seed should preferably be sown during the year of its collection. As *Acacia catechu* is a good seeder, there should be no problem in the collection of sufficient fresh seeds every year.
- About 30 to 40 seeds weigh one gram.
- Seed yield per tree is about 0.5 to 2.0 Kg.

Nursery technique

- Sowing is done in February-March in well prepared nursery beds.
- The spacing adopted is 20 cm between the lines and 2 cm between the seeds in the lines.

Planting technique

a) Polybag plants:

- A pit of $30cm^3$ is prepared with a spacing of 3m × 3m about 2 months in advance
- Planting is done in the month of July
- Polythene container must be removed at the time of planting

b) Ball of the earth planting:

- The taproot is cut at a depth of 25-30cm at the time of uprooting of seedling

- Splitting or bruising tap root is avoided
- Transplanting of seedling is done in rainy season as winter entire transplant are failure

c) Stump planting:

- Stumps are prepared from 12-15 month old seedling
- The root and shoot portion should be 23-31cm and 2.5 to 5.0cm respectively.
- Stump less than 1cm collar diameter give poor survival
- Stump can be stored for 3 days
- Planting of stump should be done in the onset of monsoon

Silviculture system for management

The best system under which khair is managed is the clear felling followed by artificial regeneration.

Disease

Ganoderma lucidum causes root rot disease with considerable mortality in khair plantation raised after clearfelling.

Economic importance

- Heartwood is mainly used for katha extraction
- Timber is mainly used for agriculture implements
- Small branches for fuel-wood
- Leaves as fodder for goats
- Gum is also important product obtained from *Acacia catechu* and regarded as the best substitute for the gum-arabic

SIMPLE QUESTIONS TO BE ANSWERED

1) Phenology refers to

a) Leaf fall c) leaf renewal

b) Flowering d) All of these

2) *Acacia catechu* is ……. Species
   a) Strong light demander c) Shade loving
   b) Shade bearer d) None of these
3) Variety sundra of *Acacia catechu* found in …..
   a) Indian Peninsular region c) North-East states
   b) Himalayan region d) None of these
4) *Acacia catechu* is …..
   a) Strong coppicer c) Bad coppicer
   b) Non coppice d) None of these
5) Katha is obtained from
   a) Leaves c) Pods
   b) Roots d) Heartwood

KEYS FOR THE OBJECTIVE QUESTIONS

1) d
2) a
3) a
4) a
5) d