

## LECTURE-18

### “LEARNING OBJECTIVE: ECONOMICS OF CULTIVATION-NURSERY AND PLANTING OF *Tamarindus indica* L. AND *Azadirachata indica*. A.”



Plate 18.1 *Tamarindus indica* L.

**Botanical Name:** *Tamarindus indica* L.

**Common Name:** Emli, Tamarind

**Family :** Leguminosae (Caesalpiniodeae)

#### Description

- It is a large evergreen tree attaining a height up to 15m
- Spreading crown 9 to 12m in diameter with numerous branches and twigs.
- The trunk is short, the lower branches are borne almost horizontal.
- Bark is moderately thick and dark grey with numerous longitudinal fissures and horizontal cracks.
- Two varieties has been identified East Indian variety with long pods, 6-12 seeded
- West Indian variety with shorter pods, 1-4 seeded

## **Distribution**

- One of the most common tree of Tropical India,
- It is believed to be indigenous to Tropical Africa probably introduced long back to India by Arabs.
- It is not tree of forest but is cultivated throughout country except Himalayan region and arid western zone.

## **Site factor**

### **Climate**

- Temperature - Maximum 35°-46°C Minimum 0°-17.5°C
- Rainfall - 750-1900mm
- Altitude - up to 1000m

### **Soil**

- It is non-exacting type tree
- It tolerates slightly saline and alkaline soils
- Best growth is found on deep loamy or alluvial soils with adequate supply of moisture

### **Phenology**

- Leaf-fall - April-May
- Leaf renewal - March-April
- Flowering - April-June
- Fruiting - March-April
- Seed collection - March- April
- Seed weight - 1800-2000 seeds per Kg
- Germination per cent - 75%

### **Silvicultural characters**

- Strong light demander can't grow under shade,
- Frost tender,
- Resistant to drought,

- Produce root suckers and coppice well
- Deep rooted and wind firm in nature
- Not fire hardy but considered best tree for planting along fire lines in Karnataka.

### **Regeneration**

#### **Natural –**

- It is not adequate in any circumstances.
- Scattered seeds may germinate especially in abandoned areas, ruins etc.
- Weeds retard the growth of the seedlings whereas weeding greatly favours growth.
- The seedlings may attain a height of 0.6m or more in the first season and 1.20 m or more in the second season if they are regularly weeded and watered.

#### **Artificial –**

- It can be raised easily through direct sowing, planting out of entire plants or stump planting or poly bag container plants.

### **Seed collection and storage**

- Plant begins to yield seed when about 8-10 years of age
- Ripe pods are collected in the month of March-April
- Seed is separated from edible pulp by washing with water then dried and stored
- Fully grown tree produce 2 quintal of fruits per season
- Individual pods contains 3-10 seeds

### **Nursery technique**

- Seeds sown in March-April in irrigated nursery in lines about 20-25cm apart.
- No pre-treatment of the seed is necessary.
- Germination starts in about a week and take about a month to complete
- Seedlings attain plantable size by the July when they are about 3-4 months old and attain a height of 30-40cm.

### **Direct Sowing**

- It is done in lines or patches.
- Depth of sowing is about 1.5cm.

- The lines are spaced at 4-5 m apart and the seeds are sown 10cm apart.
- About 20 kg of seed is requires to sow one hectare area.
- It gives 80% survival against transplants 60%.

### **Planting technique**

- Planting is done at the commencement of rainy season during July-August.
- Seedlings were irrigated with 2 litres of water while planting.
- The pit size of 30cm<sup>3</sup> is recommended for planting
- The plants should be protected through fencing

### **Stump planting**

- It is carried out in 30 cm<sup>3</sup> pits as soon as rain break.
- It gives 42% survival.

### **Vegetative propagation**

- It is done with soft terminal cuttings.
- The cuttings are prepared with current year's shoots and it is collected with new leaves flush early in the morning in turgid condition.
- Cuttings are treated with 1000ppm IBA in 50% Isopropyl alcohol as quick dip for second then transfer to polypropylene tubets

### **Economic importance**

- The chief value of this tree lies in its fruits which are used for various types of food preparations and sherbets.
- The wood is used for carving.
- It makes an ideal avenue tree by virtue of its shade, ornamental flowers and longevity (200years or more).



**Plate 18.2 *Azadirachta indica* A.**

**Botanical Name:** *Azadirachta indica* A.

**Common Name:** Neem

**Family :** Meliaceae

#### **Description**

- It is versatile, hardy Indian tree of great religious, medicinal and ornamental importance.
- It is a medium to large sized, handsome tree with rounded crown of bright green dense foliage, a stout, strong and glabrous branches.
- The bark on young trees is smooth, soft, moderately thick.

#### **Distribution**

- It grows throughout the greater parts of India, more especially in the drier parts of the country.
- It is absent in areas with excessive cold and as such does not grow in Himalaya above 1000m elevation.
- The species has been used to afforest drier tracts, ravines and refractory soils in the states of Gujarat, Rajasthan, Punjab, Haryana, Uttar Pradesh, Bihar, Orissa, Madhya Pradesh, Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu. It is also planted in Assam and Andaman islands also.

## **Climate**

Temperature - Maximum 40°-45°C Minimum 0°-15°C

Rainfall - 450-1125 mm

## **Soil**

- It grows well on a wide variety of deep or shallow soils ranging from sandy soils in Rajasthan to clayey soils in Maharashtra,
- Does not survive on water-logged, highly saline or deep dry sand.
- Best growth is reported from black cotton soils
- It is salt tolerant species and suitable for afforesting saline and alkaline soils.

## **Phenology**

- It is semi-evergreen tree
- Leaf-fall - February-March
- Leaf renewal - March-April
- Flowering - April-May
- Fruiting - June-August
- Starts fruiting at the age of 5 year but economic yield is obtained at the age of 10-12 year
- Medium size tree produce 35-37Kg fruits
- About 3300-4500 seeds weigh one Kg
- Seed collection - June-July
- Seed weight - 9-10 seeds per gm
- Seed viability - 6-8 weeks, Reduces rapidly after 2 weeks
- Germination per cent - Fresh seeds upto 86%

## **Silvicultural characters**

- Strong light demander,
- Tolerates fairly heavy shade in early years,
- Susceptible to fire and browsing damage,

- Seedling and saplings are very sensitive to frost
- Seedlings are intolerant of water logging conditions
- It can withstand drought better than excessive rainfall
- It coppices well and produce root suckers in dry locality

### **Regeneration**

#### **Natural –**

- It is seldom found growing gregariously,
- It regenerates naturally by seeds, coppice and root suckers
- Fruit ripening coincides with rainy season; fallen fruits germinate within a fortnight giving a thicket of seedlings under mature tree.
- Germination is epigeal
- Mature tree comparatively have short tap root and number of horizontally growing lateral roots

#### **Artificial –**

- It can be raised easily through direct sowing, planting out of entire plants or stump planting

### **Seed collection and storage**

- Fruiting starts early in south Indian and late in North India
- Seeds are preferably collected June-July or some time seeds swept from the floor as soon as they fall down
- Seed do not require any pre-sowing treatment
- De-pulping and cleaning the seed considerably improve germination percentage

### **Nursery technique**

- Sowing in raised nursery beds is done in June in drills 15cm apart;
- The seeds being sown 2.5cm apart in the lines.
- They should be lightly covered with soil since the emerging radicles are eaten by rodents.
- Depth of sowing is to 2.5cm.

- Seed can be sown in poly bags (22cm×9cm) and later transplanted to 30cm×16cm size poly bags.
- Pricking out of seedlings or wilding is done at three leaves stage into polythene bags.

### **Direct Sowing**

- It is done by dibbling in bushes, broadcast sowing, sowing in lines or patches, in trenches, sunken beds or circular saucers etc.
- Especially sowing in lines or patches has been employed under taungya system.

### **Planting technique**

- One year old seedlings are considered the best over either two years or below one year.
- Planting should be done in July-August during rainy period and stopped in the non-rainy days
- Winter planting is unsuitable for neem.
- Cleaning around the pits should be done at the time of planting.

### **Stump planting**

- It is carried out in 30 cm<sup>3</sup> pits as soon as rain break.
- Stumps are usually prepared from two year old seedlings,
- One year old seedlings of fertilized nurseries can also be used.

### **Vegetative propagation**

- It is propagated by air-layering or by rooting stem cuttings and root cuttings.
- Successful air-layering was achieved by treatment with 0.1 per cent Indole-butyric acid or naphthalene acetic acid.

**Economic importance:** Almost every part of neem tree is useful from its roots, trunk, bark, leaves, flowers, fruits and seeds in day to day life.