

## **Lec.16 Silvicultural practices for Casuarina , Silk cotton, Acacias and Bamboos**

### **1. Casuarina**

ScientificName	: <i>Casuarina equisetifolia</i>
English Name	: Beaf wood
Tamil Name	: Savukku
Hindi Name	: Janlisaru
Family	: Casuarinaceae

### **Distribution**

Casuarina is indigenous on the sandy shores and dunes along the Bengal coast, Tenasserim, Andaman and Nicobar islands, etc. It has been raised in many parts of the country as a coastal plantation, an ornamental garden tree and an inland sand dune plantation.

### **Physiognomy**

It is a large evergreen tree with a straight stem. The foliage is feathery and comprises of a number of long, slender, drooping, jointed, angled, leafless branches rising from rough, woody branches. The jointed branchlets are green and perform the function of leaves. They are partly deciduous. Casuarina resembles a feathery, coniferous tree in appearance. The bark is brown, fibrous, rough and exfoliates in longitudinal stripes. The tree may grow upto a height of about 35 m or so; though it generally does not have a life of more than 50 years, becoming hollow and unsound in about 35 years. By habit, casuarina is gregarious in its natural state, forming pure crops. There is little or no undergrowth except grassy patches and a few coastal shrubs.

### **Phenology**

It is generally evergreen. Pieces of the jointed branchlets are shed all round the year. Flowering occurs twice a year once from February to April and again from September to October. Fruit ripening occurs in June and again in December. Seeds are viable for about six months or so, though it is always better to use fresh seed

## **Silvicultural Characters**

Strong light demander and drought resistant. Susceptible to fire. Coppices badly. Young plants susceptible to browsing

## **Climate and Soil**

Absolute maximum and minimum temperature is 35°C-49°C and -4° to 18°C. Normal annual rainfall 750-4,500 mm. Best suited soil is alluvial soil having a considerable proportion of sand and good moisture supply. Also survive on poorly drained sites.

## **Nursery Technique**

Seed is sown in the nursery in May, 5 cm apart in lines 23 cm apart and watered till the break of rains. Seedlings should be shaded during the hot weather. They are suitable for making stumps and/or entire transplanting when 1 year old. In Assam, 2 year old plants are transplanted, when 1-2 m high even taller. In West Bengal, practice is to plant out seedlings about 30 cm high, with ball of earth. One year old stock is used for making stumps.

## **Planting**

Direct sowing may be done in raised patches 3.7 m x 3.7 m, just before the commencement of rains, using 3 to 6 seeds per patch. In taungya plantations of Uttar Pradesh direct sowing are done in continuous lines.

It has been successful in comparatively high rainfall region of Assam, West Bengal and Kerala. For stump planting, stumps are prepared from 1 or 2 years old nursery raised seedlings, keeping only 4 cm of shoot and 30 cm of root and running all side roots. Planting may be done in crow-bar holes or in pits of 30 cm<sup>3</sup> Utilization.

Semal wood is very soft and light. Untreated wood is highly perishable and extremely durable under water. It is in great demand as matchwood; is very suitable for light plywood containers. It is also used for packing-cases, shingles, well-curbs, brush handles, dug-outs, etc. Floss from semal seeds is the Silk Cotton or Indian Kapok of commerce, which is used for stuffing cushions, pillows upholstery, packing, etc. Bark exudes a gum,

known as mocha-ras, which is of great medicinal value. Inner bark yields a good fibre suitable for cordage.

## **2. Silk Cotton**

Scientific Name : *Ceiba pentandra*

English : Silk cotton tree

Tamil : Pulai

Hindi : Semal

Family : Bombacaceae

### **Distribution**

It is very widely distributed, almost throughout India, excepting the arid region; ascending upto 1200 m, occasionally even upto 1500 m. It is typical of alluvial savanna type of forests; it grows sporadically in mixed deciduous forests of West Coast, and the evergreen forests of Bengal and Assam. It is very common in Tarai and Bhabar areas of Uttar Pradesh and Bihar. It is also widely distributed in peninsular India. Indo-genetic plain and parts of the sub-Himalayan tract.

### **Physiognomy**

It is a huge tree with a clean bole and development of buttress. Its wood is very soft and light. Untreated wood is highly perishable; is extremely durable under water. Bark exudes a gum, known as mocha-ras, Inner bark yields a good fibre suitable for cordage. Scarlet red flowers appear in February-March. It coppies in early years; produces root suckers

### **Phenology**

Leaf-fall occurs in the month of December. The leaves turn yellow and fall off. The flowering takes place in the leafless period from January to early March. The fruits occur in April and May. Seeds are surrounded by floss and are hence dispersed by wind.

### **Silvicultural Characters**

It is a strong light demander and drought resistant. Fairly resistant to frost and fire. It produces root suckers and early coppicer.

### **Climate and Soil**

Absolute maximum and minimum temperature is 35°C-49°C and -4° to 18°C. Normal annual rainfall 750-4,500 mm. Best suited soil is alluvial soil having a considerable proportion of sand and good moisture supply. Also survive on poorly drained sites.

### **Nursery Techniques**

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### **Utilization**

Semal wood is very soft and light. Untreated wood is highly perishable and extremely durable under water. It is in great demand as matchwood; is very suitable for light plywood containers. It is also used for packing-cases, shingles, well-curbs, brush handles, dug-outs, etc. Floss from semal seeds is the Silk Cotton or Indian Kapok of commerce, which is used for stuffing cushions, pillows upholstery, packing, etc. Bark exudes a gum, known as mocha-ras, which is of great medicinal value. Inner bark yields a good fibre suitable for cordage.

### **3. Acacias**

Scientific Name : *Acacia auriculiformis*

English Name : Australian Wattle

Tamil Name : Kathivel

Family : Mimosae

#### **Distribution**

It is a native of New Guinea, North Australia and Queensland; and exotic in India. It has been successfully raised in West Bengal, Bihar and Andhra Pradesh for about forty years, and more recently in Kamataka, Orissa, Uttar Pradesh and Maharashtra.

#### **Physiognomy**

It is a moderate sized tree, attaining a height of 10m sometimes upto 15m. Bark is smooth, white or light grey, fissure occurs in later years. The leaf stalks are modified into flattened blade called as phyllode, which is narrow oblong slightly curved and sickle shaped, leathery, dull green.

#### **Phenology**

Seeds ripen during January - March; best time for collection of pods is February - March, by lopping and spreading out for 5-9 days to open. Seeds retain viability upto 2 years. Germination capacity is about 50%.

#### **Silvicultural Characters**

It is a strong light demander but regenerate under shade. It is a fire tender. It is drought-tolerant but sensitive to severe drought. It produces profuse root suckers but is a poor coppicer under Indian condition

#### **Climate and Soil**

It grows from sea-level to about 700 m altitude. It does well in temperature of 26-30°C and can survive up to 40°C. It is well adapted to drought and grow with as little as 600 mm rainfall.

### **Nursery Technique**

Seed requires pre-treatment, either 24-48 hours immersion in water at room temperature or in cooling boiled water, for 24 hours. May be sown in nursery beds in polythene bag containers during March to early April, under shade which is removed after germination is completed. Seed is sprinkled with kerosene oil to protect against ants. Germination starts in 15-20 days and is complete in 30-35 days. A thatch barrier on one side of the bed is given to protect against direct winds.

### **Planting**

Four months old nursery seedlings are planted out with ball of earth, when 15-30 cm tall, at the break of monsoon in June - July; can be successfully raised by stump planting also. Planting is done in pits 30 cm<sup>3</sup> to 45 cm<sup>3</sup> at a spacing of 1 m x 1m to 2m x 2m.

### **Utilization**

It is reasonably good fuel-wood, furniture wood and pulpwood; is suitable as a shade and ornamental avenue tree; useful for afforestation and reclaiming wastelands.

Scientific Name	: <i>Acacia nilotica</i>
English Name	: Indian gum arabic tree
Tamil Name	: Karuvelam
Hindi Name	: Babul
Family	: Mimosae

### **Distribution**

Babul is indigenous to the Western part of the India- Gangetic plains and the Northern part of Deccan plateau, including Andhra Pradesh, Maharashtra, Rajasthan and Gujarat. It is widely planted, or self - sown throughout the hot regions of India, viz., Punjab, Haryana, Uttar pradesh, Madhya pradesh and Karnataka. It is an important constituent of southern dry mixed deciduous tropical forests, Northern and Southern tropical thorn forests of India; at an elevation range of 200-500 m.

### **Physiognomy**

It is a moderate - sized, almost evergreen tree with a short trunk, a spreading crown, and feathery foliage. Bark dark brown, nearly black, pinkish brown and hard inside, with regular deep longitudinal fissures which very often run spirally up the tree. Young branches green, pubescent. Stipulate spines straight, white, up to 2 inches long, variable, sometimes absent in old trees. The tree varies much in size, remaining little more than a shrub in some localities, and in others attaining a height of 50 to 60 ft. or even more, and occasionally a girth of 8 to 10 ft.

### **Phenology**

The young leaves appear from March to May, the old leaves commencing to fall before they appear. Flowering is most general in the rainy season, from June to September, but trees may be found in flowers as late as December or January. The time of fruit ripening varies according to locality, but is usually from April to June.

### **Silvicultural Characters**

It is drought-resistant; frost-tender. It is strong light-demander. Its coppicing power is very variable, generally poor.

### **Climate and Soil**

*A nilotica* can grow on a variety of soils, provided sufficient moisture is available. It prefers well drained fresh alluvial sandy loam soil in riverain tracts, though it can grow on clay and black cotton soil also. It can stand mild soil salinity provided sufficient moisture is available. In its natural habitat, average rainfall is 400 to 1500 mm; fairly drought resistant, but thrives best in areas with 500-1250 mm.

### **Nursery Technique**

Babul seedlings are raised in polythene bags (5 cm x 22 cm, 150 -200 gauge). Treated seeds are sown, about 1.5 cm deep, 2-3 seeds in each bag in February - March (or May, for freshly collected seed) and regularly watered and weeded. Excessive watering should be avoided; shading is necessary to avoid surface cracking.

### **Planting**

Seedlings are fit for planting out in July - August of the same year (when 3-4 months old). For obtaining bigger plants, seeds is sown in June - July in bigger bags and one year old seedlings are planted out. It's rotation is 30 years for timber and 15-20 years for tannin; it yields 23.02 m<sup>3</sup> wood per ha. At the age of 30 years and 8-10 tonnes of pods per ha.

### **Utilization**

Leaves and pods are widely used as fodder. It is an extremely valuable source of fuel wood and charcoal of excellent quality. General utility of timbers for construction of carts, wheels, agricultural tools and implements, doors, windows, mine props, fencing materials etc. Bark is one of the best tanning materials of Northern India. Babul gum is used in inks, paints, matches and confectionery

## **4. Bamboos**

Scientific Name : *Dendrocalamus strictus*

English Name : Solid Bamboo

Tamil Name : Kal Moongil

Family : Graminae

### **Distribution**

*Dendrocalamus strictus* is the hardest, most widely distributed and important of bamboo species found in India. It occurs throughout the country barring Northern parts of West Bengal, Assam and other very moist areas. It is common in most hilly parts of Peninsular India, except very moist places. It occurs in alluvial plains and ravines, and on hill slopes to an altitude of about 1100 m.

### **Physiognomy**

A bamboo plant has 10 to 30 culms and the plant is usually referred to as a clump. The culms may reach a height of 7 to 20 m and a diameter of 2.5 to 8.0 cm. The culms are almost if not entirely solid, hollowness varying from a pinhole to 2.5 cm in diameter; there is no hollowness in drier localities. The culms emerge from an underground rhizome. *D. strictus* shows sympodial type of rhizome also called pachymorph. Sympodial rhizomes are solid usually short and thick and their lateral buds only produce new rhizomes each of which eventually produces a solitary culm. The sympodial

arrangement ensures that each new culm will have its own new roots. The buds on rhizome nodes enlarge for many months in the soil and tender shoots emerge and pointed cones completely covered with imbricate sheaths. These shoots elongate rapidly attaining full height in four months which is followed by development of branches. At this stage, the culm sheaths cover the lower part of each internode and the exposed upper part is covered with waxy powder. The culm sheaths are modified leaves arranged in two ranks mainly for the protection of the growing culm. The sheath is attached at the node clasping the culm and when old, falls off leaving a scar. Width of the sheath is greater than the girth of the nodes so that the two sides of the sheath overlap. Growth of culm is rapid being 0.3 to 0.9 m per day. Full culm maturity is completed in 3 to 4 years and new culms are produced every year with the commencement of rains. The average life of a culm is 7 years.

### **Phenology**

*D.strictus* exhibits both spodic and gregarious flowering

### **Silvicultural characters**

It is drought resistant and frost hardy. It is also a light demander.

### **Climate and Soil**

It is commonly found in drier areas and grows on well drained soils and stony soils on hill slopes.

### **Nursery technique**

Seeds are sown in raised bed . Germination commences within 11 days after sowing. Fourty days after sowing , the seedlings are transferred to polybags.

### **Planting**

10 months to one year old seedlings are planted in the main field at a spacing of 5mx5m. The management of bamboo involves two main considerations viz., felling cycle and felling intensity.

The felling rules are observed at every cutting cycle.

- i) Culms less than 2years of age should not be cut
- ii) In a clump, atleast 6 mature culms are to be retained
- iii) The culms should be cut at 15cm above ground level
- iv) While cutting the culms should not be split

**Utilization**

It is mainly used in paper industry. Its seeds are eaten by people. Leaves and young culms are used as fodder.