

**BAMBOO**



*CLUMP OF BAMBUSA BAMBOS*



CLUMP OF *DENDROCALAMUS STRICTUS* IN UTTHAN GARDE



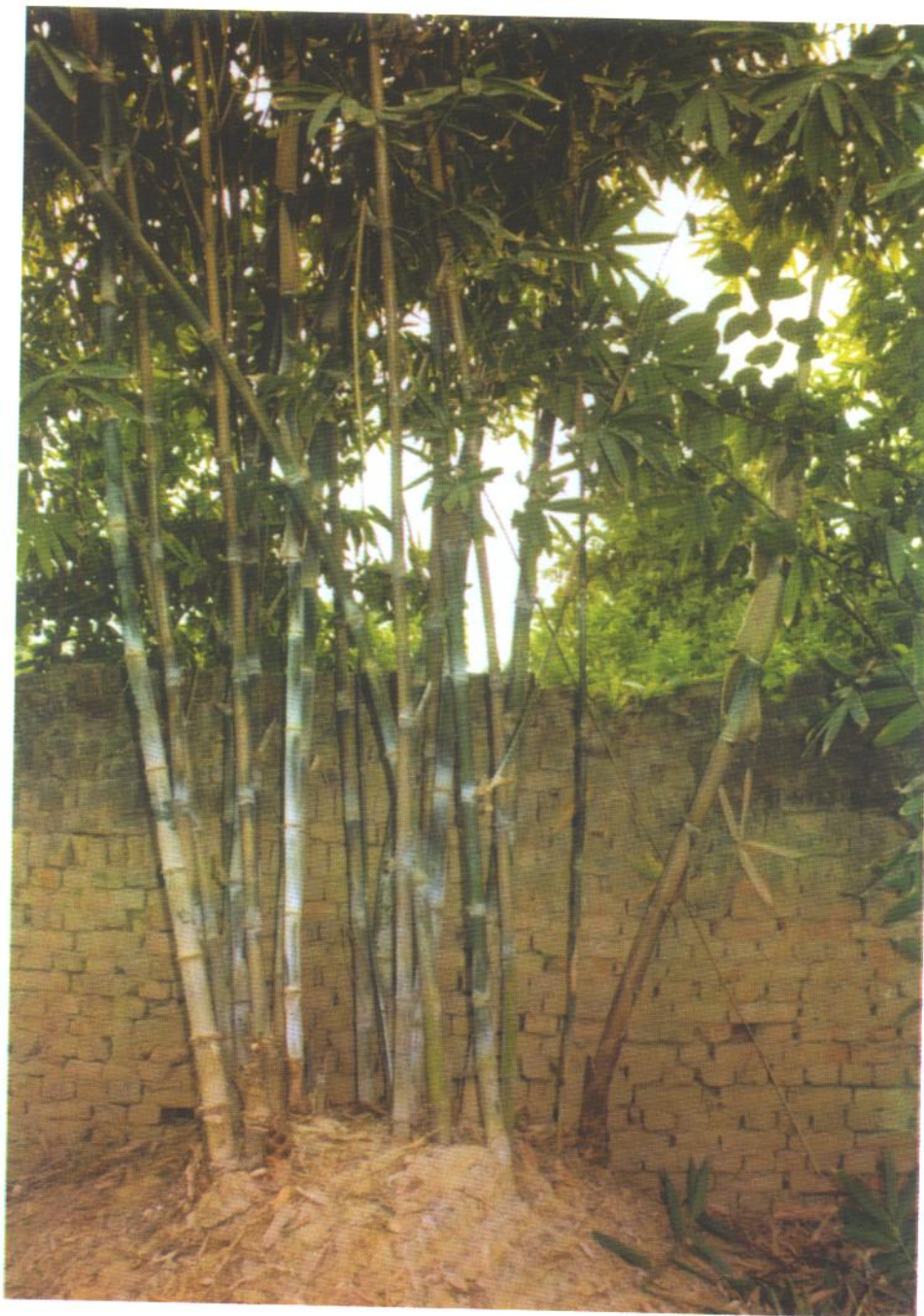
*CLUMP OF BAMBUSA POLYMORPHA*



*CLUMP OF BAMBUSA VULGARIS*



*CLUMP OF BAMBUSA TULDA*



*CLUMP OF DENDROCALAMUS ASPER IN UTTHAN GARDEN*



CLUMP OF *GADUA ANGUSTIFOLIA*



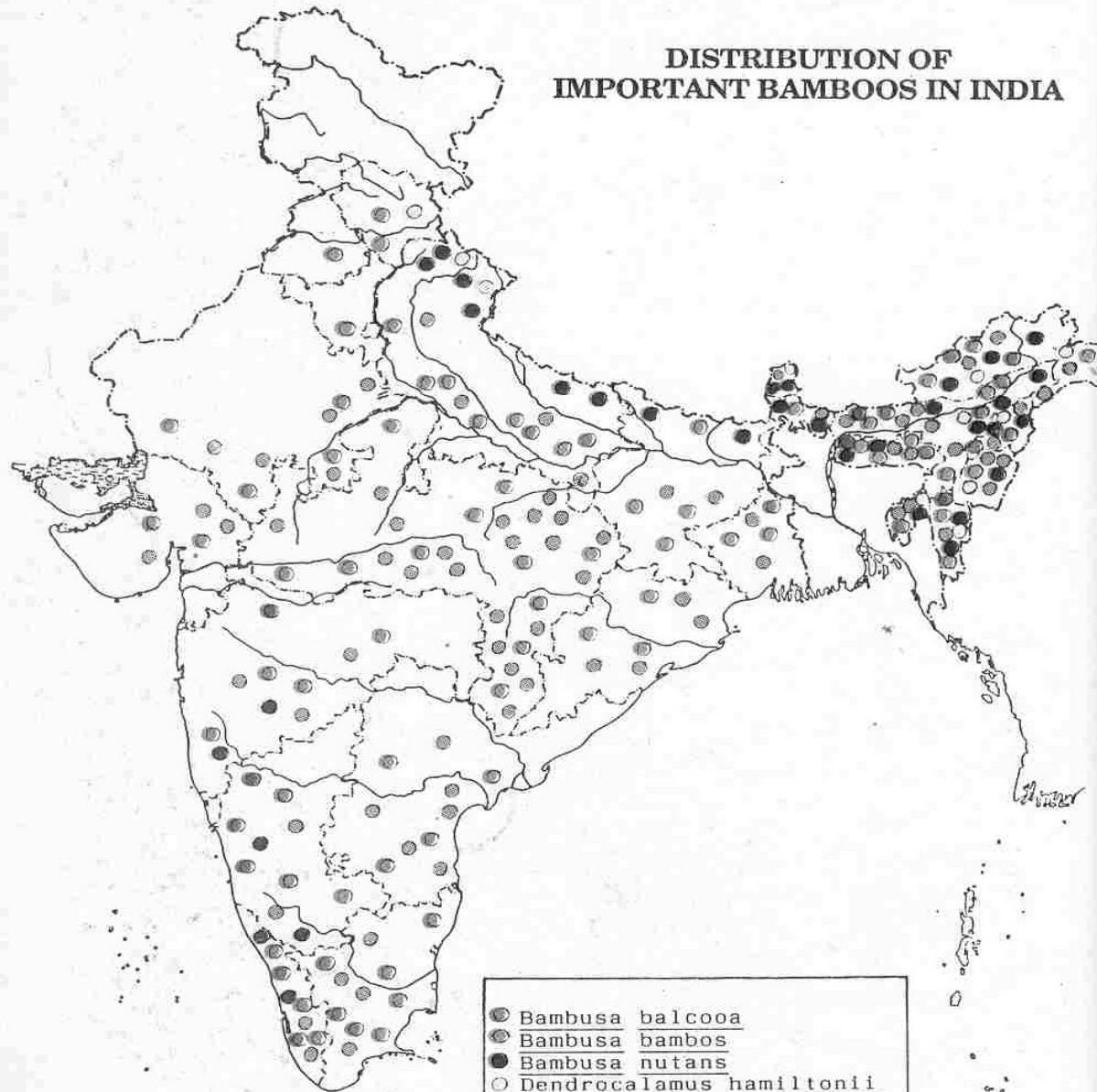
SPECIMEN OF DIFFERENT BAMBOO RAW MATERIAL

# BAMBOO

- Family: Poaceae (Gramineae)
- Sub family: Bambusoideae
- 23 genera 125 species: Indigenous-exotic
- 10.03 million ha 12.8% of forest areas
- Is known as “green gold”, Poor man’s timber and “the cradle to coffin timber”.



## DISTRIBUTION OF IMPORTANT BAMBOOS IN INDIA



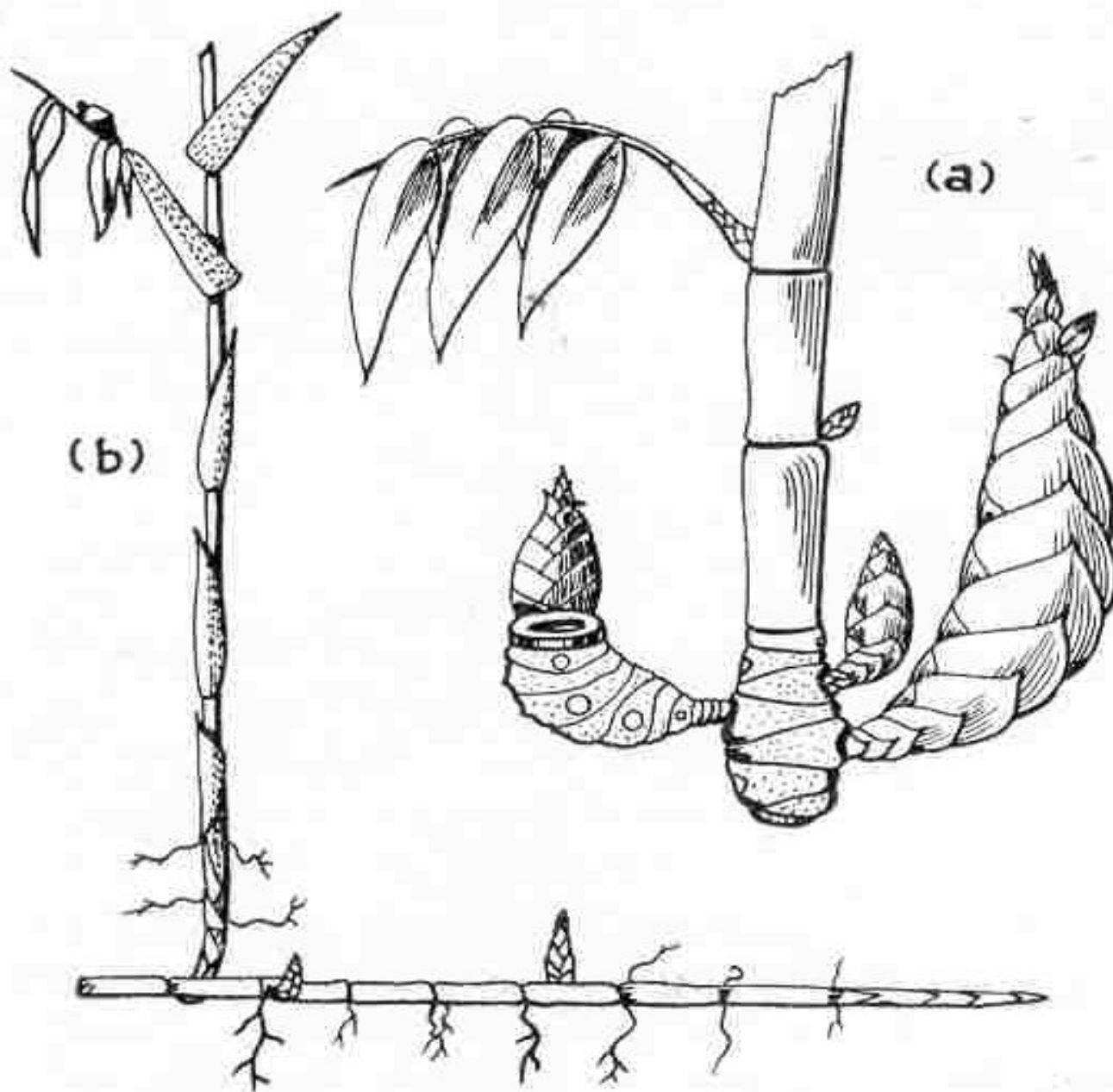
- Bambusa balcooa
- Bambusa bambos
- Bambusa nutans
- Dendrocalamus hamiltonii
- Dendrocalamus strictus
- Gigantochloa macrostachya
- Melocanna baccifera
- Ochlandra spp.
- Pseudoxytenathera ritcheyi
- Schizostachyum pergracile

# DISTRIBUTION AND HABITAT

- Distribution of bamboos naturally follows distribution of the rain fall.
- 50% species occur in Eastern India.
- **North West India:** *D.strictus*, *Bambusa balcooa*, *B.arundinaria*.
- **Western India:** *B.bambos*, *B. nutans*, *B.vulgaris*, *D. hamiltonii*, *D.strictus*.
- **Western Ghats:** *Gigantochloa* and *Ochlandra*.
- **Bengal Assam and North East Himalayas:** *D.hamiltonii*, *B.tulda*, *Mallocanna baccifera*.
- **Andaman & Nicobar Island:** *G. rostrata*, *Dinochloa andamanica*

# GENERAL CHARACTERISTICS

- Are perennial grasses of extremely gregarious habits.
- Woody stems (culms) arise from woody rhizomes (Root stock)
- Scaly rhizomes produced from the base of seedling which grows downwards and curves up again as a culm.
- Full size culms produced after 4-12 years.
- Rhizomes are more or less densely clustered and culms arise in clumps- **sympodial**.
- Culms arise at intervals of 30-90 cm from a long creeping rhizomes – **monopodial**
- New culms arise in the rainy season and elongate rapidly in 2-4 months.



**Types of Rhizome : (a) Sympodial (*Bambusa* SPP.)  
(b) Monopodial (*Arundinaria* SPP.)**

# GROWTH CHARACTERISTICS

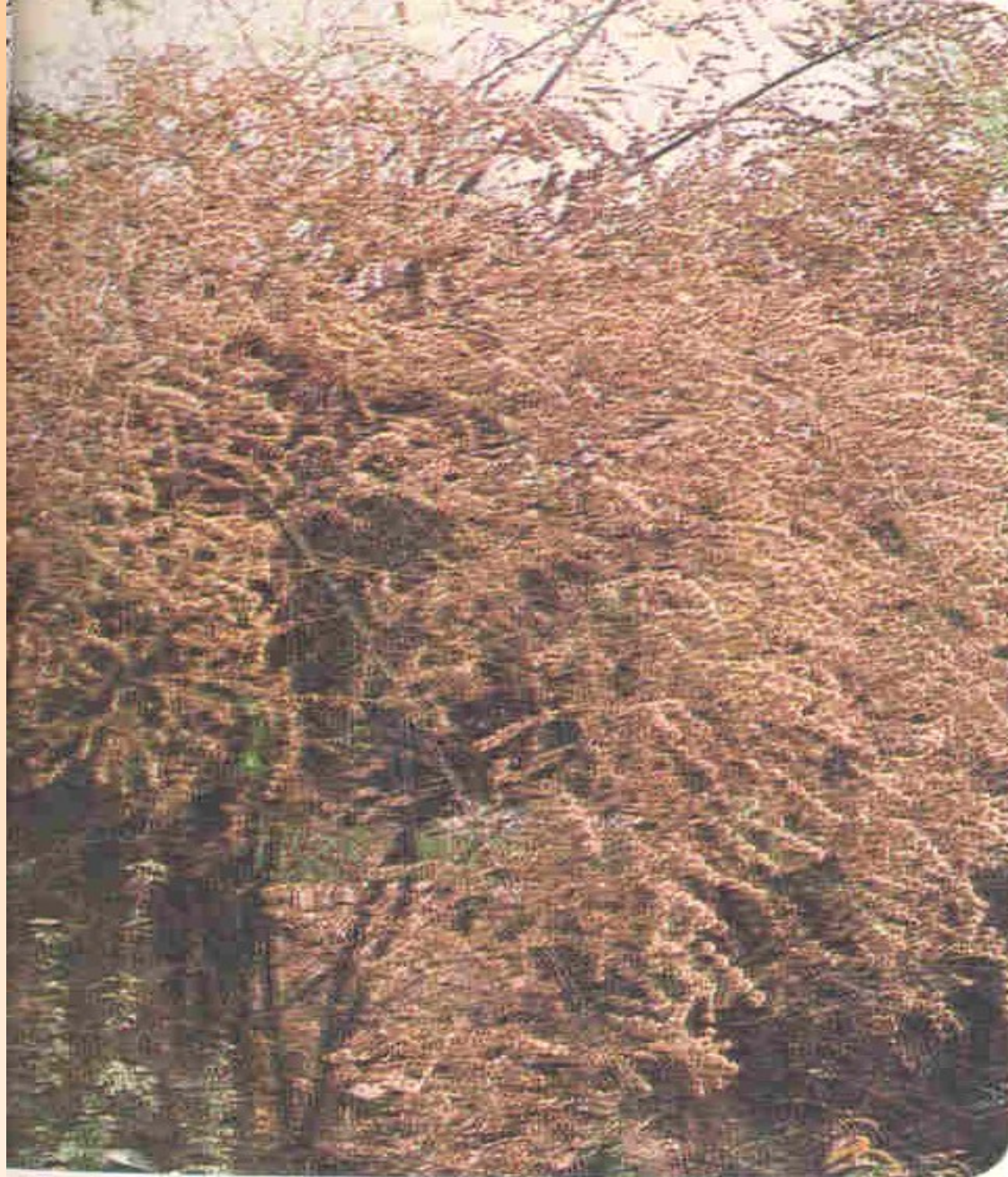
- Seedling – clump – 6-8 yrs.
- Rhizome – culm – 3-4 months
- Maturity for harvest 3-4 yrs.
- Fast growth 1 mt./day.

# SILVICULTURAL CHARACTERS

- Light demander
- Sensitive to fire and grazing
- Do not favour saline and alkaline soils
- Seeds (on flowering) ensure adequate regeneration.

# SILVICULTURAL CHARACTERS *contd...*

- Flowering: Nov.- March
- Fruiting: April – May
- Annual (Ochlandra and few other species)
- Gregarious & Periodic (7-120 yrs. cycle)
- Definite physiological cycle for different spp.  
and different seed origin.
- Sporadic flowering



Flowering of bamboo *Dendrocalamus strictus*





Fructing of bamboo

# REGENERATION

- Natural - from seeds
  - from rhizomes
- Artificial - from seeds (sown in Sept./Oct.)
  - from rhizomes
  - by tissue culture
- Seed count - 20000/kg. viability (3-6 months)
- Seeds edible



**GERMINATION OF BAMBOO SEEDS**



**BAMBOO SEEDLINGS IN ROOT TRAINERS**



## COMPARATIVE STUDY OF ROOT SYSTEMS OF BAMBOO SEEDLINGS



**VIGOROUSLY GROWING BAMBOO SEEDLINGS**

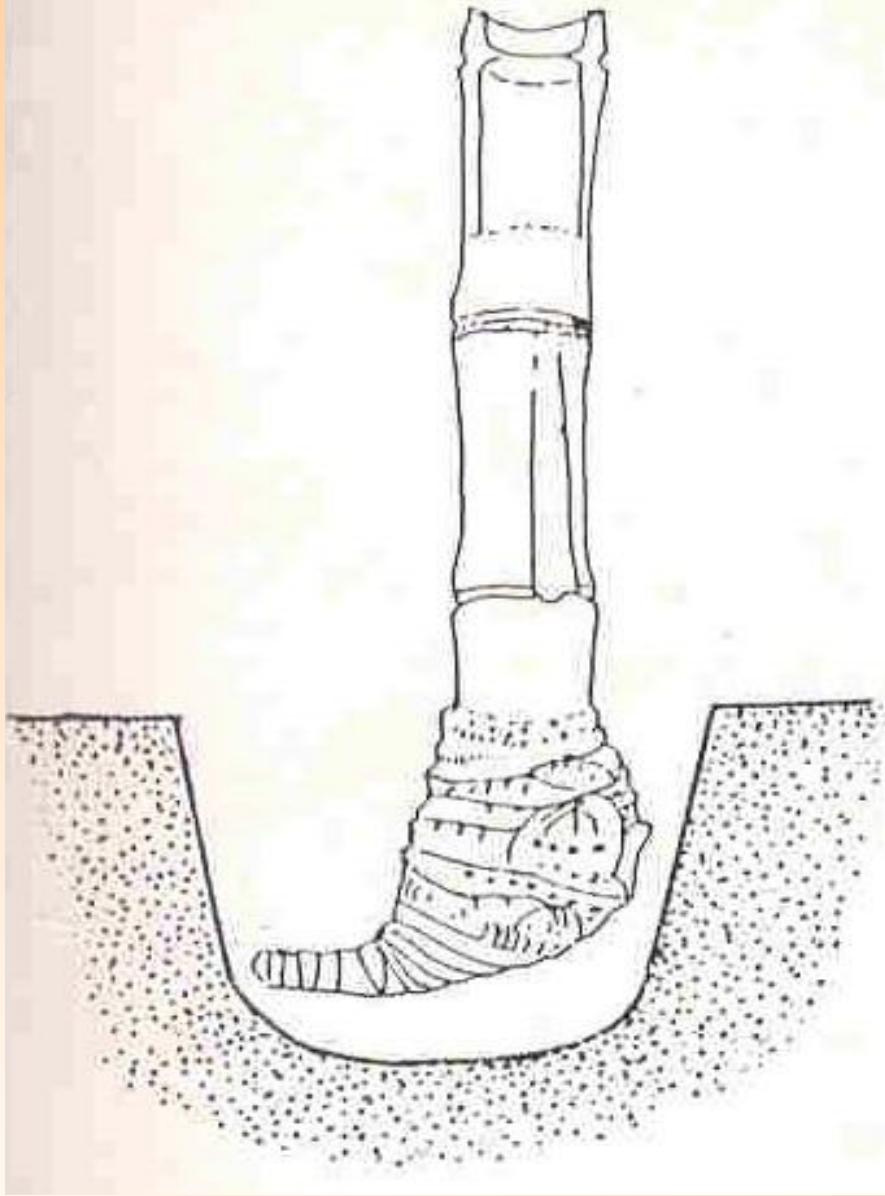


**EXPERIMENTATION ON PRODUCTION OF QUALITY  
BAMBOO SEEDLINGS**

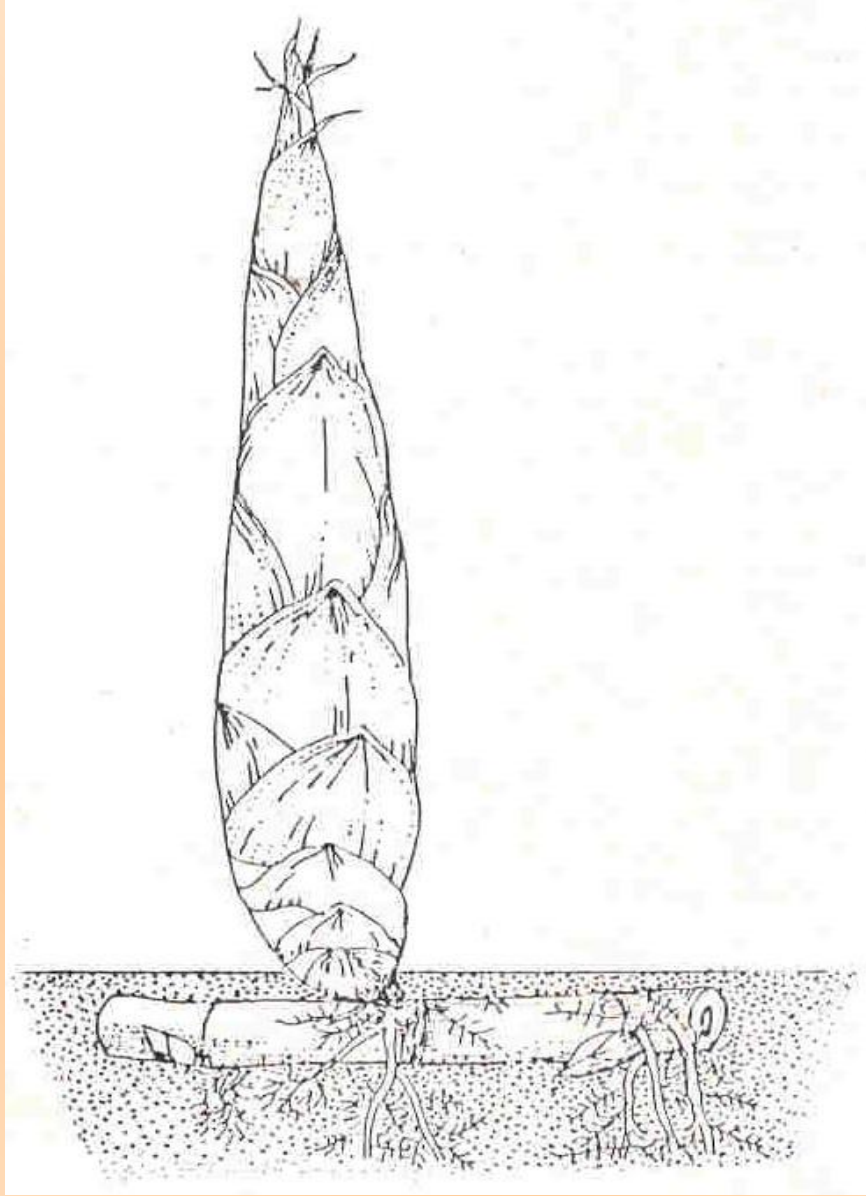
# VEGETATIVE PROPAGATION

- Off – sets and clump division
- Rhizome cutting
- Culm cutting
- Layering
- Seedling multiplication (macro-proliferation)

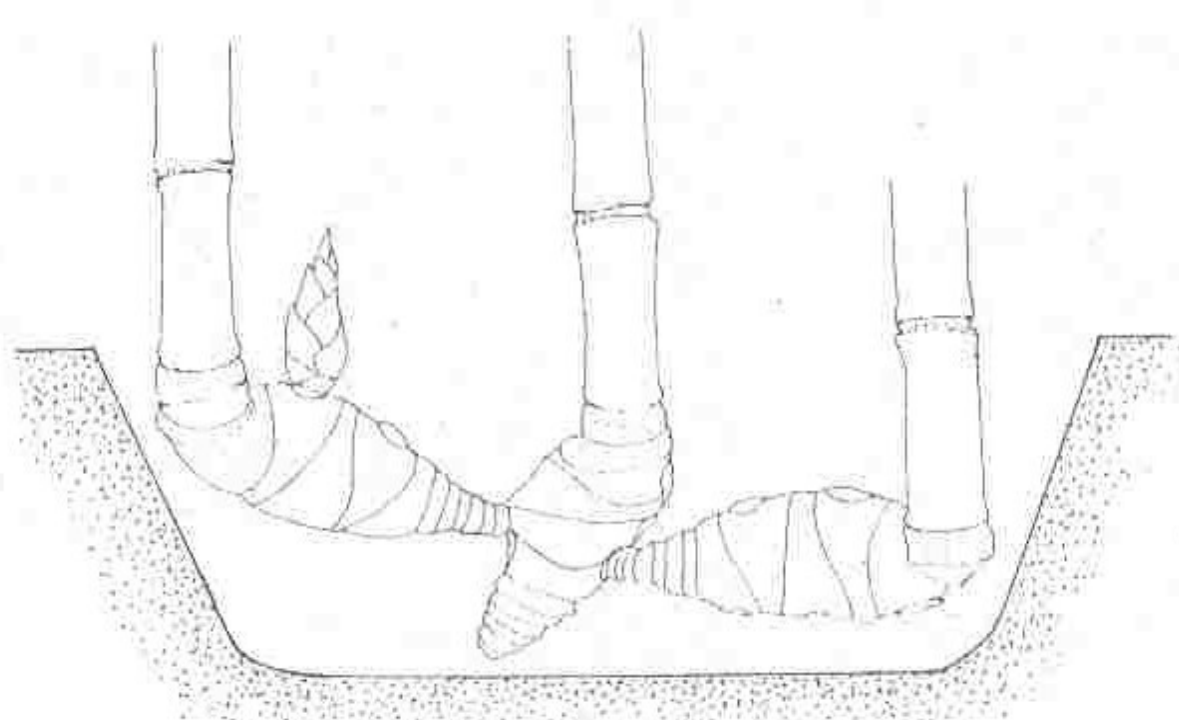




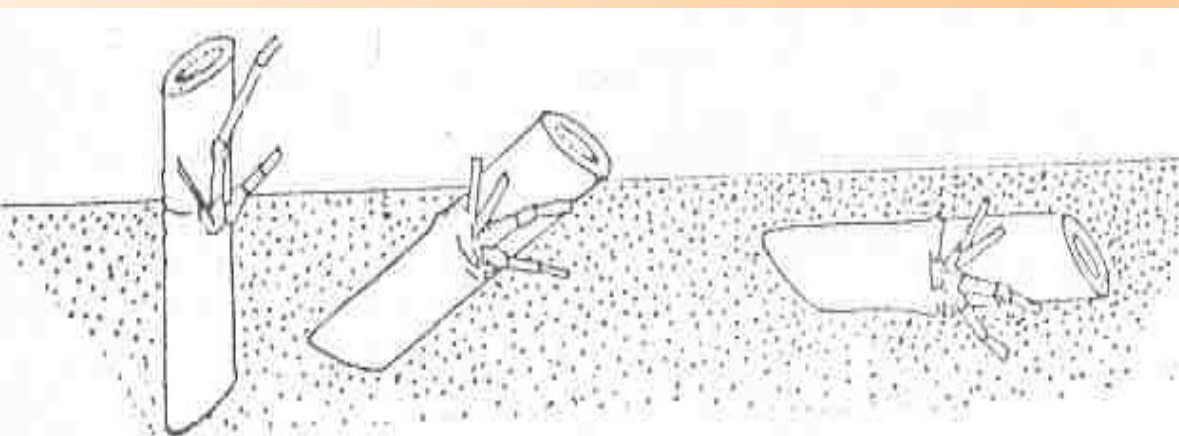
Offset planting,  
sympodial



Rhizome cutting sprouted  
and rooted, Monopodial



**Clump-division planting**

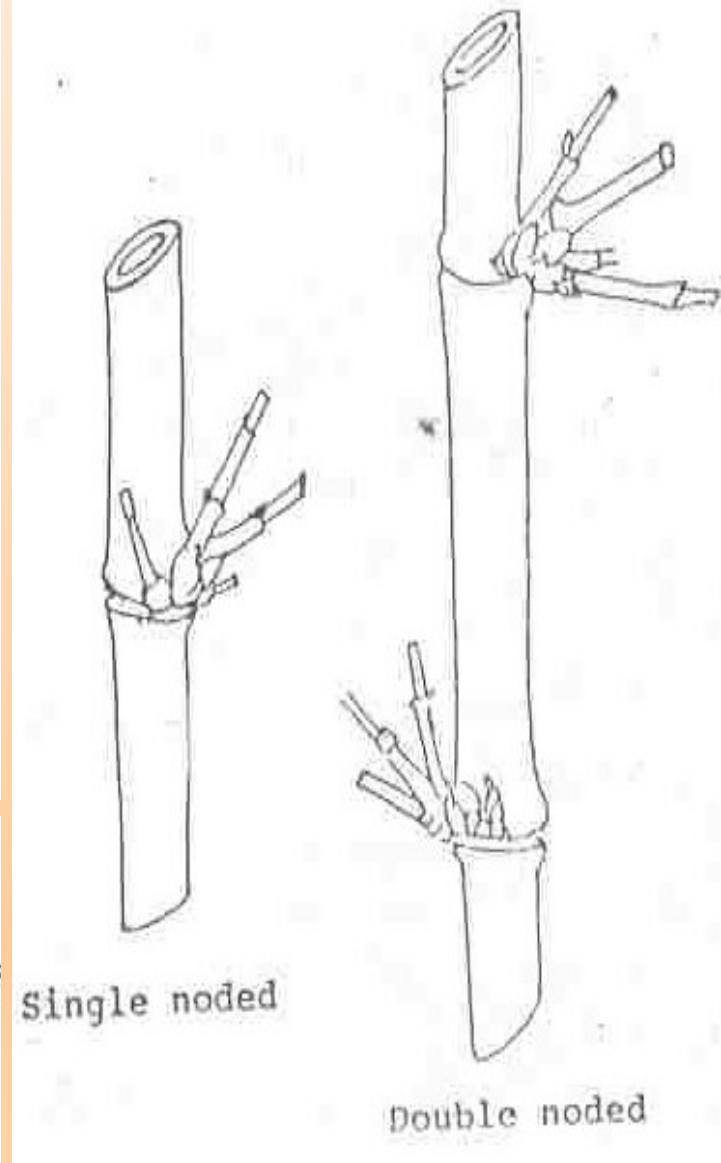


Erect

slanting

Horizontal

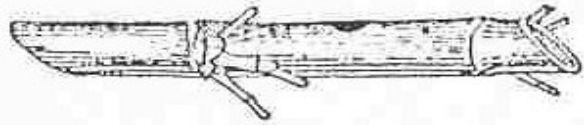
**How to strike cuttings of clumped bamboo**



Single noded

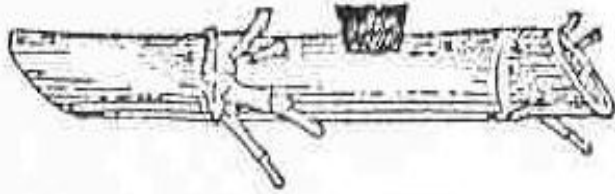
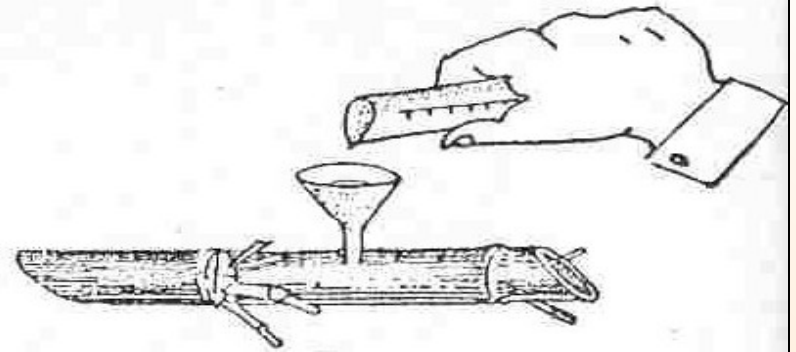
Double noded

**Cuttings of Clumped Bamboo**



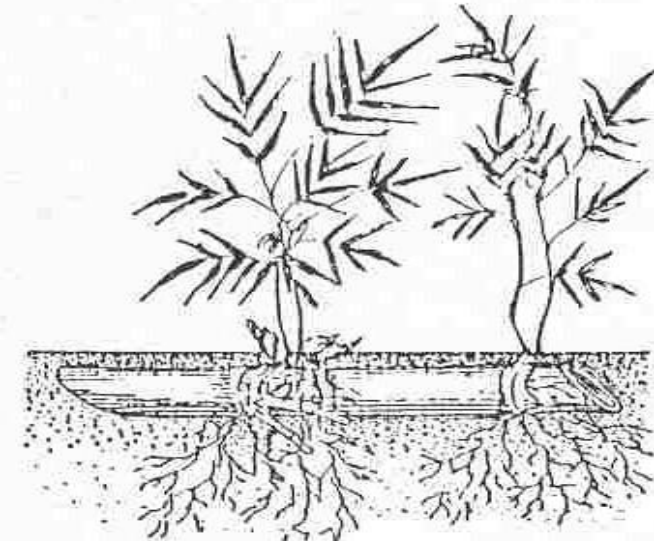
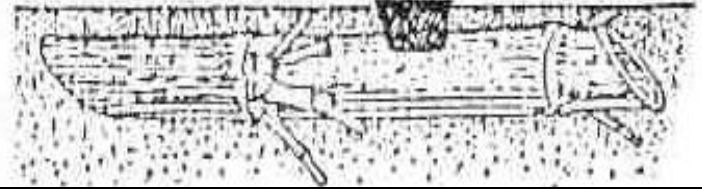
A

B



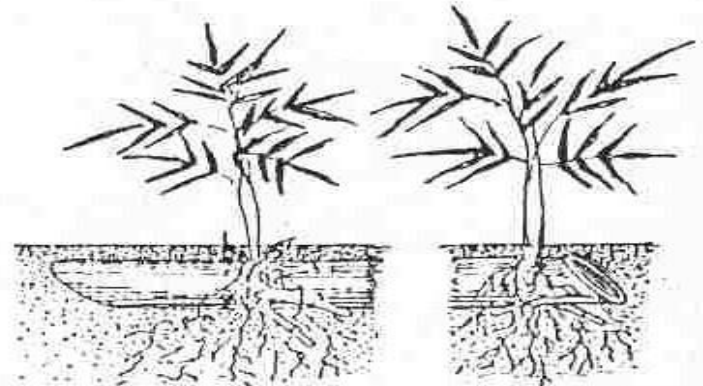
C

D

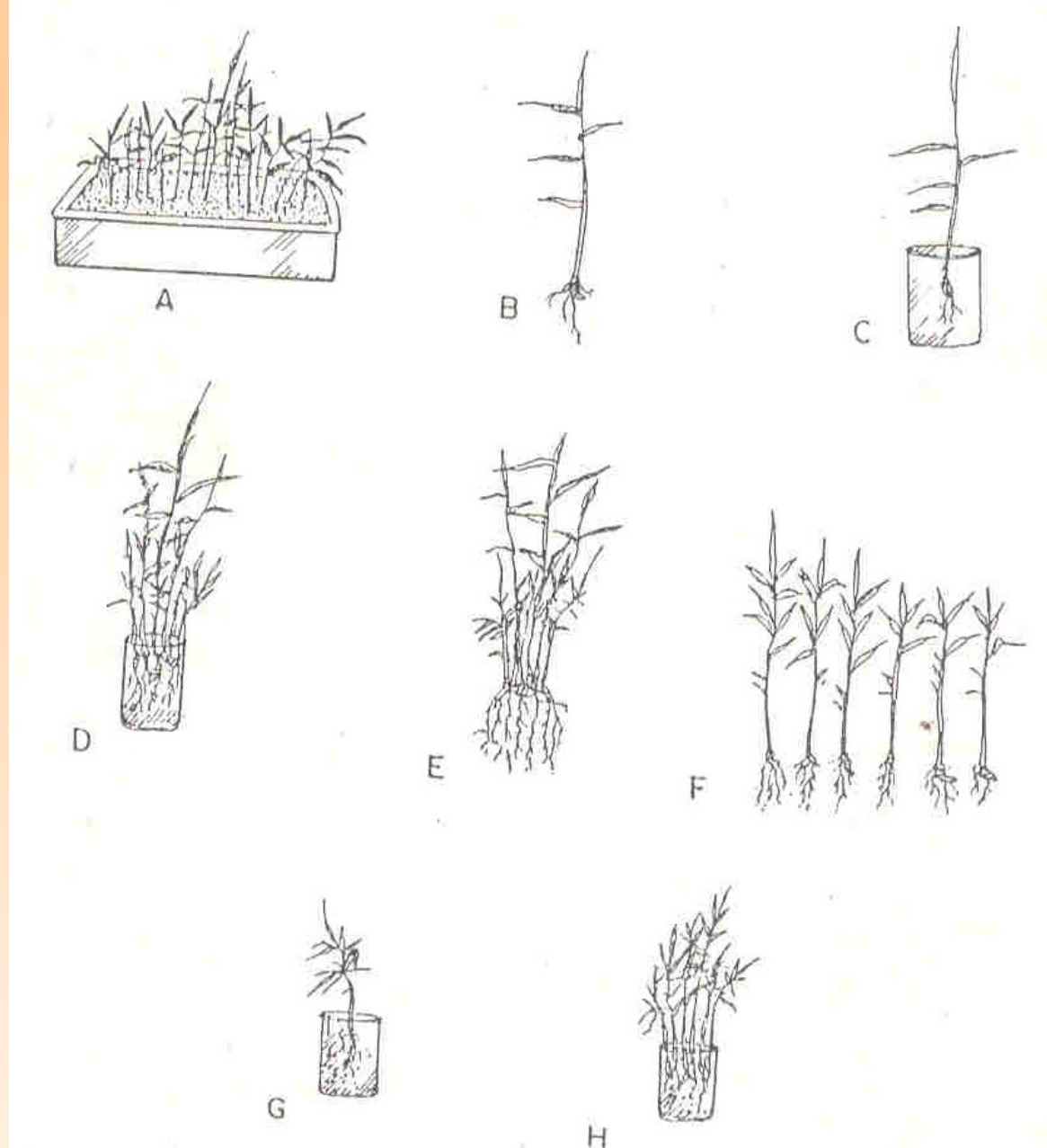


E

F



**Culm-cuttings planted after treating with Growth Regulating Substances A. Hole made at internode B. Filling internode with GRS solution C. Closing the hole D. Planting E. Sprouting and rooting F. Separation of plants**



**Different stages involved in the multiplication of bamboo seedlings initially starting from seed**



**MACRO PROLIFERATION OF BAMBOO SEEDLING**



**SEPARATED BAMBOO PLANTS**

# PLANTATION

- **Site:**
  - Well drained soil
  - Abundant rainfall
  - Sympodial prefer high temp.
  - Monopodial prefer cool climate
  - Poor soil and dry site produce harder culm
- Spacing 4x4, 5x5, 6x6, pits 30 cm<sup>3</sup> or 45 cm<sup>3</sup>  
silvicultural tending required.

# HARVESTING OF BAMBOO

- 3-4 yrs. old culms
- Annual cycle up to 4 yrs. cycle.
- Retention prescribed quality class wise
- Felling rules
- Sizes of bamboo
- Precautions in harvesting
- Estimation of quantity



# CULM SELECTION SYSTEM

- Operate all clumps older than 1 year.
- Harvest every year
- Retain old culms equal in number to 1 year old culms.
- Remove all twisted culms – new or old.
- Remove coppice and lower branches.

# GENERAL RULES FOR WORKING BAMBOO AREAS

- No felling from March to Sep./Oct.
- No felling of 1 year old culms.
- Retention of sufficient no. of 2 year and old culms.
- Cut at a height  $> 15$  cms and  $< 45$  cms.
- Leave at least one prominent, node.
- Cut with sharp weapon and obliquely.
- Do not dig Rhizome

# GENERAL RULES FOR WORKING BAMBOO AREAS *contd...*

- Clear fell congested parts of clumps.
- Clear fell flowering culms after seed fall
- Do not leave cut parts in clumps.
- Well stocked and well grown clumps.
  - Quality – I (> 9 mtrs) Retain – 20 culms.
  - Quality – II (6-9 mtrs) – 15 culms.
  - Quality – III (<6 mtrs) – 10 culms.