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GOVT. OF ASSAM



Forest Department
of Assam

NURSERY TECHNIQUES OF SOME TREE SPECIES OF ASSAM



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SILVICULTURIST ASSAM
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Silviculture Division, Assam
Basistha, Guwahati
Email : dfo-silviculture@gov.in

Data collection and compilation assisted by

Mrs. Himamoni Handique, Research Officer
Sri Monoj Kumar Goswami, Asstt. Conservator, Forest
Sri Pulin Mahanta, Forester-I
Mrs. Gayatri Gogoi, Forester-I
Sri Pranjal Das, Forester-I

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MESSAGE

The rich Bio-diversity of the Brahmaputra and Barak basins, including the two Hill Districts, ranging from the Evergreen Rainforest in Upper Assam to the Sal forests in the West, provides a unique opportunity to a Forester, to pursue research studies in forestry conservation.

Silviculture is the Art and Science of growing trees. The Silviculture Division, at Basistha, Guwahati, Assam, with its dedicated team has been playing a pivotal role in Forestry Management practices and Silvicultural intervention in Assam.

I am glad, that the Division is publishing a Hand Guide on Nursery Techniques of some important tree species found in Assam. I am sure the Forest Officers, and the frontline staff in particular, will be enriched by it. I congratulate the whole team under RE & WP Wing of Assam Forest Department for their contribution.

A.M. Singh, IFS
Principal Chief
Conservator of Forests & HoFF, Assam



MESSAGE

Assam is endowed with a wide variety of natural wealth and unique Eco-systems, some of which are endemic to Assam in particular and the Northeast as a whole.

Silviculture plays an important role in application and management of Forest resources. Silvicultural experimental, Sample and Preservation Plots spread over the state of Assam, under different climatic conditions, is an indicator of its contribution to the conservation efforts of the Forest Department.

In this regard, I am pleased to learn that the Silviculture Division is publishing a handbook on Nursery Techniques of various tree species found in Assam which can be used as a reference book not only by the Field Officers and frontline staffs, but also by the Schools and Colleges. I congratulate the Officers and Staff of Silviculture Division for taking interest in bringing the handbook.

A handwritten signature in blue ink, appearing to be 'Anurag Singh', with a checkmark-like flourish to the right.

Anurag Singh, IFS
Chief Conservator of Forests
Research, Education and Working Plan



PREFACE

There has been a long pending demand of our department for a hand book on nursery techniques of local tree species found in the State for raising of seedlings of these tree species. In view of the above this book has been published by our team under Silviculturist, Assam under the scheme SOPD, Publicity, office of the P.C.C.F. and Head of Forest Force, Assam

Since there is a limitation of fund only 50 (fifty) nos. of tree species have been included in this Book. The aim is to provide the basic knowledge of the species and their nursery techniques for raising seedlings from seeds in a very simple language. During the preparation of this Book the actual experiences/ideas of grass root field staff has been incorporated by visiting various nurseries of this department under the initiative of Mrs. Himamoni Hardique, Research Officer, which are showcased in this Book. Lastly special thanks to Mr. Yunush Salim, A.C.F. for his final touch in this Book.

(Sailer Das, AFS)
Silviculturist, Assam
Basistha, Guwahati-29



ACKNOWLEDGEMENT

I take my gratitude herein and offer my sincere thanks to Mr. A.M. Singh, IFS, Principal Chief Conservator of Forests and Head of Forest Force, Assam for his continued encouragement in publication of this handbook namely "**Nursery Techniques of Some Tree Species of Assam**". I also convey sincere thanks to Mr. Anurag Singh, IFS, Chief Conservator of Forest, Research & Education & Working Plan, Assam for tendering his valued guidance.

The completion of this book could not have been accomplished without the special guidance, support and initiative taken by Mr. Narayan Mahanta, IFS, presently Conservator of Forest, Eastern Assam Circle, Jorhat.

I would like to express my immense gratitude to my Research Officer, Mrs. Himamoni Handique and Assistant Conservator of Forest, Mr. Manoj Kumar Goswami, AFS, for giving their invaluable support and assistance in field data collection required in publication of this book.

I would like to take the opportunity also to thank my staff, Mr. Pulin Mahanta, Forester - I, Mrs. Gayatri Gogoi, Forester - I and Mr. Pranjal Das, Forester - I, for their hard field works in data collections of various trees from different places of Assam essentially required in publication of this handbook.

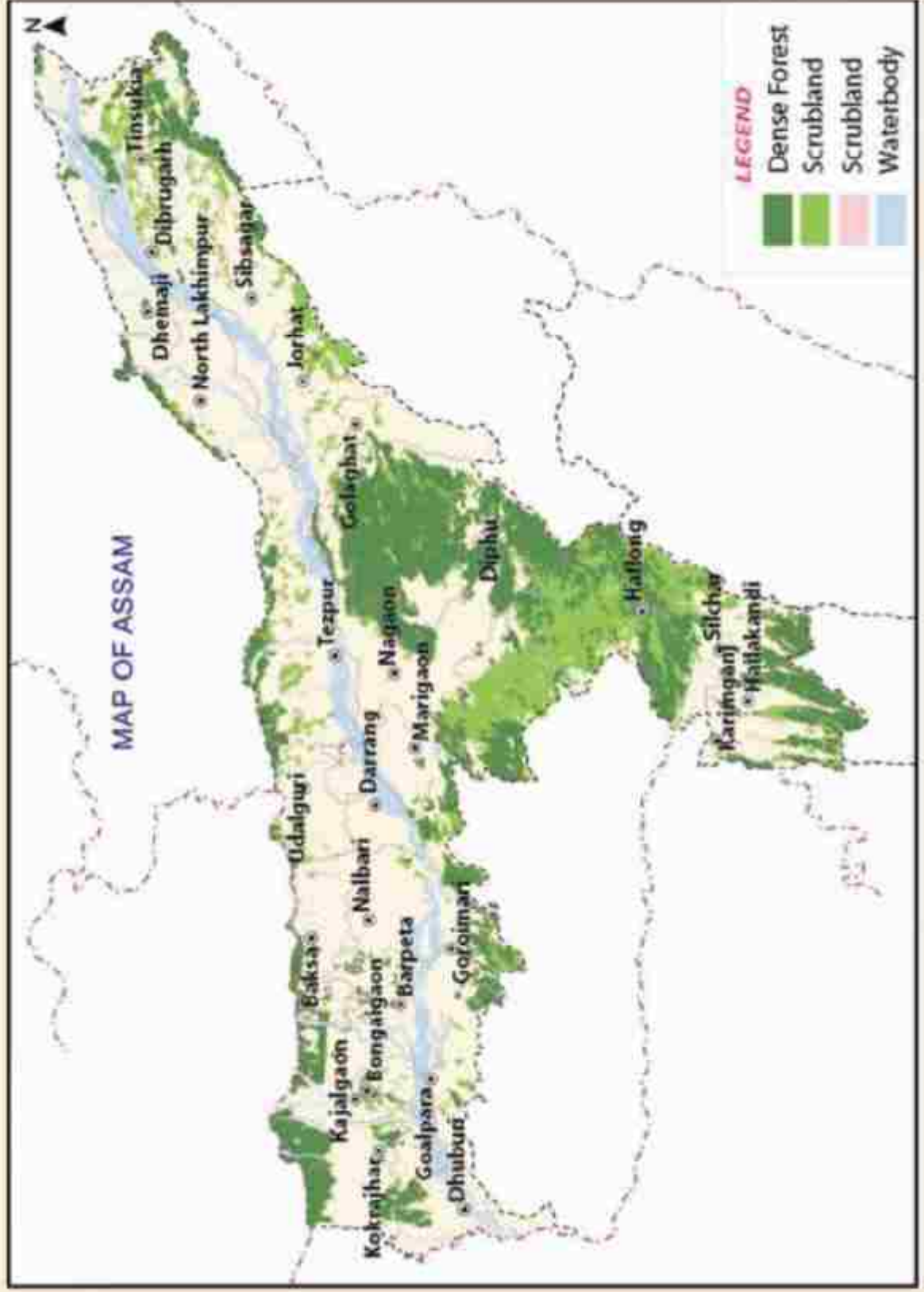
Finally, I heartily dedicate this handbook to all students, research scholar and all forest officials who may find some guidance in regards to raising of nursery and plantations of the various species published in this handbook.

Nazmul Hussain Mazumder, AFS
Silviculturist, Assam
27/03/2019 to 27/08/2020

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Local Name : Arjun (Arjun tree)

1. Botanical Name : *Terminalia arjuna* (Roxb.) Wight & Arn.
2. Distribution : Commonly found throughout India especially in sub Himalayan tracts and Eastern India. It is found widely in Assam.
3. Description of tree : Large evergreen tree with a height of 20-25 mt. with a wide canopy at the crown, conical leaves and has a smooth grey bark.
4. Tree used for : Timber, medicine, hardwood is used for utility items.
5. Family : Combretaceae
6. Part of plant used : Bark, seed, fruit, timber
7. Flowering time : February-May
8. Fruiting time : July
9. Seed collection time : February-May
10. Seed viability : One year
11. No. of seed/kg. : 250-300 nos. (Dry wt.)
12. Seed sowing time : April-May
13. Germination % : 70%
14. Germination Time : 20-30 days
15. Nursery Technique : Seeds are soaked in water over night and directly dibbled in polypot/mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Aamlokhi (Indian gooseberry)

1. Botanical Name : *Phyllanthus emblica* L.
2. Distribution : Found all over in Assam & in all forest types of tropical & semi-tropical & deciduous regions.
3. Description of tree : Medium growth deciduous tree with a height of 8-13 mt. with a crooked trunk and wide branches.
4. Tree used for : Medicine, firewood
5. Family : Phyllanthaceae
6. Part of plant used : Fruit, seeds, leaves, root, bark & flowers.
7. Flowering time : April-May
8. Fruiting time : July-September
9. Seed collection time : November-February
10. Seed viability : 6 months – 1 year
11. No. of seed/kg. : 330-500 nos. fruit (Dry wt.)
12. Seed sowing time : March
13. Germination % : 90%
14. Germination Time : 20-30 days
15. Nursery Technique : Seeds are kept in earth pits for a week or soaked in hot water for 10-20 mins. for the pulp to get rotten. After this process the seeds are sundried until they are cracked and good quality seeds are collected for sowing in mother bed or dibbling in polypot. The medium for mother bed or polypot is prepared consisting of sand, river silt, vermicompost /cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Agar (Agarwood)

1. Botanical Name : *Aquilaria malaccensis*. Lam.
2. Distribution : Partially distributed in Assam specially in Upper Assam and are widely distributed in India, mostly in foothills of north-eastern region and West Bengal.
3. Description of tree : Upper canopy evergreen tree that grows to 18-24 mt.
4. Tree used for : Medicine, Aromatic, Religious
5. Family : Thymelaeaceae
6. Part of plant used : Stem and Bark.
7. Flowering time : April
8. Fruiting time : May
9. Seed collection time : June-July
10. Seed viability : Generally within 24 hours. But under special care 7 days
11. No. of seed/kg. : 3000-4000 nos. (Dry wt.)
12. Seed sowing time : June-July
13. Germination % : 30-50%
14. Germination Time : 10-15 Days
15. Nursery Technique : Matured seeds are collected within 24 hours and sown in mother bed. Since seeds have very short viability, propagation is done soon after bursting of fruits. A layer of sand and silt is put in equal proportion and seeds are sown.
16. Planting mechanism: One to two year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Azhar (Giant crepe-myrtle)

1. Botanical Name : *Lagerstroemia speciosa* (L.) Pers
2. Distribution : Commonly distributed in Assam and also found naturally in Indian subcontinent.
3. Description of tree : Tropical Asian tree that grows to 18-24 mt. It is an ornamental tree.
4. Tree used for : Timber, planted as ornamental tree in avenues/roadside
5. Family : Lythraceae
6. Part of plant used : Timber
7. Flowering time : June –July
8. Fruiting time : August onwards
9. Seed collection time : January- February
10. Seed viability : 1 Year
11. No. of seed/kg : 7000 seeds approx. (Dry wt.)
12. Seed sowing time : February- March
13. Germination % : 90%
14. Germination Time : 10-30 Days
15. Nursery Technique : Seeds are soaked in water for 2-3 days. After that they are sundried and put in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion. A temporary shade should be arranged to cover the seeds so that rain does not hamper the growth and seeds don't get buried deep.
16. Planting mechanism: One-two year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Bhelkar (Gutel)

1. Botanical Name : *Trewia nudiflora* L.
2. Distribution : Distributed from Kumaon region of Garwal up to Eastward to Assam
3. Description of tree : Soft wooded, Fast growing, deciduous tree height up to 20M with spreading branches.
4. Tree used for : Soft timber and medicine (traditional medicine) for making agriculture implements.
5. Family : Euphorbiaceae
6. Part of plant used : Soft timber, Leaves, Bark, Root
7. Flowering time : April/May
8. Fruiting time : May/June
9. Seed collection time : July - September
10. Seed viability : 6-12 month
11. No. of seed/kg. : 1300-1500 nos. (Dry wt.)
12. Seed sowing time : Feb/March/May/June
13. Germination % : 90%
14. Germination Time : 15-20 days
15. Nursery Technique : Seeds are soaked in water overnight and directly dibbled in polypot/mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : **Bhomora (Bastard myrobalan)**

1. Botanical Name : *Terminalia bellirica* (Gaertn.) Roxb.
2. Distribution : Sporadic throughout Assam
3. Description of tree : Large deciduous tree with a height of 35 mt., wood is yellowish brown, bole often buttressed.
4. Tree used for : Timber, medicine
5. Family : Combretaceae
6. Part of plant used : Bark, seed, fruit
7. Flowering time : April-May
8. Fruiting time : July-August
9. Seed collection time : November – February
10. Seed viability : One year in general. But it can survive upto 5 years if kept in airtight condition (Data collected from Mahesh Ch. Nath, Fr-I, Halodhiati Campa Nursery)
11. No. of seed/kg. : 150 nos. (Fresh wt.) 300 nos. (Dry wt.)
12. Seed sowing time : March-April
13. Germination % : 80-90%
14. Germination Time : 15-25 days
15. Nursery Technique : Seeds are soaked in water overnight and directly dibbled in polypot/mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/ cowdung in 1:1:1 proportion.
16. Planting mechanism : One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Barhamthuri

1. Botanical Name : *Magnolia hodgsonii* (Hook.f. & Thomson) H. Keng
2. Distribution : Partially distributed in Assam and found in evergreen mixed sub tropical rainforest regions.
3. Description of tree : Evergreen tree that grows to 18-24 mt. with wide spreading branches.
4. Tree used for : Medicine
5. Family : Magnoliaceae
6. Part of plant used : Leaves, Flower
7. Flowering time : June-July
8. Fruiting time : July-August
9. Seed collection time : November – December
10. Seed viability : 7-10 Days
11. No. of seed/kg. : 1000-1500 nos. (Dry wt.)
12. Seed sowing time : December-January
13. Germination % : 80-90%
14. Germination Time : 40 Days
15. Nursery Technique : The cover of the seeds are removed and sundried. After that they are directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : **Baghnola** (Soft bollygum)

1. Botanical Name : *Litsea glutinosa* (Lour) C.B. Rob.
2. Distribution : Partially distributed in Assam and a native to India.
3. Description of tree : Evergreen tree that grows in rainforest up to 18-24 mt.
4. Tree used for : Medicine, Aromatic
5. Family : Lauraceae
6. Part of plant used : Leaves, Bark and Fruit.
7. Flowering time : April
8. Fruiting time : May
9. Seed collection time : July
10. Seed viability : One Month
11. No. of seed/kg. : 5000 nos. approx. (Dry wt.)
12. Seed sowing time : June-July
13. Germination % : 90%
14. Germination Time : 20-25 Days
15. Nursery Technique : After collection seeds are directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cow-dung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Bhatghilla (Indian caper)

1. Botanical Name : *Oroxylum indicum* (L.) Benth ex kurz.
2. Distribution : Wild grown and sporadic throughout state of Assam. It is native to Indian subcontinent & Himalayan foothills.
3. Description of tree : Deciduous tree and reaches a height of 18 mtrs. The tree is a night bloomer and flowers are adapted to natural pollination by bats.
4. Tree used for : Ayurvedic medicine, Bark used in internal abscess, hypertension and ulceration in mouth of children and babies, seeds used in eczema.
5. Family : Bignoniaceae
6. Part of plant used : Bark, Seeds.
7. Flowering time : July- August
8. Fruiting time : August-September
9. Seed collection time : February-March
10. Seed viability : One month
11. No. of seed/kg : 2000-3000 approx. (Dry wt.)
12. Seed sowing time : April-May
13. Germination % : 90%
14. Germination Time : 10-15 Days
15. Nursery Technique : After collection seeds are directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Bor Thekera (Garcinia)

1. Botanical Name : *Garcinia pedunculata* Roxb.ex Buch.Ham
2. Distribution : Partially distributed in India and found commonly in Assam.
3. Description of tree : Evergreen tree that grows to 18-24 mt. with short spreading branches.
4. Tree used for : Medicine and Timber
5. Family : Clusiaceae
6. Part of plant used : Fruit, Wood.
7. Flowering time : October-November
8. Fruiting time : December-January
9. Seed collection time : April- May
10. Seed viability : Six Months
11. No. of seed/kg. : 2000-3000 (Dry wt.)
12. Seed sowing time : June-July
13. Germination % : 60%
14. Germination Time : 20-25 Days.
15. Nursery Technique : Seeds are extracted from fruits and directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/ cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 4m x 4m. May be planted as mixed or pure crop.



Local Name : Bonsom

1. Botanical Name : *Phoebe goalparensis* Hutch
2. Distribution : Partially distributed in Assam but found abundantly in Northern banks.
3. Description of tree : Evergreen tree that grows to 18-24 mt.
4. Tree used for : Timber
5. Family : Lauraceae
6. Part of plant used : Wood
7. Flowering time : May-June
8. Fruiting time : June-July
9. Seed collection time : March-April
10. Seed viability : 1-2 Month
11. No. of seed/kg. : 1000 nos. approx. (Dry wt.)
12. Seed sowing time : May-June
13. Germination % : 30%
14. Germination Time : 30-45 Days
15. Nursery Technique : Seeds are collected and soaked in water for 2-3 days and then sundried and then directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Bola (Long Mulberry)

1. Botanical Name : *Morus macroura* Miq.
2. Distribution : Partially distributed in Assam. Native of tropical and sub tropical Himalayas. Found in deciduous and mixed forests.
3. Description of tree : Fast growing evergreen tree that grows upto 20 meters tall. Tree starts fruiting after 3-5 years.
4. Tree used for : Timber
5. Family : Moraceae
6. Part of plant used : Wood
7. Flowering time : April
8. Fruiting time : June-July
9. Seed collection time : October-November
10. Seed viability : 6-12 Months
11. No. of seed/kg. : 5000 nos. approx. (Dry wt.)
12. Seed sowing time : March-April
13. Germination % : 60%
14. Germination Time : 20-50 days
15. Nursery Technique : Seeds are soaked overnight and dried for one day before planting. Seeds are directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One-two year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Buwal (Assyrian plum)

1. Botanical Name : *Cordia myxa* L.
2. Distribution : It is found growing primarily in Asia, as well as across the globe especially in tropical regions. Found partially all over Assam.
3. Description of tree : Evergreen tree which grows to a height of 10-15 mt. with a dense spreading crown.
4. Tree used for : Medicine, Timber
5. Family : Boraginaceae
6. Part of plant used : Fruit, Wood
7. Flowering time : March-April
8. Fruiting time : June
9. Seed collection time : July-August
10. Seed viability : 1 month
11. No. of seed/kg. : 800 nos. approx. (Dry Wt.)
12. Seed sowing time : June-July-August
13. Germination % : 70%
14. Germination Time : 15-20 days
15. Nursery Technique : The outer cover of the seeds are removed. The next layer of latex found surrounding the seed is removed by rubbing on sandy or rough surface carefully after which inner seed is washed with clean water and sundried for 2-3 days. After that they are sown in mother bed (1:10 mtr.) or polypot (5:8 inch). The mother bed or medium for polypot is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion in medium compressed method.
16. Planting mechanism: 1-2 year old seedlings are ready for planting during rainy season. Spacing 4m x 4m. May be planted as mixed or pure crop.



Local Name : Borpat (Trees of heaven)

1. Botanical Name : *Ailanthus excelsa* Roxb.
2. Distribution : Large deciduous tree found in India and commonly found in Assam.
3. Description of tree : Large deciduous fast growing tree that grows to 18-25 mt. Trunk straight, bark light grey and smooth, becoming grey brown and rough while matured.
4. Tree used for : Medicine, Soft Timber and Veneer
5. Family : Simaroubaceae
6. Part of plant used : Timber, leaves, bark and gum.
7. Flowering time : July-August
8. Fruiting time : September
9. Seed collection time : January-February
10. Seed viability : One month
11. No. of seed/kg : 1000-1500 approx. (weight alongwith seeds inside pod)
12. Seed sowing time : March
13. Germination % : 50%
14. Germination Time : 20-25 days
15. Nursery Technique : Since the seeds are small in size, they are sown on top of mother bed. A hay shed is prepared to cover the mother bed to protect the seeds from direct sunlight, rain and wind so that seeds do not get dabbled in earth. The medium for mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One-two year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Cham Kathal (Jackfruit spp.)

1. Botanical Name : *Artocarpus chama* Bunch.-Ham
2. Distribution : Distributed locally throughout Assam and Meghalaya. It grows in moist to wet tropical regions where there is a distinct dry season.
3. Description of tree : A canopy tree of evergreen, semi-evergreen and moist deciduous forests with a large spreading crown that grows to 30-40 mt. tall.
4. Tree used for : Timber
5. Family : Moraceae
6. Part of plant used : Timber
7. Flowering time : April-May
8. Fruiting time : June-July
9. Seed collection time : July-August
10. Seed viability : 1 Month
11. No. of seed/kg : 150 – 200 seeds (Dry wt.)
12. Seed sowing time : August-September
13. Germination % : 80%
14. Germination Time : 10-20 Days
15. Nursery Technique : Seeds are collected and sundried and then directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost /cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Dhuna (Black dammar tree)

1. Botanical Name : *Canarium resiniferum* Bruce Ex King.
2. Distribution : Found in tropical and sub-tropical forests in India with a height of 30-40 mtrs. It is found mainly in Upper Assam.
3. Description of tree : Large evergreen tree which is a fumigating natural insecticide.
4. Tree used for : Medicine & Commercial
5. Family : Burseraceae
6. Part of plant used : Trunk, Resin
7. Flowering time : January – February
8. Fruiting time : February-March
9. Seed collection time : April-May
10. Seed viability : Three month
11. No. of seed/kg. : 150-200 nos. (Dry wt.)
12. Seed sowing time : June-July-August
13. Germination % : 10%
14. Germination Time : 45-90 days
15. Nursery Technique : The seeds are soaked in water and allowed to rot so that the outer layer is removed, or seeds are cut on both ends and are sown horizontally in mother bed (1:10 mtr.) or polypot (5:8 inch). The medium for mother bed or polypot is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion in medium compressed method.
16. Planting mechanism: 1-2 year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Garjan (Gurjan)

1. Botanical Name : *Dipterocarpus turbinatus* C.F.Gaertn
2. Distribution : Native to northeastern India. An indigenous tree of Assam, Manipur, Arunachal Pradesh, Tripura, Annaman & Nicobar islands.
3. Description of tree : Evergreen lofty tree that grows to 30-45 mt. with a straight cylindrical bole. Wood is a good source of plywood.
4. Tree used for : Plywood.
5. Family : Dipterocarpaceae
6. Part of plant used : Wood.
7. Flowering time : March-April
8. Fruiting time : May
9. Seed collection time : June –July
10. Seed viability : One week.
11. No. of seed/kg. : 100 -125 nos. approx (Dry wt.)
12. Seed sowing time : July
13. Germination % : 80-90%
14. Germination Time : 7-10 Days
15. Nursery Technique : Because of short viability, seeds are collected carefully and directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion. The procedure must be done in place where abundant sunlight is available.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Gomari (White teak)

1. Botanical Name : *Gmelina arborea*. Roxb.
2. Distribution : Distributed throughout greater part of India. Gomari tree survive in various conditions and are found all over Assam.
3. Description of tree : Fast growing deciduous tree that grows to 18-24 mt.
4. Tree used for : Timber
5. Family : Lamiaceae
6. Part of plant used : Timber
7. Flowering time : April-May
8. Fruiting time : May
9. Seed collection time : May-June
10. Seed viability : 6-12 Month
11. No. of seed/kg. : 200-300 nos. seeds (Dry wt.)
12. Seed sowing time : April-May
13. Germination % : 60-80%
14. Germination Time : 20-35 Days
15. Nursery Technique : Seeds are soaked in water overnight and the outer coat is removed and inner seeds are directly dibbled in polypot/mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cow-dung in 1:1:1 proportion. Seeds collected from disperse of cattle can get 100% germination.
16. Planting mechanism: One-two year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. Mixed cropping is necessary for this plant because this species is easily invaded by other species and also easily harmed by pests.



Local Name : Hollong

1. Botanical Name : *Dipterocarpus retusus*, Blume.
2. Distribution : State tree of Assam and widely found in wet evergreen forests of Upper Assam and north east India
3. Description of tree : Evergreen tree that grows to 20-30 mtr. A medium hardwood timber tree with clean straight bole.
4. Tree used for : Timber, Plywood
5. Family : Dipterocarpaceae
6. Part of plant used : Timber
7. Flowering time : May-November
8. Fruiting time : December-January
9. Seed collection time : March-April
10. Seed viability : 3-7 Days
11. No. of seed/kg. : 60-80 nos. (Dry wt.)
12. Seed sowing time : March- April
13. Germination % : 30-40%
14. Germination Time : 13-15 Days
15. Nursery Technique : Because of less viability, seeds are collected carefully and directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion. The procedure must be done in place where abundant sunlight is available.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 4m x 4m. May be planted as mixed or pure crop.



Local Name : Hilikha (Black or chebulic myrobalan)

1. Botanical Name : *Terminalia chebula* Retz.
2. Distribution : In India it is found in the South Himalayan region from Ravi eastwards to West Bengal and Assam. Commonly distributed all over Assam.
3. Description of tree : Medium to large deciduous tree with a height of 20-25 mt. with a wide canopy at the crown.
4. Tree used for : Timber, medicine
5. Family : Combretaceae
6. Part of plant used : Bark, fruit
7. Flowering time : April-May
8. Fruiting time : July-September
9. Seed collection time : January-March
10. Seed viability : One year
11. No. of seed/kg. : 200 nos. (Fresh wt.) 400 approx. (Dry wt.)
12. Seed sowing time : June-July
13. Germination % : 50%
14. Germination Time : 60-90 days
15. Nursery Technique : Seeds are soaked in water for 2-3 days for the pulp to get rotten and then directly dibbled in polypot/mother bed. For early germination the same can be covered with polythene and hay overall to absorb maximum heat and moisture. The medium for polypot is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion. Another method is where both sides of the seed are cut and dibbled horizontally in the polypot or motherbed.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Jalphai (Indian olive)

1. Botanical Name : *Elaeocarpus floribundus* Bl.
2. Distribution : Occurs in evergreen forests of north east India. Distributed all over in Assam.
3. Description of tree : Evergreen moderate sized tree that grows to 18-24 mt. with spreading crown.
4. Tree used for : Medicine and Timber
5. Family : Elaeocarpaceae
6. Part of plant used : Bark and Fruit.
7. Flowering time : April
8. Fruiting time : July-August
9. Seed collection time : October-December
10. Seed viability : 6 Month-1 year
11. No. of seed/kg. : 70-100 nos. seed (Fresh Wt.)
12. Seed sowing time : January-February
13. Germination % : 50-80%
14. Germination Time : 35-60 Days
15. Nursery Technique : The outer fleshy coat is removed by cutting or rotting and inner seeds so got, are directly dibbled in polypot or mother-bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Jamuk (Java plum)

1. Botanical Name : *Syzygium cumini* (L) Skeels
2. Distribution : This tree is native to Bangladesh, India, Nepal, Pakistan, Sri Lanka, Malaysia, Philippines and Indonesia. Commonly found throughout India. It is found widely in Assam.
3. Description of tree : Evergreen tree that reaches upto 30 meter tall. Its dense foliage provides shade and is grown just for its ornamental and medicinal value.
4. Tree used for : Wood, Fruit is used as medicine.
5. Family : Myrtaceae
6. Part of plant used : Seed, fruit and wood
7. Flowering time : April-May
8. Fruiting time : June-Aug
9. Seed collection time : June-July
10. Seed viability : 1 month
11. No. of seed/kg. : 500-800 nos. (Dry wt.)
12. Seed sowing time : June - July
13. Germination % : 90%
14. Germination Time : 20 to 30 days
15. Nursery Technique : Seeds are washed & sundried after collection and directly dibbled in poly pot/mother bed. In rainy condition germination of seeds takes place early. The medium for poly pot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Kordoi (Starfruit/Carambola)

1. Botanical Name : *Averrhoa carambola* L.
2. Distribution : Found all over the state of Assam.
3. Description of tree : Small evergreen tree that grows to 5-10 mt.
4. Tree used for : Medicine
5. Family : Oxalidaceae
6. Part of plant used : Leaves, Bark and Fruit.
7. Flowering time : July-September
8. Fruiting time : October-January
9. Seed collection time : January
10. Seed viability : One Month.
11. No. of seed/kg. : 4000 seeds approx. (Dry wt.)
12. Seed sowing time : April
13. Germination % : 90%
14. Germination Time : 30-45 Days
15. Nursery Technique : Seeds are collected and sundried and then directly dibbled in polypot or mother bed. The medium for polypot/motherbed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Kadam (Burflower-tree)

1. Botanical Name : *Anthocephalus cadamba*. (Roxb.) Miq
2. Distribution : Native to Indian subcontinent. Distributed all over Assam.
3. Description of tree : Evergreen tree that grows to 18-24 mt. Quick growing with spreading branches and grows rapidly for the first 6-8 years.
4. Tree used for : Medicine, soft wood
5. Family : Rubiaceae
6. Part of plant used : Leaves, Bark and Fruit.
7. Flowering time : March
8. Fruiting time : May
9. Seed collection time : Every 3 months seeds can be collected as the flowering occurs 3 times in a year.
10. Seed viability : One Year
11. No. of seed/kg. : 1500 approx. or more as huge nos. are uncountable.
12. Seed sowing time : February
13. Germination % : 80-90%
14. Germination Time : 21 Days
15. Nursery Technique : After preparation of mother bed the husks of rice are spread on the bed in which seeds are sowed. On top sandy soil is spread and again husks are applied and covered for a minimum of 15 days. This procedure is done so that seeds do not get washed/blown away.
16. Planting mechanism: One to two year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Krishnachura (Royal poinciana)

1. Botanical Name : *Delonix regia* (Boj. ex Hook) Raf
2. Distribution : Distributed in tropical and sub tropical regions of India. Very commonly found in Assam.
3. Description of tree : Evergreen ornamental tree with spreading crown that grows upto 20 mt.
4. Tree used for : Medicine, Avenue plantation for aesthithic value
5. Family : Fabaceae
6. Part of plant used : Leaves, Bark and Fruit.
7. Flowering time : April to September
8. Fruiting time : May
9. Seed collection time : March-April
10. Seed viability : 6 Month-1 year.
11. No. of seed/kg. : 250 nos. (Dry wt.)
12. Seed sowing time : April-May
13. Germination % : 60%
14. Germination Time : 15-25 Days
15. Nursery Technique : Seeds are soaked in medium hot water overnight and directly dibbled in polypot/mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Khair (Black Cutch tree)

1. Botanical Name : *Acacia catechu* (L.f.) Willd
2. Distribution : Partially distributed in Assam.
3. Description of tree : Deciduous thorny tree that grows upto 18-24 mt. approx.
4. Tree used for : Manufacture of Kattha (Catechu)
5. Family : Fabaceae or Leguminosae
6. Part of plant used : Timber and Bark.
7. Flowering time : July-August
8. Fruiting time : August-December
9. Seed collection time : January-March
10. Seed viability : 6-12 Months
11. No. of seed/kg. : 6000 seeds approx. (Dry wt.)
12. Seed sowing time : April-May
13. Germination % : 30-50%
14. Germination Time : 30 Days
15. Nursery Technique : Seeds are soaked overnight and dried for one day before planting. Seeds are directly dibbled in polypot or mother-bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion. Seeds that grow on shaded beds grow well.
16. Planting mechanism: One-two year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Kuji Thekera (Indian gamboge tree)

1. Botanical Name : *Garcinia morella* (Gaertn.) Desr
2. Distribution : Partially distributed in India and found commonly in Assam.
3. Description of tree : Evergreen tree that grows upto 12 mtr. tall with short spreading branches.
4. Tree used for : Medicine and Timber
5. Family : Clusiaceae
6. Part of plant used : Fruit, Wood.
7. Flowering time : January-February
8. Fruiting time : April-May
9. Seed collection time : June-July
10. Seed viability : Six Months
11. No. of seed/kg. : 2000 approx. (Dry wt.)
12. Seed sowing time : June-July
13. Germination % : 80%
14. Germination Time : 20-25 Days.(Sometimes it records germination after 6 months. As experienced by Tazimullah, (Fgd) in Silviculture Divn.)
15. Nursery Technique : Seeds are collected and directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/ cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Kothal (Jack fruit)

1. Botanical Name : *Artocarpus heterophyllus* Lam.
2. Distribution : Evergreen tree commonly found in India as well as Assam.
3. Description of tree : Medium-size evergreen monoecious tree upto 20mt
4. Tree used for : Fruit bearing, medicinal and timber. (wood espc. used in making traditional assamese musical instrument – Dhol)
5. Family : Moraceae
6. Part of plant used : Fruit, leaves, wood and seed.
7. Flowering time : January- February
8. Fruiting time : February-March
9. Seed collection time : June- July
10. Seed viability : 15 days (One month if seeds are covered with silt and sand and kept in shade).
11. No. of seed/kg. : 200 nos. approx. (Dry wt.)
12. Seed sowing time : July
13. Germination % : 80%
14. Germination Time : 20-30 days
15. Nursery Technique : Seeds are collected and directly dibbled in polypot/mother-bed, with adequate sunlight. Dampness and rain will lessen the germination percentage of seeds. The medium for polypot is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 4m x 4m. May be planted as mixed or pure crop.



Local Name : Khokon (Khokon)

1. Botanical Name : *Duabanga grandiflora* (Roxb. ex DC.) Walpers
2. Distribution : Found in tropical wet evergreen forest and moist areas abundantly in Assam.
3. Description of tree : Evergreen tree growing upto 30 mt tall
4. Tree used for : Timber
5. Family : Lythraceae
6. Part of plant used : Wood, Fruit (Edible), Leaves (Dye), Bark (fish poison)
7. Flowering time : July
8. Fruiting time : August
9. Seed collection time : April-May
10. Seed viability : One month
11. No. of seed/kg. : 10,000 approx (Dry wt.)
12. Seed sowing time : May-June
13. Germination % : 60-70%
14. Germination Time : 15-20 days
15. Nursery Technique : Seeds are collected and directly dibbled in polypot/mother-bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Mahaneem (Nimtree or Indian lilac)

1. Botanical Name : *Azadirachta indica* A. Juss
2. Distribution : Found all over in Assam & in all forest types of tropical & semi-tropical regions.
3. Description of tree : Evergreen fast growing tree with a height of 15-20 mt. with oval or roundish dense crown.
4. Tree used for : Timber, medicine and shade bearing
5. Family : Meliaceae
6. Part of plant used : Leaves, bark, seeds
7. Flowering time : May
8. Fruiting time : June
9. Seed collection time : July to August
10. Seed viability : One month in general. But it can survive upto 5 years if kept in airtight condition (Data collected from Mahesh Ch. Nath, Fr-I, Halodhiati Campa Nursery)
11. No. of seed/kg : 500- 550 nos. (Fresh wt.); 3000 nos (Dry wt.)
12. Seed sowing time : July
13. Germination % : 90%
14. Germination Time : 10-20 days
15. Nursery Technique : Seeds are put in sacks for the pulp to get rotten for 10-15 days after which raw seeds are sown in mother bed (1:10 mtr.) or polypot (5:8 irich). The mother bed or medium for polypot is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion in medium compressed method.
16. Planting mechanism : Seedlings of 4 inch with 3-4 leaves can be shifted from motherbed to polypot. Six months to one year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : **Monisal / Reetha** (Indian soapberry)

1. Botanical Name : *Sapindus mukorossi* Gaertn.
2. Distribution : Found all over in Assam and native to warm temperate to tropical regions.
3. Description of tree : Medium growth deciduous & evergreen tree with a height of 12 mt.
4. Tree used for : Ayurvedic Medicine
5. Family : Sapindaceae
6. Part of plant used : Fruit, seed
7. Flowering time : May-June
8. Fruiting time : August
9. Seed collection : November-December time
10. Seed viability : 2-6 months/ 1 month
11. No. of seed/kg. : 200 nos. (Dry wt.)
12. Seed sowing time : March
13. Germination % : 70%
14. Germination Time : 30-40 days
15. Nursery Technique : Matured seeds are sundried for 2-3 days after which they are sowed in mother bed or dibbled in polypot. The mother-bed or medium for polypot is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Manipuri Seam (Tree Bean)

1. Botanical Name : *Parkia timoriana* (DC.) Merr.
2. Distribution : Commonly found in north eastern regions of India.
3. Description of tree : Deciduous tree that grows upto 30 m tall.
4. Tree used for : Medicine, Edible
5. Family : Fabaceae
6. Part of plant used : Seeds
7. Flowering time : December
8. Fruiting time : January
9. Seed collection time : June-July
10. Seed viability : 60 days
11. No. of seed/kg. : 150-200 nos. (Dry wt.)
12. Seed sowing time : April-May
13. Germination % : 70%
14. Germination Time : 15-20 days
15. Nursery Technique : Seeds are collected and soaked in water. After that they are directly dibbled in polypot/mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion. Seeds have a good germination record.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Nahor (Indian rose chestnut)

1. Botanical Name : *Mesua ferrea*. L
2. Distribution : It is distributed all over Assam and in semi evergreen sub tropical regions of India.
3. Description of tree : Evergreen tree that grows upto 30 mtr.
4. Tree used for : Timber
5. Family : Calophyllaceae
6. Part of plant used : Timber
7. Flowering time : March – April
8. Fruiting time : June
9. Seed collection time : July-September
10. Seed viability : 6-12 Months
11. No. of seed/kg. : 50-70 nos. (Dry wt.)
12. Seed sowing time : July-September
13. Germination % : 90%
14. Germination Time : 60 Days
15. Nursery Technique : Seeds are collected carefully and then directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/ cowdung in 1:1:1 proportion and should get abundant sunlight. shade bearing in early stage.
16. Planting mechanism: One-two year old seedlings are ready for planting during rainy season. Spacing 4m x 4m. May be planted as mixed or pure crop.



Local Name : Outenga (Elephant Apple)

1. Botanical Name : *Dillenia indica* L.
2. Distribution : Evergreen tree commonly found in India as well as Assam. The tree forms an important part in the food chain in core area of our forests.
3. Description of tree : Medium size evergreen tree upto 15 mt tall.
4. Tree used for : Fruit bearing, medicine and timber.
5. Family : Dilleniaceae
6. Part of plant used : Fruit, wood, seed and pulp.
7. Flowering time : May
8. Fruiting time : July
9. Seed collection time : February-March
10. Seed viability : 6 months
11. No. of seed/kg : 8,000-10,000 (Dry wt.)
12. Seed sowing time : April-May
13. Germination % : 80%
14. Germination Time : 30-60 days
15. Nursery Technique : Seeds are collected and directly dibbled in polypot/ mother-bed with adequate sunlight. A shed with agronet must be made on top so that the soil remains warm as well as rain penetration is less. Hay shed must be avoided as it will dampen & destroy the seeds (as experienced by Sri Sukreswar Kalita, Mali, Guwahati Social Forestry). The medium for polypot/ mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Poniol (Indian coffee plum)

1. Botanical Name : *Flacourtia jangomas* (Lour) Raeusch
2. Distribution : Rainforest tree common to tropical Southern India. Widely found in Assam and north-eastern regions.
3. Description of tree : Small deciduous shrub or tree that grows to 6-10 mt.
4. Tree used for : Medicine, Culinary
5. Family : Salicaceae
6. Part of plant used : Leaves, Bark, Fruit.
7. Flowering time : April
8. Fruiting time : May
9. Seed collection time : July-August
10. Seed viability : 15-20 Days
11. No. of seed/kg. : 80-100 nos. fruits (Fresh wt.)
12. Seed sowing time : July-August
13. Germination % : 30-40%
14. Germination Time : 30-45 Days
15. Nursery Technique : No specific method. Seeds are directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/ cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 2m x 2m. May be planted as mixed or pure crop.



Local Name : Palash (Sacred Tree or Flame of Forest)

1. Botanical Name : *Butea monosperma* (Lam.)Taub.
2. Distribution : Tropical and sub-tropical parts of Indian subcontinent. It is native to Assam.
3. Description of tree : Dry season deciduous medium sized slow growing tree with a height of 15 mtr. These trees have crooked trunks and irregular branches.
4. Tree used for : Timber, Religious, Resin, Medicine, Dye etc.
5. Family : Fabaceae
6. Part of plant used : Leaf, Bark, Wood, Gum, Flower
7. Flowering time : February
8. Fruiting time : March
9. Seed collection time : April
10. Seed viability : 7 days
11. No. of seed/kg. : 1500-2000 (Dry wt.)
12. Seed sowing time : April
13. Germination % : 90%
14. Germination Time : 7-10 days
15. Nursery Technique : Seeds are sown in mother bed (1:10 mtr.) or polypot (5:8 inch). The mother bed or medium for polypot is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion in medium compressed method.
16. Planting mechanism: 1-2 year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Rudraksha (Ultrasum Bead Tree)

1. Botanical Name : *Elaeocarpus ganitrus* Roxb. ex G. Don
2. Distribution : Partially distributed in Assam and found in tropical evergreen forests.
3. Description of tree : Evergreen tree that grows to 18-24 mt. The tree bears fruit in 4 to 6 years.
4. Tree used for : Medicine, Religious
5. Family : Elaeocarpaceae
6. Part of plant used : Fruit, seed, bark, leaves (Seeds are traditionally used for prayer beads in Hinduism).
7. Flowering time : May-June
8. Fruiting time : August
9. Seed collection time : September - December
10. Seed viability : 2-4 months
11. No. of seed/kg. : 100-150 nos. (Dry wt.)
12. Seed sowing time : March
13. Germination % : 15-20%
14. Germination Time : 2-3 months.
15. Nursery Technique : The outer husk containing the seed is broken carefully. The inner seed so procured is then kept in humid temperature by covering or wrapping it up with green hay or black polythene for 10 days for good sprouting after which they are sowed in mother bed or dibbled in polypot. as experienced by Sri Sukreswar Kalita, Mali, Guwahati Social Forestry. The mother bed or medium for polypot is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: Two year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Sajina (Drumstick tree)

1. Botanical Name : *Moringa oleifera* Lam.
2. Distribution : Throughout Assam and indigenous to sub-Himalayan tracts, widely cultivated through the tropical regions.
3. Description of tree : Fast growing medium sized deciduous tree that grows to 10-15 mt. with an open crown of drooping fragile branches.
4. Tree used for : Medicine, Culinary
5. Family : Moringaceae
6. Part of plant used : Leaves, Flower and Fruit.
7. Flowering time : February
8. Fruiting time : March
9. Seed collection time : April- June
10. Seed viability : 45 days approx.
11. No. of seed/kg. : 1100-1200 nos. (Dry wt.)
12. Seed sowing time : June-July
13. Germination % : 60-70%
14. Germination Time : 20-30 Days
15. Nursery Technique : Seeds are soaked in water overnight and directly dibbled in polypot/mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cow-dung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Sain (Indian laurel)

1. Botanical Name : *Terminalia elliptica* Willd.
2. Distribution : The tree occurs in both dry and moist deciduous forest.
3. Description of tree : Laurel tree generally grows to 30M tall with a trunk diameter of 1M the bark is fire-resistant.
4. Tree used for : Timber use for furniture, Making Boat, Rail track, Musical Instrument etc.
5. Family : Combretaceae
6. Part of plant used : Wood, Leaves, Bark
7. Flowering time : May/June
8. Fruiting time : June/July
9. Seed collection time : Feb/March
10. Seed viability : 3-4 month
11. No. of seed/kg. : 1300-1500Kg (Dry wt.)
12. Seed sowing time : April
13. Germination % : 90%
14. Germination Time : 25-30 days
15. Nursery Technique : Seeds are soaked in water over night and directly dibbled in polypot/mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Simolu (Colton tree)

1. Botanical Name : *Bombax ceiba* L.
2. Distribution : Widely found in temperate regions, valleys. Distributed commonly in Assam.
3. Description of tree : Large tropical tree with a straight trunk, leaves are deciduous in winter, the tree grows to a height of an average 20 mt., some old trees up to 60 mt. in wet tropical regions.
4. Tree used for : Medicine and Timber
5. Family : Malvaceae
6. Part of plant used : Leaves, Bark, Flower, Fruit, Root, Timber.
7. Flowering time : November-December
8. Fruiting time : January
9. Seed collection time : March- May
10. Seed viability : 6 Months.
11. No. of seed/kg. : 5000 approx. (Dry wt.)
12. Seed sowing time : May
13. Germination % : 80-90%
14. Germination Time : 20-25 Days
15. Nursery Technique : Seeds are collected and sundried and then directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost /cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Satiana (Devil's tree)

1. Botanical Name : *Alstonia scholaris* (L.) R. Br.
2. Distribution : Native tree to Indian subcontinent. Widely distributed in Assam.
3. Description of tree : Evergreen tropical glabrous tree that grows to 18-24 mt.
4. Tree used for : Medicine, Timber
5. Family : Apocynaceae
6. Part of plant used : Leaves, Bark, Fruit and Timber.
7. Flowering time : December-January
8. Fruiting time : March-April
9. Seed collection time : May-July
10. Seed viability : One Month.
11. No. of seed/kg. : 10,000 nos. approx. (Dry wt.)
12. Seed sowing time : June-July
13. Germination % : 50-80%
14. Germination Time : 20-25 Days
15. Nursery Technique : Seeds are collected and sundried and then directly dibbled in polypot or mother bed. The medium for polypot/ mother-bed is prepared consisting of sand, river silt, vermicompost /cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



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Family: GUTT...
Uses: Tim...

Local Name : Sia Nahor

1. Botanical Name : *Kayea assamica* King & Prain
2. Distribution : Partially distributed in Assam, especially in Dullung Reserve Forest, Upper Assam. It is found in semi evergreen sub tropical regions.
3. Description of tree : Evergreen tree that grows to 18-24 mt.
4. Tree used for : Timber
5. Family : Clusiaceae
6. Part of plant used : Timber
7. Flowering time : April-May
8. Fruiting time : March to May
9. Seed collection time : August-September
10. Seed viability : 1 Month
11. No. of seed/kg. : 40-50 nos. (Dry wt.)
12. Seed sowing time : August-September
13. Germination % : 20%
14. Germination Time : 6-12 Month.
15. Nursery Technique : Seeds are collected carefully. Outer coat of the seed is partially removed. These are directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/ cowdung in 1:1:1 proportion.
16. Planting mechanism: One-two year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Sissoo (Shisham)

1. Botanical Name : *Dalbergia sissoo* Roxb.
2. Distribution : Sissoo is native to Indian subcontinent and southern Iran commonly found in the foothills of the Himalayas.
3. Description of tree : Fast growing medium to large size deciduous tree grows upto 25 to 30 M in Height. Trunks are often crooked when matured.
4. Tree used for : Source of good Timber
5. Family : Fabaceae
6. Part of plant used : Wood
7. Flowering time : April/May
8. Fruiting time : May/June
9. Seed collection time : January/February
10. Seed viability : 1-2 month
11. No. of seed/kg. : Approx. 7000 nos. (Dry wt.)
12. Seed sowing time : March
13. Germination % : 80-90%
14. Germination Time : 10-15 days
15. Nursery Technique : After collection seeds are directly dibbled in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cow-dung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Sal (Sal)

1. Botanical Name : *Shorea robusta* Roth.
2. Distribution : Found all over north western part of Assam & in Central India upto 1700 meter elevation. It is widely grown in the foothills of Himalayas.
3. Description of tree : Large deciduous tree that occurs in mixed hard wood forest, with a height of 30-35 mtr.
4. Tree used for : Timber
5. Family : Dipterocarpaceae
6. Part of plant used : Wood
7. Flowering time : February to March
8. Fruiting time : April-May
9. Seed collection time : May-June
10. Seed viability : 24 hours
11. No. of seed/kg. : 1200-1500 nos. (Dry wt.)
12. Seed sowing time : May-June
13. Germination % : 90%
14. Germination Time : 7 days
15. Nursery Technique : Wings of the seeds are cut and sown in mother bed (1:10 mtr.) or polypot (5:8 inch). The mother bed or medium for polypot is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion in medium compressed method. Direct dibbling of seeds in plantation area after thoroughly hoeing and softening of soil give good result than propagation in nursery.
16. Planting mechanism: 1-2 year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Sidha (Small flowered Crepe myrtle)

1. Botanical Name : *Lagerstroemia parviflora* Roxb.
2. Distribution : Mixed deciduous forest of India. It is found widely in Assam.
3. Description of tree : Small to medium sized tree growing to a height of 30 mtr. Leaves are deciduous. The flowers of this plant blooms only once in a year at the peak of summer.
4. Tree used for : Timber, Bark, Dye, Fuelwood for good charcoal.
5. Family : Lythraceae
6. Part of plant used : Leaf, Bark, Wood, Gum, Flower
7. Flowering time : January – February
8. Fruiting time : February-March
9. Seed collection time : April-May
10. Seed viability : One month
11. No. of seed/kg. : 900-1000 nos. (Dry wt.)
12. Seed sowing time : June-July
13. Germination % : 70%
14. Germination Time : 15-25 days
15. Nursery Technique : Seeds are collected and soaked for 2-3 days after which they are sown in mother bed (1:10 mtr.) or polypot (5:8 inch). The mother bed or medium for polypot is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion in medium compressed method. The seeds should be covered with shade on top.
16. Planting mechanism: 1-2 year old seedlings are ready for planting during rainy season. Spacing 4m x 4m. May be planted as mixed or pure crop.



Local Name : Samidh

1. Botanical Name : *Prosopis cineraria* (L) Druce
2. Distribution : Deciduous forests of India and Assam.
3. Description of tree : Deciduous tree growing upto 15 mt tall.
4. Tree used for : Timber, Medicine, Religious
5. Family : Mimosaceae
6. Part of plant used : Wood, Roots, Branchlets
7. Flowering time : September-October
8. Fruiting time : November
9. Seed collection time : April
10. Seed viability : One week
11. No. of seed/kg : 10,000 -12,000 (Dry wt.)
12. Seed sowing time : April
13. Germination % : 80%
14. Germination Time : 7-10 days
15. Nursery Technique : Seeds are collected and directly dibbled in polypot/ mother-bed The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Sonaru (Amaltas)

1. Botanical Name : *Cassia fistula* L.
2. Distribution : The tree Occurs in both dry and moist deciduous forest.
3. Description of tree : Laurel tree generally grows to 30M tall with a trunk diameter of 1 M. the bark is fire-resistant.
4. Tree used for : Timber used for furniture, Making Boat, Rail track, Musical Instrument etc.
5. Family : Fabaceae
6. Part of plant used : Fruit pulp /flower/leaves etc.
7. Flowering time : May/June
8. Fruiting time : August
9. Seed collection time : March - April
10. Seed viability : 6-12 month
11. No. of seed/kg. : 1800-2000 nos. (Dry wt.)
12. Seed sowing time : March/ April
13. Germination % : 80%
14. Germination Time : 5-7 days
15. Nursery Technique : Seeds are soaked in water over night and directly dibbled in polypot/mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/ cowdung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 3m x 3m. May be planted as mixed or pure crop.



Local Name : Teteli (Tamarind)

1. Botanical Name : *Tamarindus indica* L.
2. Distribution : Found all over Assam and India.
3. Description of tree : Evergreen tree that grows to 18-24 mt., canopy compact and spreading.
4. Tree used for : Medicine.
5. Family : Fabaceae
6. Part of plant used : Leaves, Bark and Fruit.
7. Flowering time : October-November
8. Fruiting time : December
9. Seed collection time : March- April
10. Seed viability : 6-8 Months.
11. No. of seed/kg. : 110-150 nos. approx. (Dry wt.)
12. Seed sowing time : April
13. Germination % : 66%
14. Germination Time : 15-20 Days
15. Nursery Technique : Seeds are soaked in water overnight and directly dibbled in polypot/mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cow-dung in 1:1:1 proportion.
16. Planting mechanism: One year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Local Name : Titasopa (Champak tree)

1. Botanical Name : *Michelia champaca* (L)
2. Distribution : It is found in tropical and subtropical moist broadleaf forests ecoregions. Native to India. Distributed in all parts of Assam.
3. Description of tree : Large evergreen tree that grows upto 40 mt tall. The tree has a umbelliform crown.
4. Tree used for : Timber
5. Family : Magnoliaceae
6. Part of plant used : Wood.
7. Flowering time : April-May
8. Fruiting time : May
9. Seed collection time : September-October
10. Seed viability : 7-10 Days.
11. No. of seed/kg : 4000 approx. (Dry wt.)
12. Seed sowing time : September-October.
13. Germination % : 30%
14. Germination Time : 30-45 Days
15. Nursery Technique : After seeds are collected and sundried the top red coat is removed by rubbing the seeds under rough surface or sand. After this the seeds are dibbled in polypot/mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion.
16. Planting mechanism: One-two year old seedlings are ready for planting during rainy season. Spacing 4m x 4m. May be planted as mixed or pure crop.



Local Name : Taraksopa (Haldu)

1. Botanical Name : *Haldina cordifolia* (Roxb.) Ridsdale
2. Distribution : Native to Southern Asia and well distributed in Assam.
3. Description of tree : Deciduous tree that grows upto 40 mt. high
4. Tree used for : Timber, Medicine
5. Family : Rubiaceae
6. Part of plant used : Timber, Bark
7. Flowering time : April-May
8. Fruiting time : June-July
9. Seed collection time : February-March
10. Seed viability : 20 Days
11. No. of seed/kg. : 5000 nos. approx. (Dry wt.)
12. Seed sowing time : May
13. Germination % : 50%
14. Germination Time : 30 Days
15. Nursery Technique : Seeds are soaked in water overnight and dried for another day. After that they are put in polypot or mother bed. The medium for polypot/mother bed is prepared consisting of sand, river silt, vermicompost/cowdung in 1:1:1 proportion. But a temporary shade should cover the seeds so that rain does not hamper the growth and seeds don't get buried deep as the size of seeds are very minute.
16. Planting mechanism: One-two year old seedlings are ready for planting during rainy season. Spacing 5m x 5m. May be planted as mixed or pure crop.



Seeds of Celastrus paniculatus



Seeds of Abrus precatorius (Rotimoni)



Seeds of Magnolia hodgsonii (Barhomthuri)



Seeds of Gardenia campanulata (Togor)



Seeds of Nothapodytes nimmoniana (Gandheli)



Seeds of Uraria picta (Hiyal Nejia)



Mother bed preparation in nursery



Khoiyar seedling



Polytoped cuttings & seedling



Hollokh seedling

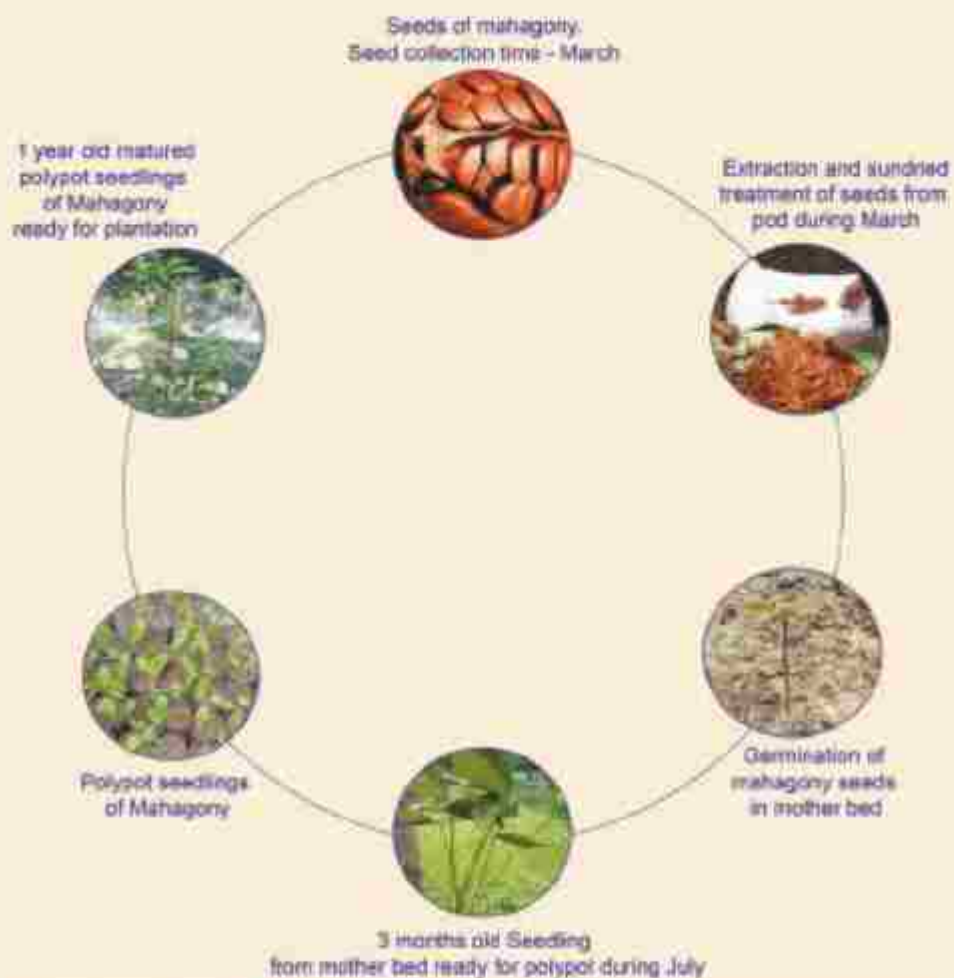


Field visit for data collection



Interaction with frontline staff

MAHOGONY FROM SEED TO SEEDLING



Team of silviculture division on field for data collection



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