

ABOUT ICFRE - IFGTB

ICFRE - Institute of Forest Genetics and Tree Breeding (ICFRE - IFGTB), Coimbatore is a National Research Institute under the Indian Council of Forestry Research and Education. ICFRE - IFGTB envisions a wood secure society. The Institute primarily aims to carry out research to improve productivity of forest tree species through conventional breeding programmes and biotechnological interventions. The major areas of research include tree improvement, breeding, planting stock improvement, marker assisted selection, genomics, clonal propagation, agroforestry systems, climate change research, integrated disease and pest management, seed handling and testing, eco restoration and conservation.

ABOUT EIACP

EIACP (erstwhile ENVIS) established by the Government of India, in 1982 has been on providing environmental information to decision makers, policy planners, scientists and engineers, research workers, etc. all over the country. It is a comprehensive decentralized information system on environment involving effective participation of institutions / organisations in the country actively engaged in work relating to different subject areas of environment. A large number of nodes, known as EIACP PC RP (erstwhile ENVIS Centres), have been established in the network to cover the broad subject areas of environment with a Focal Point in the Ministry of Environment, Forest and Climate Change.

INSTRUCTIONS TO CONTRIBUTORS

Dear Author/Subscriber/Contributor,

We invite contributions to the EIACP Newsletter issues! The EIACP Resource Partner at ICFRE-IFGTB focuses on Forest Genetic Resources and Tree Improvement. It aims to act as a window for quality scientific publications and a forum for presenting your thinking on the challenges in the fields of FGRs and tree improvement. The EIACP Newsletter, Van Vigyan, a quarterly publication, publishes original research articles, reviews, reports, research highlights, news-scan etc., related to the thematic area of the EIACP Resource Partner. Original research and review articles, notes, research and meeting reports are invited for the newsletter. Details of forthcoming conferences / seminars / symposia / trainings / workshops also will be considered for publication in the newsletter. Articles may be sent in Times New Roman (with font size 12) in double spacing with a maximum of 5-6 typed pages. Photographs/line drawings and graphs need to be of good quality with clarity for reproduction in the newsletter. Only electronic submission will be accepted.

Details may be sent to: ifgtb@envis.nic.in.

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EIACP Newsletter Forest Genetic Resources & Tree Improvement

VAN VIGYAN

ICFRE - INSTITUTE OF FOREST GENETICS AND TREE BREEDING
(Indian Council of Forestry Research and Education)

- Volume 9 Number 3
- A Quarterly Issue
- October to December

In this issue

1. Know Your Trees -
Melia dubia Cav.
2. EIACP Activities
3. ICFRE - IFGTB Products



From the
Director's Desk

Melia dubia, a popular fast-growing tree species native to India, is commonly used in plywood, furniture, and pulp and paper production. The tree has a high carbon sequestration capacity and is often used for reforestation and agroforestry projects. This species has been gaining popularity among farmers. The EIACP team brings to the readers latest information on various aspects of forest genetic resources and Tree improvement. This issue provides details on the species, its cultivation, and management. We look forward to your suggestions and seeks your support.

Dr C. Kunhikannan
Director, ICFRE - IFGTB

Know Your Trees - *Melia dubia* Cav.

Taxonomic and nomenclature

Melia dubia belongs to the family Meliaceae. The vernacular names are English : Malabar Neemwood; Hin : Mahanim; Irula : Meentrai maram; Kannada : Betta Bevu, Heb bevu Heb-bevu, Turbevu; Malayalam : Aryaveppu, Kattuveppu, Malavemppu, Malaveppu, Valiyaveppu; Tamil : Malaivembu, Malay Vembu, Masaveppu.

Distribution and habitat

Melia dubia is a fairly large, deciduous and fast growing tree, it attain 20-25 m height and 1.2-1.5 m in girth, with a straight cylindrical bole of about 9-12 m. *M. dubia* widely distributed in Sri Lanka, Malaysia, Java, China and Australia. In India it is indigenous to the Western Ghats of southern India and is common in moist deciduous forests found in Eastern Himalayas, Sikkim, North Bengal, upper Assam, Khasi hills, Hills of Orissa, North Circars, peninsula from the Ganjam hills southwards to Tirunelveli in the



east and from the Konkan southwards in the west. Due to its wide distribution, the tree is capable of withstanding wide range of climatic conditions. In Western Ghats at an altitude of 1500-1800 m. and in the Himalayas up to 6000 ft. and even higher. The species is most competitive in dry areas with less than 900 mm annual rainfall.

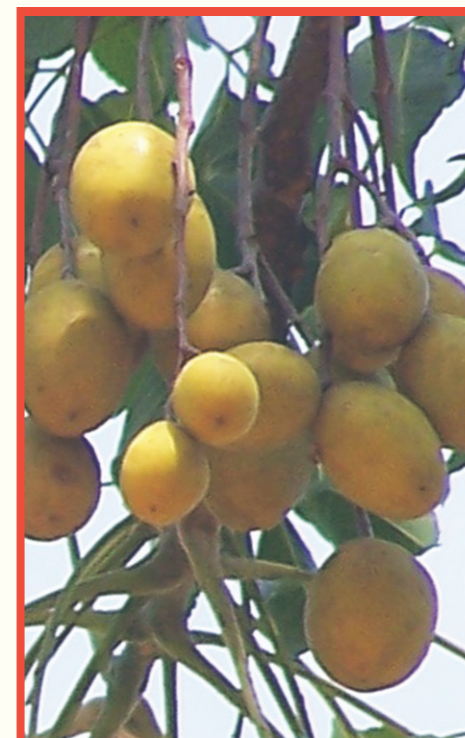
Botanical description

M. dubia is a large deciduous and fast growing tree with wide spreading branches on a stout, straight, tall bole 20 m high, bark 6-8 mm thick, dark brown, rough, lenticellate, exfoliations rectangular, long and broad, attached by the distal end, exfoliated surface brown; outer part pink, inner fibrous; young shoots and inflorescence scurfy tomentose. Leaves 2-3 pinnate, (rarely 1-pinnate), imparipinnate, attenuate, estipulate, rachis 10-30 cm long, terete, slender, swollen at base, scurfy tomentose when young; pinnae 3-7 pairs, 10-20 cm long; leaflets 2-11 on each pinnae, opposite, estipellate; petiolule 3-10 mm long, slender; lamina 4.5-9 x 2-4 cm, ovate-lanceolate, base oblique, acute, obtuse, round or attenuate, apex acuminate, margin crenate, glabrous at maturity, lateral nerves 6-10 pairs, pinnate, slender, prominent; intercostae reticulate, prominent. Flowers bisexual, 5-6 mm long, greenish-white, in axillary panicles; calyx lobes 5, 2 mm long, ovate, pubescent; petals 5, 7-10 x 1-3 mm, obovate, thick, simple, pubescent within; staminal tube 7 mm, white, scabrid, ribbed, apically dilated, 10-dentate, tooth 2-fid, mouth woolly; disc annular; anthers exerted;

ovary superior, oblong 1 mm, 5-celled; ovules 2 per cell; style to 4.5 mm, terete; stigma capitate. Fruit a drupe, pendulous 2 x 1 cm, dorsally compressed with longitudinal ridges, yellow, fleshy; seeds 3 or 4, 1 cm (indiabiodiversity.org).

Reproductive biology and breeding system

The flowers are borne on the axillary panicles in the upper axil and are shorter than the leaves. The flowers are numerous star shaped, greenish white in colour. The petals are pubescent on both surface. The tree flowers during January to April when the trees shed their leaves



Fruit collection and processing

Fruits ripen from October to February. Immature fruits are green in colour, mature fruits are yellow which turn brown. The average size of the fruit is 3.0 x 2.0 cm with about 250-300 fruits per kilogram. Samples with 500 fruits per kg have also been observed. A single tree can produce 15 - 20 kg of fruits. The seeds have an average size of 1.5 cm x 0.5 cm. 100 seed weight is about 150 g.

It is best to adopt ground collection in Melia than obtain fruits by climbing and / or shaking the fruiting branches. The ground can be cleared off and a tarpaulin spread under the tree. Care should be taken to collect only the ripe yellow or brown fruits. Green fruits indicate immaturity and should not be collected.

After collection the fruits can be transported to the place of processing in gunny bags or bamboo baskets. Ripe yellow fruits can be depulped easily if the fruits undergo fermentation and heating as the pulp is difficult to remove. Under natural conditions, ground fallen fruits are eaten by goats / deer which depulp the fruits and spit out the stony endocarp. The pulp can be softened by allowing the fruits to ferment which can be hastened by soaking the fruits in water which is slightly acidified (to pH 5.5-5.6) or in lime water (Dilute calcium hydroxide solution).

Once fermented, the fruits are macerated in bamboo baskets and thoroughly washed under running water so that even a small quantity of pulp is not adhered to the seeds. Sand can be used as an abrasive to remove the pulp thoroughly.

The drupes thus extracted have to be sun-dried for ten days in shade. Cleaned and dried drupes can then be stored in gunny bags or sealed tins for one to two years without losing viability. The drupes stored for over a year will show improved germination over fresh ones. No instances of pest incidence have been observed in the fresh or stored drupes of *M. dubia*. If the pulp is not thoroughly removed, the drupes are susceptible to fungal infestation. This can be overcome using Captan or Bavistin (@ 4 g/kg seeds).

Germination

Reports state very poor germination in *Melia*. The highest recorded germination in the species is 15-20 percent. Various pretreatments like hot-water soaking (60-70°C), boiling water treatment (100°C), roasting drupes at 60°C for 5-10 minutes, storing of drupes in farmyard manure, treatment with concentrated sulphuric acid (H₂SO₄), drupes collected from the spittings of goats, soaking of drupes in cow-dung slurry for two to fifteen days, cutting the hard endocarp of drupes and soaking drupes in cold water for a week have been suggested to improve the germination rate of *M. dubia*. However, studies at IFGTB reveal germination as high as 75 percent without any pretreatment. The drupes should be graded in water to remove floating drupes prior to sowing. The major constraints in germination identified in the species at IFGTB are the source of collection, time and medium of sowing.

Nursery

Seed sowing: Cleaned and dried drupes should be sown in the open raised nursery beds, in drilled lines, 5 cm apart. About 6-7 kg of dried drupes containing about 1500 numbers are required for one standard nursery bed (10 x 1 m). The drupes sown need to be watered regularly. At places where daytime temperature is not very high, or where nursery beds are in shade, the bed should be covered with a tarpaulin sheet to retain temperature in the medium.

Pricking and maintenance of seedlings

About one month old seedlings in the nursery bed can be pricked and polypotted. Care should be taken at the time of transplantation as the species is very sensitive to transplantation shock. The potted seedlings can be maintained in the shaded nursery with regular watering for normally 3-4 months. It is better to shift them to outdoor conditions at the end of six months, as further retaining them in shade hampers their growth.

Vegetative propagation

Juvenile stem cuttings, branchlets and mature branches of *M. dubia* can be tried for rooting or sprouting. The juvenile stem cuttings respond well to 1000 – 2000 ppm IBA (liquid formulation). Mini cutting technique has been standardized at TNPL for large scale propagation of the species. The size of the cutting and season of rooting plays a major role in the rooting of cuttings. Cuttings of size 15 cm and above respond better to rooting.

Insect pests and diseases

Red spider mite: The mites occur in groups beneath the leaves and feed on the epidermal tissues. Low to medium level infestation was found during June to July and November to December. Application of Derrimax 0.3 ml/lit of water can control the mites.

Ascortis selenaria defoliator: A polyphagous defoliator attacks *Melia* seedlings during the rainy season- June to July and November to December. The main host is *Prosopis juliflora*. It also occurs in *Peltophorum ferrugenum*, *Santalum album*, *Delonix regia* etc. At low infestation level, handpicking of caterpillars can be done to manage the pest. Adults are usually attracted to light and therefore light traps can be installed for a week after the first showers. At high infestation level Methyl parathion (2 ml/lit) can control the pest.

Mealy bug: Occasional incidence of mealy bugs was noticed at low level in seedlings. Application of Neem oil or tobacco extract directed towards the underside of the leaves control the scales.

Leaf miners: Leaf miners also damage the leaves in nursery seedlings at very low level.

In seedbeds, collar rot and seedling web blight by *Rhizoctonia solani*, leaf spots caused by *Colletotrichum dematium* (Pers. ex Fr.) Grov. and *Cylindrocladium ilicicola* (Hawley) Boedijn & Reitsma are the diseases recorded on *M. dubia* in nursery. The symptoms produced by both the pathogens are almost similar; disease appears as a small pin prick lesions, pale brown in colour, later spreading to form circular necrotic lesions. The infection spreads to the entire leaf lamina in case the attack is severe. Premature defoliation is noticed in container seedlings. Both the

foliage diseases can be controlled by the application of Carbendazim (@ 0.1% a.i.) as foliar spray at fortnightly interval as well as soil drench at weekly interval.

Both the pests and diseases incidence are serious, causing heavy mortality to the species, and hence require to be monitored closely.

Plantation pests and diseases

No major incidences of pests are noticed in the plantations of *M. dubia*. However, a few diseases like stem canker and gummosis result in damage to the clean bole affecting its market value.

Planting techniques and post planting operation

Growth requirements: *Melia dubia* is fast-growing and possesses strong potential as a reforestation and agroforestry species. The species grows well in temperature ranges of 30-45 °C at an altitude of 650 – 1800 m. The species requires a mean annual rainfall of 750 – 2500 mm. It grows in well drained red, red loam and black loam soils with pH ranging from 5.5 to 7.0 and depth 50-150 cm, requires moderate soil fertility and can come up in soils with salinity of <4 dS/m.

Silvicultural characteristics: The tree is a heavy light demander, requiring full overhead light for





development. Young plants are easily browsed, and hence care should be taken during the first year of planting. It is an excellent coppicer, coppicing profusely from large stumps, however, younger stems or stumps of one to two year old trees yield only a few coppice shoots. It produces root suckers freely. The species is susceptible to the attack of mealy bug, which attacks stumps and destroys the young coppice.

Out-planting of seedlings

The species performs best in wide spacing of 5 x 5 m in staggered rows, though lesser spacings of 4 x 4 and 3 x 3 are also adopted. Planting should be done prior to the rains. Pit size of 60 cm x 60 cm x 60 cm is essential. Irrigation is essential during the first two years, devoid of which the species does not survive even in good sites. Fertilization during the first two years hastens growth.

Agroforestry practices

It can be planted as intercrop among coconut trees. Groundnut, Blackgram and Greengram can come up as intercrop under *Melia dubia*. It also performs well as a bund plant for Casuarina, banana, drumstick and sugarcane plantations and Mango orchards. The species can support cultivation of tomato/ turmeric underneath. It is also grown as a shade tree in coffee and tea plantations.

Wood properties

Very large sized boles can be obtained attaining up to 30 m in length and about 120 cm in diameter at breast height at the end of 20 years. The species has a basic specific gravity of 0.414, moisture content of 12 % and drying time index

(DTI) of 0.889 (0.1 DTI = about 1.5 days drying time interval)

Wood gross structure

Growth rings	Semi-ring-porous to diffuse -porous; Distinct
Vessels	Large to medium, small in late wood, few, solitary or in radial pairs, transition from early to late wood gradual
Parenchyma	Paratracheal - scanty or vasicentric, rarely forms small irregular or oblique patches around small vessel groups in the extreme late wood portions
Rays	Moderately broad, rather widely spaced, ray flecks distinct on radial surface
Gum canals	Vertical, traumatic

Wood properties

Colour	Sapwood grey or pinkish-white with yellow cast, heartwood light red
Hardness	Moderately hard
Weight	Light, 450 kg/m ³ at 12% m.c.
Grain	Straight; texture coarse

Strength under green conditions

Static Bending - Modulus of Rupture (kg/cm²)	399.84
Static Bending - Modulus of Elasticity (kg/cm²)	51,759
Impact Bending (cm)	212.94
Compression parallel to grain - Max. crushing stress	371

Wood Processing

Drying	Green conversion and open stacking under cover recommended
Working properties	Easy to saw, machining satisfactory, can be brought to a smooth surface
Natural durability and preservation	Moderately durable under cover

Timber characteristics

The wood is moderately hard and 450 kg/m³ in weight. The sapwood is grey or pinkish-white with a yellowish tinge and the heartwood is light red in colour. It is straight grained and coarse textured. The wood is easy to saw, machines

Pulp characteristics

Physical Properties	Bulk density (OD basis) (kg /m3)		280
	Basic density (OD basis)(kg /m3)		538
	Chips classification (%)	+ 45 mm	Nil
		+ 8mm (over thick)	4.2
		+ 7 mm (accepts)	83
		+ 3 mm (pin chips)	12.6
	- 3mm (dust)	0.2	
Chemical Composition	Ash		0.82
	Solubility in	Hot water	3.6
		1% NaOH	14.7
		Alcohol benzene	3.4
	Acid insoluble lignin		24.7
	Pentosans (ash corrected)		16.3
Hollo cellulose (ash corrected)		73.7	

satisfactorily and can be finished into a smooth surface. It is only moderately durable, that too under cover. Wall-boards, door panels, furniture, agricultural implements and floorings are also made with the wood. It has been identified as the best raw material for plywood, as both face and core veneer. It can also be used for match industries, packing cases and as a paper pulp for production of paper. It has been identified as a high calorific value species, hence is deployed in energy plantations. Timber is highly useful and it seems very suitable for agriculture implements, plywood, boxes and packaging purpose. It is used for cabinet making and in construction because of its resistance to termites. Due to the light weight, it is widely used for making catamarans (kattumarams) also.

Pulp yield quality	Chemical charge as Na ₂ O (%)		16
	Unbleached pulp yield (%)		50.5
	Screen rejects (%)		0.16
	Screened yield (%)		50.3
	Kappa number		19.6
	Black liquor	pH	12.2
		Total solid(gpl)	217
		TTA * as Na ₂ O	30.3
		RAA* as Na ₂ O	5.22
	Strength properties @ 300ml CSF	Tear index (mNm ² /g)	10.1
Tensile index (NM/g)		86	
Burst index (KPa m ² /g)		5.8	

(FC&RI, 2010)

Properties of bleached pulp – refined and unrefined

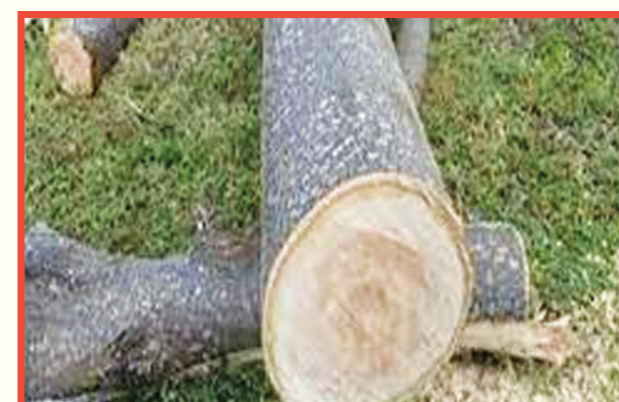
Bleached pulp properties	Unrefined pulp	Refined pulp
Bulk (g/cc)	1.7	1.42
Tensile index (Nm/g)	49.2	86
Tear index (mNm ² g)	5.2	10.1
Freeness (ml CSF)	540	300
Burst index (kPa.m ² /g)	2.4	5.8
Brightness (% ISO)	82	80
Opacity (%)	83.4	79.2
Scattering coefficient (m ² /kg)	48.4	38.5
Yellowness (%)	8.9	9.2

(APA, 2010)

Tree improvement

Utilization

Extracts from the tree are medicinal and the leaves are lopped as fodder. The seeds are reported to contain linoleic and oleic acids (65-82%) and they also yield greenish-yellow butter oil, not utilized now but with potential in preparation of soap and hair oil. The bitter principle of the fruit is a remedy for colic, half a fruit being the dose for an adult. The fruit is used



as an anthelmintic. The juice of the green fruit, with a third of its weight of sulphur and an equal quantity of curd heated together in a copper pot, is used as an application to scabies, and to sores infested with maggots.

Economics

The information provided in this section has been obtained from Hunsur Plywood Works Pvt. Ltd., Hunsur, Karnataka based on the growth performance of the species planted by the concern in 1995 and evaluated at the end of 15 years. Ten trees were selected and harvested. The trees had an average bole length of 8.90 m and a girth of about 100 cm producing approximately 0.425 cu.m. (15 Cft) per tree. These logs can be used for core veneer by peeling and logs of smaller sizes can also be utilized. Trees with a minimum of 16 inches (40 cm) girth are saleable at the rate of Rs 2000 per tonne for match industry.

This performance of the species can be expected only under good maintenance and controlled irrigation upto atleast six years. Unattended plantations with weed growth, poor soil conditions, water logging, etc., do not produce logs of the desired size. If bund planting is taken up in a single row about 60 trees can be planted at 5 m spacing which will fetch an income of about Rs.2 lakhs in the sixth year, as trees planted along bunds have been recorded to put on girth faster than the block planted material.

If the plantation is maintained for 30 years, the logs fetch higher prices (Rs. 650/- per cft) as the utility value of the wood is increased. The logs can be used for face veneer and the process is more akin to splitting for which larger sized logs are required.

Area of the plantation	1 Acre (0.40 ha)
Species planted	<i>Melia dubia</i>
Spacing	6 x 6 m
Total trees planted (Block)	108
Percent survival	90
Average height of the plantation	7.84 m
Total expenditure for plantation (includes establishment, weeding, manuring, watering) upto maturity	6000/-
Average girth of the plantation	96 cm
Average yield per tree [#]	15 Cft. (0.425 cum)
Market value of timber (current price)	Rs. 280/- per cuft (boles with length >8.5 m and GBH 115 cm fetch higher prices)
Average value per tree	280 x 15 = 4200/-
Current value of the plantation*	4200 x 97 = 4,07,400/-
Net profit	4,01,400/-

* Cost of land not included. [#] Only clear bole is taken into account. Lops and tops are not accounted for.

**Rekha R. Warriar, T. Vamadevan
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EIACP ACTIVITIES

Wildlife Week 2022 Celebrations

As part of the AzadiKaAmritMahotsav (AKAM) and Ek Bharat Shreshtha Bharat (EBSB), the EIACP PC Resource Partner on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore, organized an awareness campaign to commemorate Wildlife Week 2022. The main aim of this event was to raise awareness about the significance of wildlife conservation among students and the general public. As a part of this commemoration, an online elocution competition on the theme "Importance of Wildlife" was conducted from 12.09.2022 to 05.10.2022, and people from different walks of life participated. E-certificates were awarded to all the participants. Copies of the awareness poster released during the occasion, signifying the importance of wildlife conservation, along with handouts, were distributed to students and the general public, and soft copies were electronically transmitted to various stakeholders.



ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement
Institute of Forest Genetics and Tree Breeding
Ministry of Environment, Forest and Climate Change (Indian Council of Forestry Research & Education)
P.B.No. 1061, Forest Campus, R.S.Puram PO, Coimbatore - 641 002

WILDLIFE WEEK
OCTOBER 2-8, 2022

Wildlife in India
A wide range of wildlife can be found in India. With its diverse ecosystems, including the sands in the west, the swampy mangroves of the east, and the Himalayas in the north, evergreen rain forests in the south, it is a biodiversity hotspot. A total of 6.0% of flowering plant species, 6.2% of reptilian species, 6.2% of bird species, 7.6% of mammal species, and 14.7% of amphibian species may be found in India. The forests of India are home to more than 2000 bird species and 500 kinds of animals. There are 981 protected areas including 106 National Parks, 566 Wildlife Sanctuaries, 97 Conservation Reserves and 214 Community Reserves. In addition there are 51 Tiger Reserves, 18 Biosphere Reserves and 32 Elephant Reserves

Amphians 41%	Mammals 27%	Conifers 34%	Birds 13%	Sharks & Rays 37%	Reef corals 33%	Selected crustaceans 28%	Reptiles 21%
Cycads 69%							

Source: IUCN

Why should we conserve wildlife?

- Protects ecological stability and balance
- Promotes pollination and continuity of native plant species
- Conservation of biological diversity
- Protects the livelihoods and knowledge of indigenous people
- Promotes tourism attraction
- Useful for conducting investigatory research
- Enhances food security
- Preserves heritage and culture
- Provides benefits for health and wellbeing
- Aesthetic and recreational value

How an individual can contribute to protect wildlife?

- Plant native species
- Adopt an animal
- Take part in conservation activities
- Promote Afforestation
- Restore habitats
- Avoid insecticides and chemical fertilizers
- Recycle and reuse
- Use Eco-friendly products
- Resort to renewable energy
- Stop indiscriminate killing of wildlife and wildlife trade

Green Deepavali Awareness

As part of AzadiKaAmritMahotsav (AKAM) and Ek Bharat Shreshtha Bharat (EBSB), ICFRE-IFGTB EIACP PC on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore organized an awareness campaign on 21.10.2022 to spread the message on the importance of the celebration of Green Deepavali. Green Greetings on Green Deepavali Celebrations containing information on its need and the tips for celebrating the festival in a green way was released and disseminated to students, general public and various stakeholders.

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CELEBRATE ECO FRIENDLY DIWALI

IFGTB ENVIS wishes you a HAPPY DIWALI

Tips to celebrate green diwali

- Use traditional lightings
- Wisely dispose wastes after celebration
- Avoid plastics
- Adopt to eco-friendly gifts and decorating items
- Plant more trees
- Burst only green crackers if inevitable

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World Soil Day 2022 celebrations

As a part of AzadiKaAmritMahotsav (AKAM) and Ek Bharat Shreshtha Bharat (EBSB), EIACP (Environmental Information, Awareness, Capacity Building and Livelihood Programme) Program Centre on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore (erstwhile IFGTB EIACP PC RP) organized an awareness campaign on 05.12.2022 to commemorate the World Soil Day 2022. This awareness event on the theme "Soils: where food begins" was also registered in the worldwide events organized by the FAO of the United Nations.

An Awareness Quiz on soil was also organized for students and the general public. People from all walks of life have participated and E Certificate was also awarded to all. An awareness poster highlighting the current year's theme was released during the occasion and disseminated to various schools & the general public in and around the district, its digital copies were shared with all the stakeholders.



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WORLD SOIL DAY 2022
 Theme: "Soils: Where food begins"

Healthy soils are the foundation of the food system. Our soils are the basis for agriculture and the medium in which nearly all food-producing plants grow. Healthy soils produce healthy crops that in turn nourish people and animals. Indeed, soil quality is directly linked to food quality and quantity. Soils supply the essential nutrients, water, oxygen and root support that our food-producing plants need to grow and flourish. They also serve as a buffer to protect delicate plant roots from drastic fluctuations in temperature.

The Soil Food Web

How To Make Soil Healthy and Increase Soil Productivity?

- Optimize irrigation
- Add organic matter and manure
- Use cover crops
- Practice crop rotation
- Plant salt-tolerant crops
- Increase soil nutrients

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International Mountain Day 2022 Celebrations

As a part of AzadiKaAmritMahotsav (AKAM) and Ek Bharat Shreshtha Bharat (EBSB), a Tree Sapling Planting Programme was organized by EIACP (Environmental Information, Awareness, Capacity Building and Livelihood Programme) Program Centre on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore (erstwhile ICFRE-IFGTB EIACP PC RP) on 12.12.2022 to celebrate International Mountain Day 2022. Dr C. Kunhikannan, Director, IFGTB inaugurated the event. Saplings of indigenous medicinal and timber tree species like *Trema orientalis* (Indian Charcoal Tree), *Ficus benjamina* (Weeping Fig), *Ficus hispida* (Hairy Fig), *Terminalia bellirica* (BellericMyrobalan), *Terminalia elliptica* (Indian Laurel) and *Phoenix dactylifera* (Date Palm) etc were planted in the Botanical Garden by officers, staff members and scholars of IFGTB. An awareness poster on 'Women move mountains', was released and disseminated to various schools & the general public in and around the district, its digital copies were shared with all the stakeholders.



75 Azadi Ka Amrit Mahotsav

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INTERNATIONAL MOUNTAIN DAY - 2022

Theme : "Women move mountains"

Women play a key role in mountains environmental protection and social and economic development. They are often the primary managers of mountain resources, guardians of biodiversity, keepers of traditional knowledge, custodians of local culture, and experts in traditional medicine. Increasing climate variability, coupled with a lack of investment in mountain agriculture and rural development, has often pushed men to migrate elsewhere in search of alternative livelihoods. Women have therefore taken on many tasks formerly done by men, yet mountain women are often invisible due to a lack of decision-making power and unequal access to resources.
(Source: FAO, United Nations)

Do You Know ?

- Mountains host about half of the world's biodiversity hotspots and 30% of all Key Biodiversity Areas
- Rural Mountain Women Are Vital to Biodiversity Conservation, and Water and Food Security
- More than half of humanity relies on mountain freshwater for everyday life
- Mountain covers around 27% of Earth's land surface
- 6 important food crops originated and diversified in the mountains: POTATOES, MAIZE, TOMATOES, SORGHUM, APPLES, BARLEY
- Mountains are home to 15% of World's population

ICFRE - IFGTB PRODUCTS



ICFRE - INSTITUTE OF FOREST GENETICS AND TREE BREEDING

(Indian Council of Forestry Research and Education)

(An autonomous body of Ministry of Environment Forest & Climate Change, Govt. of India)
P.B. No. 1061, R.S. Puram, Coimbatore - 641 002. Tamil Nadu, India



The following Services are provided at ICFRE - IFGTB for various stakeholders. Please contact us for details as below.

Services		Cost per unit	Contact Number with Email ID	
Clonal Seedling: For Sale & Booking				
1.	Clones of Casuarina Hybrids (CH-1, CH-2 & CH-5)	Rs. 4.50 per plant	Smt. K. Shanthi, CTO, Division of Plant Biotechnology, Phone : 0422 2484122 E-mail : shanthik@icfre.org	
	Eucalyptus clones (EC-4, EC-6, EC-9 & EC-11)	Rs. 4.00 per plant		
2.	Tissue Culture Teak Plants	Rs. 55.00 per plant	Dr Rekha R. Warriar, Scientist - F & Head, Division of Chemistry & Bioprospecting Phone : 0422 2484167	
	Bamboos Plants	Rs. 25.00 per plant		
3.	Windbreak Clones (WBC-1, WBC-2, WBC-3 & WBC-4)	Rs. 4 per plant	Dr. C. Buvaneswaran, Scientist - G, Sliviculture & Forest Management Division, Phone : 0422 2484198, 94422 45047 E-mail : buvanesc@icfre.org	
4.	ArborEasy® DNA Isolation Kit Pack Size	Price Rs.	Dr. Modhumita Dasgupta, Scientist - G, Division of Plant Biotechnology Phone : 0422 2484115 E-mail : ghoshm@icfre.org gmodhumita@gmail.com	
		10 Reactions		950.00
		20 Reactions		1900.00
50 Reactions	4750.00	300.00		
5.	Soil Testing (pH, EC, OC, Micro and Macro Nutrients)	Rs. 4750.00	Dr. A.C. Surya Prabha, Scientist - D, Sliviculture & Forest Management Division, Phone : 0422 2484150 E-mail : acsuryaprabha@icfre.org	
6.	Phytosanitary Certificate	Rs. 100.00 + Tax per application	Dr. John Prasanth Jacob, Scientist - G, Forest Protection Division, Phone : 0422 2484157 E-mail : jacob@icfre.org	

Products of IFGTB: For Sale & Booking			
7.	Hy-Act (Natural and Seed Oil Based Biopesticide)	Rs. 80.00 per bottle	Dr. N. Senthilkumar, Scientist - F Phone : 0422 2484193 Mobile : 9629160703 E-mail : senthink@icfre.org
	Tree PALH (Natural and Seed Oil Based Biopesticide)	Rs. 80.00 per bottle	
	Crawl clean (Plant Based Green Insecticide)	Rs. 25.00 per packet	(or)
	Tree Rich Biobooster (Instant Organic potting mixture for home garden, terrace and kitchen garden)	Rs. 50.00 per packet	Smt. R. Sumathi, CTO Division of Chemistry & Bioprospecting, Phone : 0422 2484144 Mobile : 9942245542 E-mail : sumathir@icfre.org
Tara Red Jam (with natural fruit colorant)	Rs. 60.00 per bottle		