

ENVIS Newsletter
Forest Genetic Resources & Tree Improvement

VAN VIGYAN

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

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From the Director's Desk

Van Vigyan, the newsletter of ENVIS RP on Forest Genetic Resources and Tree Improvement brings out quick updates of activities related FGRs and tree improvements carried in last three months. The present issue carries news on a multipurpose tree-*Albizia odoratissima*, the events taken up such as Van Mahotsav, International Day for Conservation of Mangrove Ecosystems, World Ozone Day and ICFRE Award of Excellence and various products of IFGTB, Coimbatore. I hope that the information in the newsletter will be of interest to forestry professionals/researchers, students, tree growers and farmers. I take this opportunity to thank the IFGTB ENVIS team for their good efforts and help to bring out this newsletter.

Dr C. Kunhikannan
Director, IFGTB

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Know your trees - *Albizia odoratissima* (L.f.) Benth

Introduction

Albizia odoratissima is a large woody, fast growing deciduous, multipurpose nitrogen fixing tree species. It is commonly called as black siris, fragrant albizia, Ceylon Rosewood (English), bansa, kali siris (Hindi), shirisha (Sanskrit). Kal-thuringi, kar raghe, bilwara, ponnai murankai, sela vanjai, (Telagu) Shinduga,



telsu, yerijuchinta, karu vage (Tamil), Pullibaghi, Godhunchigolanchu, bilwara (Kannada) Karu vagei, Kunni-vaka, Nelli-vaka, Chittilei-vaka, Puli-vaka, Karu-vaka, Chela-vaka (Malayalam). It is an important tree species for shade and soil improvement in tea plantations. In the Asian subcontinent particularly North- East India and Bangladesh, 75% of shade trees are Albizias (Sana, 1989).

Taxonomic classification

Kingdom : Plantae
Division : Magnoliophyta
Class : Magnoliopsida
Order : Fabales
Family : Fabaceae
Genus : *Albizia*
Species : odoratissima

Distribution and habitat

A. odoratissima is a fast-growing large deciduous erect tree. It normally grows to a height of 15-25 m and diameter of 120-150 cm (Amrish and Tarasingh, 2011). It is native to the humid tropical parts such as India, China, Laos, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, and Vietnam. It is introduced to Burundi, Kenya, Malawi, Mozambique, and Zimbabwe. In India, the species are distributed in Himalaya Seed Peninsular regions. It grows in a wide variety of soils, but prefers moist, well-drained, loamy soils. *A. odoratissima* is found 1500 msl and grows well in areas with an average annual rainfall of 635 to 3048 mm (Troup, 1921).

Botanical description

Its bark is 10-15 mm thick, surface greyish-brown to dark brown, rough, irregularly cracked; blaze reddish-pink. Leaves are bipinnate, alternate, stipulate; stipule free, lateral, caducous; rachis 20-30 cm long. Flowers are bisexual, white, in globose heads forming terminal panicles; peduncle, slender, puberulous; calyx tube cupular, 1-1.5 x 1-1.3 mm, teeth minute, deltoid, pubescent; corolla broadly funnel shaped, lobes 5, ovate-

lanceolate, pubescent; stamens many, 1.2-2 cm long, ovary stipitate, glabrous or pilose, style filiform, stigma terminal. Fruit is a pod 15-20 x 2.5-3.7 cm, flat, strap-shaped, with parallel margin or often some portion constricted, rounded to rostrate at apex, glabrous, often glossy, reddish-brown to dark brown, finely reticulately veined; seeds 6-12, oblong, orbicular, compressed (Kirtikar & Basu, 1935).

Reproductive biology and breeding system

A. odoratissima is a hermaphrodite with a leafless period from December to February. Fresh leaves normally start before the old ones have completely fallen/shed (March-April in northern India). Flowers appear during March to June. Fruits appear in early August and start ripening by the end of October. In South India, flowers start appearing during March to June, often profuse during April and May. The fruits develop in the month of July and matures mostly during November and December, ripened pods are 13 to 30 cm long and 2.54 to 3.3 cm wide and are reddish brown which contains 8 to 12 reddish brown individual seeds.



Fruit collection and processing

According to Troup (1921) fruits of *A. odoratissima* mature during January-February in North India. Pods should be collected while on the tree immediately after they turn brown. Half-opened pods are also collected from beneath the trees. The fruits (pods) can be collected both from the ground as well as climbing & picking or lopping the branch tops from the trees using pruning poles. Following this, the pods are dried in the sun for 5-7 days, unopened pods are manually pounded with hammer to open the pods and the extracted seeds are dried again in the sun for 3-4 days. *A. odoratissima* seeds average about 22,000 per kg (Chowdhury 1975, Matin and Rashid 1992). Seeds stored in gunny-bags or air-tight containers remain viable for 1 year. If seeds are to be stored for a long period, they should be treated with 5% DDT or Heptachlor dust at the rate of 100 grams per kg of seeds (Anon, 1988).



Germination

A. odoratissima seed storage behavior is orthodox. To break the physical dormancy, seeds can be soaked in cold water for 1 hour or soaked for two minutes in 80° C water, or 30 seconds in boiling water. The treated seed is then sown the next day. Seeds are sown in seed trays, polybags, or seed beds filled with soil and cow dung in the ratio 3:1. It may be maintained in partial shade or direct sunlight. Seedlings emerge within a week. Fresh seeds may have a germination rate of 99%. Germination decreases to 55-65% at the end of one year (Kannan *et al.*, 1996). Thirty days after transplanting, partial shade seedlings showed 100% survival while those in direct



sunlight showed about 94.5% survival (Matin and Rashid 1992).



Vegetative propagation

A. odoratissima is established by stump cuttings also. For quick establishment, stump cuttings gives the best results. Stumps are prepared in the late dormant season immediately before buds swell. Trees with stem diameter 5-7 cm are appropriate for stumps. Selected trees are cut at a height of 1.5 - 2 m and all the lateral branches are removed. It is best to select trees with few lateral branches below the 1.5 - 2 meter cutting. Trees should have well developed roots. Carefully, expose the root system to a depth of 90 cm. Sever the taproot at 80-90 cm and prune all lateral roots. Stumps should be planted immediately in pits 90 cm deep and 75 cm wide (Nair, *et al.*, 1991).



In vitro propagation

Epicotyl, petiole, cotyledon, node and leaf nodal explants collected from 14 days old *in vitro*-grown seedlings of *Albizia odoratissima*

was cultured either solely or in combinations of Murashige and Skoog (MS) medium with different concentrations of 6 benzylaminopurine (BAP), N6-(2-isopentenyl) adenine (2-iP) and kinetin. The highest shoot regeneration (82.5%), the maximum number of shoots per explant (6.9), and the maximum shoot length (2.55 cm) were found on *A. odoratissima* cotyledonary node explants. (Rajeswari and Kailash Paliwal, 2008).

Pest management

A. odoratissima is comparatively free from pest attack in their natural stands but it is highly sensitive to attack by caterpillars, root borers, and root diseases, particularly as a young tree as well as dieback, branch canker and red rust. Damping-off, a fungus infection is common in poorly maintained nurseries (Barua, 1989). Heart-rot is caused by *Ganoderma applanatum* (Lenne, 1992). Larva of *Bruchidius bilineatopygus* cause heavy damage to developing pods and seeds. There are reports of mild attack by the caterpillars of *Archips* sp. and *Phycita* sp. and by a bug *Oxyrschis tarandus* in natural stands. The caterpillars characteristically webbed the tender leaves and fed from within. However, they did not cause any serious damage to the foliage (Nair, *et al.*, 1991)



Planting techniques and post planting operations

Usually spacing varies from 6 x 6 to 12 x 12 m. Seedlings are planted in pits- 90 cm deep and 45 cm wide and for stumps the pits should be 90 cm deep and 75 cm wide. For direct sowing, seed should be sown in lines 3 m apart. For trees less than 2.5 m height broadcast 300 g Triple Super Phosphate (TSP) in a 1.5 m, up to 4 m height 333 g TSP is applied to a 3 m diameter-circle around the tree. Fertilization should be repeated 3 times per year; April, June and August. On good sites 5-year-old trees can be 5 m in height and 14 cm in diameter. A mean annual diameter increment of 1.3 cm has been recorded for this species. *A. odoratissima* is classified as moderately light demanding. Juvenile trees require shade. Trees coppice well, shoots reaching a height of 3 m in 2 years. It is susceptible to fire, resistant to weed competition, drought and regenerates naturally in sheltered areas with good soil (Anon, 1988).

Agroforestry practices

In Northeast India and Bangladesh, it has been extensively planted as a shade tree in tea and coffee plantations (Sana, 1989). The shade extends the productive life of crop plants and increases annual yields. It is multipurpose tree with variety of uses ranging from timber, fodder, shade and medicinal uses. It is dominant shade tree in tea plantation at Manipur registering 82% of individuals (Kalita *et al.*, 2013).

Tree improvement

The economic utility and conservation value of *A. odoratissima* have been prioritized, plus trees has been selected and provenance trials have been laid out (Krishnakumar, *et al.*, 2012). As the species has great scope for improvement. it can be taken up for release of better clonal varieties for timber production.

In Puttalam, Srilanka this species is planted in 50 ha (625 plants/ha). Normally 40 years is the rotation period but by providing favorable conditions they were harvested in 25 years (Kannangara, 2010).



Utilization

A. odoratissima has been cultivated widely in tea and coffee plantations as a shade tree. The shade improves crop plant production and raises annual yield. It increases tea and coffee



production in many ways. *A. odoratissima*'s well developed root system decreases erosion and utilizes the subsoil moisture and nutrients not available to tea and coffee plants. Leaf litter of *A. odoratissima* provides organic matter and soil nutrients to the rhizosphere of understory plants. Tree canopies decrease soil desiccation, suppress weed growth, and protect plants from hail and rain storms. Its dead and defective branches from shade trees are used for fuel wood. The heartwood of mature trees wood is suitable for carts, wheels, and furniture. Wood weight at 12 percent moisture content is 735 kg/m³. The wood is 20-40 percent stronger than teak. The pods of *A. odoratissima* are eaten by monkeys. The leaves are an excellent green manure and cattle fodder. Sana (1989) reported that *A. odoratissima* contributed 16 kg/ha of nitrogen from 655 kg dry weight of leaf litter.

A. odoratissima has been used in Indian as folk medicine to treat numerous inflammatory pathologies, such as leprosy, ulcers, burns and asthma. The leaves of *A. odoratissima* showed potent free radical scavenging property and antimicrobial (Banothu *et al.*, 2017). Its bark possesses significant antimicrobial activity against Gram positive bacteria (*Staphylococcus aureus*, *Staphylococcus mutans*) and yeast (*Candida albicans*) which might be due to the

presence of steroids, saponins and phenolics in the bark, with no effect on Gram negative bacteria (Kumar *et al.*, 2011).

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- T. Vamadevan, S. Vigneswaran, V. Thangavel and Rekha R. Warriar**
Institute of Forest Genetics and Tree Breeding,
Coimbatore

ENVIS ACTIVITIES

Van Mahotsav 2020 Celebrations by IFGTB ENVIS

The ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore commemorated Van Mahotsav 2020 by organizing a Tree Planting Programme on 03.07.2020 following social distancing in the light of Covid-19. The main aim of this event was to create and spread awareness about the importance of trees and to protect the environment from degrading by planting indigenous trees.

Dr C Kunhikannan, Director, IFGTB inaugurated the function and released an awareness poster for students. In his address, Dr



Kunhikannan explained the disastrous impacts of monoculture on the ecology and stressed on the need for planting resilient native tree species to maintain ecological balance.

Dr Kannan CS Warriar, Scientist F and ENVIS Coordinator spoke on the significance of this annual tree planting festival in India started by K.M. Munshi, the then Union Minister for Agriculture and Food in 1950. In 2019, the world lost 38 lakh hectares of tropical primary forest, equivalent to losing a football ground area of forests every six seconds. In India, however, an increase of 0.65% forests over the previous assessment in 2017 has been reported, he pointed out. Increased awareness and conservation strategies have resulted in safeguarding the invaluable tree resources, he added.

Saplings of indigenous medicinal and fruit tree species like *Syzygium cumini* (Jamun), *Terminalia bellirica* (Belleric Myrobalan), an ingredient of 'Triphala', *Thespesia populnea* (Portia tree, Poovarasu), *Ficus benghalensis* (Banyan), *Terminalia catappa* (Indian Almond) etc. were planted in Forest Campus by officers, staff members and students.

A theme song 'Kadarivu' composed by Dr Kannan CS Warriar for Kerala Forests and Wildlife Department for this Van Mahotsav was released online through Facebook live earlier by Adv. K Raju, Honourable Minister of Forests, Kerala. Shri P. Jayachandran, renowned play back singer has sung this awareness song on forests penned by Shri Pramod Krishnan, Chief Conservator of Forests.

Soft copies of the poster were transmitted electronically among the different stakeholders. Dr T Vamadevan, Information Officer proposed the vote of thanks.

ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement
 Institute of Forest Genetics and Tree Breeding
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Van Mahotsav 2020
 A Tree Planting festival in India
 1st July to 7th July

Van Mahotsav is an annual tree planting festival in India celebrated during 1st week of July. It was initiated in 1950 by K. M. Munshi, the then Union Minister for Agriculture and Food to create an enthusiasm in the minds of the populace for the conservation of forests and planting of trees. Millions of saplings of diverse species are planted by various agencies and public across India on the occasion of Van Mahotsav. During this "festival of forests", people plant tree seedlings in the premises of their homes, offices, schools, colleges, etc.

Why Van Mahotsav?

- Good air & water:** One mature tree cleans air by absorbing 22 kilos of carbon dioxide and releasing oxygen in exchange every year. By intercepting pollutants, trees also provide cleaner water.
- Pollution prevention:** Plants form a surface that absorbs particulate matter, black carbon and dust, thus serves as a trap for pollutants.
- Increased Biodiversity:** Trees provide essential habitats for diverse wildlife.
- Disease free society:** Research shows that trees promote both physical and mental health. A clean environment results in reduced infection levels.
- Social impact:** Access to trees and green spaces promotes greater physical activity, and reduces stress, while improving the quality of life in our cities and towns.
- Carbon absorption:** Trees sequester carbon (CO₂), thereby reducing the overall concentration of greenhouse gases in the atmosphere.
- Increased habitats:** Trees save energy through cooling in the hotter months, and provide a blanket during winter.
- Personal & Spiritual value:** Both beautiful and symbolic, trees are very powerful and can influence our spiritual lives.
- Economic & environmental value:** Landscapes with healthy tree-cover attracts new residents, industries and ecotourism.

"PLANTING A TREE IS NOT FOR THE SELF, BUT FOR POSTERITY"

Poster No. 04/IFGTB ENVIS - July 2020

International Day for the Conservation of the Mangrove Ecosystem - 2020

The ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore commemorated International Day for the Conservation of the Mangrove Ecosystem on 27.07.2020 following the mandatory protocols to contain the spread of COVID 19. The main aim of this event was to raise awareness about the importance of mangrove ecosystems and to promote solutions for their sustainable management and conservation.


Dr C Kunhikannan, Director, IFGTB during his inaugural address, explained how mangrove contributes to the wellbeing, food security and protection of coastal communities worldwide. They harbour a rich biodiversity and support a number of threatened and endangered species in addition to commercially important species. Mangroves also provide a valuable nursery habitat for fish and crustaceans, he added. It is essential to plant more mangrove species and increase their density, Dr Kunhikannan explained.

Dr Kannan CS Warriar, Scientist F and ENVIS Coordinator spoke on the role of mangroves as effective carbon sinks, sequestering vast amounts of carbon. Carbon emissions from mangrove



deforestation account for up to 10% of emissions from the deforestation globally despite covering just 0.7% of land coverage. Mangroves also act as a form of natural coastal defence against storm surges, tsunamis, rising sea levels and erosion, he explained. He also highlighted that, in a recent research, mangrove forests were found to provide ecosystem services (benefits to humans) valued at \$194,000 per hectare annually. However, mangroves vanish 3 to 5 times faster than global forest declines with major environmental and socio-economic impacts. And since 1990, the area of mangroves has decreased by 1.04 million hectares. Quoting the recent statistics of Forest Survey of India, he pointed out that the mangrove cover has increased by 54 sq km in India during 2017 to 2019. Among the 12 major mangrove habitats in India, a positive trend could be observed in the states of Gujarat (37 sq km), Maharashtra (16 sq km) and Odisha (8 sq km) and the marginal decline was reported in Tamil Nadu (-4 sq km), West Bengal (-2 sq km) and Andaman and Nicobar Islands (-1 sq km). Though Tamil Nadu lost, 4 sq km of mangroves, the State recorded an increase in the forest cover to the tune of 83 sq km that is a marginal increase of 0.32% over 2017, he observed. Participatory forest management practices like developing locally-led communities for the protection and conservation of mangroves is the need of the hour.

An awareness poster signifying the status, contributions and conservation of mangroves was released during the occasion and was electronically transmitted to students and stakeholders.



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 Ministry of Environment, Forest and Climate Change (Indian Council of Forestry Research & Education)
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International Day for the Conservation of the Mangrove Ecosystem - 2020

Mangrove Ecosystems - Status, Contributions and Conservation

Did You Know?

- Mangroves are extraordinary ecosystems, located at the interface of land and sea in tropical regions, which offer a considerable array of ecosystem goods and services.
- 113 countries have areas of mangrove forest, totalling an estimated 14.79 million hectares.

5.55 mha Asia	3.24 mha Africa	2.57 mha North & Central America	2.13 mha South America	1.30 mha Oceania
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- Mangrove forests represent less than 1% of all tropical forests worldwide, and less than 0.4% of the total global forests.
- More than 40% of the total area of mangroves reported in four countries.

19% Indonesia	9% Brazil	7% Nigeria	6% Mexico
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- Mangroves vanish 3 to 5 times faster than global forest declines, with major environmental and socio-economic impacts. Since 1990, the area of mangroves has decreased by 1.04 million hectares.

Their Contributions

Role in Biodiversity

- Contribute to the wellbeing, food security, and protection of coastal communities worldwide.
- Rich in biodiversity, mangroves support complex communities, where thousands of other species interact.
- Mangroves provide a valuable nursery habitat for fish and crustaceans.
- Mangroves act as a food source for wildlife and a source of nectar for honeybees.

Role in Climate Mitigation

- Mangrove ecosystems are highly effective carbon sinks, sequestering vast amounts of carbon within the soil, leaves, branches, roots, etc.
- One hectare of mangrove can store 3,754 tons of carbon; it's the equivalent of taking more than 2,650 cars off the road for one year.
- Carbon emissions from mangrove deforestation account for up to 10% of emissions from deforestation globally, despite covering just 0.7% of land coverage.


As a Natural Coastal Defence

- Mangroves act as a natural coastal defence against storm surges, tsunamis, rising sea levels and erosion.
- Mangroves play an important role in reducing vulnerability to natural hazards and increasing resilience to climate change impacts.
- A 500-meter mangrove strip reduces wave heights by 50 to 99%.


How we can Conserve Mangrove Forests?

- Devising well-balanced coastal land-use plans, such as maintaining sustainable limits in logging and other harvesting activities of its resources.
- Retaining protective mangrove buffers along coastlines and rivers to prevent erosion.
- Plant more and increase their density.
- Avoid destructive shrimp farming.
- Increasing sensibility and sensitivity in eco-tourism.


Largest Mangrove Forests of India




Sundarbans Mangroves, West Bengal




Bhitarkanika Mangroves, Odisha



Pichavaram Mangroves, Tamil Nadu



Godavari - Krishna Mangroves, Andhra Pradesh



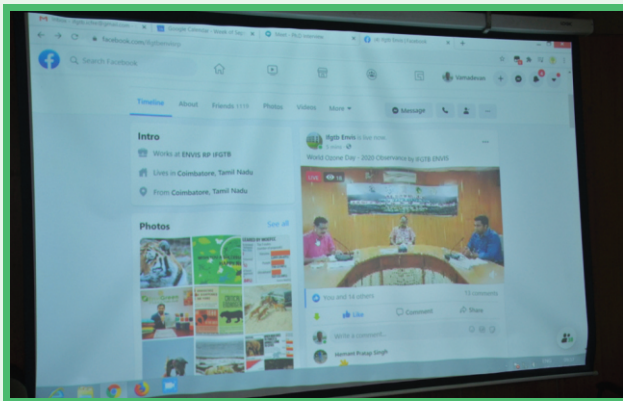
Baratang Island Mangroves, Andamans

Poster No. 05/IFGTB ENVIS - July 2020

World Ozone Day 2020 Celebrations by IFGTB ENVIS


The ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding, Coimbatore marked the World Ozone Day 2020 digitally by organizing an online awareness programme through Facebook live. An online awareness quiz on ozone was also organized for students and people from all walks of life, and about 1000 individuals took part in it. The event received the attention of the Honourable Minister of Environment, Forest and Climate Change Shri Prakash Javadekar.

The digital event began with an invocation on Nature in Sanskrit based on Yajur Veda by Dr Kannan CS Warriar, Scientist F and ENVIS Coordinator. During the introductory remarks, Kannan Warriar highlighted on the theme “Ozone for life: 35 years of ozone layer



protection". The Montreal Protocol has led to the phase-out of 99% of ozone-depleting chemicals in refrigerators, air-conditioners and many other products. Governments, scientists and industries worked together for it. As a result, the abundance of Ozone Depleting Substances in the atmosphere is declining and a recent study has indicated that the ozone layer is recovering. And it is predicted that the ozone hole shall vanish by 2060 if we follow the Montreal Protocol in the right sense, he added. India has been successfully implementing the phase out programme for the Ozone Depleting Substances in the country wherein the Chlorofluorocarbon, Carbon tetrachloride and Halons have been phased out. Dr Warriier explained that India is one of the first countries in the world to develop a comprehensive Cooling Action Plan (India Cooling Action Plan) that has a long-term vision to address the cooling requirement across sectors and list out actions which can help reduce the cooling demand. The Kigali Amendment to the Montreal Protocol, which came into force, in 2019, will work towards phasing down the hydrofluorocarbons also.

Dr C Kunhikannan, Director IFGTB while inaugurating the event spoke on impacts of ozone depleting substances. He explained the causes and effects of the ozone layer depletion due to various activities carried out by humans. He gave an insight into the importance of the ozone layer and the need to protect this fragile shield of gas which protects the Earth from the harmful ultraviolet radiations. The Director further urged all the citizens to actively take part in meeting the goal to eradicate all ozone depleting substances.

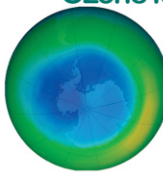


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International Day for the Preservation of the Ozone Layer

16th September 2020

Ozone for Life: 35 Years of Ozone Layer Protection

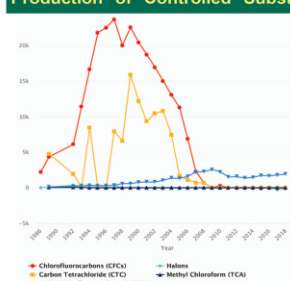


0 100 200 300 400 500 600 700
Total Ozone (Dobson units)

The latest false-color view of total ozone. The purple and blue colors are where there is the least ozone, and the yellows and reds are where there is more ozone

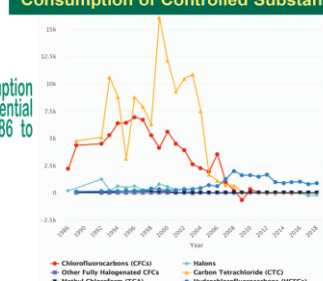
Without the Sun's heat and light, the Earth would be a lifeless ball of ice-coated rock. The ozone layer in the upper atmosphere (Stratosphere) is a natural layer of gas that protects humans and other living organisms from harmful ultraviolet (UV) radiation from the sun. The ozone layer seals out most harmful UV radiation from the sun and is therefore essential for life on earth.

Production of Controlled Substances



Production and consumption of Ozone Depletion Potential (ODP) in India from 1986 to 2018

Consumption of Controlled Substances



Source: UNEP

Tips to protect ozone layer

- Phase out ozone depleting refrigerants at the earliest
- Avoid cosmetics/sprays that release CFCs
- Reduce the usage of chemical fertilizers
- Avoid burning plastic and rubber products
- Practice recycling
- Use eco-friendly products

- Drive less
- Utilize public transport
- Adoption of hybrid and electric vehicles
- Conserve energy
- Plant more trees
- Adopt India Cooling Action Plan (ICAP)

"Earth without ozone is a house without a roof"
 Save nature, Save ozone layer else you may lie in n(O)zone

Poster No. 06/IFGTB ENVIS - September 2020

An awareness poster highlighting the theme was released during the occasion and its digital copies were shared with students and all the stakeholders. The Online event was also attended by the Officer Trainees of Central Academy for State Forest Service (CASFOS), Coimbatore. E- Certificates were awarded to all the participants of the online quiz programme. Dr S. Vigneswaran, Programme Officer, ENVIS proposed the vote of thanks. The event can be accessed at <https://bit.ly/35DxA8w>.

ICFRE Award of Excellence for Outstanding Research in Forestry



Dr Kannan CS Warriar, Scientist F at the Institute of Forest Genetics and Tree Breeding, Coimbatore has been conferred with the ICFRE Award of Excellence for Outstanding Research in Forestry for the year 2019. He has released three productive clones of *Casuarina equisetifolia* suitable for salt affected soils. The research has significance as about 6.73 million hectares of salt affected lands exist in India. These clones will also support the efforts of ICFRE which has been declared as the Centre of Excellence for addressing issues related to land degradation by the Honourable Prime Minister of India. He is also leading a tree improvement programme of *Thespesia populnea* to evolve crook free

varieties of this multipurpose tree species. Plus trees numbering 139 have been selected with straight stem form from south Indian States which otherwise grow in short twists and turns. Dr Kannan Warriar was also the recipient of the Rolla S Rao National Award by the Indian Association of Angiosperm Taxonomy for the best research work on biodiversity conservation. His extensive research on conservation of endangering sacred groves won him this award. His classical composition Prakruthi Vandanam, an invocation on nature, based on Yajur Veda, released for the Ministry of Environment Forest and Climate Change has been well received. Dr Kannan Warriar has composed music for the Official Theme Song of the Kerala Forests and Wildlife Department “Kadarivu” sung by the renowned playback singer P. Jayachandran. He is also functioning as the Coordinator of ENVIS Centre on Forest Genetic Resources and Tree Improvement.

IFGTB PRODUCTS



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 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 , ACTO, 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		
	Tissue Culture Teak Plants	Rs. 25.00 per plant		
2.	Windbreak Clones (WBC-1, WBC-2, WBC-3 & WBC-4)	Rs. 4 per plant		Dr. C. Buvaneshwaran , Scientist- F, Silviculture & Forest Management Division, Phone : 0422 2484198, 94422 45047 E-mail : buvanesc@icfre.org
3.	ArborEasy® DNA Isolation Kit	Price Rs.	Packaging & Transportation Rs.	Dr. Modhumita Dasgupta , Scientist-F, Division of Plant Biotechnology, Phone : 0422 2484123 E-mail : ghoshm@icfre.org gmodhumita@gmail.com
	Pack Size			
	10 Reactions	950.00	150.00	
	20 Reactions	1900.00	200.00	
	50 Reactions	4750.00	300.00	
4.	Soil Testing (pH, EC, OC, Micro and Macro Nutrients)	Rs. 2850.00		Dr. A.C. Surya Prabha , Scientist-C, Silviculture & Forest Management Division, Phone : 0422 2484150 E-mail : acsuryaprabha@icfre.org
5.	Phytosanitary Certificate	Rs.100.00 + Tax per application		Dr. John Prasanth Jacob , Scientist- G, Forest Protection Division, Phone : 0422 2484159 E-mail : jacob@icfre.org
Products of IFGTB: For Sale & Booking				
6.	Hy-ACT (Natural and Seed Oil Based Biopesticide)	Rs. 80.00 per bottle		Dr. N. Senthilkumar , Scientist-E & Head, Division of Chemistry & Bioprospecting, 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 , ACTO 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		

ABOUT IFGTB

Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore is a National Research Institute under the Indian Council of Forestry Research and Education. 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 ENVIS

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 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 ENVIS Newsletter issues! The ENVIS Resource Partner at 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 ENVIS Newsletter, Van Vigyan, a quarterly publication, publishes original research articles, reviews, reports, research highlights, news-scan etc., related to the thematic area of the ENVIS 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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