



ENVIS Newsletter Forest Genetic Resources & Tree Improvement

VAN VIGYAN

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



From the Director's Desk

This year's third quarter of ENVIS Newsletter brings to you information on the matchwood tree *Ailanthus excelsa*. It also details on new method of cultivation viz the Miyawaki. ENVIS successfully completed 02 Green Skill Development Programmers (GSDP) 1. Plant Tissue Culture Techniques & its Applications & 2. Forest Entomology and Pest Control during the quarter. Participants from all over the country participated enthusiastically and are now in different stages of taking up entrepreneurship activities. Bidding good bye to another fruitful year and looking forward to many more achievements in the New Year.

Dr S. Murugesan
Director, IFGTB

In this issue

1. Know Your Trees - *Ailanthus excelsa*. Roxb
2. Akira Miyawaki Method of Cultivation
3. ENVIS Activities
4. IFGTB Products

Know Your Trees - *Ailanthus excelsa*. Roxb

Taxonomic classification

Kingdom	:	Plantae
Phylum	:	Tracheophyta
Class	:	Magnoliopsida
Order	:	Sapindales
Family	:	Simaroubaceae
Genus	:	<i>Ailanthus</i>
Species	:	<i>Ailanthus excelsa</i> Roxb

Introduction

Ailanthus excelsa. Roxb is a fast growing, multi-purpose tree species belonging to the family Simaroubaceae. The name '*Ailanthus*' comes from 'ailanthos' tree of heaven. It is native to central, western and southern India and Sri Lanka and is widely cultivated in semi-arid and subtropical areas. It introduced to several countries particularly in Sudan for its timber. Commonly found in mixed deciduous forests and some Sal forests, it is rare in moist areas with high monsoons. *A. excelsa* is associated with salt – tolerant species *Acacia catechu*, *A. leucophloea* and *Azadirachta indica*.

It is a large deciduous tree, 18 - 25 m height with straight trunk girth and girth of 2.5 m with cylindrical bole. The species has been found suitable for planting in dry areas with annual rainfall of about 400 mm. It grow well in the altitude from 0 to 900m, mean annual rainfall 500 – 2500 mm, mean annual temperature between 0°C and 45°C. It grows in broad range of soil types including sandy soils and adapts to drought stress and tolerates a dry season of 4-6 months. It avoids clayey soils with poor drainage



and water logged areas (Kumar *et al.*, 2010). This species is preferred by farmers, forest departments, match industry, plywood industries and other stakeholders due to fast growth, multi-utility and high economic returns.

Botanical description

Branches are thick and spreading with a massive spreading crown. The bark is greenish or gray or light gray-brown in colour, bark smooth in young trees while rough in old trees due to large conspicuous leaf scars. Leaves alternate, pinnately compound, large, 30-more than 60 cm length, leaflets 8-14 or more pairs, 10-15 cm long alternate or subopposite, coarsely and irregularly serrate, oblique at base; petioles 5-8 cm long, long stalked, ovate or broadly lanced shaped from very unequal base, wide, often curved, long pointed, hairy gland, edges coarsely toothed and often lobed. Flower cluster lobed at leaf base, shorter than leaves, much branched, flowers many, mostly male and females on different trees, shorter stalked, greenish – yellow, calyx 5 lobed, 5 narrow petals spreading 6 mm across, stamen 10, on other flowers, 2-5

separate pistils, each with elliptical ovary, 1 ovule and slender type. Fruit, a 1 seeded samara, lanced shaped, flat, pointed at ends, 5 cm long, 1 cm wide, copper red, strongly veined, twisted at the base.

It is cultivated as an avenue tree for its deep shade and can be used for anti-erosion purposes. It thrives best on porous loamy soil. The tree can be raised from both seed and stumps. Its quick growth and absolute immunity to grazing gives the species first choice among soft woods (Anonymous, 1956). The leaves are rated as highly palatable and nutritious fodder for sheep and goats and an average tree yields about 500-700kgs of green leaves twice a year. The wood is yellowish white colour and suited for cabinet making (Bhandari and Gupta, 1972). The tree is easily broken by wind due to the brittleness of the stem and branches.

Reproductive biology and breeding system

The leaves are shed during winter and new leaves appear in March-April. Flowering is during February – March in Central India and in the month of April in Northern parts. January – March in South India. The flowers appear in large open clusters among the leaves towards the end of the interval. Male, female and bisexual flowers are produced on the same or in separate trees. Flowers are pollinated by insects and wind. The fruits ripen just before the onset of southwest monsoon. The seeds are very light and dispersed far and wide by the wind.

Fruit collection and processing

The fruits are formed soon after flowering. The fruits ripen in May-June, just before the

onset of south west monsoon. The seeds are very light and winged and are dispersed far and wide by wind. Since the seeds are light weight, the fruit bunches at the end of the branches should be cut with long-handled tools as soon as they show signs of ripening. The seeds are dried on clean floor so as to prevent seeds from being blown



away by winds. The seeds are then separated and stored in sealed air tight tins after being thoroughly dried. The seeds should be used in the same year as they cannot stand storage till the second year. The seed loses viability fast but under proper storage conditions they can remain viable for up to 8 months otherwise the normal viability is 4-5 months. The number of seeds in one kg is about 8000-10,000.



Germination

A. excelsa is propagated by both seeds and vegetative methods. Seeds are sown directly in root trainer or poly bags or in raised mother beds measuring 0.6 m in height, filled with sand up to a height of 0.5 m. Seeds are closely placed in the bed in rows with a gap of 5 cm. The seed sown beds are to be watered twice a day. Excess water will lead to damping off disease in seedlings.

The germination is epigeal and starts 8-14 days after sowing and is complete in 40-45 days. No pre treatment is required. The germination percentage is nearly 60-70% after 3 weeks 5-10 cm long they can be transplanted into 10 X 20 cm containers (Poly bags). The roots are very delicate and fragile and require special attention



during transplantation. From one kg of seeds about 1500 healthy seedlings can be obtained. 15 gm of seeds are required for sowing 1 sq. m of bed. Mixing of seeds with ash or pulverized soil ensures uniform sowing. One to two month old seedlings from mother beds are pricked out into plastic container for 3-5 months they become ready for planting.

Vegetative propagation

The method of vegetative propagation adopted for *A. excelsa* is branch cuttings and coppice shoot cuttings. Age is the deterrent factor on rooting. Most of the young trees show



good rooting. Particularly the trees upto four years showed good rooting percentage. When the trees are left to grow long enough to prove their genetic worth, it is difficult to clone them.





Cuttings are collected from lower and outer portion of the canopy from healthy vigorous branches measuring 2 cm in diameter and 25 cm length. Good rooting response can be seen only in the month of October and November. In *A. excelsa* around 30% of rooting response can be seen only in IBA 2000 ppm.

Planting techniques and post planting operations

A. excelsa prefers sandy and porous soils. It also establishes well on slopes and stony patches under suitable moisture conditions. Too moist or water logged areas or area prone to frost should not be selected. After selecting the site, plough the field 2 to 4 times at a depth of 50-60 cm with tractor drawn disc ploughs in order to make the soil a fine tilth.

Planting

A. excelsa 6-8 months old seedlings / cuttings can be planted as block planting, row planting, line planting and mixed plantations for planting size of pits 30 cm³ or 45 cm³ with a basal application of FYM and NPK. Usually planting will be carried out in the month of July or October based on the monsoon pattern in the region.

Initial watering is enough for *A. excelsa*, regular watering produce better growth and development.

Pruning

Pruning is an important practice in the cultivation of *A. excelsa*. Pruning decides the growth, clear bole and intercropping ability. Removal of side branches, dead and insect affected shoots should be done once in six months. Regular removal of epicormic shoots is mandatory for better growth and development.



Thinning

Thinning is generally required under block planting. The first silvicultural thinning may be carried out in the third or the fourth year when



the tree attains a height of 6-8 m. Fencing is also needed in areas where goat and sheep browse it.

Insects-pests and disease management

Atteva fabriella, *Batocera rufomaculata*, *Atteva niveigutta*, and *Eligma narcissus* defoliate *A. excelsa* seedlings or saplings in nursery stage. In *A. excelsa* plantation, wilt disease caused by the fungi of *Verticillium albo-atrum*, *Eligma narcissus* is a serious pest in young plantations as well as nurseries. *Atteva fabriella* is a serious pest causing severe defoliation in young plantation and nursery of *A. excelsa*. Introducing predators, parasitoids and bio control agent to manage the pest and diseases are the biological means of pest control. Chemical control involves application of systematic insecticide and fungicide (Chatterjee, *et al.*, 1959; Verma, 1986).

- A. excelsa* + Barley
- A. excelsa* + Mustard
- A. excelsa* + Banana+onion
- A. excelsa* + Groundnut



Onion + Banana + *A. excelsa*



Cassia angustifolia + *A. excelsa*



Banana + *A. excelsa*



Agroforestry practices

Growing of *A. excelsa* in agroforestry model is commercially practiced in several regions of India. Some of the popular agroforestry models practiced in the country is

- A. excelsa* + Wheat
- A. excelsa* + Millet

A. excelsa + Pulses

A. excelsa + Maize

Farm forestry of *A. excelsa* is more popular among farmers. Tikka *et al.* (2003) reported that the architecture of the tree makes it suitable for Agri-silvi production and indicated higher monetary returns from sole crops in comparison to Agri-silvi production.

Rotation period

There is no specific period for harvesting the tree but the crop rotation period suitable for *A. excelsa* is 20 years. Six to eight years trees are used for safety matches splints. The safety match requirements are as follows,

- ❖ Branches with 20 cm and grown up tree are utilized for safety matches production.
- ❖ Tree need to be saw slantingly ½ feet above the ground. It allows the tree for coppicing and second harvest.
- ❖ Within three days of harvest the tree has to reach the industry in order to avoid the weights lose. The harvested material

should reach the industry within 15 days, delay will lead to change in colour and misfits for the industry.

Growth and Yield

A. excelsa attains a diameter of 20 cm or more at age of 20 years. In Tamil Nadu, about 50-75 tons/ha at a rotation of 5-6 years was realized through seed based raised plantations in un-irrigated conditions. But irrigated conditions the yield rose to 120-135 tons/ ha in 5-6 years rotations. Lopping of the trees is started from the 4th year onwards but lopping after 7 years resulted in better fodder yield. For leaf fodder, complete crown lopping is done twice or thrice a year. Mostly lopping is done during November - January and May - July. Consequently these are the peak months of the availability of *A. excelsa* leaves in the market. During February – April, fodder availability is less due to shedding of old leaves and flowering and fruiting seasons. The branches can be used as small timber and should be cut after rainy season from well-grown trees. It is estimated that an average tree gives about 100, 200 and >400kg green leaf fodder per year at the age of 5, 10 and >20 years respectively.

Year (Rotation)	Rain fed				Irrigated				
	No of trees / ha	Wood yield (Tons)	Sale price / t	Income (Rs)	Year (Rotn)	No of trees / ha	Wood yield (Tons)	Sale price / t	Income (Rs)
6	997	80	5500	4.4 lakhs	6	1055	126	5500	6.93 lakhs

Tree Improvement

Tree improvement programme of *A. excelsa* program was initiated in Institute of Forest Genetics and Tree Breeding to carried out intensive survey in Southern India. Around 100 Candidate Plus Trees (CPTs) were selected based on growth superiority *via.*, total tree height, clear bole height, girth at breast height, pest and disease resistance. List of few selected trees given below.

S. No	Location	Latitude	Longitude	Height (m)	Girth (cm)	Elevation (m)
1	Sivagiri	9°22'29.45	77°22'39.93	13.8	80	737
2	Trichy	10°55'35.10	78°28'43.71	14	221	687
3	Varusanadu	9°39'30.78	77°25'15.08	16	136	678
4	Lower camp	9°41'56.98	77°27'03.33	25.5	185	580
5	Salem	11°45'13.28	78°08'04.91	35	305	250
6	Vellore	12°43'26.22	78°40'06.051	8	120	528
7	Krishnagiri	12°56'19.27	78°54'30.80	16	260	427
8	Siruvani	10°57'36.41	76°41'22.41	23.5	283	528
9	Idikarai	11°07'19.56	76°57'29.15	13.5	72	430

Seeds were collected from selected CPTs and progeny trials were established at Kurumbapatti, Salem and Neyveli with randomized block design with a spacing of 3x3 m. biometric characteristics were recorded for evaluating the growth performance of progenies. Standardized silvicultural techniques were also established for commercial cultivation of *A. excelsa* in farmland.

Uses

The wood of *A. excelsa* is traditionally used for manufacture of safety matches, pencils, boat, paper and packing cases. The wood contains cellulose, penta cellulose, lignin and ash content so it is suitable for paper making industries. A mature tree of *A. excelsa* yield 600-700kg of green leaves; it is used as a fodder for goat, sheep and cow. *A. excelsa* leaves contain protein, fat, fiber, carbohydrates, metal salts, calcium and phosphorus. Leaves used for traditional



Wood density and other properties of *A. excelsa*

Physical properties	Units	Mechanical properties	Units
Green seasoning condition		Green seasoning condition	
Specific gravity	0.307	Static Bending	
		MOR (kg/sq.cm)	276
Weight (Kg/cu m)	908	MOE (kg/sq.cm)	42.8
Shrinkage % Rain	3.8	Impact Bending	
		Max Ht. of Drop (cm)	54
Temp	4.0	Compression	
		Parallel to grain (kg/sq.cm)	121
		Perpendicular to grain (kg/sq.cm)	28
Weight (Kg/cu m)	364	Hardness	
		Side (Kg)	185
		End (Kg)	202
		Shear Parallel to grain (Kg/sq.cm)	38.6
		Tension perpendicular to grain (Kg/sq.cm)	26.6
Dry seasoning condition		Dry seasoning condition	
Specific gravity	0.325	Static Bending	
		MOR (kg/sq.cm)	407
Weight (Kg/cu m)	364	MOE (kg/sq.cm)	53.7
		Impact Bending	
		Max Ht. of Drop (cm)	33
		Compression	
		Parallel to grain (kg/sq.cm)	208
		Perpendicular to grain (kg/sq.cm)	45
		Hardness	
		Side (Kg)	225
		End (Kg)	264
		Shear Parallel to grain (Kg/sq.cm)	54.6
		Tension perpendicular to grain (Kg/sq.cm)	21.8

medicine. *A. excelsa* flowers contain huge amount of nectar so bees collect the nectar when the floral visit. Bark and root of *A. excelsa* used as a traditional medicine for to cure Asthma, cold and also used for abortion.

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Institute of Forest Genetics and Tree Breeding,
Coimbatore - 641 002.

AKIRA MIYAWAKI METHOD OF CULTIVATION

An unique method of plantation to restore native forests for environmental protection, as a water retention resource and to protect against natural hazards by **Akira Miyawaki** Japanese botanist, an expert in study of Natural forest and Restoration of Natural Vegetation by using traditional principles. He chose various native species of trees that he tested on the substrate to be afforested, created a nursery where plants were mixed and then planted on the site. He implemented and recommended unusually dense plantation of very young seedlings. The Density is to stir competition between species and the onset of Phytosociological relations close to what would happen in Natural Forests (30 to 50 plants per sq/m).

Benefits of the Miyawaki Method

- ❖ The effectiveness of the Miyawaki method reflects in how this 'potential natural vegetation' concept, regardless of soil and climatic conditions.
- ❖ The method allows you to create a forest space within a short period of 20 to 30 years. In comparison, a conventional forest can take anywhere up to 200 to 300 years to develop.
- ❖ Also, the forests grown using Miyawaki technique grow 10 times faster and 30 times denser.

- ❖ When compared to monoculture plantation, this method has 30 times greener surface area, 30 times better carbon dioxide absorption capacity and 30 times better to noise and dust reduction.
- ❖ Another benefit of the method is that a Miyawaki forest, after two years of plantation, becomes a self-sufficient and does not rely on any external maintenance.
- ❖ These types of dense forests not only help to retain groundwater, recharge groundwater tables and support local biodiversity but also increase green cover and curb air pollution.

Miyawaki Method in Tamil Nadu

Thuvakkam, an NGO has introduced Miyawaki method and customised it for the Chennai conditions. By promoting natural vegetation on land destroyed by natural calamities and man-induced mistakes, this method manages to raise mini forests along the coastline areas.

As a side benefit, these forests serve as a natural bulwark against soil erosion and Tsunami. As Chennai has had a bitter taste of Tsunami, it would do well replicate this model. The trees grow faster too and are free of chemicals and fertilisers.

Miyawaki Method in Coimbatore

This method was introduced by “Siruthuli”, an NGO in various places of Coimbatore District. In the year 2015-16 Coimbatore forest division implemented this method under Massive Tree Planting Programme in Vellalore Dumping yard by joining hands with Rapid Action Force Battalion, Mahalingapuram, Coimbatore city corporation, Coimbatore city police, various NGO's and leading Corporate Banks in Coimbatore.

Miyawaki Method is followed worldwide as this method could offer a quicker and more effective reforestation approach adopting naturalistic theoretical principles, which has the additional challenge of a seasonal climate.



ENVIS ACTIVITIES

Wildlife Week Celebration



The ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at IFGTB organized Wildlife Week Celebration on 04th October, 2019. The programme began with an invocation in Sanskrit on the significance of conservation of nature and natural resources by Dr Kannan CS Warriar. Dr S. Murugesan, Director, IFGTB inaugurated the programme. During his inaugural address, he highlighted on the significance of wildlife week celebration. Dr B. Nagarajan, Scientist G shared his experience in the management of captive elephants. Coordinator ENVIS elaborated on the ecological, cultural, investigatory, recreational, agricultural and economic importance of wildlife. Awareness posters and handouts depicting the significance of conservation of wildlife and forest genetic resources were released and distributed to children of various schools and colleges in and around Coimbatore. Short films on the theme were also screened. Dr S. Vigneswaran, Programme Officer ENVIS proposed the vote of thanks.

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OBSERVANCE OF WILDLIFE WEEK
 OCTOBER 2 - 8, 2019

SIGNIFICANCE OF WILDLIFE AND CONSERVATION OF FOREST GENETIC RESOURCES

Wildlife: Wildlife includes both animals and plants living free in nature.

Forest Genetic Resources (FGR): FGR refers to the heritable materials that are of actual or potential economic, scientific or social value.

"The importance of Forest Resources cannot be underestimated"

Observance of Wildlife Week:

- To create awareness among people on the conservation and protection of the wildlife.
- To focus the people's attention towards the importance of conservation of forest genetic resources.
- To implement better services to preserve the wildlife.
- To plant more trees to make the planet cool.
- To ensure sustainability of ecosystem services.

WHY TO CONSERVE WILDLIFE AND FOREST GENETIC RESOURCES ?

Ecological importance: Wildlife helps in maintaining the balance of nature.

As a gene bank: Stores and conserve the plant genetic resources of major crop plants and their wild relatives.

Plant propagation: Pollinators in most plant species are attracted by their, taste and aspects that help in propagation.

Economic importance: Wildlife tourism fetches money.

Cleaning of environment: Some species of birds, insects and other animals, such as vultures, scavenging birds, foxes, shrews, chipmunks, etc., help in cleaning the environment.

Cultural importance: Forests play a vital role in the life and culture of people around the world. The diversity and abundance of trees has a strong psychological and social character in most human cultures.

Recreational and aesthetic value: Forests provide an environment where it is possible to make firm choices of modern life and connect with nature.

CRITICALLY ENDANGERED ANIMALS IN INDIA

IMPACTFUL CRITICALLY ENDANGERED/ENDANGERED/VULNERABLE/THREATENED TREES IN INDIA

1. Archbold's Woodpecker
2. Amur Leopard
3. Dalbergia latifolia
4. New Holland Parakeet
5. Rhynchospora stricta
6. Sandalwood
7. Singapore Parakeet
8. Tawny Woodpecker
9. White-bellied Woodpecker

Green Deepavali at IFGTB 2019

ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at IFGTB, Coimbatore organized an awareness programme to spread the message on celebration of Green Deepavali. Dr S. Murugesan, Director inaugurated the programme. Dr Kannan CS Warriar, Scientist F and Coordinator ENVIS spoke on Air Quality Index (AQI) and the ill effects of busting crackers during the festival as the AQI reaches to Severe Plus Category. Green Greetings on Green Deepavali Celebrations containing information on its need and the tips for celebrating the festival in a green way was released by the Director and was sent by email to all the members of IFGTB family, farmers and students in the ENVIS mailing list. Saplings of indigenous tree species including *Thespesia populnea*, *Neolamarckia cadamba*, *Ficus benghalensis*, *Gyrocarpus asiaticus* and *Syzygium cumini* were planted in the Institute premises by all the members of IFGTB family.



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Green Deepavali Wishes from IFGTB ENVIS

2019

Why Clean and Green Deepavali?

- Firecrackers contain chemicals including heavy metals that are toxic to humans and animals.
- During Deepavali celebrations the Air Quality Index (AQI) rises to "Severe Plus Category" due to pollution.
- No Deepavali bonfire in winter season, the atmosphere around this time is moist. The smoke released by the crackers gets trapped in the mist and this affects the environment severely.
- The noise from the firecrackers disturbs wildlife, birds, dogs, cats, babies and toddlers around.

TIPS for Celebrating Green Deepavali:

- Avoid electric lights to illuminate your home. Instead, opt for earthen lamps or candles.
- Use eco-friendly gifts and decorating items.
- Limit usage of fireworks that emit poisonous smoke and noise.
- Report to green crackers approved by GSI.
- Dispose off waste properly after celebrations.

Observance of World Soil Day

The ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at IFGTB observed World Soil Day 2019 on 05th December, 2019. The programme began with an invocation in Sanskrit on the significance of conservation of nature and natural resources by Dr Kannan C.S. Warriar, Scientist F & Coordinator ENVIS. He welcomed the gathering and gave an overview on the theme of the World Soil Day 2019 prescribed by the FAO “Stop Soil Erosion, Save Our Future”. Dr R. Yasodha, Scientist G and Director in-charge, IFGTB in her special address emphasized the importance of conservation and management of the soil resources in the country. Dr K.K. Krishnamurthi, Chairman Indian Society for Certification of Organic Products (ISCOP), Krishnamurthi International Agriculture Development Foundation and former Dean, Tamil Nadu Agricultural University (TNAU), Coimbatore graced the function as Chief Guest and presented a lead lecture on the significance of soil conservation and how unsustainable agricultural practices and developmental activities deteriorate the various soil properties. An awareness poster highlighting the theme was released during the occasion. Awareness poster and handouts were distributed among school and college students. Soft copies of them were also sent to all in the mailing list and Whats App broadcast of IFGTB ENVIS. Dr S. Vigneswaran, Programme Officer ENVIS proposed the vote of thanks. The details on the observance of World Soil Day 2019 by IFGTB ENVIS have found a place in the FAO website.



Green Skill Development Programme (GSDP) on “Plant Tissue Culture Techniques & its Applications”



A Green Skill Development Programme (GSDP) on “Plant Tissue Culture Techniques and its Applications” (level-6) was conducted for a period of 40 working days (320 hours) from 04th November to 31st December 2019 by the ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at the Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore. Dr R. Yasodha, Scientist G and Head, Plant Bio-technology and Cytogenetics Division inaugurated the training programme. Field visits to various leading tissue culture laboratories

were organized to the trainees to provide an insight on recent techniques and applications in tissue culture. An eco tour to Sadivayal Forest Area, Western Ghats Region in collaboration with Tamil Nadu Forest Department was also organized on the occasion of International Mountain Day 2019. The Valedictory function of the certificate was held on 31.12.2019. Dr S. Murugesan, Director presented the certificates to the 15 participants from Tamil Nadu, Kerala, Puducherry and Uttar Pradesh who successfully completed the course and wished all success in their future endeavors.

Green Skill Development Programme (GSDP) on Forest Entomology and Pest Control

A Green Skill Development Programme (GSDP) on “Forest Entomology and Pest Control” (level-6) was organized for 27 working days (216 hours) from 22nd November to 23rd December 2019 by the ENVIS Resource Partner on Forest Genetic Resources and Tree Improvement at IFGTB, Coimbatore. The training programme was inaugurated by Dr S Murugesan, Director, IFGTB. Field visit to Kerala Forest Research Institute Teak museum at Nilambur, Horticulture Department (Rose Garden) Ooty, the Bee Park at apiary wing of TNAU, Corcyra lab at TNAU, District Sericulture Centre, Coimbatore, Green Life Bio-tech Lab, Somanur, near Coimbatore were imparted to the trainees of GSDP were taken to. An eco tour to Sadivayal Forest Area, Western Ghats Region in collaboration with Tamil Nadu Forest Department was also organized on the occasion of IMD 2019. The valedictory function of the Certificate Course on “Forest Entomology and Pest Control” was held on 23.12.2019. 13 participants from various parts of the country successfully completed the training. Dr S. Murugesan, Director distributed the course completion certificates to the participants and wished all success in their future endeavors.



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 : senthilnk@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		
	Tree Rich Biobooster (Instant Organic potting mixture for home garden, terrace and kitchen garden)	Rs. 50.00 per packet		(or)
	Tara Red Jam (with natural fruit colorant)	Rs. 60.00 per bottle		Smt. R. Sumathi , ACTO Division of Chemistry & Bioprospecting, Phone : 0422 2484144 Mobile : 9942245542 E-mail : sumathir@icfre.org

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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Views expressed in this newsletter are not necessarily those of the Editors or of the Institute of Forest Genetics and Tree Breeding