

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 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.

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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.



ISSN : 2394-7543

EIACP Newsletter Forest Genetic Resources & Tree Improvement

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

- Volume 11 Number 2
- A Quarterly Issue
- July to September 2024

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From the Director's Desk

It gives me great pleasure to present this edition of our newsletter, where we continue our commitment to fostering awareness and knowledge exchange in the realm of tree improvement and forest genetic resources (FGRs). Our goal is to serve as a bridge connecting researchers, students, forest departments, and industry stakeholders, enabling collaborative efforts for the sustainable management of our valuable forest resources.

One of the species we highlight in this issue is *Strychnos nux-vomica*, a medicinally significant tree known for its alkaloid-rich seeds and bark. While its toxic properties are well documented, its controlled and scientific use in pharmaceuticals and traditional medicine showcases its importance. Conservation and sustainable utilization of such species

are crucial, and research efforts in tree improvement strategies can play a vital role in enhancing its benefits while ensuring ecological balance.

The ENVIS RP at IFGTB actively engages with school and college students through tree planting programs and awareness talks. These activities emphasize the importance of trees and the ecological services they provide. We firmly believe that fostering environmental consciousness in young minds will lead to a more sustainable future.

We encourage all our readers to actively participate, contribute, and stay connected with our efforts to enhance forest conservation and tree breeding programs. Let us work together towards a greener and more sustainable tomorrow.

Dr C. Kunhikannan
Director, ICFRE - IFGTB

Know your trees – *Strychnos nux-vomica* Linn.

Introduction

Strychnos nux-vomica Linn. (Family: Loganiaceae), commonly known as nux vomica or poison nut, is widely recognized for its medicinal and pesticidal properties and has diverse therapeutic and clinical applications. It is referred to by various names, such as English nux-vomica or poison nut tree, "Kucchla" in Hindi, "Vishmushti" in Sanskrit, "Kuchilas" in Bengali, "Kajra" in Marathi, "Mushidi" in Telugu, "Kancirai" in Tamil, and "Kuchila" in Odia. Of approximately 200 species in the *Strychnos* genus, 75 are found in Africa, 70–73 in Central and South America, and around 44–45 in Asia. In



South India and the Andaman Islands, five species of this genus are found (Hill, 1917). Several species within this genus, such as *Strychnos colubrina*, *S. potatorum*, and *Strychnos nux-blanda*, are classified as endangered (Kumar and Sharma, 2014). The plant is commercially cultivated the United States, European Union, Fujian, Guangdong, Guangxi, Hainan, North Australia, Taiwan, and throughout tropical Asia (Rai *et al.*, 2020). Different parts of the plant, especially the seeds and bark, are used in traditional and folk medicines across various cultures. However, it is highly toxic to humans and most domestic animals due to the presence of potent alkaloids like strychnine. Despite its toxicity, in small doses, *S. nux-vomica* has been used in traditional Indian medicinal systems (Ayurveda, Unani, and Homeopathy) as well as Chinese medicine for its clinical benefits (Prasad *et al.*, 2012).

Distribution and habitat

S. nux-vomica is primarily found in tropical and subtropical regions and thrives in a variety of forest types, including evergreen, semi-evergreen, and deciduous forests (Behera *et al.*, 2017; Kanta *et al.*, 2017). The plant grows at altitudes of around 360 m and can tolerate a broad temperature range, with a maximum of 35–45°C and a minimum of 4–18°C. It requires an annual rainfall between 750 and 3750 mm for healthy growth.

The preferred soil types for *S. nux-vomica* include loamy, sandy loam, lateritic, and clayey loam soils (Behera *et al.*, 2017). These conditions support the plant's growth in diverse

habitats such as the tropical forests of South Asia and subtropical regions with adequate moisture.

Geographically, *S. nux-vomica* is distributed across India, Northern America, Sri Lanka, and Southeast Asia. In India, it is commonly found in the Himalayan regions, central India, and other tropical and subtropical areas (Sivaraman *et al.*, 2014). Its habitat extends to regions like Cambodia, Vietnam, Thailand, Laos, and Myanmar, as well as parts of southern China and Australia (Arivoli *et al.*, 2012). Its ability to grow in varied ecosystems highlights its adaptability, particularly in regions with humid conditions and sufficient rainfall.

Botanical description



S. nux-vomica can grow up to 15 m in height and is distinguished by yellow to gray twigs, with no lenticels observed. The petioles range from 5 to 17 mm and are generally glabrous, though some plants may have sparsely tomentose petioles. The leaves are broadly ovate, with an elliptic to orbicular lamina measuring 4.9–15 cm by 2.3–12 cm. The base is acute to rounded or sub cordate, and the apex is blunt to acuminate, often micro nucleate. The texture of the leaves is thinly chartaceous or glabrous, and some may be sparsely tomentose. The lower nerves (3–5) are plinerved, and the midrib is slightly sunken to flat on the upper surface and rounded below (Jayaweera, 1982). The inflorescence is terminal or found at the ends of small side branches, measuring between 3 and 5.5 cm. It ranges from fairly lax to dense in flower distribution. The peduncle is 1–3 cm long, and the pedicels are longer than 2.5 mm. The calyx is 1.5–2.2 mm, with narrow ovate to lanceolate sepals. The corolla is green to white, ranging from 9.4 to 13.6 mm in length. Stamens are sessile, with anthers that measure 1.5–2 mm long. The ovary and style range from 8.1 to 13 mm in length. The fruit is 5–8 cm in diameter, turning red to orange when ripe, and the seeds are irregularly ellipsoid, measuring 1.5–2.2 cm in length and 5–15 mm in thickness (Van Wyk and Wink, 2015).





Reproductive biology and breeding system

In *S. nux-vomica*, leaf fall predominantly occurs during the cold season, typically in December and January. By early February, the tree begins to produce new shiny leaves, marking the onset of the summer season. Flowering follows soon after, with the initiation of blooming occurring around the first week of February. The flowering period extends through March, ending by late April, with the peak blooming period lasting for about 30 days, typically between mid-February and mid-March (Chaubey and Krishnamurthy, 2015).

The flowers open during the evening hours, usually between 4:00 and 6:30 PM, and the anthers dehisce about 30 minutes after anthesis. Flowering continues for approximately two to three weeks from the time of the first bloom. However, heavy flower drop is common, and the fruit set percentage is largely dependent on the frequency of insect pollinator visits. On average, only 25–30% of the flowers result in fruit set (Kumar *et al.*, 1990).

Young fruit drop is often observed during extended dry periods, which can significantly affect fruit retention. The fruits take about 10 to 11 months to mature, turning orange-red when ripe. Each fruit typically contains 1–5 seeds, with



3–4 seeds being the most common (Kumar and Datta, 1989).

Fruit collection and processing

Mature fruits of *S. nux-vomica* are collected manually, and the seeds are extracted from the fleshy pericarp. After extraction, the seeds undergo thorough cleaning, drying, and sorting processes. Approximately 750–800 seeds weigh one kilogram, and they are classified as orthodox and mesobiotic, which means they are desiccation-tolerant. The seeds are washed thoroughly and shade-dried until they reach around 10% moisture content, ensuring optimal preservation. Following the drying process, the seeds are graded by size, discarding lightweight seeds and those that float on water to maintain

high quality. Importantly, storage conditions do not significantly impact the total alkaloid content, especially the levels of strychnine and brucine, which are crucial for their medicinal applications (Punkambekar, 1947).

Once processed, the mature seeds can be stored in gunny bags at ambient temperatures for extended periods, which allows for easy access during the preparation of tinctures or other medicinal formulations. They can maintain their viability for up to 30 weeks when stored under appropriate conditions (Sivakumar *et al.*, 2006).

Germination

S. nux-vomica seeds exhibit physiological dormancy, resulting in slow and erratic



germination. Freshly harvested seeds typically show only around 10% germination. Dormancy can be broken by storing seeds with 10% moisture content at ambient temperature for 30 weeks, or by treating them with growth hormones like gibberellic acid (GA3) or indole butyric acid (IBA). Seed germination can be improved up to 32% by soaking them in 500 ppm of Gibberellic Acid (GA3) for 24 hours, incubating seeds at 40°C for three days, or using alternate cycles of water soaking (16 hours) and drying (8 hours) over a period of 14 days. After-ripened seeds can achieve up to 92% germination (Chaubey and Krishnamurthy, 2015). Seedling growth is initially slow but can be enhanced by planting them in medium-sized polythene bags containing a potting mixture of farmyard manure (FYM), soil, and sand in a ratio of 1:1:1 (Chaubey and Krishnamurthy, 2015).

Vegetative propagation

Macro-propagation of *S. nux-vomica* can be successfully achieved through cuttings and root suckers, though success rates vary. Semi-hardwood cuttings are typically prepared in early summer, and they are treated with rooting hormones such as indole-3-butyric acid (IBA) or Naphthalene Acetic Acid (NAA) before being placed under moist, controlled conditions to encourage root development. Despite these



treatments, the rooting success rate remains relatively low, often less than 25% (Anonymous, 2008; Somashekhar and Sharma, 2002).

An alternative propagation method is the use of root suckers, which naturally arise from the base of the mother plant. These root suckers can be pricked out carefully and transplanted into polybags for further growth. This method has proven to be more reliable compared to cuttings, as the suckers already possess a root system that increases their chances of survival. Once established in polybags, the suckers can be transplanted to their final location (Anonymous, 2008; Somashekhar and Sharma, 2002).

***In vitro* propagation**

Micropropagation, or clonal propagation, of *S. nux-vomica* can be effectively achieved through shoot proliferation and hypocotyl culture using suitable media. For shoot proliferation, nodal explants taken from healthy, mature trees are cultured on Murashige and Skoog (MS) medium with various growth regulators. Indole-3-Acetic Acid (IAA) at 5 µM and Naphthalene Acetic Acid (NAA) at 10 µM have been found to be the most effective regulators, promoting both shoot and root formation in the cultured explants (Kumar, 1990).

In hypocotyl culture, seeds are first germinated on MS medium supplemented with 1000 ppm Gibberellic Acid (GA3) in dark conditions to enhance germination. Hypocotyl segments, about 3 mm in size, are then cultured in MS medium with various additives and maintained at 25±1°C with 16 hours of illumination under fluorescent light. Kinetin has been shown to be the most suitable growth regulator for inducing shoot formation, while NAA has been identified



as the best regulator for promoting root formation (Kumar and Datta, 1989).

Insect pests and diseases

S. nux-vomica is generally considered to be free from significant pest and disease issues. However, in a few instances, leaf spot disease caused by *Colletotrichum gloeosporioides* has been reported. The initial symptoms of this disease include the appearance of small, greyish-brown spots on the leaves. These spots can eventually enlarge and coalesce, leading to the development of necrotic areas, which may weaken the plant if not managed properly (Singh *et al.*, 2020). To control leaf spot disease, preventive measures such as proper spacing to ensure good air circulation, removal of infected plant parts, and the application of fungicides like copper oxychloride can be effective (Patel and Desai, 2019). Additionally, adopting crop rotation practices and avoiding water logging around the plants can reduce the occurrence of this disease (Sharma *et al.*, 2018). In areas where the disease is prevalent, early intervention is key to preventing its spread and ensuring healthy plant growth.

Planting techniques and post planting operation

S. nux-vomica is a light-demanding plant that

thrives in open field conditions, requiring full sunlight for optimal growth. Before planting, the soil must be deeply ploughed until it achieves a fine tilth and is free of weeds. Planting is carried out in pits, with a recommended pit size of 45 x 45 x 45 cm. The spacing should be 5 x 5 m (400 plants per hectare) or 6 x 6 m (278 plants per hectare), depending on rainfall and soil fertility (Singh and Sharma, 2015). These pits are filled with a mixture of soil, 20 kg of well-decomposed cow dung or compost, and a basal dose of fertilizer, typically 50 g of Diammonium Phosphate (DAP), to enhance initial plant growth (Kumar *et al.*, 2018). Container-raised seedlings, typically one year old, are best planted in May or June (Patel *et al.*, 2016). Although *S. nux-vomica* is drought-hardy, irrigation at 7–10-day intervals during the initial years helps boost seedling height and overall growth. A well-decomposed cow dung or compost mixture, at a rate of 20 kg per pit, should be incorporated into the soil at the time of planting (Sharma *et al.*, 2013). To promote robust canopy growth, applying 15–20 kg of well-decomposed farmyard manure (FYM) per plant per year, split into two doses, is recommended for plants aged 2–10 years (Singh and Gupta, 2014). Additionally, 50 g of DAP should be mixed with the soil at planting. After 30 days, 50 g of nitrogen should be applied in two split doses to support initial growth. From the second year onward, 100 g of NPK (Nitrogen, Phosphorus, and Potassium) per plant should be applied in two split doses, one in June–July and the other in October–November, following cleaning and hoeing around the plant's base (Patel *et al.*, 2016).

Agroforestry practices

S. nux-vomica is a slow-growing plant during its

initial years. For the first 6–8 years, farmers can successfully cultivate fast-growing intercrops such as bottle gourd (*Lagenaria siceraria*), lady's finger (*Abelmoschus esculentus*), cucumber (*Cucumis sativus*), ridge gourd (*Luffa acutangula*), and green gram (*Mung bean*) (*Vigna radiata*) in the spaces between the *S. nux-vomica* plants. Intercropping with pulse crops like green gram and black gram (*Vigna mungo*) is particularly beneficial during these early years. These legumes not only enhance soil fertility through nitrogen fixation but also provide an additional source of income while the *S. nux-vomica* matures. This practice maximizes land usage and can lead to better overall productivity in the initial stages of cultivation.

Tree improvement

Selection of trees and the conservation of genetic diversity in *S. nux-vomica* are essential for optimizing its medicinal and commercial potential. The work done by **Govindan Sivaraman *et al.* (2014)** has been instrumental in identifying and preserving elite genotypes.

Utilization

Ethnomedicinal uses

The medicinal properties of *S. nux-vomica* are largely attributed to its high content of the alkaloids strychnine and brucine. These alkaloids contribute to its diverse applications in traditional medicine systems like Ayurveda and Unani. In these systems, the fruit is used as an appetizer, tonic, aphrodisiac, and antipyretic. Additionally, it is considered an effective treatment for leucoderma, blood disorders, itching, ringworm, piles, ulcers, anemia, jaundice, urinary disorders, joint pain, lumbago,

and limb weakness (Kumar *et al.*, 2015; Singh and Gupta, 2017). The seeds of *S. nux-vomica* are particularly valued for their use in treating digestive and nervous system disorders such as dyspepsia, chronic dysentery, atonic diarrhea, cholera, and diabetes. Moreover, they have been used to manage emotional disorders, hysteria, epilepsy, intermittent fevers, gout, rheumatism, hydrophobia, insomnia, urinary incontinence, spermatorrhoea, as well as paralytic and neuralgic conditions. Seeds are also employed as an antidote for alcoholism (Mitra *et al.*, 2014). In addition to the seeds, the stem and root bark juices are useful in treating intermittent fevers, cholera, and acute dysentery. Internally, the bark's infusion is used in the treatment of epilepsy, while externally, it is applied to ulcers and leprosy-affected areas. The leaves of the plant, when applied as a poultice, promote the healing of sloughing wounds or ulcers, especially in cases where maggots have formed (Patel *et al.*, 2016).

Pharmacological activities

The extract of *S. nux-vomica* is known to be toxic in its raw form, but when properly processed, it



has been widely used in traditional medicinal formulations across various cultures. Despite its toxicity, *S. nux-vomica* exhibits a range of pharmacological activities, making it a valuable component in several therapeutic applications.

Antioxidant: The extract helps in scavenging free radicals, protecting cells from oxidative stress (Patel *et al.*, 2016).

Hepatoprotective: It has been found to protect the liver from damage caused by toxins, promoting liver health (Kumar *et al.*, 2018).

Antinociceptive: It has pain-relieving properties, helping to reduce the sensation of pain (Sharma *et al.*, 2015).

Anti-allergic: The extract has been shown to alleviate allergic reactions (Mitra *et al.*, 2014).

Anti-inflammatory: It helps in reducing inflammation and can be used to treat conditions related to chronic inflammation (Singh and Gupta, 2017).

Antibacterial: It exhibits antibacterial properties, effective against various bacterial strains (Reddy *et al.*, 2012).

Anticancer: Studies suggest that *S. nux-vomica* has potential anticancer properties due to its ability to inhibit the proliferation of cancer cells (Mitra *et al.*, 2014).

Gastroprotective: The extract has protective effects on the stomach lining, preventing ulcers and aiding in digestive health (Patel *et al.*, 2016).

These pharmacological activities make *S. nux-vomica* a versatile plant in traditional and alternative medicine, despite the careful processing required to mitigate its toxicity.

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Van Mahotsav 2024

As part of the EK Ped MaaKeNaam campaign and Mission LiFE, and in connection with Van Mahotsav 2024, EIACP (Environmental Information, Awareness, Capacity Building and Livelihood Programme) Programme Centre (erstwhile IFGTB ENVIS) RP at the ICFRE - Institute of Forest Genetics and Tree Breeding, Coimbatore in collaboration with Extension Division organized an awareness event and tree sapling planting programme for the students of PPG College of Nursing, Coimbatore. By creating and spreading awareness about the importance of tree planting and the role of individuals in environmental protection, this event aimed to empower the students with the knowledge and motivation to make a positive impact on their surroundings by planting indigenous trees. Director Dr C Kunhikannan, released an awareness poster fostering the benefits of EK Ped MaaKeNaam.

Saplings of *Terminalia bellirica*, *Azadirachta indica*, *Terminalia arjuna*, *Albizia amara*, *Majidea zanguebarica*, *Thespesia populnea*, *Ficus benghalensis*, and *Mitragyna parvifolia* were planted in the premise of the Gass Forest Museum by the Director, Group Coordinator Research, staff and students of PPG Nursing College, Coimbatore. Awareness materials and handouts detailing the benefits of Mission LiFE were distributed to the students. Additionally, the students collectively took the Mission LiFE Pledge, affirming their commitment to the initiative.

Best Centre Award

The ICFRE-IFGTB EIACP Regional Centre participated in the National Coordinators Meet in New Delhi on 07.09.2024 and was honored with the Best Centre Award for FY 2024 for its outstanding contributions to environmental awareness, capacity building, and sustainable development initiatives. The award recognizes the centre's impactful outreach programs, innovative digital dissemination, and active engagement in Mission LiFE, climate action, and eco-friendly livelihood promotion. Through workshops, training sessions, and policy-driven collaborations, IFGTB EIACP has played a pivotal role in advancing environmental sustainability and community empowerment at the national level.

EIACP ACTIVITIES



International Day for the conservation of Mangrove Ecosystem

As part of the EK Ped MaaKeNaam campaign, Mission LiFE, Shiksha Sapathand in connection with the International Day for the conservation of Mangrove Ecosystem 2024, EIACP (Environmental Information, Awareness, Capacity Building and Livelihood Programme) Programme Centre (erstwhile IFGTB ENVIS) RP at the ICFRE - Institute of Forest Genetics and Tree Breeding, Coimbatore organized an awareness event and tree sapling planting programme at Corporation Girls Higher Secondary School, Ramanathapuram and Government Boys High Secondary School, Thadagam. This #Plant4Mother initiative involves to strengthen the bond between students, their mothers, and Mother Earth and aimed to empower students with the knowledge and motivation to positively impact their surroundings by planting indigenous trees.



Plastic Free Day 2024

As part of Mission LiFE and in connection with International Plastic Bag Free Day 2024 EIACP (Environmental Information, Awareness, Capacity Building and Livelihood Programme) Programme Centre (erstwhile IFGTB ENVIS) RP at the ICFRE - Institute of Forest Genetics and Tree Breeding, Coimbatore organized various campaigns for students and the general public. The main objective of the campaign was to educate students and the general public about the eradication of plastic usage and promote sustainable alternatives.



Awareness Poster Release

A poster highlighting the adverse effects of plastics was released during the awareness campaign. The poster was widely distributed among students, public places, and social media platforms to maximize its reach. The poster focused on the environmental and health hazards posed by plastic waste, emphasizing the need for immediate action.

To encourage the use of sustainable alternatives, cloth bags were distributed among the participants. This initiative aimed to provide a practical solution to reduce reliance on plastic bags and promote environmentally friendly practices. The campaign successfully reached a wide audience, effectively spreading awareness about the issues related to plastic usage and the benefits of adopting sustainable alternatives. The distribution of cloth bags was well-received, with many participants expressing a commitment to using them in place of plastic bags.

Ozone Day 2024

As part of Mission LiFE, Ek Ped MaaKeNaam and in connection with International Day for the Preservation of the Ozone Layer 2024, EIACP (Environmental Information, Awareness, Capacity Building and Livelihood Programme) Programme Centre (erstwhile IFGTB ENVIS) RP at the ICFRE - Institute of Forest Genetics and Tree Breeding, Coimbatore organized awareness campaigns and tree sapling planting programme in Government Adhi Dravidar Higher Secondary School, Welspuram and Government Middle School, Mettupalayam. The main aim of these events was to raise awareness about the significance of ozone layer among students and the general public.

School students disguised as the five elements of nature and explained the importance of each. They shared how these elements viz earth, water, fire, air, and space are essential for life. Each student described how their element supports the balance of nature, highlighting the need to protect and preserve these natural resources for the health of the planet and all living beings. Saplings of indigenous tree species were planted in the school campus by students and staff. The newly planted tree saplings were honored by naming them after their mothers. Awareness poster highlighting the significance of Ozone layer was released and disseminated to the students. They have also pledged to follow the Mission LiFE activities in their daily lives.



MoEFCC's PRAKRITI Programme

As part of MoEFCC's PRAKRITI Programme, an awareness campaign was organized at Corporation Girls High School, Selvapuram, Coimbatore, focusing on key environmental themes such as biodiversity conservation, waste management, and climate action. The campaign engaged students through interactive sessions, educational activities, and discussions on adopting eco-friendly lifestyles, reinforcing their role as future environmental stewards.





	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 and Bamboo Plants	Rs. 55.00 per plant Rs. 25.00 per plant		Dr Rekha R. Warriar, Scientist - G & Head, Division of Chemistry & Bioprospecting Phone : 0422 2484167 E-mail : rekha@icfre.org
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.	Packaging & Transportation 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	150.00	
	20 Reactions	1900.00	200.00	
	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
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 : senthilnk@icfre.org (or)
	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		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		