



INSTITUTE OF FOREST GENETICS AND TREE BREEDING

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From the Director's Desk

Biological diversity prevalent in tree species can be exploited for the benefit of tree growers and foresters. Species, land races, provenances etc. of species in demand provide improved material, which, though not subjected to intensive selection and improvement, can offer better gains than unimproved material. IFGTB, has, over the last two decades, steadfastly pursued tree improvement programmes for the selection of improved planting material for its stakeholders. With the implementation of these programmes for species, IFGTB has developed tree varieties and clones capable of adapting to changing weather conditions.

IFGTB also stays committed to reaching out to our stakeholders, keeping them well informed of the latest initiatives and developments in the field of research. This newsletter will give an insight into our extension activities spread over a mosaic of user groups.

Director, IFGTB

Visit of Hon'ble Minister to IFGTB

The Hon'ble Minister of State for Environment and Forests, Sh. Jairam Ramesh visited the Institute on 22.11.2009. He visited the Automated Open Top Chambers of the Institute.



The Hon'ble Minister visited the Biotechnology Laboratories of the Institute and discussed at length with scientists the advanced research and development activities being undertaken in the field of biotechnology in forestry.



Later, he addressed the scientists of the Institute. Appreciating the quality research work being carried out at IFGTB, Hon'ble Minister expressed his happiness at IFGTB being able to develop varieties in Casuarinas and Eucalypts for the benefit of farmers.



Need for a Germplasm Collection of Casuarina in India

Collection, Conservation, Documentation, Evaluation and Use are the various steps sequentially involved in any germplasm assemblage. Collection and Conservation has the practical function of storing all possible extent of genetic variability for eventual use, whenever required. This is of paramount importance to any organization involved in tree improvement. A systematic collection related to a domesticated species should cover all kinds of genetic resources like land races, advanced cultivars, wild relatives of the domesticated species or wild species (Frankel and Bennett, 1970). As far as *Casuarina* is concerned, in India, land race, introduced provenances, cultivars, hybrids and wild populations are available and a systematic survey and collection is urgently required, for the genetic conservation as well as improvement of the species. Any organization working on the improvement of *Casuarina* has to have a good germplasm collection in its possession. The strategy for the same is outlined below.

A. Landrace: The introduction of *Casuarina* in the peninsular region has happened at different periods by various agencies. The sources of introduction are not known and are undocumented. Under varied climatic and edaphic conditions, these land races have evolved and there is a need for a thorough evaluation of this genetic resource, collection of representative samples and productive individuals adapted to the local conditions. Such a collection can concentrate on various agroclimatic zones and the soil types within the zone, to tap the variation that has arisen due to geographic variation. Land races would have greater adaptability due to the long

cycle of selections and breeding by the cultivators. Such selections should be done in an organized way in West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Pondicherry, Kerala, Karnataka, Maharashtra and Gujarat Coasts, agroclimatic zonewise and soil typewise through intensive exploration.

B. Natural Population: Natural populations of *Casuarina equisetifolia* exist in the Andaman and Nicobar Islands (Abeyesundere and De Rosaryo, 1939) at North Andaman, Little Andaman and the Nicobar Group of Islands, besides introductions from peninsular India at Middle and South Andaman, where they were introduced under the Social Forestry project in the 1980s. In the natural populations great potential exists for selection of elite trees and representatives of these populations for the germplasm collection. These populations have been observed to have superior form and growth traits compared to the land race in peninsular India, and can be a good genetic resource for tree improvement.

C. Introduced provenances: A large number of Provenance trials and progeny trials have been laid out in the country using germplasm supplied by CSIRO, Australia, since 1992. These can also serve as source of selection for germplasm collection. The provenances that have survived and grown well in the country under varying climatic conditions can provide a lead for further improvement.

D. Hybrids: Natural and Control-crossed hybrids of *Casuarina* species also exist in the country. A natural hybrid of *C. equisetifolia* and *C. junghuhniana* was introduced into the country in 1952 and is quite popular as a clone. More hybrids have been produced by control crossing selected individuals of both the species, and can be another source of germplasm.

All these collections can serve as genetic resource collection. The working collections for the tree improvement programme will remain limited to a few elite collections. The basic reason for such a germplasm collection would be - (a) to have a representative

genetic and geographic samples of *Casuarina*, (b) to provide parental material for breeding, (c) to help in understanding the taxonomy and/or evolution of the species, (d) to increase the diversity of cultivars, when they suffer from a narrow genetic base, and (e) to help in development of reliable descriptors for the varieties evolved, for the purpose of Intellectual Property Right protection.

An important link between the collection of germplasm and its utilization is the Characterization, both quantitative and qualitative, like the botanical description, silvicultural characteristics, physiological and biochemical properties and traits of economic importance like resistance to pests and diseases, wood properties for various end uses, adaptability of various environmental conditions, response to climate change and physico-chemical stresses, etc. This has not commenced in a systematic way in the country and there is an urgent need for the same. The Institute of Forest Genetics and Tree Breeding has just commenced activities in this direction.



References:

- Abeyesundere, L.A.J. and R.A. De Rosaryo (1939) Check-lists of the forest trees and shrubs of the British Empire. No. 4 draft of first descriptive check-list for Ceylon. Imperial Forestry Institute. Oxford. 115 pp.
- Frankel, O.H. and E. Bennett (1970) Genetic resources in plants- their exploration and conservation. International Biological Programme Handbook No. 11., Blackwell Scientific Publications, Oxford, 554 pp.

R.S.C. Jayaraj
Silviculturist, IFGTB

New projects taken up

Validation of DUS Testing Guidelines for Casuarinas and Eucalypts.
Funding Agency: PPV&FRA.
Duration: 2 years. Budget: 22.00 lakhs.

Seminars / Workshops/ Technical meets

The Director, IFGTB accompanied by Dr. B. Nagarajan, Dr. Jacob, Dr. C. Kunhikannan, Dr. Maheswar Hegde, Dr. Buvanewar, Dr. N. V. Mathish, Dr. Senthil Kumar, Smt. Anandalakshmi and Dr. Vijayaragavan visited TBGRI, Palode to hold discussion on the possible areas of collaborative research projects. The team identified opportunities for collaboration in areas of Bioprospecting, Phytochemistry and Conservation Biology.

Education and Awareness

The Division of Plant Biotechnology organized two days training programme on "Germplasm characterization using DNA marker technologies" on 3-4 December, 2009 for the researchers and Assistant professors from various colleges and Universities. The course comprised of a few lectures covering the basics of DNA markers with particular emphasis on their applications in plant germplasm analysis. The course included a substantial hands-on training on DNA isolation, PCR methods, ISSR, RAPD and SSR marker techniques used in population genetics analyses. The statistical packages like NTSYS, Popgene and DarWIN, used for population genetic analysis were demonstrated. A manual consisting of elaborative step by step practical notes and troubleshooting guides on various DNA marker systems was distributed to the participants for future reference.



A one day training programme on "Forest Botany and Herbarium Techniques" was conducted for the trainee foresters of the Tamil Nadu Forest Academy (TNFA) on 23.10.2009. A total of 30 officers participated in the training. Dr. Jaganatha Rao, IFS, Addl. Director, TNFA was the chief guest. Training on taxonomy of flowering plants, identification of plants based on morphological features, and collection and preservation of plant specimens in the form of herbarium were provided to the participants.

Shri K. Ravichandran, Shri Kannan C.S. Warriar, Dr. Rekha R. Warriar, Dr. C. Kunhikannan and Dr. K.R. Sasidharan participated in the Forest Fair organized by the Kerala Forest and Wildlife Department at Ernakulam, Kerala during 2-8 October 2009. A stall was put up by the Institute and visitors included Hon'ble Forest Minister of Kerala, MLAs, Officials of the Forest Department, Officials from other Government Departments, farmers, scientists, research scholars, teachers and students from various colleges and schools.



Inauguration of Tree Information Centre: A Tree Information Centre set up in the Institute to sensitize farmers on various forestry related activities of the Institute and general information related to tree cultivation was inaugurated on 16.11.2009 by Dr. G. Kumaravelu, IFS (Retd.) Member, Tamil Nadu State Planning Commission.



Automated Open Top Chambers (AOTC) for climate change research were inaugurated by Shri T.M. Manoharan, PCCF, Kerala. The AOTC enables altering CO₂ levels to study impact of elevated concentrations on tree crops.



A video conferencing hall was inaugurated by Shri R. S. Baruah, Addl. PCCF, Tamil Nadu. Seedlings were also distributed to the farmers.

VVK activities

Kerala: Organised Karshaka Mela in collaboration with Kerala Forest Department and Kerala Forest Research Institute on 3rd and 4th November 2009 at KFRI, Peechi. The mela was organised with an objective to sensitise the farmers of Kerala on issues related to tree cultivation. About 150 farmers from various districts of Kerala took part in the mela.



Issues related to the cultivation, management of important tree crops, seed handling and nursery techniques for quality planting stock production, integrated pest and disease management, industries and institutions in plantation forestry, Agroforestry and medicinal plants, etc were detailed.



An interactive session with farmers was held to assess their needs and aspirations in the field of farm forestry and agroforestry. A book on Quality planting stock production in Malayalam was released.



Coimbatore: Dr. G.S. Rawat, IFS, DG, ICFRE inaugurated the Model Nursery at Van Vigyan Kendra (VVK), Coimbatore established in collaboration with Tamil Nadu Forest Department on 8-12-2009 and interacted with farmers.



DEMO VILLAGE - KANDIYUR

The Director General, ICFRE inaugurated the model nursery at Demo village, Kandiyur on 8.12.2009 in presence of the CCF, Extension, Tamil Nadu Forest Department.



Commemorative planting was done by DG, ICFRE and other senior Officers in the Model Nursery. He also interacted with the Self Help Group who have been assigned with the task of raising and maintenance of the nursery established at the Demo village.



A meeting was held with the villagers of Kandiyur. Shri K. Ravichandran, IFS, Extension Officer briefed about the purpose of adopting the village and the activities to be undertaken in the village by IFGTB. Shri Krishnasamy, President, Village Forest Committee, Kandiyur village welcomed the DG, ICFRE and others. He thanked IFGTB for adopting the demo village. Director, IFGTB outlined the programmes to be implemented in the village in the current plan period.



Shri Irulandi, CCF, Extension, Tamil Nadu Forest Department spoke about the technologies developed by IFGTB and requested the villagers to benefit from the technologies related to tree farming. Dr. G.S. Rawat, IFS, Director General, ICFRE, spoke at length about the purpose of establishing VVK and Demo Village and the technologies to be demonstrated by the ICFRE institutes.



DG, ICFRE distributed the gas connection to the anganwadi for the benefit of the children and chairs and tables to the primary school. He also distributed quality planting material to the villagers.



DG, ICFRE and others inspected the various dryland agroforestry models demonstrated by IFGTB in farmers' field at the Demo Village.



Training programmes

A two day training programme on quality planting stock production for farmers was organised on 8.10.2009 and 9.10.2009. A total of 27 farmers from Karur, Erode, Coimbatore and Pudukkottai participated in the training programme. The training programme was inaugurated by Dr. N. Krishnakumar, IFS, Director. Training was imparted on Seed Collection and Handling, Nursery Management, Use of bio-fertilizers in forestry, Pest Management in Nurseries, Biological Control and Bio-pesticide, Disease management, and Plantation Management. The participants were taken to Sathyamangalam on field visit.



A one day training programme on Tree Cultivation and Protection of Plant varieties was organised to farmers through the Van Vigyan Kendra of Tamil Nadu in association with the Genetics division and Forestry Extension Division of the Tamil Nadu Forest Department and Coimbatore District Herbal and Tree Growers Association on 6.10.2009. A total of 150 farmers participated in the training programme. The training programme was presided by Dr. N. Krishnakumar, IFS Director, IFGB and Shri A. Ulaganathan, IFS, DCF, Genetics Division. Shri Devarajan, President Coimbatore District Herbal and Tree Growers Association welcomed the gathering. Talks were delivered on the Training and extension programmes of the institute including the activities of VVK and Demo village, cultivation of casuarinas and eucalyptus and protection of plant varieties by Shri K. Ravichandran, Dr. A. Nicodemus, Dr. V. Sivakumar and Dr. B. Gurudev Singh respectively. Demonstration of mechanical weed cutter was organised for the benefit of the farmers.



A Training Programme on Plantation Management was organised through VVK Tamil Nadu for the Assistant Conservators of Forests and Range Officers of the Extension wing of the Tamil Nadu Forest Department on 9.11.2009 at the institute. A total of 25 officers participated in the training programme.



Vigilance Awareness Week was celebrated in the Institute from 3rd to 7th November, 2009. Lectures were delivered on Office procedure for transparency and accountability by Vigilance Officer and Effective use of RTI for ensuring transparency in administration by Public Information Officer. An essay competition for the staff of IFGTB on the topic "My vision for a corruption free Administration in India" in Tamil and English. The Valedictory Address was delivered by Shri V. S. Kumar, Additional Commissioner of Income Tax, Coimbatore on 6.11.2009 and prizes were distributed.



BOOKS / BROCHURES PUBLISHED

1. An Illustrated guide on Insect Pests of some important tree species in South India.
2. Quality Planting Stock Production (In Malayalam).
3. Manual on Biofertilizers and Biomanures

Brochures

1. Cultivable Bamboo Species of Tamil Nadu
2. *Ailanthus excelsa*
3. Automated Open Top Chambers
4. Development of Agroforestry systems – Alley cropping with Mangium and Beans

FORTHCOMING EVENTS

1. Farmers' Mela - 18-19th February, 2010
2. Training on Isolation, Identification and Mass Production of Bio-fertilizers and bio-inoculants
3. Fundamentals of Tissue culture and its applications – for Higher Secondary School teachers.

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