



## Overview





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The annual report for the year 2016-17 is divided into 5 chapters namely Introduction, Research Highlights, Education Vistas, Extension Panorama and Administration and Information Technology. The Annual Report discusses about the projects undertaken by various institutes that have been grouped in the relevant sections of 5 chapters. All India Coordinated Research Projects (AICRPs)/ Multi Institutional Projects (MIPs) are presented separately.

The overall allotted budget for current financial year 2016-17 for Research, Extension and Education was Rs. 987.34 lakhs and the expenditure incurred was Rs. 955.93 lakhs.

### Summary of projects\*

Projects	Completed Projects	Ongoing Projects	New Projects initiated during the Year
Plan	39	73	79
Externally Aided	37	109	54
Total	76	182	133

\*Data provided under various research themes in similar tables may vary from this tally due to the multidisciplinary nature of the projects.

### Performance Appraisal for ICFRE

Performance Review of ICFRE has been taken up by Indian Institute of Management (IIM), Kashipur. The report on performance review consists of evolution of ICFRE, Evolved strength, Strengths of individual institutes, weakness and improvement opportunities.



Department Efficiency	FRI	IFGTB	IWST	TFRI	AFRI	RFRI	HFRI	IFP	IFB
Genetics	1	1	0.64	0.82	1	0.22	NA	0.43	NA
Ecology and biodiversity	NA	1	NA	0.13	1	0.34	1	0.72	NA
Forest Extension	0.78	NA	1	1	1	1	0.68	0.13	NA
Non Wood Forest Product	1	NA	NA	1	1	NA	1	NA	NA
Silviculture	0.76	NA	NA	1	1	1	1	1	NA
Forest Protection	NA	1	1	NA	1	0.81	1	NA	NA

### List of Varieties /Clones developed and released by Institutes of Indian Council of Forestry Research and Education, Dehradun

In pursuance of the mandate of ICFRE to develop improved germplasm of forest tree species, the Council and its Institutes have been working on the subject and have developed improved germplasm of many forest tree species and has released 47 high performing and disease resistant clones of *Eucalyptus*, *Casuarina* and *shisham*, *Melia*, sarpagandha over the last seven years with a envisaged production gain of more than 20%. The developed germplasm is being made available to the State Forest Departments and farmers for use in plantations.

### Varieties / clones developed by Forest Research Institute, Dehradun and released by VRC held on 27.02.2017 for northern India

#### Cultivated varieties of *Melia dubia* Cav. (10 Nos):

- FRI/MD/032 (BAHUMUKHI)
- FRI/MD/075 (KSHITIZ)

- FRI/MD/231 (MEGHA)
- FRI/MD/232 (VARSHA)
- FRI/MD/235 (SHARAD)
- FRI/MD/241 (KARTIK)
- FRI/MD/256 (DEV)
- FRI/MD/261 (RITU)
- FRI/MD/262 (AMAR)
- FRI/MD/349 (SHASHI)



Variety Releasing Committee (VRC) meeting for release of clones at New Delhi



### Clones of *Eucalyptus tereticornis* Sm. (3 Nos):

- FRI/ET/031 (SAHAJ)
- FRI/ET/032 (RIJU)
- FRI/ET/035 (CHAURAS)

### Clones developed by Institute of Forest Genetics and Tree Breeding, Coimbatore and released by VRC held on 27.02.2017

### Clones of *Inter-specific hybrids of Casuarina equisetifolia* X *C. junghuhniana* (5 Nos):

- IFGTB-CH-1 (Test ID-17)
- IFGTB-CH-2 (Test ID-18)
- IFGTB-CH-3 (Test ID-19)
- IFGTB-CH-4 (Test ID-22)
- IFGTB-CH-5 (Test ID-25)

### Varieties developed by Tropical Forest Research Institute, Jabalpur and released by VRC held on 27.02.2017 for central India

### Varieties of *Rauvolfia serpentina* (Sarpagandha)

- TFRI-RS-1 (Test ID A-14)
- TFRI-RS-2 (Test ID A-17)



*Melia dubia*

## New Research Initiatives

### 1. Climate Change

- IFGTB, Coimbatore conducted screening of tree species for intra-specific variation in carbon sequestration potential under elevated CO<sub>2</sub>. Initially, 33 clones of teak have been shortlisted for the studies.
- AFRI, Jodhpur carried out studies on climate change mitigation and adaptation strategies in 6 districts of western Rajasthan.
- AFRI, Jodhpur prepared digitized maps to display various soil parameters, vegetation composition, site characteristics and carbon stock in different forest blocks of Rajasthan under a project- carbon stock, vegetation and soil mapping for Rajasthan forests.
- HFRI, Shimla has initiated a long-term study to assess the effect of global warming and trials to rehabilitate degraded site in high altitude transition zone in Himachal Pradesh. Floristic studies in high altitude zones between 3400 to 4000m and capacity building-cum- awareness programmes were conducted.

### 2. Ecology and Environment

- Natural regeneration studies of important tree species of Nallamala, Seshachalam Hills and Kaundinya Wildlife Sanctuary of Eastern Ghats of Andhra Pradesh was conducted by IFB, Hyderabad.
- Studies on diversity of insect pollinators and their role in fruit/ pod production of *Acacia Senegal* (Kher), *Capparis deciduas* (Karel) and *Prosopis cineraria* (Khejri) in Rajasthan was carried out by AFRI, Jodhpur.

- Documentation and conservation strategies of rare, endangered and threatened species are in progress at FRI, Dehradun.

### 3. Tribals and Traditional Knowledge System

- Studies on indigenous knowledge and documentation of extent of utilization of herbs in folk-medicines prevalent in tribal pockets of Madhya Pradesh were conducted by TFRI, Jabalpur. The information was recorded from 116 Vaidyarajs on various plant parts and their formulations in cure of various ailments.

### 4. *Santalum album* (sandalwood)

- IWST, Bengaluru has initiated propagation of *Santalum album* (sandalwood) in Punjab. It established demonstration plots at three locations and a model nursery at Bhatoli, Hoshiyarpur having capacity for raising 50,000 sandalwood quality seedlings per annum.
- Distribution, assessment and growth of *Santalum album* L. (Sandalwood) was studied in 11 forest divisions in Karnataka by IWST, Bengaluru.
- With a view to identify best cultural practices and to develop and demonstrate best plantation model, evaluation of existing plantations, establishment of agro forestry trials and capacity building to promote *Santalum album* (Sandalwood) cultivation in Gujarat and Rajasthan was carried out by AFRI, Jodhpur.

### 5. Shifting Cultivation (Jhum)

- RFRI, Jorhat conducted studies on soil profile attributes under Forest and Jhum land areas of some selected sites of Nagaland. 70 soil profiles were studied under 8 land

uses covering 5 forest types. Highest amount of carbon was found to be sequestered in the soils of Montane wet temperate forest type of Nagaland.

- Studies on adaptation and mitigation measures in relation to shortening of jhum cycle vis-à-vis soil nutrient status and productivity in different traditional systems of Nagaland was carried out by RFRI, Jorhat.

#### **6. Fodder Problem in Arid areas**

- Studies conducted by AFRI, Jodhpur on enhancing fodder productivity through silvipastoral system on degraded land of India to suggest the silvipastoral systems that could provide an alternative to improve pastoralism in the arid salt affected region, giving a greater buffer capacity and allowing for sustainable production even in critical years.

#### **7. Bio- technology**

- IFGTB, Coimbatore has undertaken the studies on development of candidate gene based DNA markers in Eucalypts for linkage and QTL mapping. A total of 349 potential polymorphic SSRs were recorded across parents and hybrids.
- Barcoding in *Pterocarpus* species was carried out at IFGTB, Coimbatore. In order to develop DNA barcoding approaches in these species, the candidate barcoding

genes were sequenced and the average sequence length is ranged between 300 bp-800 bp.

- High density genetic linkage maps for QTL localization and validation for rooting ability and wood property traits in *Eucalyptus* were developed at IFGTB, Coimbatore.

#### **8. Policy and Legal issues**

- IWST, Bengaluru conducted studies on implication of legislation / deregulation policy (2001) on Sandalwood cultivation in Karnataka.
- FRI, Dehradun conducted an important study on impact of ban on green felling on biophysical status of forests in context to production prescribed in working plans vis-a-vis actual production from the chir forests of Uttarakhand in terms of Supreme Court's order.

#### **9. Wood Substitutes**

- Studies on thermal modification of wood for value addition to plantation timbers at IWST, Bengaluru revealed that modified wood exhibited good dimensional stability and reduced equilibrium moisture content as compared to unmodified wood.
- IWST, Bengaluru has also developed a process of solvent free chemical modification of wood with acetic anhydride for microwave assisted chemical modification of wood.



# Organizational Structure Of ICFRE Society

