

CHAPTER V

RAIN FOREST RESEARCH INSTITUTE JORHAT

The Rain Forest Research Institute was established with the primary aim to carry out research on ecology, regeneration, tending and management of forests in the seven North-Eastern States, West Bengal and Sikkim.

PROJECTS COMPLETED DURING THE YEAR 2001-2002

Project 1: Integrated disease management in seedlings and plantations. [RFRI/FP/06/1999-2002]. For technical report contact Principal Investigator- Mr. Rajib Kr. Borah

Findings : Disease appraisal in bamboo nurseries and plantations raised in the campus of RFRI, Jorhat revealed 4 diseases of bamboo. Of these, branch necrosis of *B. bamboos* was found to be the most serious disease killing the entire branch within a week and the disease subsided to some extent after spraying of Bavistin @0.1%. But soil borne nature of the causal organism makes its control more complicated. *Corynespora* leaf spot of *Gmelina arborea* was another important disease recorded and the disease was found to be the unfavourable factor to the nursery seedlings as it caused premature defoliation of the diseased seedlings. This disease is recorded for the first time in this host from India. Screening of fungicides *in vitro* revealed Indofil M-45 and Bavistin as most effective one giving 100 per cent inhibition on growth of the fungus. Out of the five botanicals evaluated for their efficacy as fungi toxicant, ginger, turmeric extract were found to be comparatively more effective. Further, two diseases were recorded in case of teak one each in nursery and plantation. Of these, wilt of teak was the most serious one.

Project 2: Production of organic waste based quality compost for forest nursery. [RFRI/FP/04/1999-2002]. For technical report contact Principal Investigator- Mr. Rajib Kr. Borah

Findings : The effect of fungal inoculation and cowdung slurry application on the decomposition of a common nursery weed (*viz. Imperata cylindrica*) was studied. The inoculation of the substrate with cowdung slurry and the uninoculated control resulted in more loss of weight as compared to that inoculated with the fungi.

Project 3 : Study of the successional changes in plant communities under shifting cultivation [RFRI/SC/01/1997-2001]. For technical report contact Principal Investigator- Dr. Jasbir Singh

Findings : Phytosociological studies of jhum fallow vegetation and nearby disturbed forest and primary forest were conducted. Exotic weed species *Lantana camara* and *Chromolaena odorata* along with native species *Saccharum arundinaceum* and *Imperata cylindrica* were observed as early colonizers of fallow lands. Species diversity was found to be increased gradually upto 4th year fallow. A large number of species like *Costus speciosus*, *Ageratum houstonium*, *Phyllanthus urinaria*, *Globba* spp. etc., indigenous medicines are going to be threatened. *Alpinia allughas*, *Costus speciosus*, *Geodorum densiflorum*, *Gnetum gnemon* etc. were observed as jhum affected species. *Vatica lanceaefolia* and *Elaeocarpus tectorius* alongwith *Castanopsis* spp. are found maximum in the primary forest. *Hydnocarpus kurzii* and *Dysoxylum procerum* found dominant in the disturbed natural forest.

Project 4: Study of the changes of morphological, physical and chemical properties of soil under shifting cultivation [RFRI/SC/02/1997-2001]. For technical report contact Principal Investigator- Dr. Jasbir Singh

Findings : Soil samples were collected from various shifting cultivation areas and nearby forest. From the results recorded it can be inferred that shifting cultivation have changed the physico chemical properties of soil.

Project 5 : Isolation and evaluation of *Rhizobium* strains from leguminous forestry trees in nurseries of three districts of Assam [RFRI/FP/08/1999-2001]. For technical report contact Principal Investigator- Dr. Jasbir Singh.

Findings : Total 42 nos of strains were isolated from different forest legumes. Out of these, 8 were isolated from *Acacia auriculiformis*, 13 from *Dalbergia sisoo*, 7 from *Albizia procera* and 14 from *Samania saman*. High dosage of fertilizer nitrogen inhibits the efficiency of nitrogen fixing potentiality of *Rhizobium* in soil.

Project 6 : Clonal propagation of important forest species [RFRI/TI/06/1998-2001]. For technical report contact Principal Investigator- Dr. Ashok Kumar

Findings : The vegetative propagation protocol for adult trees was developed. The juvenility was incorporated through repeated coppicing, and protocol through rooting of cuttings was standardized.

Project 7: Genetic conservation and improvement of bamboos and canes. [RFRI/TI/04/1998/2001]. For technical report contact Principal Investigator- Dr. K.C. Pathak.

Findings : Six species *Bambusa tulda*, *Bambusa bamboos*, *Bambusa balcooa*, *Bambusa nutans*, *Bambusa pallida* and *Dendrocalamus hamiltonii* were selected

based on their demand, extent of use in household, construction and handicraft industries.

Selection index method was used for scoring of the clumps. Weightage of criteria was decided in each of the species based on its end use. Clumps with higher scores were designated as plus clump and selected for germplasm conservation. Germplasm of the selected clumps were collected in replicated and planted in the RFRI germplasm bank. Growth rates were recorded.

PROJECTS CONTINUED DURING THE YEAR 2001-2002

Project 1 : Development of VAM as bio-fertilizer for some economically important forest plant species of Assam and Arunachal Pradesh [RFRI/FP/07/2000-2003]. *Principal Investigator - Mr. Rajib Kumar Kalita.*

Status: Survey conducted to assess the diversity and dynamics of VAM fungi in the fuel wood species planted into Experimental Station of RFRI at Naharani. The changes did not follow any definite trend.

Project 2 : Management of seed and soil borne diseases of *Gmelina arborea* and *Dipterocarpus retusus* [RFRI/FP/05/2000-2003]. *Principal Investigator - Dr. A. N. Singh.*

Status : Fungal flora species of *Phoma* and *Fusarium* were found dominant and most frequent assigning their role in rotting of vegetative cuttings of *Gmelina arborea* and in fresh samples from different clones of *G. arborea*. Apart from mercuric chloride (0.2%), Captan (0.2%) and Bavistin (0.02%) were found equally effective in reducing the number of fungal species from the vegetative clonal cuttings *in-vitro*. The study on pest infestation status of *Dipterocarpus retusus* seeds collected from Hologapara Reserve Forest (Gibbon Wild Life Sanctuary) revealed enormous pest pressure. Only 32% seeds were found healthy from the natural stand. Soil treated with neem cake in combination with either Captan or Bavistin resulted minimum nursery disease incidence than in soils treated with biological antagonists, formaldehyde or solar rays. All the treatments proved effective in suppressing the root and foliar diseases significantly. Comparing the effect of different chemical, biological, soil solarization, fumigation and soil amendment treatments on incidence of nursery diseases of *Gmelina arborea* were founded. Soil or seeds treatment with different biological antagonists proved ineffective in checking the disease incidence. *Corynespora* leaf spot initiated randomly in all the treatments in two months old seedlings assuming 100% disease incidence and severity. Neither of the pre-treatments was found effective against *Corynespora* leaf spot.

Project 3 : Integrated nutrient management in shifting cultivation soil through green manuring and inorganic fertilizers [RFRI/SC/04/2001-2004]. *Principal Investigator - Dr. Jasbir Singh.*

Status : Field experiment was conducted to study the effect of green manure and

inorganic fertilizer application to increase soil fertility and productivity on abandoned jhum fallow at Silonijan Karbi Anglong Assam.

Project 4 : Study on seed biology of important forests species of North-East India [IRMDFR/TI/01/1998-2003]. *Principal Investigator - Dr. M. Kundu.*

Status : A detailed study was performed on germination, dormancy and seed storage behaviour of *Phoebe goalparensis* seed. Lowest safe moisture content of *Michelia champaca* seed was estimated and trials are continued to develop the storage methodology. It was experimentally proved that seeds of *Calamus tenuis* are recalcitrant and these seeds can best be stored at 100% RH at ambient temperature for at least one year. Storage method for hollong (*Dipterocarpus retusus*) seeds was improved. Study of seed physiology related to the germination and viability of *Canarium resiniferum* is continued.

Project 5 : Genetic improvement of *Gmelina arborea* [RFRI/TI/03/1998-2002]. *Principal Investigator - Dr. Ashok Kumar.*

Status : A total of 119 plus trees were selected from Assam (38), Arunachal Pradesh (38), Mizoram (18) and West Bengal (25). Vegetative multiplication garden in an area of 1.50 ha was established at two locations (Deovan and Naharani). The clonal seed orchards were established in Assam (5.25 ha), Manipur (3.00 ha) and Tripura (1.00) states totaling to an area of 9.25 ha. Seeding seed orchards were established in an area of 2.50 ha in Assam (1.0), Manipur (0.75) and Tripura (0.75) states. The fertilizer trial comprising 48 clones has been established at Naharani to study the response of various fertilizers on them. The evaluation trial of 70 clones has been established at the Experimental Station of RFRI at Naharani to test their performance, stability and adaptability. Entomological studies were carried out on twenty-seven clones of *Gmelina arborea* to screen *Calopapla leayeana* resistance in them. Eight and twenty six percent of the clones were found highly and moderately resistant to the pest respectively. Variability in fruiting and flowering was monitored in the clonal seed orchard at Deovan.

Project 6 : Ecological monitoring of biological diversity and the strategy of conserving thereof in the Kaziranga national park of Assam [RFRI/EE/01/1999-2001]. *Principal Investigator - Dr. P.K. Khatri.*

Status : Vegetation studies in Kohora Range in Kaziranga National Park have been done. Phytosociological attributes of woodland, tall grass and short grassland have been evaluated. Species diversity index of tree community was calculated. Biomass estimation of tall grass has been assessed. Recorded 23 endemic and endangered medicinal plants. Data collected in the previous year has been computed.

Project 7 : Evaluation of current status of tropical moist forests for their sustainable utilisation with special reference to dipterocarps [RFRI/EE/02/2000-2002]. *Principal Investigator - Dr. S. Trivedi.*

Status : Sixteen permanent sample plots in the different microhabitats have been laid down in the Tropical Moist Forest in the Namdapha Tiger Reserve of Arunachal Pradesh. Complete enumeration of vegetation occurring in the permanent plots have been completed. Analysis of soil samples is under progress.

Project 8 : Standardization of nursery techniques for selected bamboo species of North-East India [RFRI/SM/01/1999-2003]. *Principal Investigator - Mr. S. Pattanaik.*

Status : Nursery techniques have been standardized for four different bamboo species viz. *Bambusa tulda*, *B. nutans*, *B. balcooa* and *Dendrocalamus hamiltonii*. Trials were laid in two other species viz. *B. bambos* and *B. pallida*. Field preparation for the fertilizer trial was completed.

Project 9 : Fertiliser response studies in nursery for some important species of North-East region [IRMDFR/SM/02/1999-2003]. *Principal Investigator - Mr. B. Goala.*

Status : Large seedling containers (8"x 6"polybag) with potting media can be replaced by even very small root trainer (150cc) or polybag (8"x3"). Established field trials on different age group seedling of *Gmelina arborea* and also trial for four different species for their performance in the field are in process.

Project 10 : Genetic improvement of *Dipterocarpus retusus* for higher merchantable biomass [RFRI/TI/02/1998]. *Principal Investigator - Mr. Ajay Thakur.*

Status : Effect of different positions of seedlings and coppice shoots were tried with various concentrations of IBA. Chip budding has been successfully carried out. Overall 20-30 % success was obtained. Early spring was found to be the best time for successful union. The work on vegetative multiplication of the species from SSO has also been initiated. The materials collected from SSO Deovan, are being laid out in various experiments to find out the rooting ability of the species by using various growth hormones.

NEW PROJECTS INITIATED DURING THE YEAR 2001-2002

Project 1 : To study the dynamics of soil physicochemical and biological properties under different tree vegetation [RFRI/2001-2004]. *Principal Investigator - Dr. K.G. Prasad.*

Status : Completed soil survey and the soil samples collected from different vegetation sites, were analysed.

Project 2 : Studies on distribution dynamics of bamboos and canes and their *ex-situ* conservation [RFRI/EE/03/2001-2003]. *Principal Investigator - Dr. K.C. Pathak.*

Status : Germplasm collection and conservation of 17 species of bamboos have been done.

Project 3 : Genetic improvement of Khasi pine (*Pinus kesiya*) [RFRI/TI/08/2001-2004]. *Principal Investigator - Dr. Ombir Singh.*

Status : The technical reports in respect of plants to be culled & retained for establishment of seed production areas to the tune of 5 ha and 10 ha. in the states of Manipur & Meghalaya, respectively, was prepared and submitted to respective State Forest Departments for carrying out culling operations. In the state of Manipur, culling operations has already been completed.

Project 4 : Germplasm evaluation of selected bamboo species for various end uses [RFRI/SM/03/2001-2004]. *Principal Investigator Mr. V.K.W. Bachpai.*

Status : Plus clumps of different bamboo species were multiplied as per the protocol developed by the Silviculture and Forest Management Division. Land has been identified at Tripura for laying out of field trials.

EXTERNALLY AIDED PROJECTS

PROJECTS COMPLETED DURING THE YEAR 2001-2002

Project 1 : Survey and evaluation of selected species for energy plantation in North-East region of India (RFRI/EP/01/1999-2001). (Funded by : MNES). *For technical report contact Principal Investigator - Mr. N.N. Zhasa.*

Findings : A total of 79 villages of six blocks, 3 wards in urban area and 3 tea gardens were surveyed for the demand and supply of fuel wood species in the Jorhat district. Findings reveal that maximum fuelwood is consumed in rural area and is followed by tea estate. Fuel wood deficit in the district is found to be 24876.69 tones per annum. Results indicate that there is scarcity of the suitable fuelwood species in the region. An evaluation trial of 20 fuelwood species has been conducted in the Naharoni Research Station, of the Rain Forest Research Institute, Jorhat, Assam. One-year growth data reveals that some of the species have potential for future energy programme. The results indicate that *Mallotus albus*, *Tephrosia candida* and *Anthocephalus chinensis* have a good potential and can be exploited for the future energy generation programme. Spacing trials of two promising fuel wood species i.e. *Albizia lucida* and *Gmelina arborea* have been laid down. First year data reveals no significant difference in different spacing.

Project 2: Resource enhancement and processing of cane and bamboo species suitable for handicraft (RFRI/2000-2002). (Funded by : UNDP and Min. of Textiles, GOI). *For technical report contact Principal Investigator - Mr. S. Pattanaik.*

Findings : Survey of bamboo and cane handicraft industries was taken up in 8 districts of Assam and 4 districts of Manipur. Eleven bamboos and seven cane species were collected and planted in the Bambusetum and Canetum located at RFRI, Jorhat. Suitability of different vegetative propagation techniques has been tested in *Bambusa nutans*, *B. balcooa*, *B. bambos* and *Dendrocalamus hamiltonii*. Nursery and silviculture management practices for six different bamboo species were compiled. Preservative treatment through Boucherie method was adopted for *Bambusa tulda* and *B. balcooa*. Germplasm of *B. balcooa*, *B. nutans*, *B. tulda* and *D. hamiltonii* were planted in the RFRI Germplasm bank. Four thousand seedlings of *B. bambos* and *Calamus tenuis* each were raised in the nurseries located at Jorhat and Imphal. A novel buy back scheme for Kissan nursery was launched. Fourteen entrepreneurs belonging to six clusters were sort listed for Kissan nursery and provided with seed materials to initiate work. Seedlings of *B. bambos*, *Ochlandra travancorica*, *B. balcooa* and *B. nutans* have been raised for the demonstration plantations. Eight training programmes were conducted at different places of Assam & Manipur on bamboo and cane nursery raising techniques. Seven video shows on bamboo nursery raising and plantation management techniques were organised at different places of Assam and Manipur.

Research Achievements

Name of state	No. of project Completed in 2001-2002	No. of Ongoing Projects in 2001-2002	No. of projects Initiated in 2001-2002
Assam	3	4	4
Arunachal Pradesh	-	1	-
Manipur	-	1	-

Education & Training

Sl.	Name and designation	Training	Place of Training	Duration	National/ International
1.	Shri Pawan Kaushik	Study tour	Florida, USA	30.7.2001 to 26.10.2001	International
2.	Dr. Tilak Chandra Bhuyan	Study tour	Kualampur, Ipoh, Montakab and Seramban of Malaysia	3.3.2002 to 10.3.2002	International
3.	Dr. K.G. Prasad and Dr. Ashok Kumar	Intellectual Property Rights and relate Issues	IWST, Bangalore	19 th -21 st Dec., 2001	National

4.	Shri H.N. Dhungana,	Orientation Course in Records Management for Departmental Records	Natioanal Archives of India, New Delhi	16 th -20 th April 2001	National
5.	Mr. R.K. Borah, Dr. Ashok Kumar, Mr B.K.Pandey, Dr. A.N. Singh, Mr. S. Pattanaik, Dr. M. Kundu, Mr. Ajay Thakur, Dr. R. Sett, Mr. H.P. Singh, Dr. Ombir Singh,	SPSS	Tezpur University, Assam	24 th -28 th Setember 2001	National
6.	Mr. N.N. Zhasa Dr. R. Sett Mr. B. Goala Mr. B. Goala Mr. R.K. Kalita Mr. R.K. Borah Dr. Ombir Singh and Mr. B.K. Pandey	Research writing	NFLIC, ICFRE, Dehra Dun	5 th -9 th November 2001	National
7.	Dr. Ombir Singh Shri H.P. Singh and Shri S. Pattanaik	Management of Servers and LAN	ICFRE, Dehra Dun	20 th -26 th November 2001	National
8.	Shri S. Pattanaik	Window 2000 I server and Network Administrator	ICFRE, DehraDun	-	National
9.	All HODs, Scientists Research Assistants and Research Fellows	SPSS Version 10	RFRI, Jorhat	-	National

Linkages & Collaboration

National

The linkage and collaboration with State Forest Departments of Assam, Meghalaya, Manipur, Arunachal Pradesh, Nagaland, Tripura, West Bengal and organizations like Assam Agricultural University, Jorhat, Regional Research Laboratories, Jorhat, Tocklai Experimental Station, Jorhat, North Eastern Hill University, Shillong, Central University, Tezpur, Guwahati University, Guwahati, Assam University, Silchar, North Eastern Regional Institute of Science and Technology, Naharlagoon, State Forest Research Institute, Itanagar, National Bureau of Plant Genetic Resources, New Delhi, Kerala Forest Research Institute, Peechi have already been developed.

Publications

Books

1. Ashok Kumar, Ombir Singh, Amrit K. Matharoo, P. Saikia & H.B. Sharma (2001). Seed Production Area of *Pinus kesiya* (SPA/MN/PK/1). Khonghampat, Imphal (Manipur), RFRI, Jorhat, September, 2001.
2. K.G. Prasad; Application of Improved Technology for Afforestation in North-East India, [IRMDFR-BK-NO-9].
3. Singh J. and Anup Chandra (2000). Shifting Cultivation to Agroforestry- Changing perspective. In : Sustainable Management of Forests-India, Edited by: A. Arunachalam, M. L. Khan. International Book Distributors. Dehra Dun : 353-368.
4. Singh Jasbir, T.C Bhuyan & Ombir Singh (2001). Seed Production Area of *Pinus kesiya* (SPA/ML/PK/II). Riet khawn, Shillong (Meghalaya), RFRI, Jorhat, December 2001.

Journals

International

1. Ashok Kumar, P.H. Chawhaan, and A. K. Matharoo, (2001). Improvement through selection of plus trees in *Gmelina arborea*. *Journal of Tropical Forest Science*, Malaysia. (In Press).1. Singh, A.N. and Ajay Thakur. Polyembryony in *Dipterocarpus retusus* : a new record. *Journal of Tropical Forest Science. Forest Research*, Kepong- 52109. Kula Lumpur, Malaysia.
2. Singh, A.N. and Ajay Thakur. Polyembryony in *Dipterocarpus retusus* : a new record. *Journal of Tropical Forest Science. Forest Research*, Kepong- 52109. Kula Lumpur, Malaysia.
3. Tripathi, Y.C. (2002). Biotechnology towards enhanced production of phyto- pharmaceuticals, In Recent Progress in Medicinal Plants, Vol. 4 Biotechnology and Genetic Engineering (Eds. J.N. Govil, P. Anand Kumar and V.K. Singh), *SCI TECH Pub.*, USA, 75-98 pp.
4. Tripathi, Y.C. and C. P. Sharma, (2002) Pharmacological validation of anti-

Diabetic phytomedicines of arid Rajasthan, In Recent Progress in Medicinal Plants, Vol. 8 Phytochemistry & Pharmacology II (Eds. D.K. Majumdar, J.N. Govil & V.K. Singh), *SCITECH Pub.*, USA, 243-256 pp.

National :

1. Ajay Thakur and Papori Sharma, and Nityananda Mahanta. Study on germination variation in seeds of different provenance of *Acacia mangium*. *The Indian Forester*, vol.127, and No. 11, November, 2001
2. Ajay Thakur and Papori Sharma. Rhizogenesis through leaf bud cuttings of *Dipterocarpus retusus* : a new report. *The Indian Forester*, Jan., 2002.
3. Barua, K.N. and J. Singh, (2001). Leaf architecture in *Terminalia* species. *J. Forestry*. 24 (2):189-195.
4. Chandra, A. and Rupjyoti Borah (2001). Physiological assessment of seedling quality. Application of Improved Technology for Afforestation in India, NEHU and IRMDFR: 70-78.
5. Chandra, A., Vijay Rawat, Rashmi Rekha Kalita, R. Borah and H. Mishra (2001). Bamboo and its in Homestead- A case study in the Titabor Block of Jorhat District of Assam, KFRI, Kerala: 72-74.
6. Gogoi, Sabi; J. Singh and K. G. Prasad (2001). Deovan Sotai soil catena: Its characterization and classification. *Ann. For.* 9 (2): 264-274.
7. I.P. Borah, A. Baruah and J. Singh (2001). Effect of metabolites of seed mycoflora on seed germination and seedling growth of *Leucaena lucocephala* (Lamk.) De Wit. *Ann. For.* 9 (2): 323-326.
8. Kundu, M and S. Chanda (2001). Preliminary studies on dessication and storage of *Calamus tenuis* Roxb. seed. In *Danida Forest Seed Center (IPGRI)*: No. 9.
9. Kundu, M. (2001). Desiccation and storage of *Dipterocarpus retusus* seed. In *Danida Forest Seed Center (IPGRI) Newsletter*: No. 8. pp : 20-21.
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11. Negi, M.S., M.Y. Ansari, and H.P. Singh, (2001). Market Channels in Agroforestry products- A case study of Yamunanagar market. *The Ind. For.* 127 (5) 519-525.
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14. Prasad, K.G. and J. Singh, (2001). Integrated approach to shifting rth-East

- Cultivation. Paper presented during workshop on strategy for management of jhum cultivation in North-East India conducted by the NAEB NEHU on 11 & 12 October 2001 at Shillong.
15. Singh J. and Anup Chandra (2001). Afforestation a pragmatic approach to shifting cultivation. Application of Improved Technology for Afforestation in India, NEHU and IRMDFR: 89-96.
 16. Singh, J., A. Chandra, H.C. Saikia, and G. Thakuria, (2002). Socio-Economic status of Karbi Tribe of Silonijan- a case study in Karbi Anglong district, Assam. (Accepted for publ. in *Indian Forester*).
 17. Singh, J., I.P. Bora, and A. Baruah (2002). Effect of shifting cultivation on nutrient status of soil in Silonijan (Karbi Anglong) Assam (Accepted for publ. in *The Indian Forester*).
 18. Singh, J., I.P. Bora, and A. Baruah, (2002). Changes of the physicochemical properties of soil under shifting cultivation with special reference to Karbi Anglong district of Assam. (Accepted for publ. in *Indian J. Forestry*).
 19. Singh, Jasbir; Indrani P. Bora and Arundhati Baruah (2001). Physicochemical attributes of soil under jhum cultivation in Amphengiri (Burnihat), Meghalaya. *Ann. For.* 9 (2): 257-263.
 20. Tripathi, Y.C. and Ranjana Arya, (2000-2001) Ethnomedicinal appraisal of traditional phytomedicines of arid Rajasthan, *J. of Medicinal and Aromatic Plant Sciences*, 22/4A & 23/1A: 487-498.

Proceedings

1. A paper entitled "Bamboo and its Uses in Homestead-A Case Study in the Titabor Block of Jorhat District of Assam" [under project No. RFRI/EP/01] published in proceedings of national workshop on Policy and Legal Issues in Cultivation & Utilization of Bamboo, Rattan and Forest Trees in Private & Community Lands, Kerala Forest Research Institute, Peechi, August 7-9, 2001.
2. Goala, B., "Nursery Management" Article presented in the workshop and incorporated in the workshop proceeding viz Application of Improved Technology for Afforestation in North-East India" held at RFRI, Jorhat, 2001
3. Pattanaik, S., Hazarika, P. & Das, P., "Productivity Improvement Strategies for Bamboos of North-East India" Article presented in the workshop and incorporated in the proceedings of book-"Application of Improved Technology for Afforestation in North-East India" held at RFRI, Jorhat, 2001.
4. Zhasa, N.N. (2001). Joint Forest Management, History and Trends. (In Proceedings of the workshop on "Application of Improved Technology for Afforestation in North- East India" held at RFRI, Jorhat, Assam on 24th to 26th April 2001.)

News articles

1. "Institute to do Research on Bamboo Growth in N-E "-(*The Telegraph*, 28th, Oct., 2001.

2. "Kissan Nursery-Bristi Bon Gobeshona Protisthan Abhinab Asoni"-(*Dainik Asom*, Assamese daily) 16th Nov'2001.
3. "Bah Phular Pisot Lobologia Byabastha"i.e. Strategies for management of bamboos after flowering- (*Amar Asom*, Assamese daily), 11th Dec, 2001.
4. "Rain Forest Research Sonstha Ki Karyasala " (*Purbanchal Prahari*,-Hindi news paper, 2nd Jan, 2002.

Technical Bulletin :

Training Brochures on "Bamboo and Cane" in English, Assamese, and Manipuri languages prepared and distributed.

Conferences, Meetings, Workshops, Symposia and Exhibitions

Workshops /Exhibitions Attended

Sl.	Subject	Duration	Organised by
1.	Training-cum-workshop on Intellectual Property Rights and Related Issues Workshop-cum-Peer Review on <i>Albizia</i> spp.	19 th -21 st December, 2001	IWST, Bangalore
2.	National Symposium on Forestry towards 21 st Century	-	Tamil Nadu Agricultural University, Coimabtoe
3.	National Symposium on Transfer of Forest Technologies	-	Institute of Forest Genetics and Tree Breeding, Coimbatore
4.	Workshop on Application of Improved Technology for Afforestation in North-East India	24 th -26 th April, 2001	NEHU, Shillong and RFRI, Jorhat
5.	Review Meeting of Energy Plantation Project	31st August, 2001	Ministry of Non Conventional Energy Sources, Biomass Division, Govt. of India, New Delhi
6.	National Workshop on Policy and Legal Issues in Cultivation & Utilization of Bamboo, Rattan and Forest Trees in Private & Community Lands	7 th -9 th August, 2001	Kerala Forest Research Institute, Peechi, Kerala
7.	National Seminar on Approaches for Increasing Agricultural Productivity in Hill and Mountain Ecosystem	18 th -20 th Oct. 2001	Umiam, Meghalaya

8.	International Network of Cane and Bamboo	-	Assam
9.	Exhibition/Demonstration of Various Activities	20 th -21 st Jan., 2002	Cotton College, Guwahati
10.	4 th Indian Agricultural Scientists and Farmers' Congress	16 th -17 th Feb., 2002	Bioved Research and Communication Centre, Allahabad
12.	Workshop on Commercialization of Patchouli (<i>Pogostemon cablin</i>)	9 th -11 th April, 2002	NEDFI, Guwahati
13.	National Interactive Meet on Scope and Opportunities in Research and	17 th -18 th May, 2002	Central Institute of Business of Medicinal and Aromatic Plants Medicinal and Aromatic Plants, Lucknow.
14.	Kisan Mela	8 th Feb., 2002	Assam Agricultural University, Jorhat (Assam)
15	Exhibition	22 nd - 23 rd Jan., 2002.	Assam Administrative Staff College, Guwahati

Workshops and Conferences organised

Sl.	Subject	Duration	Target Group
1.	North-East Forest Officers Research Advisory Group Meeting	2 nd & 3 rd November 2001	States Forest Departments.
2.	Review Meeting of Energy Plantation Project	14th and 15th June 2001	Ministry of Non- Conventional Energy Sources, and Govt. of India.
3.	Farmers Training and Demonstration Programmes on Bamboo and Cane at Naharani, Guwahati, Imphal	--	Farmers.

Awards

Dr. Y.C. Tripathi, Scientist D, Community Forestry & Extension Division of RFRI, Jorhat was awarded the ICFRE Cash Award For the year 1998-99 for his outstanding research work in the field of Non-Wood Forest Products.

Distinguished Visitors

District Administration Authority along with DRDA officials of Jorhat, Principal, Science College & Head Master, Cheniamguri High School visited RFRI on 09.03.2002 in connection with the proposed Botanical Garden.

Miscellaneous

Sports

Sl.	Name of Participaants	Game	Award
1.	Shri Mridul Saikia	Power Lifting	Gold Medal
2.	Miss Ritashree Khanikar	Badminton (doubles) 4 x 100 metre Relay Race	Silver Medal Bronze Medal
3.	Miss Bebija Loktongbam	4 x 100 metre Relay Race	Bronze Medal