



# SPICES NEWS

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**DR. MANGALA RAI – NEW DIRECTOR GENERAL, ICAR AND SECRETARY, DARE**

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Dr. Mangala Rai, an eminent scientist and administrator has taken over as the Director General, Indian Council of Agricultural Research (ICAR) and Secretary, Department of Agricultural Research and Education (DARE), Government

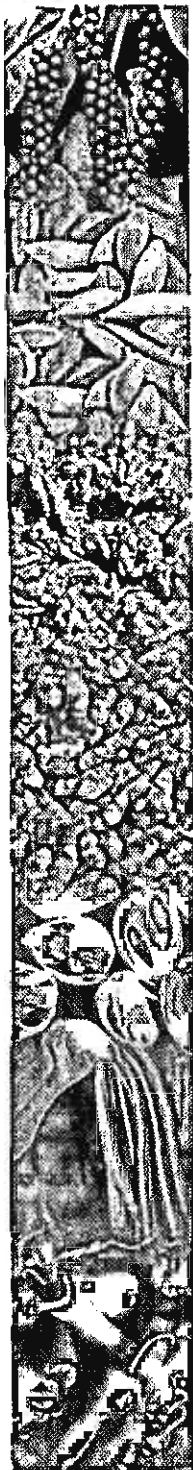
of India on 9 January 2003. An alumni of BHU, Dr. Mangala Rai backed with brilliant academic record blossomed into a very successful plant breeder, teacher and research manager who held important positions in Agra University, Orissa University of Agriculture and Technology prior to his joining with the Indian Council of Agricultural Research.

In the ICAR, Dr. Rai served earlier as Coordinator of AICRP on Linseed, Director (Oilseeds Technology Mission), ADG (Seeds), ADG (Policy & Perspective Planning), National Director (NATP) and DDG (Crop Science)

A renowned expert in agriculture, Dr. Rai has travelled to 23 countries. He served as Consultant to FAO and International Development Research Centre, Canada, Member of CIMMYT Board of Trustees, Chairman of AMBIONET and as Chairman SAARC Agricultural Information Centre and Technical Committee of SAARC on Agriculture. Dr. Rai's kitty of honours include presidentship of seven national societies including the Indian Society of Genetics & Plant Breeding, Indian Society of Seed Technology, Indian Society of Plant Genetic Resources, Indian Society of Oilseeds Research, etc. in addition to fellowship of many academics. He has over 200 publications.

Endowed with a chiseled style and dynamic vision, Dr. Rai has shown an yen for perfection in whatever genre he lends his flair.

The Director, scientists and the staff of the Indian Institute of Spices Research, Kozhikode feel elated and congratulate Dr. Rai on his coveted new assignment.



## HRD ROAD MAP IN PLACE AT IISR, KOZHIKODE

Age cannot wither her nor custom stale her infinite variety, wrote Shakespeare while describing Cleopatra. Unfortunately, unlike Cleopatra's charm, manpower is subjected to withering and become stale, if not trained in tune with the change of time. The Indian veneration of age and seniority, though still packs punch, will no longer serve the need of the rapidly changing global scenario, if not backed by strategic planning towards Human Resource Development.

Foreseeing this future road block, the HRD programme at the Indian Institute of Spices Research, Kozhikode has been given a new thrust with the reconstitution of the HRD committee during September 2002.

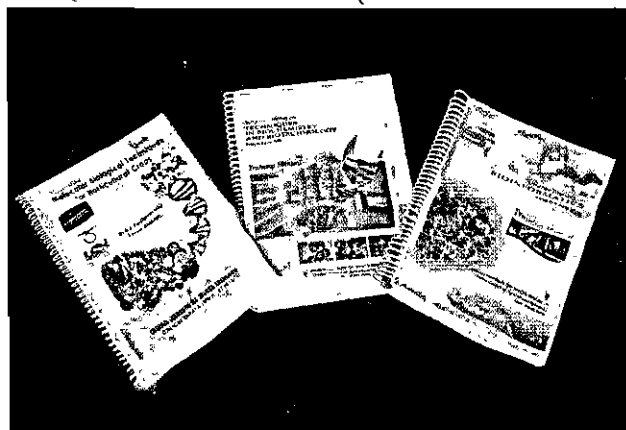
Not only the scientists of the Institute are refreshed with the latest technological innovations, the administrative, technical and even the last grade supporting staff members are also being trained in their respective fields. The HRD training programme conducted during January-June 2003 for the Institute staff and M.Sc. students amounts to 7, an average of 1.1 training per month. The trainings in most cases are backed with exhaustive training manuals.

HRD training programmes conducted during January-June 2003 are as follows:

1. Training in statistical procedures (for scientists, technical officers and research scholars) (continuing from 11 December 2002).
2. Orientation training programme (for supporting staff) (19-22 February 2002)
3. Training in computer applications (for scientists, technical officers and research scholars) (continuing from 28 March 2003).
4. Workshop on administrative and financial procedures (for administrative and finance staff) (23-24 April 2003)
5. Summer training in Biotechnology (for M.Sc students) (5 May - 4 June 2003)
6. Summer training in Bioinformatics (for M.Sc students) (5 May - 4 June 2003)
7. 27 M.Sc students undertook their project work at the Institute during January-April 2003.

In addition to the training of the above nature, regular Ph.D training (25 Ph.D students are now pursuing their studies at the Institute) is an important HRD activity of the Institute and the Institute is a recognized research centre of Calicut University and Bharathiyar University.

Thirty eight MSc (Biotechnology/Biochemistry/Microbiology/Plantation Development) students from different universities such as Bharathiyar University (Coimbatore), Bharatidasan University (Thiruchirappally), Periyar University (Salem), Bangalore University (Bangalore), Kannur University (Kannur) and Calicut University (Kozhikode) also completed their M.Sc. thesis



Manuals of manpower training

work in the Institute under the supervision of the scientists of the Institute during January to June 2003.

Recently, the Institute also conducted a short term training course 'Molecular Biological Technique for Horticultural Crops' for scientists of various Institutes under the Horticultural Divisions of ICAR during 27-12-2002 to 04-01-2003

### **RESEARCH HIGHLIGHTS**

#### **New black pepper varieties**

Three new black pepper lines viz., Coll. 1041, a clonal selection of Thevanmundi and HP-105 & HP-813 (hybrids) are approved for release by the SRC of the Institute. These lines are suited to high altitude areas and plains alike and showed superiority in yield and/or quality over Panniyur-1. HP-813 has more than 11% oleoresin.

#### **Viral etiology for stunting in black pepper**

The association of a badnavirus with stunted black pepper vines, showing the disease symptoms such as chlorotic flecks, chlorotic mottling along the veins and characteristic curling of leaves leading to reduced vigour and yield was established for the first time from India. Transmission of virus from diseased to healthy black pepper vines could be observed both by grafting and through mealy bug (*Ferrisia virgata*). The casual virus showed positive serological relationship with banana streak and sugarcane bacilliform badna viruses.

#### **Isolation of disease resistance genes using differential display PCR technique**

DDRT-PCR was done with total RNA isolated from *Piper colubrinum* leaves challenged with *Phytophthora capsici* and normal leaves from uninoculated plants as control. Gene specific

primers were designed for amplification of disease resistance and disease response genes. cDNAs corresponding to a putative chitinase gene (~ 600 bp) and disease resistance gene (2 cDNAs of ~ 250 bp) were amplified using one chitinase specific primer and two primers based on disease resistance genes, respectively.

#### **Molecular markers for insect resistance in black pepper**

RAPD profiling of 'pollu' beetle resistant lines (Accs. 816, 841, 1114 and 2070) along with two susceptible controls (P-24 and Panniyur-1) with 28 random primers showed polymorphism and the number of bands ranged from 8-13. Five primers showed specific bands in one of the collections. One of the primers (OPAA-08) showed specific band in only resistant lines whereas the primer OPAB-02 was specific for susceptible lines. Resistant lines formed a separate cluster with a similarity coefficient of 0.86. The primer sequences of OPAA-08 was matched with already reported sequences of insect resistant genes by BLAST search. There were 5 matches out of which three are patented insect resistant genes and two Bt sequences.

#### **High oleoresin pepper accessions from Silent Valley National Park**

Silent Valley National Park in Kerala is known for its spices flora. The National Park was explored thrice by IISR scientists. Two wild *Piper nigrum* accessions collected from the Silent Valley National Park recently, are found rich in quality traits. Acc. 5411 recorded 31% oleoresin with 6.2% piperine while Acc. 5442 recorded 21% oleoresin and 6% piperine. (Oleoresin in pepper varies from 7 to 15%)

#### **Quality evaluation in nutmeg**

Among the 30 nutmeg accessions screened for quality, it is found that the essential oil in nut ranges from 7.67% to 13.89% and that in mace

from 7.48% to 20.99%. Line A9/49 had the highest oil content in both nut and mace. Myristicin content in nut varied from 2.26% (Line A11/25) to 29.6% (Line A11/25) and that in mace from 1.7% (Line A11/25) to 28.68% (Line A9/11). Elemicin content in nut showed a range of 1.51% (Line A9/37) to 29.71 (Line A11/26) and in mace 1.05% (Line A9/47) to 29.85% (Line A9/4/11). The aminoacid profiling in nutmeg accessions using HPLC revealed a common profile.

#### Biocontrol of root mealy bug of black pepper

Evaluation of four isolates of entomopathogenic nematodes against root mealybug (*Planococcus* sp.) revealed that they are capable of causing 10-30% mortality of the test insects in laboratory bioassays.

#### Biological control of nematodes of spices

Five isolates of PGPRs, obtained from the rhizosphere of antagonistic plants like *Chromolaena odorata* and *Strychnos nuxvomica* showed suppressive action on both root knot and burrowing nematodes. Aqueous plant extracts of *Azadirachta indica*, *C. odorata* and *Naragamia alata* supported good growth and sporulation of *V. chlamydosporium*, a biocontrol organism, in liquid cultures.

#### Anthracnose tolerance in black pepper

Reaction of pepper cultivars/varieties to natural infection of anthracnose (*Colletotrichum gloeosporoides*) was recorded in the area with known history of spike shedding. Panniyur-1 was the most susceptible while Panniyur-5, Subhakara, Panchami, Balankotta and Kottanadan were found tolerant.

#### Rhizome solarisation inhibits *Ralstonia solanacearum* in ginger

Solarisation of ginger rhizomes inhibits the

population of *Ralstonia solanacearum* on ginger rhizomes as revealed by DAS-ELISA. This test also proved that the pathogen does not survive on the periderm of ginger rhizome

#### Coir pith compost - multiplication cum carrier medium for biofertilizer cultures

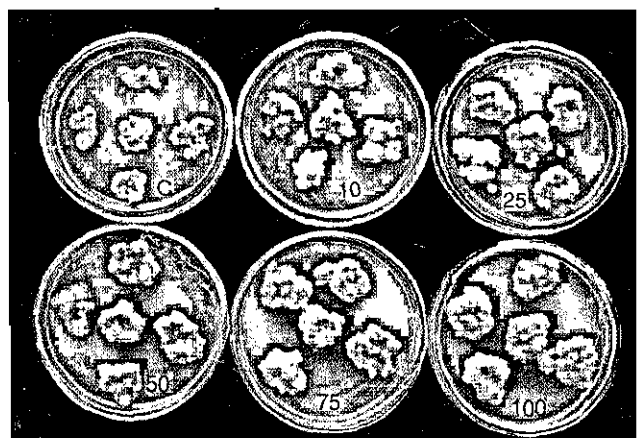
The coir pith compost amended with rock phosphate or ash in 1:10 or 1:20 proportion respectively served as a very good carrier medium for mass multiplication of biofertilizer organisms *Azospirillum* sp. and P-solubilising bacteria.

#### *Myristica malabarica* - new rootstock for budding nutmeg

Budding of nutmeg on *Myristica malabarica* root stock yielded 30% success.

#### Ampicillin promotes *in vitro* calli growth in ginger and cardamom

Antibiotic ampicillin is found to promote calli growth in ginger and cardamom under *in vitro* condition.



Effect of ampicillin on growth of ginger calli (C = control; 10-100 are concentration of ampicillin  $\mu\text{gml}^{-1}$ )

#### DNA isolation protocol from turmeric powder

A modified CTAB protocol for isolation of amplifiable DNA from powdered sample of turmeric is perfected.

### GERMPLASM COLLECTION

A joint exploration was conducted by Dr. Johnson K. George, Sr. Scientist, IISR, Kozhikode in collaboration with NBPGR, New Delhi; CARI, Port Blair; CTCRI, Thiruvananthapuram; CPCRI, Kasaragod and SBI, Coimbatore in Andaman & Nicobar islands for collection of germplasm during 10-28 March 2003. A total of 30 collections were made from the districts of South Andamans & Nicobar.

*Garcinia hombroniana*, wild *Curcuma* sp. *Homstedtia fenzi* (a bee repellent Zingiberaceous plant) and few *Piper* spp. were collected from the Islands.



*Garcinia hombroniana*

*Vanilla andamanica* collected from the Islands, seems to be self setting and could be utilized in the breeding programme for vanilla improvement.

Another germplasm collection trip was also undertaken by Dr. Johnson K. George during 3-12 February 2003 to Kolasib, Aizawal, Serchhip, Champai areas of Mizoram. Different unique species of *Piper* having pendent and erect spikes were found to occur in this area. *C. tamala*, and *Garcinia cowa* were collected from

the region. *Sernum* (*Litsea cubeba*) and *lengmaser* (*Elshaltzia blande*) are tree spices used by Mizos. *Sernum* is also thought to have medicinal properties especially for hysteria. The possibility of including these species as spices needs to be explored. Good variability in cultivated ginger (bold plumpy rhizome, lemon yellow inner core colour, less fibre) was collected during the survey.

Dr. B. Sasikumar, Sr. Scientist and Mr. K.V. Saji, Scientist (Sr. Scale), IISR, Kozhikode toured Coochbehar and Jalpaiguri, border districts of West Bengal with Bhutan and Bangladesh, to collect cultivated diversity of ginger and turmeric besides wild *Piper* species, during 14-02-2003 to 19-02-2003. The villages of these districts skirting the international borders, village markets and farmer's houses were visited in addition to exploring the Tottopara forests. 'Tottopara' is a place mainly inhabited by the ethnic tribe "Tottos" in the Indo-Bhutan border. During the survey 20 accessions of cultivated ginger, 19 accessions of cultivated turmeric were collected in addition to 4 *Piper* accessions. *Piper thomsonii* and *P. peepuloides* (erect spiked species) collected during the survey are new additions to the IISR genebank.



*Piper peepuloides* (♀)

Mr. P.A. Mathew, Principal Scientist, IISR Farm, Peruvannamuzhi collected eleven clonal accession of kokum (*Garcinia indica*) from South Kanara area of Karnataka during June 2003.

#### **PARTICIPATION IN SYMPOSIA/ SEMINARS/ TRAINING/ MEETING**

##### **Ankegowda, S.J**

Propagation and cultivation of black pepper, Master training programme on black pepper cultivation, 19 February 2003, IISR, Cardamom Research Centre (CRC), Appangala.

Cardamom cultivation, Bhagamandala Vyavasaya Seva Sahakarana Bank and Farmers club meeting, 8 March 2003, Bhagamandala, Karnataka.

Spices cultivation, Coffee Berry Borer Programme, Coffee Board, Napoklu, 26 March 2003, Bhagamandala, Karnataka.

##### **Arun Anirudhan**

Annual BTIS coordinator's meeting, 21-22 February, Bose-Institute, Kolkata.

##### **Chempakam, B**

Molecular Biology Techniques for Horticultural Crops, 27 December 2002 to 4 January 2003, IISR, Kozhikode.

Swadeshi Science Movement – Women's Empowerment Programme (SAKTHI), 22 March, 2003, Swadeshi Bhavan, Kochi.

##### **Chettiyar, S.M**

HRD Leadership Skills, 20-25 January 2003, CMFRI, Tutichorin, Tamil Nadu.

##### **Devasahayam, S**

Workshop on HRD Strategies for Agricultural Effectiveness of National Agricultural Research System, 11-12 March 2003, Hyderabad.

Workshop on Participatory Technology Development, 24 March 2003, Iringalakuda, Trissur, Kerala.

##### **Ishwar Bhat, A**

Task Force Meeting of Plant Biotechnology,

29 January 2003, DBT, New Delhi.

##### **Johnson K. George**

Brain storming session on Database for the Management of Genetic Resource of Horticultural Crops, Sponsored by DBT, New Delhi, 19 June 2003, CPCRI, Kasaragod.

Zonal meeting of NATP on Plant Biodiversity, NBPGR, Trissur, Kerala.

##### **John Zachariah, T**

Value Addition and Processing in Black pepper, State Level Training to Extension Personnel, Department of Agriculture, Govt. of Kerala, 21-January 2003, Kozhikode, Kerala.

Post Harvest Processing and Value Addition of Spices for Agriculture Assistants, Department of Agriculture, Govt. of Kerala, 30 January 2003, Kozhikode, Kerala.

Workshop on Hazard Analysis Critical Control Point for Chilli Safety Management, 4-5 February 2003, RARS, LAM, Guntur, Andhra Pradesh.

##### **Johny, A.K**

HRD Leadership Skills, 20-25 January 2003, CMFRI, Tutichorin, Tamil Nadu.

##### **Kandiannan, K**

State Level Seminar on Vanilla and Black Pepper Cultivation, 20 March 2003, Horticultural Research Station (TNAU), Thadiyankudisai, Tamil Nadu.

Advanced course on Web Design, NATP sponsored training programme, 24-29 March 2003, NAARM, Hyderabad.

Regional Workshop on Coffee based Cropping System for Kerala, 6 April 2003, Regional Coffee Research Station, Chundale, Wyanad, Kerala.

Seminar on Organic Agriculture, 5 June 2003, Spices Board, Kochi, Kerala.

##### **Krishnamurthy, K.S**

Molecular Biology Techniques for Horticultural crops, 27 December 2002 to 4 January 2003, IISR, Kozhikode.

**Leela, N.K**

Workshop on Hazard Analysis Critical Control Point for Chilli Safety Management, 4-5 February 2003, RARS, LAM, Guntur, Andhra Pradesh.

Short course on Management Development Programme for Women Scientists, 27 May 2003 to 6 June 2003, NAARM, Hyderabad.

**Madan, M.S**

Training on Advanced RDBMS Course, 30 January 2003 to 1 March 2003, NIIT, Bangalore.

**Mathew, P.A**

One day farmer's seminar, 15 March 2003, ICUP School, Poozhithode, Kozhikode.

"Karshika Mela", 30 May 2003, organized by INFARM, Kozhikode.

**Parthasarathy, V.A**

Brain storming session on Ecotourism and Event Management, 5-6 February 2003, Kozhikode.

National Workshop on HRD Strategies, 9-13 March 2003, NAARM, Hyderabad.

Meeting of High Power Committee on IT and BT, 12-13 April 2003, Govt. of Kerala, Thiruvananthapuram.

National Consultative Meeting on Improvement in Productivity and Cultivation of Ginger, Directorate of Horticulture and Ministry of Agriculture, Govt. of India, 12-14 May 2003, Aiswal, Mizoram.

National seminar on Floriculture, 14-15 May 2003, ICAR Research Complex, Barapani, Meghalaya.

IMC Meeting, 7 June 2003, CPCRI, Kasaragod.

DISC Executive Meeting for CPCRI and IISR, 19 June 2003, CPCRI, Kasaragod.

Brain storming session on Database for the Management of Genetic Resource of Horticultural Crops, Sponsored by D&T, New Delhi, 19 June

2003, CPCRI, Kasaragod (Delivered the Key note address).

**Rajeev, P**

National Review workshop of Agricultural Technology Information Centre (NATP), 17-18 January 2003, Rajasthan Agricultural University, Bikaner, Rajasthan.

Orientation workshop on Research Methodology in Social Science organized jointly by Centre for Development Studies, Thiruvananthapuram and Kerala Institute for Local Development, Trissur, 11-13 April 2003.

State Level Farm Feature Workshop organized by Farm Information Bureau, Department of Agriculture, Thiruvananthapuram, Kerala, 30-31 May 2003.

Kannur Study Circle of Kerala Research Programme for Local Development Centre for Development Studies, Thiruvananthapuram, 30 March 2003 & 16 May 2003.

**Ramana, K.V**

National Consultative Meeting on Improvement in Productivity and Cultivation of Ginger, Directorate of Horticulture and Ministry of Agriculture, Govt. of India, 12-14 May 2003, Aiswal, Mizoram.

**Rema, J**

Molecular Biology Techniques for Horticultural Crops, 27 December 2002 to 4 January 2003, IISR, Kozhikode.

**Saji, K.V**

Molecular Biology Techniques for Horticultural Crops, 27 December 2002 to 4 January 2003, IISR, Kozhikode.

Brain storming session on Ecotourism and Event Management, 5-6 February 2003, Kozhikode.

National seminar on Bioinformatics and Biodiversity Data Management, 15-17 March 2003, Thiruvananthapuram.

**Santhosh J. Eapen**

Annual BTIS Coordinator's Meeting, 21–22 February, Bose Institute, Kolkata.

Brain storming session on Database for the Management of Genetic Resource of Horticultural Crops, Sponsored by DBT, New Delhi, 19 June 2003, CPCRI, Kasaragod.

**Sasikumar, B**

Joint Meeting of the Steering Committee of State Biodiversity Strategy Action Plan (BSAP) and Kerala Biodiversity Committee, 16 January 2003, Thiruvananthapuram.

One day Farmers Seminar, 15 March 2003, ICUP School, Poozhithode, Kozhikode.

Patent Awareness Workshop, 21 March 2003, Kerala Agricultural University, Trissur.

**Shiva, K.N**

Brain storming session on Ecotourism and Event Management, 5–6 February 2003, Kozhikode.

**Somanna, K**

HRD Leadership Skills, 20–25 January 2003, CMFRI, Tutichorin, Tamil Nadu.

**Suseela Bhai**

Molecular Biology Techniques for Horticultural Crops, 27 December 2002 to 4 January 2003, IISR, Kozhikode.

Promotion of Vanilla Cultivation, Mampad Grama Panchayath, Kozhikode, 19 March 2003.

Swadeshi Science Movement – Womens Empowerment Programme (SAKTHI), 22 March, 2003, Swadeshi Bhavan, Kochi.

Short course on Management Development Programme for Women Scientists, 27 May 2003 to 6 June 2003, NAARM, Hyderabad.

**Thankamani, C.K**

Seminar on Organic Agriculture, 5 June 2003, Spices Board, Kochi, Kerala.

**GUEST LECTURES DELIVERED/ INVITED PAPERS PRESENTED****Chempakam, B**

Biosafety & laboratory practice. Summer training on Biotechnology/Biochemistry for MSc students, 5 March to 4 June 2003, IISR, Kozhikode.

**Devasahayam, S**

Insect pest management in black pepper. Workshop on participatory technology development, 24 March 2003, Iringalakuda, Trissur, Kerala.

**Ishwar Bhat, A**

Production of polyclonal antiserum, Winter school, 15 February 2003, TNAU, Coimbatore.

Serological method for detection of viruses, Winter school, 15 February 2003, TNAU, Coimbatore.

**John Zachariah, T**

Processing and preparation of value added products, 20 January 2003, Vyapara Bhavan, Thamarassery, Kozhikode.

Products diversification and value addition in spices, 15 March 2003, RARS, Ambalavayal, Wyanad.

Product diversification and value addition in spices, 28 May 2003, Karimpam, Taliparamba, Kannur.

**Johnson K. George, Saji, K.V, Sasikumar, B, Anandaraj, M. and Santhosh J. Eapen**

Molecular markers for spice germplasm management. In: Brain storming session on database for the management of genetic resources of horticultural crops, 19 June 2003, CPCRI, Kasaragod.

**Kandiannan, K**

New varieties and improved package of practices for black pepper, 20 March 2003, Horticultural Research Station (TNAU), Thadiyankudisai, Tamil Nadu

Tree spices cultivation in coffee estates, 6



April 2003, Regional Coffee Research Station, Chundale, Wyanad, Kerala.

**Krishnamoorthy, B**

Cost economics of major spices, 21 May 2003, TNAU, Coimbatore, Tamil Nadu.

**Madan, M.S**

Indian black pepper – changing scenario. State level seminar on black pepper, 21 January 2003, Kozhikode.

**Mathew P. A.**

Nutmeg and black pepper. 4 January 2003, Kisan Mela, Thodupuzha.

Vanilla - 14 and 16 January 2003, Spices Production Technology Trainees, IISR, Kozhikode.

Vanilla - 2 February 2003, Flower Show, Kozhikode.

Spices - 11 February 2003, Trainees from North-Eastern India.

Vanilla - 22 February 2003, Janakiya Vayanasala and Grandhalayam; Moyilothara, Kozhikode.

Vanilla cultivation, Nutmeg and Organic farming. 30 May 2003, Karshika Mela, INFARM, Koorachundu, Kozhikode.

**Parthasarathy, V.A**

Molecular flower breeding. National seminar on Floriculture, 15 June 2003, ICAR Research Complex, Barapani, Meghalaya.

**Parthasarathy, V.A., Kandiannan, K., Anandaraj, M. and Devasahayam, S**

Technological Advances for improving ginger production. National Consultative Meeting for Improvement in Productivity and Cultivation of Ginger, 12-14 May 2003 Aizwal, Mizoram.

**Parthasarathy, V.A. and Saji, K.V**

Key note address on Database Management for Spices. Database Management for the Genetic Resources Horticultural Crops.

Brainstorming Session, 19 June 2003, CPCRI, Kasaragod.

**Rajeev, P**

Vanilla cultivation. Research-Extension & Farmer Interface Meeting, 17 March 2003, Department of Agriculture, Kozhikode, Kerala.

**Ramana, K.V., Shiva, K.N. and Johny, A.K**

Production of quality planting material of ginger. In: Souvenir – National Consultative Meeting for Improvement in Productivity and Cultivation of Ginger. Mann, J.S. and Selvan, M.T. (Eds.), pp. 37–45.

**Sasikumar, B and Hareesh, P.S**

*Agrobacterium* mediated transformation of plants. For trainees of molecular biology techniques in horticultural crops, 31 December 2002, IISR Kozhikode.

**Sasikumar, B and Syamkumar, S**

Isolation of plant DNA and RAPD analysis. For trainees of molecular biology techniques in horticultural crops, 1 January 2003, IISR Kozhikode.

**Sasikumar, B**

Botany, varieties and varietal improvement of black pepper. Spices Production Technology Trainees, 13 January 2003, IISR Kozhikode.

Botany, varieties and varietal improvement of ginger and turmeric. Spices Production Technology Trainees, 16 January 2003, IISR Kozhikode.

IPR and Patenting. Summer training course on Biotechnology/Biochemistry MSc Students, 7 May 2003, IISR, Kozhikode.

*Agrobacterium* mediated transformation of plants. Summer training course for MSc Biotechnology/ Biochemistry students, 17 May 2003, IISR, Kozhikode.

**Srinivasan, V**

Nutrient management in black pepper. Participatory Technology Development (PTD)

workshop, 24 May 2003, Iringalakuda, Trissur, Kerala.

#### Thankamani, C.K

Organic spices. Sugandha Vignana Mela Seminar, 28 May 2003, Taliparamba Farm, Kannur, Kerala.

#### Venugopal, M.N

Production technology of cardamom, 18 February 2003, KVK, Gonikoppal, Karnataka.

Prospects of spices as intercrop in coffee plantations, 18 March 2003, Kargunda.

Varieties, pests, disease management and post harvest processing of pepper, 19 March 2003, IISR, CRC Appangala, Karnataka.

Production technology of pepper, 20 March 2003, Virajpet, Karnataka.

Option for organic cultivation of cardamom, pepper and ginger, 25 March-2003, Napoklu, Karnataka.

### PUBLICATIONS

#### Research Articles

Ankegowda, S.J., Chethan, C.V. and Korikanthimath, V.S. 2002. Soil and water conservation measures in cardamom cultivation. Proc: National Symposium on soil and water conservation measures and sustainable land use systems with special reference to the Western Ghats Region. ICAR Research Complex for Goa and NATP (Coastal), Goa, 16-17 November 2002, p. 47-49.

Korikanthimath, V.S., Gaddi, A.V., Ankegowda, S.J. and Govardhan Rao. 2002. Soil fertility evaluation in plantation belt of Kodagu District, Karnataka. J. Medi. & Aromatic Plant Sci., 24: 407-409.

Peter, K.V., Sasikumar, B. and Mohan Kumar,

B. 2002. Modern concepts in breeding in spices. Lead Paper in Session I Breeding Innovation for yield resistance and quality. In: PLACROSYM XV, 10-13, December 2003, Mysore.

Prasad, D. and Venugopal, M.N. 2002. Genetic analysis for quantitative characters in cardamom (*Elettaria cardamomum* Maton.). Ind. J. Genet. and Plant Breed, 62: 179-180.

Prasad, D. and Venugopal, M.N. 2002. Heterosis expression in cardamom (*Elettaria cardamomum* Maton.). In: PLACROSYM XV, 10-13 December 2002, Mysore

Saji, K.V., Sasikumar, B., Johnson K. George., Nirmal Babu, K., Krishnamoorthy, B. and Santhosh J. Eapen. 2003. Development of black pepper germplasm database and utilization. National Seminar on Bioinformatics and Biodiversity Data Management, Tropical Botanical Garden and Research Institute, Thiruvananthapuram, 15-17 May 2003, p. 9 (Abstr.).

Syamkumar, S., Bosco Lawrence and Sasikumar, B. 2003. Isolation and amplification of DNA from rhizomes of turmeric and ginger. Plant Mol. Biol Reporter, 21: 1-5.

#### Popular Articles

Ankegowda, S.J. 2002. Pepper harvesting and processing. Spice India (Kannada), 15 (3): 2-4.

Ankegowda, S.J. 2002. Cardamom planting and cultivation. Spice India (Kannada), 15 (9): 7-11.

Ankegowda, S.J. 2002. Improved cultivation practices in black pepper, Souvenir (Kannada), Aksaya, Krishimela, 28-29 December 2002, pp. 28-30.

Johny, A.K. and Ravindran, P.N. 2002. Hints for cardamom cultivation – High production technology, *Plant Hort Tech.* 3 (6): 21 -27.

Krishnamoorthy, B. 2002. Cloves in coconut garden. *Spice India (Tamil)*, 15 (12): 10–13.

Madan, M.S. and Kannan, S. 2002. Import liberalization and Indian spice economy. *Spice India*, 15 (3): 10–13.

Madan, M.S., Srinivasan, V., Remichandran and Nagendra, J. 2002. Integrated National Agricultural Research Information System (INARIS) – A Geo-referenced spice database. *Souvenir-National Consultative Meeting for Accelerated Production and Export of Spices, Directorate of Arecanut and Spices Development (DASD), Kozhikode, Pp. 75–82.*

Madan, M.S., Sarma, Y.R. and Nagendra, J. 2002. Spices production and prospects in Andhra Pradesh. *Ind. J. Arecanut, Spices & Medicinal Plants*, 4 (1): 42–50.

Prasath, D. and Venugopal, M.N. 2002. IISR Avinash – A rhizome rot resistant high yielding cardamom variety. *Spice India (Tamil)*, 15 (6): 1–2.

Prasath, D. and Venugopal, M.N. 2002. IISR Vijetha – A mosaic (*Katte*) resistant high yielding cardamom variety. *Spice India (Tamil)*, 15 (9): 8–9.

Sasikumar, B. 2003. Medicinally important spices and their cultivation. *Deepika News paper (Malayalam)*, 4 March 2003.

Sasikumar, B. 2003. Direct regeneration of ginger from aerial stem. *Karshakasree (Malayalam)*, 8 (9): 36.

Sasikumar, B. 2003. The epic history of black pepper. *Kerala Karshakan (Malayalam)*, 48 (10): 25 & 28.

Syamkumar, S. and Sasikumar, B. 2003. Discrimination of turmeric and ginger varieties based on PCR technique. *Karshakan (Malayalam)*, 11 (6): 36.

Thankamani, C.K. 2003. Management of bush pepper. *Spice India (Malayalam)*, 16 (1): 4, 25.

### Technical Publications

Product and market information of black pepper 1999-2000. *Spices Database, INARIS/NATP Session I*, Madan, M.S. (Ed.), Indian Institute of Spices Research, Kozhikode, 2002.

Black pepper anthology.– An Interactive CD. *Integrated National Agricultural Resources Implementation System (NATP)*, Madan, M.S. (Ed.), Indian Institute of Spices Research, Kozhikode, 2002.

Training manual on molecular biological techniques for horticultural crops. Parthasarathy, V.A., Ishwar Bhat, A., Kumar, A., Johnson K. George, Anandaraj, M. and Krishnamoorthy, B. (Eds.), Indian Institute of Spices Research, Kozhikode, 2002, p. 61.

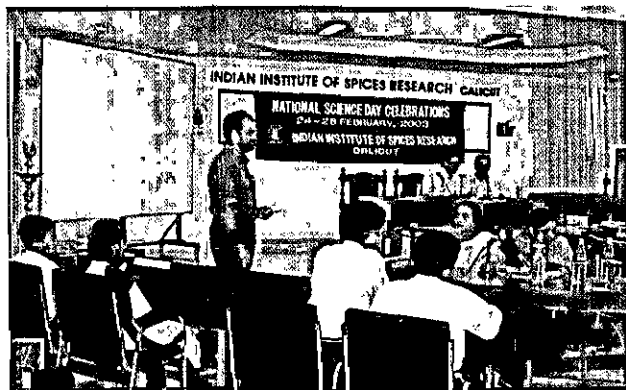
IISR Research Highlights 2002-03. Rema, J. and Devasahayam, S (Eds.). Indian Institute of Spices Research, Kozhikode.

Training Manual on summer training on Bioinformatics, Santhosh J. Eapen (Ed.) 2003. Indian Institute of Spices Research, Kozhikode, p. 212.

Training Manual on summer training on Biotechnology and Biochemistry. Johnson K. George and Ishwar Bhat, A. (Eds.), Indian Institute of Spices Research, Kozhikode, p. 190.

## NATIONAL SCIENCE DAY AT INDIAN INSTITUTE OF SPICES RESEARCH, KOZHIKODE

For the first time in the history of the Institute, the National Science Day was celebrated for 5 days from 24<sup>th</sup> February to 28<sup>th</sup> February at the main campus, Chelavoor including one day at the research farm, Peruvannamuzhi 51 km. away from the main campus was also unique in the sense that the vote of thanks in the inaugural function was proposed by the Asst. Finance & Accounts Officer of the Institute, Mr. M.K. Sachidanandan, a non scientist!



Quiz competition for school children in progress

In his genteel presidential speech, Director, Dr. V.A. Parthasarathy, stressed the need of taking science to the needy and traced back the development of scientific thinking in the country especially in south India. Knowledge proof public is one of the major hindrances in popularizing science – he added.

Science in India had a chequered past since very ancient days. 'Science in Ancient India' was in fact a well thought about topic delved by Dr. K.N. Kurup, Head of Social Science Section, Indian Institute of Spices Research, Kozhikode. He spoke eloquently on topics like 'Vedic

Mathematics' and 'Vedic Agriculture', both in Malayalam and English, in the main campus and research farm, respectively.

We had great 'rishis' like Aryabhatan, Kanadan, Charvakan, Brihaspadi, Vachaspadi, etc. who excelled in subjects like Astronomy, Physics, Geology on one hand and Astrology on the other hand. Dr. Kurup brought to the audience the contribution of many of these great saints of ancient India.

'Human cloning – good or bad' was the topic of elocution for the Institute staff and school children held on 26<sup>th</sup> and 27<sup>th</sup> February 2003, respectively, at the main campus again in English and Malayalam followed by 2 quiz, one for the Institute staff and the other for the school children. Students from 4 nearby schools of the Institute including a lone Malayalam medium school participated in the quiz program.

Human cloning is a topic that generated whoops of delight on one hand and a whole lot of disputes, on the other hand. As the technology is not going to be scale neutral or gender neutral, it would lead to skewed development in the society, result in the alienation of women reducing them to mere egg layers, etc. are some of the arguments leveled against human cloning. One thing is sure, the technology *per se* is not at fault – it is for us to use it or abuse it, that was the final consensus evolved.

In the quiz competition held for the school students, students from the Malayalam medium school topped, reminding us that education in vernacular need not be a handicap in grasping the developments in science, technology or humanities.

In the valedictory day function held on 28-02-2003, Dr. K.P. Aravindan, Associate professor, Medical College, Kozhikode was the Chief Guest. He distributed prizes to winners of different competitions and gave talk on 'Human Genome Project'. Dr. B. Sasikumar summed up the National Science Day activities. Dr. A. Ishwar Bhat proposed vote of thanks.

### FORTHCOMING EVENTS

#### PGPR workshop

The Sixth International Workshop on Plant Growth Promoting Rhizobacteria will be organized at Kozhikode, Kerala during 5-10 October 2003 by Auburn University, Alabama USA in association with the Indian Council of Agricultural Research (ICAR), New Delhi and Indian Society for Spices (ISS), Kozhikode.

#### XVII AICRPS workshop

The XVII group meeting of workers of All India Coordinated Research Project (AICRP) on Spices will be held at Indian Institute of Spices Research, Kozhikode, Kerala during November 2003.

#### Workshop on Agricultural Bioinformatics

A workshop on Agricultural Bioinformatics will be organized at IISR, Kozhikode during 29-30 October 2003.

National seminar on 'New perspective in spices, medicinal and aromatic plants'.

The Indian Society for Spices, Kozhikode will be organizing the above National Seminar at ICAR Research Complex, Goa during 27-29 November 2003.

### AWARDS/HONOURS

Dr. V.A. Parthasarathy, Director, IISR, Kozhikode is nominated to represent India in the International Society for Horticultural Science (ISHS), Belgium for three years.

Dr. V.A. Parthasarathy has been nominated as member of "Task force on Biotechnology" by ICAR under NATP.

Dr. K. Kandiannan, Scientist, Sr. Scale (Agronomy), Indian Institute of Spices Research, Kozhikode has bagged the Foreign examiners donation price for the best Ph.D student in Agronomy and Prof. S Subramanian scholar award for the best Ph.D thesis in Agronomy in (i) Irrigation management and Agroclimatology (ii) System management (iii) Input management of Tamil Nadu Agricultural University, Coimbatore for the year 2003.

Dr. M.S. Madan, Sr. Scientist (Agril. Economics) is recognized by Calicut University as a research guide in Agricultural Economics.

### TRANSFER OF TECHNOLOGY

#### Spices production technology training

A three day, Spices Board sponsored, training programme for spices production was organized for Agricultural/ Horticultural officers from North Eastern states during 13-15 January 2003, at IISR, Kozhikode.

#### Molecular biology training for Horticultural Scientists

A nine day training on important aspects of plant molecular biology was conducted at IISR, Kozhikode for scientists of ICAR institutes under Horticultural division of ICAR. A total of 9

scientists one each from National Research Centre for Grapes, Pune; National Research Centre for Citrus, Nagpur; Indian Institute of Vegetable Research, Varanasi and Central Institute for Subtropical Horticulture, Lucknow, besides five scientists from IISR, Kozhikode participated in the training programme.

#### Spices varieties go glitzy

New varieties of nutmeg, ginger and turmeric from IISR, Kozhikode are hogging the headlines. Eversince the release of new variety of nutmeg 'Viswashree' in 2002, the sale of grafts of elite lines of nutmeg has received a boost. A total of 27191 nutmeg grafts have been sold from Experimental farm, Peruvannamuzhi, since 1998 including 5186 grafts of Viswashree variety. The varieties have been diffused to various states like Kerala, Tamil Nadu, Karnataka, Goa, Haryana, Maharashtra, Orissa, Assam, North-Eastern states and West Bengal.

The new varieties of ginger viz. Varada, Mahima and Rejatha as well as turmeric

varieties, Prabha and Prathibha are also in great demand from different parts of the country both by farmers and the industry.

#### ATIC news

During the period 850 farmers availed information and product services from ATIC. Besides 12 farmers groups/comprising of 575 farmers from various states like Kerala, Karnataka, Andhra Pradesh and Andaman and Nicobar Islands visited the institute.

#### News from KVK

A total of thirty two 1-2 days/ 1-2 week training programmes were organized by the KVK, Peruvannamuzhi for farm women, youths and farmers.

The KVK also participated in Calicut Flower Show 2003, 30 January 2003 to 6 February 2003, Kozhikode. Other activities of KVK include, consultancy/advisory service (131), artificial inseminations (112) and immunization programme RDVK (120 fowls).

Sl. No.	Course	Period	No. of participants
1.	Scientific cultivation of coleus	2.1.03	20
2.	Indigenous medicines in animal treatment	4.1.03	61
3.	Goat production and management	6.1.03 & 7.1.03	15
4.	Vermicompost production	8.1.03	21
5.	Goat rearing	9.1.03	16
6.	Artificial flower making	13.1.03 to 27.1.03	19
7.	Spices production technology	17.1.03	29
8.	Coir pith compost making	18.1.03	20
9.	Fruit processing	21.1.03	16
10.	Fruit processing	22.1.03	24
11.	Fruit processing	23.1.03	22
12.	Dairy animal management and fodder production	3.2.03 to 7.2.03	11

Sl. No.	Course	Period	No. of participants
13.	Value addition of spices	4.2.03	45
14.	Fertility management in milch cow	14.2.03	65
15.	Vermicomposting	19.2.03	16
16.	Vermicomposting	20.2.03	28
17.	Indigenous medicines in animal treatment and calf management	21.3.03	62
18.	Milch cow management and preparation of silage and treatment of paddy straw with urea	22.3.03	77
19.	Milch cow management	24.3.03	67
20.	Application of urea solution for wound healing	25.3.03	24
21.	Milch cow management	26.3.03	55
22.	Nursery management	3.4.03 to 5.4.03	10
23.	Plant protection in spices	8.4.03	12
24.	Nursery management	3.4.03 to 5.4.03	10
25.	Training on treating of Bamboo for Handicraft preparation	22.4.03	13
26.	Spices production technology	23.4.03 to 26.4.03	24
27.	Vanilla cultivation	24.4.03	23
28.	Spices production technology	25.4.03 to 26.4.03	9
29.	Vanilla cultivation	28.4.03	25
30.	Vanilla cultivation	5.5.03	11
31.	Vanilla cultivation	6.5.03	8
32.	Nutrition garden	7.5.03	20

### Kisan Mela

A one day Kisan Mela was organized at Poozhithodu Village, Kozhikode in connection with the launching of front line demonstration project on biological control of pests of coconut implemented through KVK, Peruvannamuzhi. The mela was organized at ICUP School, Poozhithode on 15.03.03 in which about 300 farmers participated. Dr. R.K. Samanta, Zonal Coordinator, Zone VIII, Bangalore, inaugurated



Inauguration of the Kisan Mela by Dr. R.K. Samanta, Zonal Coordinator. Dr. V.A. Porthasarathy, Director, IISR, Kozhikode, Mr. Agustin Ambat (Ward Member), Dr. T.K. Jacob, CTO, KVK and Mr. P.A. Mathew, Scientist in charge, IISR Farm are seen (L?R)

the mela. Director, IISR, Kozhikode, Scientists (IISR), Ward members and officials from Bank also participated in the Kisan Mela. Classes on integrated pest management in coconut were also organized in connection with Kisan Mela.

### Field day

A Field day was conducted on 18.7.03 at Poozhithode on coir pith composting by KVK. Twenty farmers attended the programme.

### Radio talks

Ankegowda, S.J

Agronomic practices for better yield in cardamom, AIR, Madikeri, 10 February 2003.

Santhosh J. Eapen

Nematodes in spices.--problems and control, AIR, Kozhikode, 29 January 2003.

Sasikumar, B

Medicinally important spices, AIR, Kozhikode, 28 December 2002.

Venugopal, M.N

*Harvesting and processing of pepper and cardamom to maintain quality, AIR, Madikeri*

Propagation techniques and plant protection in pepper, AIR, Madikeri

### Consultancy service

Dr. K. Kandiannan and Dr. M.N. Venugopal

### LIBRARY

Seventy three new titles were added to the IISR library. Resource sharing between CPCRI and IISR libraries introduced. Agricultural Science Tit Bits (Jan-March 2003) containing paper clipping related to spices and spices bibliography vol. 11(2) were brought out.

### NEW PROJECTS

DBT Adhoc Project: Endophytic bacteria for biological system management of *Radophalus similis*, the key nematode pest of black pepper.

Development of rhizome disinfection technology for the management of bacterial wilt of ginger – funded by International Foundation for Science, Sweden.

"Integrated disease management of foot rot of black pepper – A study on technology diffusion and impacts". Kerala Research Programme for Local Level Development (KRPHLD) Centre for Development Studies, Thiruvananthapuram

### WOMEN'S CELL

Women's cell of IISR, Kozhikode celebrated the International Women's Day on 7 March 2003. Director presided over the function. Dr. B. Chempakam, Convenor, Women's Cell gave





View of the inaugural function of Women's day celebration

speeches by staff members. Dr. B. Sasikumar, Dr. P. Rajeev, Dr. M.S. Madan and Mr. Santhosh J. Eapen spoke on the occasion. The meeting came to a close with the vote of thanks by Dr. Suseela Bhai.

#### NEWS FROM BIOINFORMATICS CENTRE

##### **DBT Studentship**

The Bioinformatics Centre has selected Ms. Remya . R, Karpagam Arts and Science College, Coimbatore, Ms. Anila George, Sri Ramakrishna College of Arts and Science, Coimbatore, Mr. Binoy A.M and Ms. Sajitha Varghese of J.J. College of Arts and Science, Pudukkottai for the award of DBT studentship. The studentship carries a scholarship of Rs. 3000/- per month for a period of 3 months.

As part of the DBT studentship the following databases were also developed.

*Curcuma* species – a database of various *Curcuma* species of the country and their characteristics and identification by Ms. R.

Remya; *Myristica* Germplasm – a database of nutmeg germplasm collections at IISR, Kozhikode by Ms. Sajitha Varghese and *Ralstonia* Biovars – an expert system for biovar characterization of *Ralstonia solanacearum*, the casual organism for bacterial wilt of ginger by Ms. Anila George. (<http://www.iisr.org/bioinformatics/project/ralstonia/index.htm>)

##### **Traineeship Extended**

DBT has extended the traineeship of Mr. Senthil Kumar and Ms. Parvathi P.K for another six months to complete the Bioinformatics project on *Phytophthora*.

##### **New Database/software developed**

A new database on chemical compounds in cardamom volatile oil and their metabolic pathways was developed as a part of the M.Sc project of Ms. Helna. K. It is available at <http://www.iisr.org/bioinformatics/project/cardamom/index.htm>.

##### **IMC**

The Institute Management Committee met twice during the period once at IISR, Kozhikode and another time at CPCRI, Kasaragad. Dr. V.A. Parthasarathy, Director, IISR, Kozhikode chaired the meetings. ADG (PC & VC), Dr. B. S. Dhanker and other members attended both the meetings.

##### **IJC**

The Institute Joint Council met at IISR Farm,

Peruvannamuzhi on 28 June 2003. Dr. V.A. Parthasarathy, Director, IISR, chaired the meeting.

#### **RAC & SRC**

The Research Advisory Committee meeting of IISR, Kozhikode was held during 9-10 April 2003. Dr. K.V.A. Bavappa (Chairman) and members, Prof. V. Arunachalam, Dr. C.K. George, Dr. C.B.S. Rajput participated in the 2 day meeting, besides Dr. V.A. Parthasarathy, Director, IISR, Kozhikode, Dr. K.V. Ramana, Member Secretary and scientists from the Institute.

Based on the previous RAC recommendation the existing projects of the Institute was regrouped under 11 mega projects and the project leaders were identified.

The Staff Research Council (SRC) followed the RAC on 11 April 2003.



RAC session in progress. Dr. K.V.A. Bavappa (centre), Dr. V.A. Parthasarathy (right) and Dr. K.V. Ramana (left) are seen

#### **INARIS & IISR WEBSITES**

The INARIS website, [www.spicestat.org](http://www.spicestat.org), was launched on 18<sup>th</sup> January 2003 by Dr. Mruthyunjaya, Director, NCAD (ICAR) in a function held at IISR, Kozhikode. The overall objective of this website is to provide a comprehensive 'Decision Support facility' to individuals and institutions dealing with spice crops or related industry. This website provides information on almost all spices. Apart from the statistical databases, this website also gives information on cultivation aspects of spice crops besides pests. This site will be beneficial to agribusiness people too as it provides information relevant to them as well.

The IISR web site [www.iisr.org](http://www.iisr.org) has been hit by 7841 visitors since December 2001.

A database on bioinformatics prepared at the institute has been added to the site.

The web page of Indian Society of spices has been updated by including the online version of Abstracts of research articles published in the Journal of Spices and Aromatic Crops.

#### **HINDI CELL**

Quarterly meetings of the Official Language Implementation Committee was held on 04-01-2003 and 21-04-2003. A Hindi Workshop was conducted at IISR, Kozhikode on 14-02-2003 regarding Hindi Noting and Drafting. Mrs. N. Prasannakumari, Hindi Translator attended TOLIC sub committee meetings. Mr. C. Padmanabhan, Assistant was deputed for Hindi

Workshop conducted by TOLIC, Calicut on 22-01-2003. Mr. S.M. Chettiar, PS to Director was deputed for 5 days Hindi Workshop conducted by NAARM, Hyderabad from 18-02-2003 to 22-02-2003. Mrs. N. Prasannakumari, Hindi Translator, Sri. B. Krishnamoorthy, Officer in charge (Hindi Cell) and Mr. V.C. Sunil, Senior

Clerk attended the TOLIC meeting on 28-05-2003. The Official Language Inspection Committee Meeting was held on 28-05-2003. The Deputy Director (Impl.), Regional Implementation Office, Kochi has inspected official language files and Implementation works.

**OBITUARY**

Dr. M. Aravindan, Retired Principal Scientist & Chief Training Organizer, KVK, Peruvannamuzhi expired on 13.3.03. Dr. Aravindan started his career as a research assistant and served in various capacities at ICAR head quarters prior to his transfer to IISR, Kozhikode. He is survived by his wife and children.

Dr. E.V.V. Bhaskara Rao, Director, NRC (Cashew) passed away after a brief illness on 15.3.03. He is survived by his wife and children



Dr. M. Aravindan



Dr. Bhaskara Rao

**PERSONNEL**

Promotions

Name	Designation	Posted at	w.e.f
Dr. Johnson K. George	Sr. Scientist	IISR, Kozhikode	05.01.2000
Dr. A. Kumar	Scientist (Sr. Scale)	IISR, Kozhikode	11.04.2001

Dr. K. Kandiannan	Scientist (Sr. Scale)	IISR, Kozhikode	27.07.1998
Mrs. N.K. Leela	Scientist SG	IISR, Kozhikode	27.07.1998
Mr. P.S. Manaj	Technical Officer (T7)	IISR farm, P. Muzhi	30.05.1999
Mr. K.D. Prathapan	Technical Officer (T7)	IISR farm P. Muzhi	17.06.1999
Dr. R. Ramakrishnan Nair	Sr. Scientist	IISR, Kozhikode	26.02.2002
Dr. J. Rema	Sr. Scientist	IISR, Kozhikode	27.07.1998
Mr. K.V. Soji	Scientist (Sr. Scale)	IISR farm P. Muzhi	12.04.1999
Mr. Santhosh J. Eapen	Scientist SG	IISR, Kozhikode	27.07.1998
Dr. S. Shanmughavel	(Technical Officer (T7)	IISR farm, P. Muzhi	03.08.2000
Dr. V. Srinivasan	Scientist (Sr. Scale)	IISR, Kozhikode	30.05.2001
Dr. C.K. Thankamani	Scientist (Sr. Scale).	IISR, Kozhikode	27.07.1998
Dr. S.S. Veena	Scientist (Sr. Scale)	IISR, Kozhikode	11.09.2000

*Our congratulations to them.*

#### Transfer

Name	Transferred from	Posted at	Date of joining
Dr. S.S. Veeno, Scientist (Sr. Scale)	IISR, Kozhikode	IHR, Bangalore	23.12.02
Mr. K. Faisal, Stenographer Grade-III	IISR, Kozhikode	IISR farm, P. Muzhi	01.04.02
Mr. K.V. Soji, Scientist (Sr. Scale)	IISR Farm, P. Muzhi	IISR, Kozhikode	25.06.03

#### Resignations

Name	Designation	w.e.f.
Ms. Smitha S. Nair	Senior Research Fellow	26.01.2003
Mr. T.K. Arun Kumar.	Senior Research Fellow	26.01.2003
Mrs. K.M. Maya	Research Associate	21.12.2002

#### Appointments:

Name	Designation	Posted at	w. e. f.
Mr. Martin Joseph	J. R. F.	IISR, Kozhikode	28.03.03
Mr. Dinakar M. P.	J. R. F.	IISR, Kozhikode	03.04.03
Mr. Sibi M. P.	J. R. F.	IISR, Kozhikode	03.04.03
Ms. Anila George	Laboratory Assistant	IISR, Kozhikode	26.06.03

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