

# NRCS

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## News Letter

Volume 3

July - December, 1992

No. 2

NATIONAL RESEARCH CENTRE FOR SPICES  
P. O. Box No. 1701, Kozhikode - 673 012, Kerala

### NRCS CHELAVOOR CAMPUS GETS A NEW FACELIFT

To match the serene scenic beauty of the hillocks, lush green coconut grove and paddy fields fencing Chelavoor campus of the National Research Centre for Spices, the hillocks within the campus are being beautified. Terracing the hillocks on either side of the approach road to the main block is already completed. Saplings of various avenue trees, tree spices and other ornamental plants have found a place in the hillocks. The other hillock, off the main block, is also planted with tree spices such as clove and nutmeg, along with banana and coconut trees. An irrigation system is being developed in the campus for irrigation purpose.

New permanent structures are also being made in the campus. One of the old buildings which once housed Genetics and Plant Protection divisions is already converted to Plant Tissue Culture Facility. Construction of the Laboratory-cum-Administrative building is also progressing well.

A view of the newly established cinnamon germplasm conservatory at Chelavoor campus



## RESEARCH ACHIEVEMENTS

### Plant-Microbe Interaction:

Seven, more efficient VAM isolates were identified from a collection of 35 isolates obtained from various pepper growing areas of Kerala. These isolates showed diverse varietal specificity when inoculated onto four varieties of black pepper viz. Panniyur-1, Kottanadan, Subhakara & Sree-kara.

### Bio-control Research:

Scientists of NRCS have isolated and identified seven species of *Trichoderma* and *Glocadium virens* from Kerala soils which function as potential biocontrol agent of rhizome rot of ginger.

*Glomus faciculatum*, a VAM isolate, showed suppressive effect on root rot of pepper caused by *P. capsici*, *R. similis* and *M. incognita* in pot culture experiments and also resulted in increased growth of pepper vines.

Studies on the seasonal incidence of *Apanteles cypris* (Braconidae), a parasite of the top shoot borer *Cydia hemidoxa*, a pest of black pepper indicated that up to 20% of the larvae of top shoot borer was parasitised in the field during October at Peruvannamuzhi, Calicut.

### Correlating *Phytophthora* foot rot:

Statistical analysis showed a significant positive correlation between the root rot index and foliar yellowing index of foot rot affected vines suggesting that foliar yellowing can be taken as a major criteria for indexing *Phytophthora* foot rot disease of black pepper.

### Locating resistant genes against

*Pollu* beetle:

Among fourteen related

species of *Piper* screened against *Pollu* beetle, *Longitarsus nigripennis* by adopting No Choice tests, with leaf discs in the laboratory, *P. colubrinum*, *P. betle*, *P. hymenophyllum*, *P. attenuatum*, *P. barberi*, *P. mullesua*, *P. arboreum*, *P. longum*, *P. chaba* and *P. argyrophyllum* were relatively resistant to the pest.

### Spices micropropagation progresses further:

Protocols for *in vitro* micropropagation and regeneration of plantlets were standardised from leaf callus cultures of *Piper betle*, *P. barberi*, *Kaempheria galanga* and *K. rotunda*.

### Phosphorous substitute for black pepper:

Application of Mussoori rock phosphate @ 80 kg ha<sup>-1</sup> is as efficient as applying super phosphate with respect to availability of soil P, yield response, relative agronomic effectiveness and economics.

## GERMPLASM CONSERVATION AND COLLECTION

In a collaborative collection trip with NBPGR Centre, Trichur to the Muthikalum forest ranges during December 1992, 19 *piper* species were collected by Sri. Johnson K George, Scientist (Genetics) NRCS, Kozhikode. During another collection trip to Idukki district seventeen pepper cultivars and 6 wild *Piper* species were also collected by Sri. Johnson K George.

Mr. Krishnamoorthy, Scientist (Genetics), NRCS, Kozhikode has collected 3 wild species of nutmeg viz. *Myristica gibbosa*, *M. magnifica* and *M. malabarica* from Cheekilodu and Balussery forest areas of Kozhikode Dist. Another six collection of cultivated nutmeg from Mahe and Trichur, thirty allspice collections from Ambalavayal and Trichur, two clove collections from Ambanad, Quilon besides 20 cinnamon collection from Ponmudi forests were also added to the tree spices germplasm.

Eight accessions of turmeric and nine accessions of ginger collected from Sirsi, Theerthahalli, Cherukulam, Mampad and Vadapuram were added to the turmeric and ginger germplasm conservatory at Peruvannamuzhi farm.

## LATEST IN RESEARCH

### 1. Kanamycin sensitivity of black pepper:

Kanamycin-resistance is the most widely used selectable marker in genetic transformation of plants at present. In order to develop a transformation system for black pepper, kanamycin sensitivity of cultured tissues of black pepper was determined. Callus formation from cotyledon explant was completely suppressed at 50 µg ml<sup>-1</sup> and above concentrations of kanamycin.

### 2. *Agrobacterium* mediated transformation of black pepper:

Twenty percent primary

## NEW TURMERIC DISEASE

A new disease of turmeric viz., leaf rot, caused by *Rhizoctonia solani* was noticed in Tamarassery area of Kozhikode district.

## RHIZOME ROT - A SURVEY STUDY

Dr. Nageswara Rao, Scientist (SS), Plant Pathology along with Mr. P. Balakrishnan and Mr. N. M. Usman, Research Associates, NRCS, Kozhikode undertook a survey on the rhizome rot incidence of ginger and turmeric in Ernakulam, Kottayam and Idukki districts of Kerala during September 1992. Rhizome rot incidence varied from 5-25%. Bacterial wilt of ginger caused by *Pseudomonas solanacearum* was also recorded in certain pockets of Ernakulam district.

transformants have been obtained from transformation of black pepper cv. Karimunda using *Agrobacterium* Ti plasmid based vectors.

3. An *in vitro* gene bank of spices comprising about sixty accessions of black pepper, ginger, turmeric and cardamom besides other related species was established at NRCS, Kozhikode.

### AICRP ON SPICES

Tree Spices research has also been included under AICRPS. Yercaud (TNAU) will be a co-ordinating centre for tree spices besides the voluntary centres at Pechipari (TNAU) in Tamil Nadu, Ambalavayal (KAU) in Kerala as well as Thadiyankudisai (TNAU) as participating centre. Exploratory surveys, multilocation trials of elite lines of clove and cinnamon, standardisation of vegetative propagation techniques etc. of tree spices will be the mandates of the project. Multilocation trials (MLT) of clove and cinnamon with 5 elite lines each are already laid out at Yercaud, Ambalavayal and Thadiyankudisai.

During 1992 a new MLT with 14 black pepper accessions was also laid out at Panniyur, Ambalavayal, Mudigere, Yercaud and Pampadumpara centres and an

MLT on cardamom with 13 Malabar entries was also initiated at Appangala (NRCS), Mudigere, Sakleshpur (ICRI) and Thadiyankudisai centres.

### GROUP MEETING ON SEED SPICES RESEARCH

As per the decision taken during the XI Workshop of AICRPS held at Thiruvananthapuram (July 1991), a group meeting on seed spices was held at TNAU, Coimbatore during November 23-24, 1992 to outline the research strategies on seed spices in the country.

Dr. P. Rethinam, ADG (PC), Dr. K. V. Peter, Director, NRCS, Kozhikode, Dr. I. Irulappan, Dean (Hort.) TNAU, E. Velappan, Director, DCASD, Kozhikode and Professors from various Agricultural Universities working on seed spices attended the meeting convened by Dr. S. Edison, PC (Spices).

### DEVELOPMENT PROGRAMME IN SPICES

Under the Central Sector Scheme for Integrated programme for the development of Spices, ICAR has sanctioned Rs. 2.7 lakh to NRCS, Kozhikode for the production of nucleus planting material of black pepper and cinnamon seedlings during 1992-93 Plan Year.

## PARTICIPATION IN SYMPOSIA, SEMINARS AND TRAINING

1. Dr. K. V. Peter, Director, NRCS, Kozhikode co-chaired the session on 'Genetic Resources' and presented a research paper on 'Breeding for resistance to bacterial wilt in bringal and chilli' in the Gregor Mendel Foundation Seminar at Calicut University, 20-23rd July, 1992.
2. Mr. Jose Abraham, Scientist (SG), Agri. Statistics, attended a training course on Computer Applications in Agricultural Research, NAARM, Hyderabad, 14-24 July, 1992.
3. Dr. K. V. Peter, Director, NRCS and Dr. John T. Zachariah, Scientist (Biochemistry) attended 'National Seminar on Tropical essential oils' sponsored by Indian Society of Essential Oils and co-sponsored by Spices Board, Cochin and KAU, Vellanikara at Cochin, 18-19 September, 1992. Dr. K. V. Peter also delivered a talk on 'High Production Technology in Pepper and Cardamom' while Dr. John Zachariah presented a paper entitled 'Variability in gingerol and shogaol content of ginger accessions' in the seminar.

4. Dr. G. N. Dake, Sr. Scientist (Plant Pathology), attended XVIIIth Short Term Course on use of Computer in Agricultural Research. Indian Agricultural Research Institute (ICAR), Library Avenue, New Delhi - 110 012, 17-30th September, 1992.
5. Sri. Jonson George, K., Scientist (Genetics), attended a workshop on 'DNA Techniques' at Madurai Kamaraj University, 16-22 October, 1992.
6. Dr. K. V. Peter and Dr. S. Edison, Project Coordinator (Spices) attended PLACROSYM X held at CPCRI, Kasaragod, 1-3 December, 1992.
7. Dr. Y. R. Sarma and Sri M. Anandaraj attended PLACROSYM X at CPCRI, Kasaragod, 2-4 December, 1992 and presented a paper on 'Role of root infection in rhizome rot of ginger (*Zingiber officinale* Rosc)'.
9. Dr. A. K. Sadanandan attended in PLACROSYM X at CPCRI, Kasaragode, 2-4 December, 1992 and presented a paper on 'Comparative efficiency of slow release N fertilizers on transformation of nitrogen and yield response of black pepper in an axisol'.

## MEETINGS

1. Department of Biotechnology Meeting on Project monitoring, 6-7th July, 1992 New Delhi - Dr. P. N. Ravindran.
2. R & D meeting of Spices Board, Cochin, 9th July and 15th October 1992, Cochin - Prof. (Dr.) K. V. Peter.
3. Gregor Mendel Birthday lecture series and seminar, University of Calicut, 22-23 July, 1992 - Prof. (Dr.) K. V. Peter and Dr. John Zachariah.
4. Scientific panel meeting of ICAR, New Delhi, 4th August, 1992 - Prof. (Dr.) K. V. Peter.
5. Meeting of Directors of ICAR Institutes and Senior Officers. Convened by Director General, ICAR, New Delhi, 13th August 1992 - Prof. (Dr.) K. V. Peter.
6. Group meeting to discuss the Problems of cumin-cultivation in Haryana, Govt. of Haryana, Haryana, 27 August 1992, - Dr. S. Edison.
7. Pepper Tech. Meeting at Madras, 18-19th August, 1992, Organised by IPC, Indonesia - Prof. (Dr.) K. V. Peter.
8. Spices Board Meeting, Cochin, 26th August and 16th October, 1992 - Prof. (Dr.) K. V. Peter.
9. UPASI Annual Conference, 14th September 1992, Dr. Y. R. Sarma. Delivered a lecture on 'Foot rot disease management in pepper'.
10. Farmer's Seminar on Ginger in connection with the inauguration of ginger co-operative society, Panamaram, Wynad, 27th September, 1992. Dr. Y. R. Sarma gave a talk on 'Disease and Pest management in Ginger'.
11. Project Implementation Committee Meeting to consider the EFC Memo for VIII Plan of AICRPS, ICAR, New Delhi, 5-9 August 1992 - Dr. S. Edison.
12. Advanced training programme on Spices Production Technology, KAU, Vellanikkara, 28th October 1992 - Dr. S. Edison.
13. Field day at CRS, Appangala, 30th September, 1992. Prof. (Dr.) K. V. Peter.
14. Meeting convened by KAU, Vellanikkara to celebrate Platinum Jubilee of RARS, Pilicode, 13th October 1992. Prof. (Dr.) K. V. Peter.

## KRISHI VIGYAN KENDRA (KVK)

### NRCS RESEARCH FARM, PERUVANNAMUZHI

A Krishi Vigyan Kendra (KVK) under ICAR, has started functioning at the NRCS Farm, Peruvannamuzhi from November 1992 to facilitate easy and quick transfer of technology to farmers. The KVK will be imparting practical training on all aspects of agriculture, horticulture and homescience to farmers, farm women, school drop-outs, village youths (both boys and girls), village artisans, school teachers & other grass root level workers.

Mr. Jose Abraham, Scientist (SG), Agricultural Statistics, NRCS, Kozhikode has taken charge as Officer-in-charge, KVK, Peruvannamuzhi, at present.

15. Meeting on Pepper Production and constraints - Convened by the Agricultural Production Commissioner, Govt. of Kerala, 19th October 1992 - Dr. Y. R. Sarma.
16. Spices Board Meeting, Cochin, 16th October 1992. Dr. Y. R. Sarma Delivered a talk on 'The present status of foot rot disease management in black pepper'.
17. Group meeting on Seed Spices Research of AICRPS at TNAU Coimbatore, 23-24 November, 1992 - Prof. (Dr.) K. V. Peter, Dr. S. Edison and Dr. A. K. Johny.
18. 57th Annual convention of Indian Society of Soil Science, Hyderabad, 26-29th November, 1992, -Dr. A. K. Sadanandan. Presented a paper on 'Micro-nutrient interaction with yield of black pepper and their relationship with nutrients'.
19. General Council Meeting of KAU, Vellanikkara at College of Agriculture, Vellayani, 27-28th November, 1992, -Prof. (Dr. K.V. Peter).
20. AIR, Rural programme subject committee meeting, AIR Station, Kozhikode, 1st December 1992, -Sri. R. Ramakrishnan Nair.
21. State level workshop on package of practices (Crops), KAU, Mannuthy-680 651, 2-3rd December, 1992, -Shri. B. Krishnamoorthy.
22. Meeting on National Committee on Vanilla, Spices Board, Cochin-8th December 1992, -Prof. (Dr. K.V. Peter).

## TECHNICAL PUBLICATIONS/REPORTS

1. "SPICES VARIETIES" - A compendium of morphological and agronomic characters of improved varieties of spices in India. Edison S., Johny A Kallapurackal, Nirmal Babu K and Ramadasan A., NRCS, Kozhikode. (Price Rs. 125/- copy + Rs 25/- towards postage. For copies write to: Director, NRCS, Kozhikode along with DD in favour of Director, NRCS, Kozhikode-12)
2. Black pepper and Cardamom- Problem and prospects. (Proceedings of the National seminar on Black pepper and Cardamom held at Calicut, Kerala, 17-18 May 1992).
3. Annual Report, 1991-92 - AICRP on Spices, Kozhikode- Edison S & Johny A. Kallapurackal.
4. Research Highlights - 1982-91 (Ten years period) - AICRP on Spices, Kozhikode, Edison S & Johny A. Kallapurackal.
5. Status report on Vegetative Propagation of Tree Spices - Rema J. and B. Krishnamoorthy, 1992, NRCS, Kozhikode.
6. High production Technology in Cardamom (Tamil). Krishnamoorthy B. and M. Anandaraj, 1992. NRCS, Kozhikode.

## PUBLISHED ARTICLES

1. Anandaraj M., Arora P. and Nagarajan S. 1992. A linear model for predicting the prevalence level of *Koleroga*

disease of arecanut four days in advance. Ind. J. Plant Prot. 20: 75-76.

2. Anandaraj M., Sarma Y, R. 1992. Use of baits for assessing chemicals applied as soil drench to control *Phytophthora* foot rot of black pepper. Indian Phytopatho. 44(4).
3. Devasahayam S. 1992. Management of insect pests of black pepper - problems and prospects. In: Black pepper and Cardamom - problems and prospects (Eds) - Sarma Y. R., Devasahayam S. and Anandaraj M. Indian Society for Spices, Kozhikode pp. 48-50.
4. Edison S. 1992. Comparative performance of taro under mid hill conditions of Arunachal Pradesh. J. Root Crops, 18(1).
5. John Zachariah T. 1992. Recent trends in pepper drying. Spices India (Malayalam), 5: P-18.
6. Krishnamoorthy B., and Vasantha S. 1992. Sarvasughandi (Allspice). Spices India (Tamil) 6: 18-20.
7. Krishnamoorthy B., John Zachariah T., Ravindran P. N. & Gopalam A 1992. Identification of sex of nutmeg seedlings based on morphological and chemical characters. J. Plant. Crops: 20 (Suppl). 194-199.
8. Krishnamoorthy B and John Zachariah T. 1992. Drying black pepper on polythene materials. Ind. Cocoa, Arecanut & Spices J., 15: p, 75.
9. Krishnamoorthy B 1992. Clove cultivation in Tamil Nadu. Spices India (Tamil) 5: 16-19.

10. Krishnamoorthy B. 1992. *Pollu* beetle of black pepper. Spices India (Tamil) 5: 2-3.
11. Krishnamoorthy B. 1992. Nutmeg. Spices India (Tamil): 5: 13-17.
12. Peter K. V. 1992. Mineral rich food. Indian Hort., October-December: 10-14.
13. Peter K. V. 1992. Getting back in spices trade. Indian Hort., July-September: 4-7.
14. Ramana K. V., Sarma Y. R. and Mohandas C. 1992. Slow decline of black pepper and role of plant parasitic nematodes and *Phytophthora capsici* in the disease complex. J. Plant. Crops, 20: 65-68.
15. Ramakrishnan Nair R. 1992. Kosa Janithaka Sasthra Gaveshanam Kurumulakil (Cytogenetics Research in Black Pepper). Spices India (Malayalam), 10: 13-17.
16. Ramachandran N. and Sarma Y. R. 1992. Bioefficacy of systemic fungicides against *Phytophthora* infection in Black Pepper. J. Plant. Crops, 20 (Suppl): 79-84.
17. Ravindran P. N., Sasikumar B. and Nirmal Babu K. 1992. Genetics of shoot tip colour variation in black pepper. J. Plant. Crops, 20: 76-78.
18. Sarma Y. R. 1992. Disease management in Black pepper. Present scenario and future thrust. In: Black pepper and Cardamom — problems and prospects. (Eds). Sarma Y. R. Devasahayam S. and Anandaram M. Indian Society for Spices, Kozhikode pp.: 35-38.
19. Sarma Y. R. 1992. Spices — Quick wilt in pepper. Planters Chronicle, 87: 47-48.

## TRANSFER OF TECHNOLOGY

### Training Programmes conducted

1. Date: 3 to 4th August, 1992  
Course: Nursery Techniques in Spices  
Sponsor: Spices Board, Cochin  
Number of participants: 15  
Nature of position: Laison Officers and Farm Managers of different Coffee Board Stations.
2. Date: 17 to 24th August, 1992  
Course: Nursery and Cultivation of Spices  
Sponsor: Directorate of Horticulture, Arunachal Pradesh  
Number of participants: 12  
Nature of positions of trainees: Agril. Extension Officers
3. Date: 17 to 24th November, 1992  
Course: Spices Production Technology  
Sponsor: Coffee Board, Dept. of Hort./Agri. of U. P., M. P., Mizoram, Sikkim, UAS Bangalore, Konkan Krishi Vidyalaya, and Spices Board.  
Number of participants: 25  
Nature of positions: Asst. Directors, Laison Officers.

### Production and supply of quality planting material

Nucleus planting material of Sreekara and Subhakara varieties of black pepper amounting to 12260 rooted cuttings, 350 rooted laterals of black Pepper, seed rhizomes of turmeric (486 kg), seedlings of various tree spices viz. clove (600 nos.), nutmeg (100 nos.), cinnamon (1669 nos.) and nutmeg grafts (170 nos.) were distributed to various developmental agencies, research institutions and progressive farmers during the period.

### Radio talk

Prof. (Dr.) K.V. Peter: Export and import policy of spices and importance of quality maintenance. Talk in Malayalam. August 19th 1992, AIR, Kozhikode.

### STUDY CIRCLE

Study circle met seven times during the period, and twelve research articles were approved for publication. Nine special lectures were also delivered during the period.

Dr. (Mrs.) J. Rema has been nominated as the Secretary, Study Circle from December 1992 onwards.

### Ph.D. Awarded

Shri. K. Sivaraman, Scientist (Selection grade) has been awarded Ph.D. degree in Agronomy by TNAU, Coimbatore for his thesis on 'Productivity of turmeric-maize and onion intercropping system under varied population and nitrogen levels' plus course work.

### POST GRADUATE STUDIES AND TRAINING

Mrs. A. Samina, UGC Jr. Research Fellow, registered for Ph.D. on "Biochemical studies on host-pathogen interaction of black pepper (*Piper nigrum* L.) infected with *Phytophthora capsici*" under the guidance of Dr. Y. R. Sarma, Principal Scientist (Pl. Path.), NRCS, Kozhikode

Mr. P. S. Anilkumar, Post Graduate Diploma student in Biotechnology, Madurai Kamaraj University, Madurai-21, has

#### VISITS ABROAD

Prof. (Dr.) K. V. Peter attended the International Symposium on Bacterial wilt organised by AVRDC, Taiwan, Oct. 23-3rd November, 1992. He also presented a paper on breeding for resistance to bacterial wilt in tomato, egg plant and pepper.

Dr. K. V. Ramana, Senior Scientist (Nematology) attended Second Conference on 'Pepper (*Piper nigrum* L.) - Current status and future prospects, organised by the Universite Pستانian Malaysia, Bintula Campus and Department of Agriculture, Sarawak, Malaysia. He also delivered a talk on 'Nematode Management in Black Pepper in India' as invited speaker.

successfully completed one month industrial training programme at NRCS, Kozhikode.

#### EQUIPMENTS INSTALLED

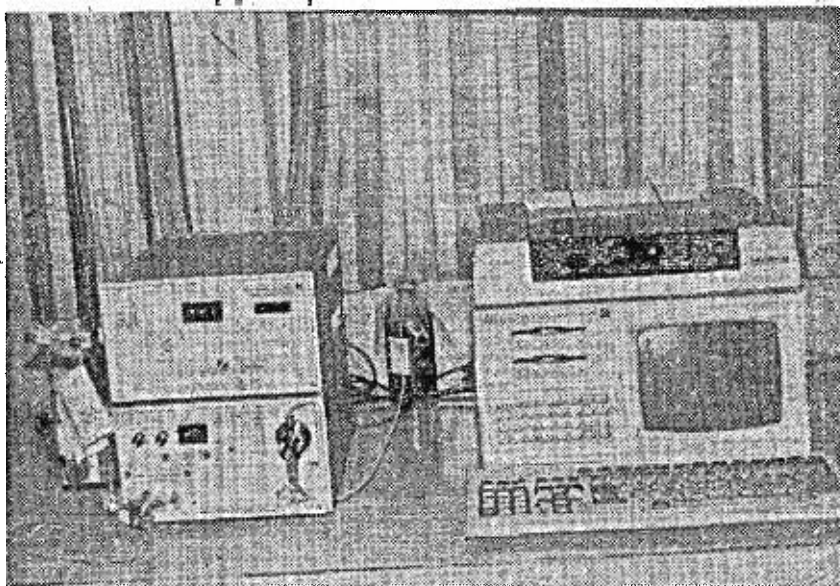
1. Shimadzu LC-6A Isocratic high performance liquid chromatograph with UV-visible detector.
2. Pharmacia LKS Phast system electrophoresis unit.

#### IJC

The Institute Joint Council met at NRCS Cardamom Research Centre, Appangala on 15th September 1992 under the chairmanship of Dr. K. V. Peter, Director, NRCS, Kozhikode.

#### DISTINGUISHED VISITORS

1. Sri K. P. Krishnan, Hon'ble Minister for Agriculture, Govt of Tamil Nadu - 17 July 1992.
2. Dr. S. Nagarajan, ADG (PP), ICAR, New Delhi - 23-24 July 1992.
3. Dr. N. K. Jain, Consultant DBT, New Delhi - 12 August 1992.
4. Prof. Rajasekaran, Head (Hor-



High performance liquid chromatography at NRCS, Kozhikode: (Shimadzu)

5. Dr. P. C. Sharma, Sr. Scientist (AE), ICAR, New Delhi. - 15 November 1992.
6. Dr. P. Rethinam, ADG (PC) ICAR. 20th October 1992.
7. Dr. M. Aravindakshan, Director of Rerearch (KAU) VellaniKkara 20th October 1992.

#### Indian Society for Spices (ISS)

Prof. (Dr.) K. V. Peter, Director and Shri S. Devasahayam, Scientist (SG), NRCS, Kozhikode have been elected as the Editor and Asst. Editor, respectively of the Journal of Spices and Aromatic Crops, the official Journal of the Indian Society for Spices, Kozhikode.

#### NATIONAL SEMINAR

The Indian Society for Spices (ISS) is organising the IInd National Seminar at RRL, Thiruvananthapuram during 13th-14 of May 1993. The theme of the seminar is 'Post Harvest Technology of Spices - present and future scenarios'. The seminar is jointly organised by ISS, Kozhikode; RRL Thiruvananthapuram; NRCS, Kozhikode and is sponsored by ICAR, New Delhi; Spices Board, Cochin; DCASD, Kozhikode. Contact: Dr. P. N, Ravindran, NRCS, P. B. No. 1701, Kozhikode-12.

## PERSONNEL

### Appointments :

#### Regular

Name & Designation	Posted at	Date of joining
Sri L. Balakrishna JTA(T1)	Appangala	05-03-92
Sri K. B. Prasanna Kumar JTA(T1)	Appangala	02-09-92
Sri K. P. Premachandran SS Gr. 1 (Mazdoor)	Peruvannamuzhi	02-09-92 (AN)
Sri C. M. Kamalam SS Gr. 1 (Safaiwala)	NRCS, Kozhikode	04-12-92

#### DBT Schemes

Sl. No.	Name & Designation	Date of joining
Name of the Scheme : "Rapid Clonal Propagation of Tree Spices"		
1.	Kum. Minoo Divakaran, Research Associate (Botany)	15-07-92
2.	Smt. Mini P. Mathai, Research Associate (Botany)	10-12-92
3.	Sri. John C. Zachariah, Research Assistant (Botany)	09-07-92
4.	Kum. A. Sajina, Research Assistant (Chemistry)	13-07-92
Name of the Scheme : "In vitro Conservation of Spices Germplasm"		
1.	Smt. C. Sreeranjini Devi Pillai, Sr. Research Fellow (Botany)	07-08-92
2.	Kum. Geetha S. Pillai, Research Assistant (Botany)	17-07-92

#### Promotions

Name	Present Position / Grade & Designation	With effect from	Promoted as	Station
Sri H. G. Nanamaiah	Driver T-2	01-01-92	Driver (T-I-3)	Appangala
Sri K. Samsudeen	Tech. Asst. T-II-3	01-07-92	Tech. Asst. (T-4)	Kozhikode
Sri K. Balan Nair	Driver T-2	01-07-92	Driver (T-I-3)	Kozhikode
Sri K. A. Somanna	T-I-3	30-07-92	Farm Asst. (T-II-3)	Peruvannamuzhi
Sri M. Padmanabhan	SS. Gr. III Peon	31-08-92	SS. Gr. IV	Kozhikode
Ms. K. Usha	Superintendent	01-09-92	Asst. Admn. Officer	Kozhikode
Smt. Enid Savitha	Assistant	03-10-92	Superintendent	Appangala
Sri C. Padmanabhan	Sr. Clerk	03-10-92	Assistant	Kozhikode
Sri P. K. Janardhanan	Jr. Clerk	16-10-92	Sr. Clerk	Kozhikode
Sri H. Y. Erappa	SS. Gr. III Watchman	31-08-92	S. S. Gr. IV	Appangala
Sri E. Kunhayyappan	SS. Gr. III Watchman	"	"	Peruvannamuzhi
Sri K. Keeran	SS. Gr. II Lab. Attender	"	SS. Gr. III	Kozhikode
Smt. H. B. Lakshmi	SS. Gr. II Mazdoor	"	"	Appangala
Sri K. M. Medashetty	SS. Gr. II Mazdoor	"	"	Appangala
Sri P. Damodaran	SS. Gr. I Mazdoor	"	SS. Gr. II	Peruvannamuzhi
Sri K. P. Vijayan Nair	SS. Gr. I Mazdoor	"	"	Kozhikode
Sri K. Raghavan	SS. Gr. I Mazdoor	"	"	Peruvannamuzhi
Sri N. Ravindran	SS. Gr. I Mazdoor	"	"	Kozhikode
Sri P. K. Balan	SS. Gr. I Mazdoor	"	"	Peruvannamuzhi
Sri K. Chandran	SS. Gr. I Mazdoor	"	"	Peruvannamuzhi

### Retirement

Mr. U. Sukumaran, Asst. Administrative Officer, NRCS, Kozhikode, retired from the service of ICAR on 31-8-92 after 38 years of distinguished service.

Published by Prof. (Dr.) K. V. Peter, Director, NRCS, Kozhikode

Editor: Dr. B. Sasikumar; Members: Dr. Johnny A. Kallapurackal, Mr. P. A. Sherif, NRCS, Kozhikode 673 012, Kerala

Printed at the Mathrubhumi M M Press, Kozhikode 673 001