



NRCB News



National Research Centre for Banana
Tiruchirapalli - 620 102, Tamil Nadu

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FROM THE DIRECTOR'S DESK



During the last decade, a tremendous increase in the area and production of banana has been witnessed there by India has become the largest producer of banana in the world. The main reasons for increase in production are: use of healthy planting material particularly tissue cultured banana plants, high yielding cultivars like Grand Naine, fertigation and adoption of improved production and management strategies. However, still banana farmers are facing production problems due to many biotic stresses. One of the problems is biotic stress caused by nematodes. Although 71 different species of nematodes belong to 33 genera have been identified infecting banana, only five nematodes such as root lesion (*Pratylenchus coffeae*), burrowing (*Radopholus similis*), root knot (*Meloidogyne incognita*), spiral (*Helicotylenchus* spp.) and cyst (*Heterodera oryzicola*) nematodes are considered as very important. These nematodes cause 40% yield and quality loss in banana. NRC Banana has developed many cost effective, farmer friendly and environmental safe management practices for the effective control of nematodes, which are presented in the news letter for the benefit of the banana growers. These technologies also fit in to the organic farming of banana, which is gaining momentum at present worldwide. By adoption of these technologies, I definitely hope that the farmers can adopt the technologies for the effective control of nematodes, thereby productivity and profitability could be increased considerably.

RESEARCH HIGHLIGHTS

Nematode Management

Nematodes are the major concern in limiting the banana and plantain production throughout the world. Crop losses caused by nematodes to bananas are very high, with an average annual yield losses of about 20 % worldwide. Among different nematodes recorded in banana, the most destructive and widely distributed nematode is the burrowing nematode (*Radopholus similis*) which causes 30 to 40 % yield reduction followed by root-lesion (*Pratylenchus coffeae*) and root-knot nematodes (*Meloidogyne incognita*) which cause yield loss of about 44.4 and 31.3 % respectively. The other economically important nematode parasites having regional significance are the spiral nematode, *Helicotylenchus multicinctus*, *H. dihystra*, cyst nematode, *Heterodera oryzicola* and reniform nematode, *Rotylenchulus reniformis*. Crop rotation and nematicides can be used to control nematodes, but crop rotation is impracticable in areas where banana is grown continuously and the price of nematicides is often prohibitive for small farmers, apart from its extreme toxicity to the environment. Hence, developing a farmer friendly and environmentally safe strategy is the need of the hour to control the nematode problems in banana.

Impact of Nematodes on Banana

Lesion nematode infested banana plants exhibit general decline, stunting, premature defoliation, unthriftiness and often produce small bunches and fruits (Fig. 1a). However, symptoms on roots and corms are more specific exhibiting small cuticular sunken lesions on young cord roots (Fig. 1b), while extensive reddish brown lesions appear in the cortex when cut longitudinally (Fig.1c). They cause decay and death of distal cells. This deadly pathogen is well established in the banana tracts where soil and temperature conditions are favourable. The plants topple easily during wet and windy weather because of inadequate anchorage (Fig. 1d). Severe nematode infection affects plants vigour that will result in smaller bunches with ill-filled fingers and longer

dissimilar from those attributed to water logging, weed competition, nutrient deficiencies or other pests and diseases. The root-knot nematode infested plants are stunted in growth with pale yellow narrow leaves exhibiting bushy appearance. Under severe infection, leaf



Fig. 1: a - Nematode infested field

b - Lesion nematode infested roots



c - Reddish brown lesion in the root cortex



d - Topping of banana plant

margin gets dried up leading to splitting of dried portion. Such plants have delayed flowering with reduced number of hands with small fruits. The most obvious symptom seen on roots is root galls produced on primary and secondary roots (Fig. 2a). The healthy roots free from nematodes appear creamy white in colour without root galls (Fig. 2b). Profuse galling with egg masses are seen when the roots are cut longitudinally (Fig.2c).



Fig.2: a Root knot nematode infested roots

b Healthy roots

c L.S. of root storing eggs to nematode

Nematode Management in Banana

I. Chemical method

- Paring of suckers and dipping them in cow dung slurry followed by treating with carbofuran granules @ 40 g/ sucker prior to planting resulted in substantial reduction of nematode population.

II. Non-chemical methods

- Soil application of any one of the biocontrol agents viz., *Pseudomonas fluorescens*, *Paecilomyces lilacinus*,

Pochonia chlamydosporia, *Trichoderma viride*, *Bacillus subtilis* and VAM (*Glomus fasciculatum*/ *G.mosseae*) @ 25g/plant at 3rd and 6th months after planting have successfully controlled (90 %) the nematode populations in banana.

- Application of neem formulations such as nimbecidine or juerken or neewin as sucker dip treatment @15ml/ litre of water for 30 minutes has successfully controlled (100%) nematodes in banana.

- Growing antagonistic plants namely *Tagetes erecta* and *T. patula* as an intercrop in banana field, significantly reduced the nematode population (90%) as shown in Fig. 3.



Fig 3. intercropping of banana with *Tagetes* sp. for the control of nematodes

III. Integrated nematode Management Package

An eco-friendly technology involving neem formulations such as Nimbecidine or Juerken or Neewin as sucker dip treatment @15 ml/litre water for 30 minutes followed by application of biocontrol agents *Paecilomyces lilacinus* (NRCB Nemacinus) and *Pseudomonas fluorescens* (NRCB Nemacens) @ 15 g each along with Neem cake @ 250 g per plant at 3rd and 6th month after planting with marigold as an intercrop was found very effective in controlling root-knot and root-lesion nematodes in banana (Fig. 4).



Fig. 4. Commercial formulation from NRCB

OTHER RESEARCH ACHIEVEMENTS

- Tissue culture techniques have been developed for near extinct landrace Manoranjitham and for recalcitrant members of *Australimusa* and *Callimusa* such as *Musa textilis*, *M. boman* and *M.jackeyii*. Besides, protocol for the direct plant regeneration from immature male flower buds of cv. Robusta has also been standardized.

- NRCB variety, Udhayam was distributed to progressive farmers for large scale production during 2009-2010. Record yields have been reported from Tirukkattuppalli, 30 km from Trichy, owned by the Mr.



Fig. 5. Udhayam Banana

Sundaram. All the harvested bunches of Udhayam recorded uniformly 50kg and above, while some recorded more than 70kg/ bunch. The bunches exhibited good market value fetching more than Rs. 800/- per bunch earning 50% more revenue over normal Karpuravalli (Fig. 5).

- Udhayam at a wider spacing of 2.4 X 2.4 m and applied with 300g N in 7:2:1 and 400 g K in 4:3:3 ratios at vegetative, flowering and bunch development stages respectively recorded the highest bunch weight of 38.5 kg/plant.
- Application of five g of ferrous sulphate + 20 g sulphur per plant at three months after planting (MAP) along with foliar spray of 0.5% each of zinc sulphate and borax at 3, 5 & 7 MAP recorded the highest bunch weight in Ney Poovan (16.6 kg) with highest TSS (29.8 °Brix), lowest acidity (0.39%) and highest pulp peel ratio of 7.79.
- Storage studies on banana-based pickles indicated that peel and central core stem pickles could be stored up to six months without any deterioration in quality and taste. The drying time was reduced by 50% in osmotically dehydrated bananas than potassium meta-bi-sulphite treated ones.
- Among the various methods of fibre extraction tried, machine extracted fibre was visually better than the

alkali treated fibre in all varieties and at all AICRP centres studied (Fig. 6).



Fig. 6. Comparative evaluation of banana fibre extracted by various methods

- *Metarrhizium anisopliae* 66 was found effective against stem weevil while *B. bassiana*-32 was found effective against corm weevil. Host extract and semio-chemical in the ratio 3:2 was found effective for attracting banana stem weevil in a short time.
- Bio-priming of banana plants cv. Grand Naine with either *Trichoderma harzianum* or *Penicillium pinophilum* (@ 30g of rice chaffy grain formulation containing 10⁹ spores/ml/plant) along with botanicals Zimmu, *Alpinia* sp or *Hibiscus* sp. (250ml/plant) resulted in complete control of Fusarium wilt disease and significant increase in plant growth parameters such as height (33.60%), girth (80%), no. of leaves (42.11%), leaf area (128.15%) and number of roots (143.04%) when compared to *Foc* alone inoculated plants.
- Virus indexing of Udhayam banana collected from NRCB field has indicated the presence of banana mild mosaic virus and sequencing of the 250 bp fragment indicated 87% homology with published sequences. Similar cloning and sequence analysis of coat protein gene of BBrMV collected from different places of Tamil Nadu and Kerala exhibited 97-99% similarity at the nucleotide level and >97% similarity at amino acid level with published sequences.

TRANSFER OF TECHNOLOGY

Exhibitions conducted/ participated

Sl. No.	Name of the Events	Organiser/ venue	Date(s)
1.	Agri Expo- 2011	Dinakaran Daily, Tiruchirapalli, Tamil Nadu	15 th - 17 th July, 2011
2.	Kissan Mela - 2011	NRCB, Tiruchirapalli, Tamil Nadu	21 st August, 2011
3.	National Agri-Horti Expo - 2011	Dept. of Agri-Horticulture, Kerala and Dept. of consumers affairs & food, Govt. of India, Cochin, Kerala	3 rd - 7 th September, 2011
4.	Kissan Mela - 2012	IISR Kozhikode, Kerala	16 th - 18 th February, 2012
5.	Agricultural Education Day	NRCB, Tiruchirapalli, Tamil Nadu	28 th February, 2012
6.	Grievance Committee Meet	NRCB and State Depts., Govt. of TN, Tiruchirapalli, Tamil Nadu	21 st March, 2012
7.	Agri Expo - 2012	Dinamalar Daily & IICPT Tiruchirapalli, Tamil Nadu	23 rd - 26 th March, 2012

List of Trainings offered

Sl. No.	Title of the training	Date
1.	Extraction of banana fibre and production of handicrafts	5 th -7 th April, 2011
2.	Production of value added products from banana	11 th -16 th July, 2011
3.	Extraction of banana fiber and production of handicrafts	26 th - 28 th July, 2011
4.	NRCB field day	21 st August, 2011
5.	Postharvest handling, packing, storage and ripening in banana for domestic and export markets	12 th - 15 th December, 2011
6.	Improved production and post harvest technology in banana	15 th December, 2011
7.	Production of value added products from banana to M/s Gramalaya, Trichy, Tamil Nadu	23 rd - 28 th January, 2012
8.	Extraction of banana fiber and production of handicrafts	21 st - 23 rd February, 2012
9.	Production of value added products from banana	27 th - 29 th February, 2012
10.	Production of value added products from banana	5 th - 7 th March, 2012
11.	Post harvest handling, packing, storage and ripening in banana for domestic and export markets to the block technology manger	12 th - 15 th March, 2012
12.	On- site training for the State Govt. officials of Horticultural Research Complex, Nagicherra, Agartala on developing DUS Guidelines for banana under DUS project	4 th November, 2011
13.	SAS software statistical programme training to all NRCB scientists on about SAS 9.2 software programme operation and data analyses	16 th - 17 th December, 2011
14.	Institute Biosafety Committee (IBSC) meeting	14 th June & 21 st December, 2011

Awards

Name of the Scientist	Name of the Award	Organizer/ Place
Padmanaban, B.	“Fellow of Society for Biocontrol Advancement” award for the year 2007-09	National Bureau of Agriculturally Important Insects (NBAIL), Bangalore, on May, 2011
Selvarajan, R.	“Hari Om Ashram Trust” award for the biennium 2008-09 for the outstanding contribution in the field of ‘Crop and Horticulture Sciences’ “Agrani award” for presenting the concept of development of nanotechnology based dipstick technique for indexing and on-site detection of banana viruses	Shri Harish Rawat, Hon’ble MOS (A) during ICAR foundation day, held at NASC, New Delhi on 16.7.2011 The Lt. Amit Singh Memorial Foundation at NASC, New Delhi on 7th September, 2011



Dr. R. Selvarajan, Sr. Scientist receiving “Hari Om Ashram Trust award for the biennium 2008-09”



Best stall Award : Received “Best stall award” at the Agri Expo -2012

Research Papers

International

- Backiyarani, S., Uma, S., Sundararaju, P., Mayilvaganan, M., Saraswathi, M. S. and Jeeva, S. 2011. Studies on time-course expression of defence genes in banana against *Pratylenchus coffeae* for the creation of a subtractive cDNA library. *Acta Hort.* 897: 281-283.
- Balasubramanian. V. and Selvarajan, R. 2012. Complete genome sequence of a banana bract mosaic virus isolate infecting the French plantain cv. Nendran in India. *Archives of Virology*, 157: 397-400.
- Durai, P., Uma, S., Saraswathi, M. S., Jayabalan, N. and Mustafa, M. M. 2011. Intersectional relationship between *Eumusa* and *Rhodochlamys* of the genus *Musa* using morphotaxonomy and microsatellite markers. *Acta Hort.* 897: 267-270.
- Mustafa, M. M. and Thangavelu, R. 2011. Status of *Fusarium* wilt in India. *Acta Hort.* 897: 323-329.
- Nwauzoma, A. B, Uma, S., Saraswathi, M. S. and Mustafa, M. M. 2011. Developing markers for Sigatoka leaf spot disease (*Mycosphaerella musicola* Leach) resistance in banana (*Musa* spp.) *African Journal of Biotechnology*. 10(33): 6213-6219.
- Saraswathi, M. S., Uma, S., Vadivel, E., Durai, P., Siva, S. A., Rajagopal, G. and Sathiamoorthy, S. 2011. Diversity analysis in Indian cooking bananas (*Musa*, ABB) through morphotaxonomic and molecular characterisation. *Acta Hort.* 897: 123-131.
- Selvarajan, R., Balasubramanian, V., Sheeba, M. M., Raj Mohan, R. and Mustafa. M. M. 2011. Virus-Indexing Technology for Production of Quality Banana Planting Material: a Boon to the Tissue-Culture Industry and Banana Growers in India. *Acta Hort.* 897: 463-469.
- Srinivasan, R., Kulothungan, S., Sundararaju, P. and Govindasamy, C. 2011. Biodiversity of plant parasitic nematodes associated with banana in Thanjavur district of Tamil Nadu. *International Journal of Plant, Animal and Environmental Sciences I*: 63-69.
- Thangavelu, R. Suganya Devi, P. Chrismala, P. M, and Mustafa, M. M. 2011. Cross infection and genetic diversity of *Fusarium oxysporum* f. sp. *ubense*, the casual agent of *Fusarium* wilt in banana. *Acta Hort.* 897: 353- 362.
- Thangavelu, R., Muthukumar, K., Ganga Devi, P. Mustafa, M. M. 2011. Genetic Diversity of

Fusarium oxysporum f.sp. *ubense* isolates (*Foc*) of India by inter simple sequence repeats (ISSR) analysis. *Molecular Biotechnology*. 5: 203-211.

Uma, S., Mustafa, M. M., Saraswathi, M. S. and Durai, P. 2011. Exploitation of diploids in Indian banana breeding programmes. *Acta Hort.* 897: 215-223.

Uma, S., Saraswathi, M. S. and Anto, D. 2011. Seed as an alternative source of DNA for molecular research of inaccessible wild *Musa* species. *Acta Hort.* 897: 285-287.

National

Anuradha, C., Gorakh, P. G., Sasikumar, K. and Polumetla, A. K. 2011. Chimeric α -Endotoxins of *Bacillus thuringiensis* with increased activity against *Helicoverpa armigera*. *International Journal for Tropical Insect Science*. 31(1-2): 59-68.

Jebasingh, T., Backiyarani, S., Manohari, C. and Usha, R. 2011. Detection of cardamom mosaic virus-related sequences in plant genomes. *Indian Journal of Biotechnology*. 10: 369-371.

Jebasingh, T., Jose, M., Kasin Yadunandam, Backiyarani, S., Srividhya, S., Krishnaswamy, S. and Usha, R. 2011. Molecular modelling and conformational analysis of native and refolded/viral genome-linked protein of cardamom mosaic virus. *Indian Journal of Biochemistry and Biophysics*. 48 : 336-340.

Palanichamy. S., Padmanaban, B., Fazal Mohamed, M. I. and Mustafa, M. M. 2011. A simple and low cost semiochemical based trapping method for the management of banana pseudostem weevil, *Odoiporus longicollis* Olivier (Coleoptera: Curculionidae). *Advances in Applied Science Research*. 2: 69-73.

Palanichamy. S, Padmanaban, B., Fazal Mohamed, M. I. and Mustafa, M. M. 2011 Microwave oven assisted extraction of banana pseudostem kairomones as attractant of *Odoiporus longicollis* electroantennogram investigations. *Archives of Applied Science Research*.. 3: 213-16.

Sundararaju, P., Padmanaban, B., Jaffar, S. and Hemalatha, S. 2011. Effect of *Tithonia diversifolia* leaf extracts on the mortality of root-lesion nematode infesting banana. *Indian Journal of Nematology*. 41: 63-67.

Uma, S., Saraswathi, M. S. and Durai, P. 2011. Evidence of new species in India - *Musa warnaphalya* and confirmation through morpho-molecular characterization. *Indian Journal of Horticulture*. 68 (6): 145-151.

Book Chapter

Padmanaban, B and Mustafa, M. M. 2011. Insect Pests of Banana; Present management strategies and future thrusts. *In: Recent trends in integrated Pest Mangement.* (Ed. by Dhawan *et.al.*,) April 18-20 , 2011, INSAIA, PAU, Ludhiana, India. pp. 195-204.

Padmanaban, B and Subaharan, K. 2012. Nano-Insecticide; *Advances in Horticulture Biotechnology.* Vol.6. Westwiley publication, New Delhi. pp. 207-214.

Ravi, I. and Mustafa, M. M. 2012. Climate change impact, adaptation and mitigation strategies for resilient banana production. *In: Adaptation and mitigation strategies for climate resilient horticulture.* (Eds: K.S.Shivashankara, Prakash Patil, G.Selvakumar and V.Sridhar). Published by IIHR, Bangalore. pp. 95-109.

Ravi, I. and Uma, S. 2011. Phenotyping bananas and plantains for adaptation to drought. *In: Drought Phenotyping in Crops: From Theory to Practice.* (Eds: P Monneveux, J.M Ribaut), CIMMYT/Generation Challenge Programme, Mexico City. pp. 417-436.

Selvarajan, R. 2011. Nano technological approaches for early detection of plant pathogens. *In Principles and Practices of Nano Applications.* (Eds. K.S. Subramanian, A. Lakshmann, N. Natarajan, K. Gunasekaran, C.R. Chinnamuthu, P. Latha and C. Sharmila Rahale). pp. 282-289.

Thangavelu, R., Ganga Devi, P., Mustafa, M. M, Sreeramanan, S., Rathinam, X. 2011. Genomics of *Fusarium oxysporum* f. sp. *ubense* causing wilt disease in banana (*Musa* spp.) pages 231-257, *In: Genetics, Genomics and Breeding of Bananas* (Eds. Michael Pillay, George Ude and Chittaranjan Kole) CRC press - Taylor and Francis group, New York. pp. 330.

Thangavelu, R. and Mustafa, M. M. 2012. Current advances in the *Fusarium* wilt disease management in banana with emphasis on biological control. *In: Plant Pathology* (Ed. by Christian Joseph R. Cumagun) In Tech publications, Croatia. pp. 273-298.

Uma, S., Saraswathi, M. S. and Pillay, M. 2011. Evolution and genetic relationships in banana and plantains: diversification, taxonomy and application of molecular markers in banana and plantains. *In: Banana Breeding – Progress and challenges* (Eds.

Pillay and Tenkouano). Published by Taylor and Francis Group. Vol. II. pp. 21-40.

Technical bulletins

Anuradha, C. and Mispah, M. 2011. ITMU-broucher. 2011 for technology commercialization and dissemination to the scientist, farmers and entrepreneurs. NRCB Technical folder. Pp. 1-10.

RAC Meeting

Research Advisory Committee (RAC) meeting of the centre was conducted during 22nd and 23rd December, 2011, wherein, all the members of RAC including the Chairman Dr. P.Rethinam, Former Executive Director, APCC, Indonesia attended the meeting. Recommendations generated from the meeting were approved by the Council and communicated the same to all the members.



Dr. P. Rethinam Chairing the RAC meeting

IMC Meeting

The fifteenth meeting of the Institute Management Committee (IMC) was held on 7.5.2011 under the chairmanship of Dr. M. M. Mustafa, Director, NRCB. During this meeting, the varies policy decisions were discussed and recommended for approval by the Council.

IRC Meeting

The Fifteenth Institute Research Council Meeting was held on 2.4.2011, 4.5.2011, 5.5.2011 and 2.8.2011 under the Chairmanship of Dr. M. M. Mustafa, Director, NRCB. The salient research achievements of previous year and technical programmes for the next year were presented by the respective project leaders of the institute as well as externally funded projects. The Chairman has reviewed the research achievements made under each project and gave critical inputs for refinement of the research programmes.

**SEMINARS/ MEETINGS/ WORKSHOPS/
CONFERENCES/ SUMMER INSTITUTES
AND FARMERS TRAININGS
ORGANIZED AT THE CENTRE**

Kissan Mela

The National Research Centre for Banana, Tiruchirapalli, has celebrated its 18th Foundation Day on 21. 08. 2011 by organizing a 'Banana Field Day' with a

theme on i) 'High density banana planting to increase productivity and ii) Integrated management of leaf spot disease.

The Field Day was organized mainly to highlight and disseminate the use of various technologies developed by the Centre including integrated management of leaf spot disease, viral diseases, insect pests and nematodes in banana cultivation to increase banana productivity. In addition, there was a Scientists Farmers



Dr. M.M. Mustafa, Director, NRCB, Dr. R. Ram Subbu, Assoc. Editor, Dinamalar, Trichy addressing in the Kissan Mela



Farmers from different districts of Tamil Nadu at the Kissan Mela meeting

interactive session in which many aspects of improved production, protection and postharvest technologies were discussed. In the field day, banana researchers, agriculture & horticulture officers, progressive farmers and entrepreneurs from different banana cultivating areas of Tamil Nadu have participated and discussed about various production and protection constraints.

Dr. R. Ram Subbu, Associate Editor, Dinamalar, Tiruchirappalli, Dr. K. Azhagu Sundaram, Director, IICPT, Thanjavur, Thiru J. Sekar, Joint Director of Agriculture, Tiruchirappalli and Mr. K. Balamurugan, Regional Passport Officer, Tiruchirappalli has participated in the function and spoken on various topics. In the technical sessions, Scientists of NRCB delivered lectures on high density planting and management of leaf spot disease. Besides, an exhibition was also arranged to demonstrate various advanced technologies on banana production developed by NRC for Banana.

Agriculture Education Day

National Research Centre for Banana (ICAR) Trichy has organized "Agriculture Education Day" on 28th February, 2012, to expose the recent developments in agricultural research particularly in banana and also to create an awareness and motivation among the students of various schools in Trichy District. On this day, the Research Centre was open to the students and other stakeholders to show-case the research activities of the Institute and also interaction with the scientists and researchers to motivate the students on the opportunities available in horticulture and agriculture as career. The Research Centre has also made elaborate arrangements by keeping all the important advanced technologies developed at this

Centre besides the basic studies conducted as well.

In this function, more than 500 students from different schools were participated. The NRCB Scientists explained various research activities of the Centre like, Banana varieties, Tissue culture techniques, Drip irrigation system, Fertigation methods, Eco-friendly and Bio-control methods for managing insects pests, nematodes, fungal and viral diseases. The value added banana products prepared at NRCB was given to all students and good response was noticed among the visitors.



Visit of students from Trichy district to learn different technologies developed at NRCB

Dr. M.M.Mustaffa, Director, NRCB inaugurated the function and gave presidential address. In his address, he informed the students about the carrier opportunities available in agriculture and allied sector and invited all the students to visit the NRCB at any time.

Grievance Committee Meeting

The Farmers Grievance Day of Tiruchirappalli District was held at NRCB on 21.03.12 which was organized by Collector, Tiruchirappalli District. In this monthly farmers' grivence day meeting, Mrs. Jayashree Muralitharan, District Collector pointed out that the banana growers in the district were yet to fully utilize the service and research programme being taken up by the NRCB for their economic growth.



Director, NRCB, District Collector and Joint Director of Agriculture, Trichy attending Farmers Grievance Day at NRCB

In the technical sessions, Scientists of NRCB delivered several lectures on high density planting, fertilizer management, improved production, protection and postharvest utilization. Besides, an exhibition was also arranged to demonstrate various advanced technologies on banana production developed by NRC for Banana.

PERSONNEL

Promotion

1. Mr.P.Ravichamy, promoted from T4, Tech. Asst (Journalism) to T5-Technical Officer w .e. f. 10.5.2010.

2. Mrs. T. Anitha Sree, promoted from T4, Tech. Asst (Field) to T5-Technical Officer w .e. f. 10.5.2010.

Superannuation

1. Mr. B. Vijayakumar, Administrative Officer, retired from the service on 30.9.2011.

OTHER INFORMATIONS

Hindi Day Celebrations

National Research Centre for Banana had celebrated 'Hindi Week' from 1st to 7th October, 2011 at the Centre. As a part of the program, various competitions like, Hindi Essay Writing, Hindi Noting and Drafting, Hindi Song, Hindi Quiz (Official language) and Memory Test were conducted for promoting Hindi as an official language in Central Govt. offices under the auspices of the Indian Council of Agricultural Research (ICAR), New Delhi. As a part of the celebrations, concluding ceremony and prize distribution was organized on 12th October, 2011 at the Centre. Shri S.G. Joshi, Chief Commissioner of Income Tax, Tiruchirapalli graced the occasion as Chief Guest and distributed prizes to the winners of various Hindi competitions. In his address, he emphasized the importance of promoting Hindi as official language and necessity of learning Hindi as 'Rajbhasha' by every citizen.



Shri S.G. Joshi, Chief Commissioner of Income Tax, Trichy delivering chief guest address on the eve of Hindi Day celebrations

Director General, ICAR visits NRCB, Tiruchirapalli

Dr. S. Ayyappan, Director General- ICAR and Secretary- DARE, Government of India, New Delhi,

visited National Research Centre for Banana on 23.10.2011 and inaugurated the newly constructed administrative building at NRCB, Trichy. In his inaugural address Dr. S. Ayyappan informed that the Indian Council of



Dr. S. Ayyappan, Director General-ICAR opening the new annexure building for administration

Agricultural Research has introduced a new programme for the farmers called "Farmer's First" in which, priority will be given to find solutions to the problems faced by the farming community by the research organizations and a special fund will be provided to carry out the research programmes. The fund will be to the tune of 3% of the total outlay of the each research institute in India. In addition to primary agriculture, more emphasis will be given to "Secondary agriculture" which involves processing, storage, business incubators and value addition of the produce. He encouraged the scientists to go for more patenting of the technologies. In this endeavour, ICAR has identified 27 research platforms covering agriculture, horticulture, animal husbandry, fisheries and allied sectors in the 12th five year projections.

Dr. S. Ayyappan, visited the NRCB research farm, all laboratories and exhibition. He reviewed all the ongoing projects of the institute and advised the scientist to give more emphasis for the team work and work on a "Consortia mode" to find the solutions of the farmer's problems and also to give priority for the waste utilization in banana. Dr. S. Ayyappan also appreciated the technologies developed at NRC for banana for the benefit of the farmers and also the infrastructure developed for carrying out the frontline research activities to solve the problems of the banana farmers by which, the productivity and production of banana could be achieved to the target of 36 million tons which is set for the year 2020.

Published by : **Dr. M.M. Mustafa**, Director,

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