



ICAR-Indian Institute of Spices Research
Marikunnu (P.O.), Kozhikode, Kerala, India

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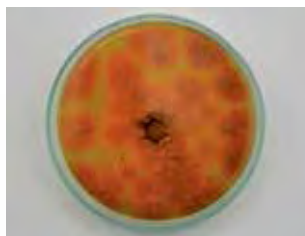
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RESEARCH UPDATE

Isolation and characterization of aflatoxin producing *Aspergillus* spp. from nutmeg

Seventy-five *Aspergillus* spp. have been isolated from infected nutmeg and mace samples collected from farmers and traders of different regions of Kerala and Tamil Nadu. Morphological features were similar to *A. flavus* having mycelia with spreading dark green, green or yellow colonies with typical large, swollen vesicle.



Orange colour pigmentation (reverse) in *Aspergillus* differentiation medium



Large swollen vesicles of *Aspergillus* spp.

Most of the vesicles are surrounded in a loosely radiate fashion by either uniseriate or biseriate phialides. Aflatoxin producing *A. flavus* were identified based on the orange colour pigmentation in *Aspergillus* differentiation medium.

Leaf blight of ginger caused by *Bipolaris rostrata*, an emerging disease in Kerala and Karnataka

Leaf blight of ginger characterized by reddish brown lesions was observed during the extensive surveys conducted in the ginger growing tracts of Mysuru, Chamarajanagar and Uttara Kannada districts of Karnataka and Wayanad and Kozhikode districts of Kerala during 2016 and 2017. The incidence ranged from 0 – 40 per cent. Symptoms manifested on ginger leaf with the formation of reddish brown oval shaped water soaked discrete spots with yellow halo on the margin and distal end of the ginger leaf lamina. Later these spots gradually increase in size and often coalesce to

form large discoloured areas which finally lead to the blighting of entire leaf. Leaf blight causing fungal isolate was identified as *Bipolaris rostrata* (Drechs.) Shoemaker [synonym- *Exerohilum rostratum*] based on conidial morphology and molecular characterization. This is a new report of *B. rostrata* causing leaf blight on ginger.



Ginger field affected by leaf blight in Karnataka

Characterization of bacterial siderophores

Among the twenty nine isolates of endophytes and epiphytes tested for the chemical nature of siderophore, 24 isolates showed Carboxylate type, 4 produced hydroxamate and carboxylate type, 1 isolate produced carboxylate, hydroxamate and catecholate type.

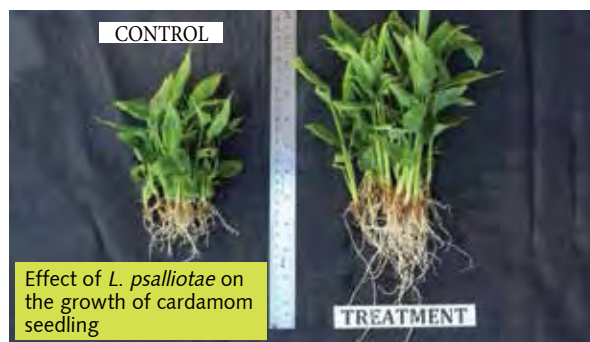
Ginger rhizosphere priming on N release kinetics in soils amended with tree leaf mulches

In a soil microcosm study conducted to determine the soil N release kinetics in ginger rhizosphere incorporated with various leaf litters (*Gliricidia sepium*, *Ailanthus altissima* and a mixture of *Artocarpus heterophyllus*, *Erythrina indica* and *Macaranga peltata*), the results indicated significantly greater cumulative and net $\text{NO}_3\text{-N}$ release in the treatments with ginger and FYM. Contrarily, $\text{NH}_4\text{-N}$ release was higher in the treatments without ginger and FYM. Among the tree leaf mulches, both $\text{NH}_4\text{-N}$ release and $\text{NO}_3\text{-N}$ release were markedly greater with *G. sepium*. Overall, the cumulative total N release and release potential was highest in treatments with ginger and FYM, while among the tree leaf mulches, *Gliricidia* followed by mixed leaves recorded the highest total N release and N release potential.

Plant growth promotion by an entomopathogenic fungus *Lecanicillium psalliotae*

Lecanicillium psalliotae, an entomopathogenic fungus previously found infectious to cardamom thrips, *Sciothrips cardamomi* promoted plant growth in cardamom, *Elettaria cardamomum*. The fungus exhibited direct plant growth promoting traits

by production of Indole 3-acetic acid and ammonia and by solubilizing inorganic phosphate and Zn. It also showed indirect plant growth promoting traits by producing siderophores, cell wall-degrading enzymes like, α -amylase, cellulase and protease. In pot culture experiments, application of the fungus at the root zone of cardamom seedlings significantly increased shoot and root length, shoot and root biomass, number of secondary roots and leaves and leaf chlorophyll contents compared to untreated plants. This is the first report on plant growth promoting traits of this fungus. The findings were published in the journal, 'Microbiological Research'.



PERSONALIA

Awards/ Honours/ Recognitions

Dinesh R

Dr. R. Dinesh, Principal Scientist (Soil Science) was elected as a Fellow of National Academy of Agricultural Sciences (NAAS), New Delhi, India. He was selected for this coveted award for his significant contributions in the area of plant-microbe interaction and their influence on nutrient cycling and nutrient use efficiency in soils under perennial horticulture.



Dr. R. Dinesh receiving the award from NAAS president, Dr. Panjab Singh

Apr. - Jun. 2018



Participation in Symposia/ Seminars/ Workshops/ Conferences/ Meetings

Akshitha H J & Ankegowda S J

One day workshop on Breeding strategies in plantation crops, ICAR-CPCRI RS, Vittal, 27 April 2018.

Ankegowda S J, Biju C N, Dinesh R, Prasath D & Sivaranjani R

Meeting of Indian Society for Spices Executive Committee, ICAR-IISR, Kozhikode, 11 June 2018.

Jayashree E

One day workshop on Primary processing and value addition in spices, AICRPS Centre, Chintapalli, 7 June 2018.

Kandiannan K

National conference on Strategies and challenges in doubling farmer's income through horticultural technologies in subtropics, ICAR-CISH, Lucknow, 21-22 June 2018.

Visited AICRPS Centre and reviewed the progress of AICRPS projects, RARS, Raigarh, 24-25 June 2018.

Annual review meeting of MIDH/NHM programmes, College of Agriculture, Raipur, 26-27 June 2018

Kandiannan K, Lijo Thomas, Nirmal Babu K & Prasath D

One day Consultative meeting on turmeric, DoH, GoT, Hyderabad, 5 June 2018.

Nirmal Babu K

Review of XXV Meeting of ICAR Regional Committee No. VIII, ICAR-SBI, Coimbatore, 17 April 2018.

Meeting on State level agricultural fair 'Krishi Unnati', ICAR-CPCRI, Kasaragod, 21 April 2018.

Workshop of AICRP Tuber Crops, ICAR-CTCRI, Thiruvananthapuram, 26 April 2018.

One day meeting, CMPR, Kottakkal, 27 April 2018.

Meeting of Kerala Sasthra Sahithya Parishad, Mukkam, 28 April 2018.

Meeting with the officials of Peermade Development Society, Idukki, 23 May 2018.

Consultative meeting on turmeric and meeting with industry representatives, Hyderabad, 5-6 June 2018.

Review the progress of work of AICRPS centre, Chintapalli, 7-8 June 2018.

Inaugural session of launch of new global project on Private business action on biodiversity (PBAB), International Zusammenarbeit (GIZ) GmbH, New Delhi, 12 June 2018.

Praveena R

TSP program on Turmeric seed material distribution and interface with scientists, Edamunda, Wayanad, 9 May 2018.

Ratha Krishnan P

Stakeholders meet to organise state level Krishi Unnati Mela, ICAR-CPCRI, Kasaragod, 21 April 2018.

Annual review workshop of KVKs, Zone XI, KVK, Idukki, 16-19 May 2018.

Santhosh J Eapen

Meeting of Board of Studies (Zoology), St. Berchmans College, Changanacherry, 22 May 2018.

Sheeja T E

Panel discussion during the program "Technology Sourcing Fest" for MSME at NIIST, Trivandrum on 12 June 2018.

Sunil V C

Two days Hindi Workshop conducted by ICAR-CRIDA, Hyderabad, 24-25 April 2018.

Lectures Delivered

Jayashree E

Post harvest processing of spices, for the internship training students, ICAR-IISR, Kozhikode, 11 May 2018.

Harvest, post harvest processing and value addition of black pepper, ginger, nutmeg and cinnamon, International trainees of Feed the Future India Triangular Training Programme on Values addition in spices, 26 May 2018.

Kandiannan K

Technological interventions in spices for higher yield in subtropics, National conference on strategies and challenges in doubling farmer's income through horticultural technologies in subtropics, ICAR-CISH, Lucknow, 21-22 June 2018.

Praveena R

Turmeric cultivation, for farmers at Edamunda, Wayanad, 9 May 2018.

Training Attended

Deepthi A

Training on Value addition in coconut, ICAR-CPCRI, Kasaragod, 22-26 April 2018.



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Jayashree E

One day International exposure training programme on Value addition in spices, CSIR-CFTRI, Mysuru, 25 May 2018.

Sivadas O G & Binoy V S

Training programme of Trainers, CHTI, New Delhi, 21-25 May 2018.

NEWS AND EVENTS

Second Dr. Y.R. Sarma memorial lecture delivered

Understanding plant microbe interactions is very crucial for sustainable agriculture said Dr. Appa Rao Podile, Hon'ble Vice Chancellor, University of Hyderabad. He urged the scientists and students to focus more on basic studies which will ultimately help in evolving technologies that withstand the test of time, while delivering the second Dr. Y. R. Sarma Memorial Lecture in a public function organized at Indian Institute of Spices Research (ICAR-IISR), Kozhikode on 19 May 2018. The lecture was organized to pay homage to renowned plant pathologist and former Director of IISR, Dr. Y.R. Sarma, on his second death anniversary. Dr. K. Nirmal Babu, Director, IISR, Kozhikode, Former Director Dr. P.N. Ravindran, Dr. S. Devasahayam, Dr. Santhosh J. Eapen, Ms. Aruna Sreenivas and Dr. C. N. Biju addressed the gathering. Around one hundred participants comprising of scientists, students and farmer representatives took part in the function. An Endowment Fund was also launched in memory of him during the occasion.



Inauguration of Second Dr. Y.R. Sarma memorial lecture

ICAR-IISR organized FTF-ITT training on Value Addition in Spices

An International Training Program on "Value Addition in Spices" under the Feed the Future - India Triangular Training (FTF-ITT) Program was jointly organized by ICAR-Indian Institute of Spices Research (ICAR-IISR), Kozhikode and The National Institute of Agricultural Extension Management (MANAGE), Hyderabad during 15 - 29 May 2018. Dr. A K Singh, Deputy Director General (Horticultural Science), Indian Council of Agricultural Research inaugurated the training program. The training was attended by 22 executives from various Afro-Asian

countries. During the 15-days program, the trainees were exposed to various aspects of spice processing and value addition by resource persons from ICAR-IISR as well as other organizations. Exposure visits were arranged to CFTRI, Mysuru, M/s Kancor Ingredients Ltd., Ankamaly, Ernakulam, M/s Panda Foods (India) Pvt. Ltd. in Wayanad and Experimental Farm, Peruvannamuzhi. The valedictory function was held on 29 May 2018. Dr. V.S. Ramachandran, Director of Regional Science Centre and Planetarium was the chief guest. All the 22 participants from five Afro-Asian countries received participation certificates and mementos from the chief guest.



Dr. A.K. Singh, DDG (Hort. Sci.) visits ICAR-IISR

Dr. A.K. Singh, Deputy Director General (Horticultural Science), ICAR, New Delhi visited ICAR-Indian Institute of Spices Research, Kozhikode on 16 May 2018. During his maiden visit, DDG went around various laboratories, the upcoming food safety cum post-harvest block, library and nursery units. He interacted with the scientists about the ongoing research works being undertaken on various aspects of spices. Booklets on 'Calendar of Operations' and 'Handbook for identification of nutritional disorders in spices' were released by DDG on the occasion. Ceremonial planting of a nutmeg plant and inauguration of the 25 kW Solar Power System were also part of his visit. In his address to the scientists of ICAR-IISR, he appreciated the quality research publications of the institute, the discipline and cleanliness maintained in various laboratories and premises. He highlighted the need to find out ways to make strategic interventions in spice sector so as to double the farmers' income.

DDG's (Hort) visit to ICAR-IISR



World Environment Day observed

World environment day celebrations at ICAR-IISR



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The World Environment Day (WED) was observed on June 5, 2018 at ICAR-Indian Institute Spices Research, Kozhikode with several activities. Saplings of several fruit trees were planted in the campus by the staff members. All the staff members assembled in the star garden ('nakshtravanam') and attended the plants they had planted a couple of years ago. A signature campaign was also conducted among the staff members to spread the theme of this year's WED – 'beat plastic pollution'. Dr. K. Kishore Kumar, Head, Botany Department, Farook College, Kozhikode sensitized the gathering with a lecture on 'Nature's Gifts to the God's Own Country' and advocated the house to be more proactive for the protection of our environment. Dr. Santhosh J. Eapen and Ms. Sivaranjini R. also spoke on the occasion.

International Day of Yoga Celebration

The fourth International Day of Yoga (IDY) was celebrated on 21 June, 2018 at ICAR-Indian Institute of Spices Research, Kozhikode with a practical yoga session handled by Isha yoga volunteers, Dr. Yadhu Krishna and Mr. Nishad. The program started with the welcome address by Dr. C.K. Thankamani, Head (i/c), Division of Crop Production and PHT and address by Dr. K. Nirmal Babu, Director, ICAR – IISR. The session ended with vote of thanks by Ms. Sivaranjani.

The International Day of Yoga was also celebrated at ICAR-IISR, Regional Station Appangala, Experimental Farm and KVK, Peruvannamuzhi.



Yoga session during International day of yoga

News From AICRPS

Project Coordinator visited ICAR- AICRPS Centre at TNAU, Coimbatore and Dr. YSRHU Chintapalle for monitoring the experiments. Scientists of PC Cell visited AICRPS Centre at RAU, Dholi, Dr. BSKKV, Dapoli and IGKV, Raigarh for monitoring the experiments.

Two hundred seventy five accessions of turmeric genotypes were harvested from the turmeric germplasm at AICRPS Centre TNAU, Coimbatore and were exhibited for the benefit farmers and students.



Display of turmeric accessions at TNAU AICRPS Centre, Coimbatore

AICRPS centre at Indira Gandhi Krishi Viswavidyalaya, Raigarh has organized Karshak Kalyan Diwas at Lailunga on 2 May 2018 focusing on Doubling farmer's income. About 500 farmers participated.

HINDI NEWS

Hindi Workshop

A Hindi workshop was conducted at ICAR-IISR, Kozhikode, on 28 June 2018 to enhance the knowledge of Hindi Noting and Drafting among staff members. Smt. Praveena, Hindi Pradhyapak, Hindi Teaching Scheme, Kozhikode delivered a lecture on Hindi Noting and Drafting.

OLIC meeting

The Official Language Implementation Committee meeting was held on 26 June 2018 under the chairmanship of Dr. K. Nirmal Babu, Director.

Publication

Masala Samachar (July-September 2017) was published.

TOLIC Meetings

Dr. Santhosh J. Eapen, Head, Division of Crop Protection and Dr. Lijo Thomas, Scientist and Hindi Officer attended 61st Half yearly meeting of Town Official language Implementation Committee on 26 April 2018 at Hotel Woodies Bliesure, Kozhikode.

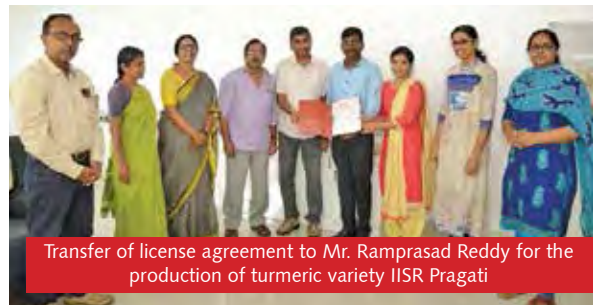
Training

Ms. Sivaranjani R. Passed Hindi Prabodh examination through correspondence course.

TRANSFER OF TECHNOLOGY

Activities of ITM-BPD Unit

Turmeric variety IISR Pragati was licensed to Mr. Ramprasad Reddy, Telangana under a license agreement signed on 12 April 2018.



Transfer of license agreement to Mr. Ramprasad Reddy for the production of turmeric variety IISR Pragati

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ITM-BPD Unit attended National Conference on Marine Debris (CoMaD 2018) and exhibited Institute technologies and products at CMFRI, Cochin on 11 & 12 April, 2018.



ICAR-IISR, ITM-BPD Unit stall at National Conference on Marine Debris, Cochin

SUCCESS STORY

Site specific soil fertility management for Nutmeg

An important factor for low productivity in tree spices like nutmeg especially in Kerala could be due to factors such as strong soil acidity, extensive deficiency of secondary nutrients calcium and magnesium and widespread deficiency of micro-nutrients like Boron. Moreover, strong soil acidity affects rooting and nutrient uptake pattern in nutmeg. This can be overcome by following some best management practices (BMP) like application of amendments (lime and lime + dolomite) along with site specific nutrients and micronutrients. This has helped to significantly increase soil fertility and yield of nutmeg in Mr. PL. Paulose's nutmeg plantation. A retired ITI instructor turned nutmeg farmer has adopted the site specific nutrient management along with application of amendments (Dolomite lime + Gypsum) and micronutrient sprays on a part of his garden comparing it with the traditional practices. The yield increase was up to 25% in the treated plots as compared to farmers practice. The farmer has registered an increase in income of Rs. 30,000-40,000 by adoption of BNP on homestead cultivation of nutmeg in one year.



KRISHI VIGYAN KENDRA

Front Line Demonstration

- Participatory seed production programme of a high yielding turmeric variety, IISR Pragati
- Demonstration of a HYV of yard long bean (YLB) viz., Githika
- Demonstration of cultivation of potted bush pepper in urban areas of Kozhikode
- Entomo pathogenic nematodes (EPN) for pseudo stem weevil management in banana
- Integrated Pest and Disease Management in Paddy
- Demonstration on waste water recycling for vegetable cultivation
- Demonstration on cultivation of cosmetic value medicinal plants – Aloe vera and Kasthuri Turmeric
- Demonstration of nutri- farms for year round nutrition security among farm families
- Ovsynch for Repeat Breeder cows
- Estrus synchronization and Fixed Time Breeding in goats
- Use of Carotenoid rich feed for freshwater ornamental fish culture (On 25 per cent cost sharing basis)
- Scientific farming of milkfish (*Chanos chanos*) in brackish water ponds with water acidity management
- Demonstration of aquaponics farming system
- Demonstration on production of healthy ginger seeds

TRAINING PROGRAMMES

KVK conducted 21 training programmes in various disciplines benefitting 856 participants. It includes training on aspects like plant propagation techniques, bush pepper production, IPDM in banana, goat rearing, diseases of cattle and their control measures, ornamental fish farming and IFS, jackfruit processing, soap making, bonsai making cultivation practices of ginger and turmeric, ornamental fish culture, brackish water aquaculture. A vocational training on Friends of coconut organized by Coconut Development Board was organized at KVK during 25 – 30 June 2018, in which 17 trainees attended.



Training on ornamental fish culture

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Other Extension activities

Technology Assessment for 2018-19

- Assessment of customized fertilizer application in cassava for higher yield
- Management of sucking pests in chillies
- Assessment of Amur common carp for fresh water aqua culture
- Assessment of nutritional adequacy in agro based farming system

Web interaction with Hon'ble PM and its live telecast at KVK (20-06-2018)



Swachh Bharat Activities at KVK

A total of four programmes were conducted at KVK during the period, as a part of Swachh Bharat Abhiyaan. Cleaning of KVK administrative building roof top, nursery area and KVK premises were undertaken by KVK staff. Disposal of plastic wastes, weeds and waste materials were done regularly.

Doubling Farmers' income

Expert lectures were delivered by the subject experts of KVK, Dr. P. Ratha Krishnan, Programme Coordinator, KVK and Dr. C.K. Thankamani, Principal Scientist, IISR on Kisan Kalyan Divas organised by Dept. of Agriculture and Farmers' welfare at 12 blocks of Kozhikode on 2 May 2018. The programme was inaugurated by MLAs and Block Panchayat Presidents of the respective blocks. A total of 811 participants attended the programme in various blocks. Besides, a Lecture on strategies and technologies for doubling farm income was delivered by Dr. P. Ratha Krishnan, Programme Coordinator on 22-05-18 at Haritha Vidya, Kozhikode in which 75 farmers attended.

Exhibitions

The Kendra has participated in the following exhibitions.

Exhibition in connection with Perambra Fest at Perambra, Kozhikode, 5-13 April 2018.



Exhibition in connection with Njattuvela Ulsavam at Chemanchery, 22-24 June 2018

PUBLICATIONS

Research papers

Aarthi S, Sharon Aravind, Shivakumar M S, Rema J, Kandiannan K & Sasikumar B 2018 Influence of weather parameters on sex expression and flowering pattern of nutmeg (*Myristica fragrans* Houtt.). Journal of Agrometerol 20(2): 155-156.

Bhai R S, Subila K P, Eapen S J, Reshma A, Pervez R, Bhat A I & Srinivasan V 2018 Effect of biocontrol agents on production of rooted black pepper cuttings by serpentine method. Journal of Spices and Aromatic Crops 27(1): 59-65.

Bhat A I, Biju C N, Srinivasan V, Ankegowda S J & Krishnamurthy K S 2018 Current status of viral diseases affecting black pepper and cardamom. Journal of Spices and Aromatic Crops 27(1): 01-16.

Biju C N, Peeran M F, Gowri R, Praveena R, Sharon A & Ankegowda S J 2018 Epidemiological parameters to delineate weather-disease interactions and host plant resistance against leaf blight in small cardamom (*Elettaria cardamomomum* Maton). Journal of Spices and Aromatic Crops 27(1): 22-31.

Kandiannan K, Krishnamurthy K S, Thankamani C K & Ankegowda S J 2018 Annual and monthly rainfall trend in plantation and spice farming Western Ghats districts. Journal of Spices and Aromatic Crops 27(1): 45-53.

Senthil Kumar C M, Jacob T K, Devasahayam S, Stephy T & Geethu C 2018 Multifarious plant growth promotion by an entomopathogenic fungus *Lecanicillium psalliotae*. Microbiological Research 207: 153-160.

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Book chapters

Nirmal Babu K, Kandiannan K & Sharon Aravind 2018 Technological interventions in spices for higher yield in sub tropics In. Rajan S, Ram R A, Maneesh Mishra, Gurjar P S & Muthu Kumar M (Eds.), Souvenir cum book of abstracts National conference on Strategies and challenges in doubling farmers income through horticultural technologies in subtropics, ICAR-Central Institute for Subtropical Horticulture, Lucknow, pp.57-65.

Popular article

Balaji Rajkumar, Ankegowda S J, Alagupalamuthirsolai M, Faisal M, Akshitha H J & Narendra C 2018 Snails -the monsoon lover and the enemy of spice planters. Spice India, June, pp.4-8.

Jacob T K, Praveena R & Senthil Kumar C M 2018 Insects Pests and diseases of ginger and turmeric. Spice India 31(6): 29-34.

Praveena R, Biju C N, Lijo Thomas & Srinivasan V 2018 Thwarting thread blight damage in nutmeg. Kerala Karshakan 12(5): 8-9.

Praveena R, Senthil Kumar C M & Jacob T K 2018 Diseases and insect pests of cardamom. Spice India 31(6): 25-28.

Praveena R, Senthil Kumar C M & Jacob T K 2018 Major diseases and insect pests of black pepper. Spice India 31(6): 35-38.

Sharon Aravind, Palanikumar M & Rema J 2018 Indian clove story: Chronicle of the Simpsons. Spice India 31: 14-16.

Training manual

Biju C N, Jeevalatha A, Aarthi S & Alagupalamuthirsolai M 2018 Training manual of Summer internship programme on advanced techniques in microbiology, biochemistry, biotechnology and bioinformatics. ICAR- Indian Institute of Spices Research, Kozhikode, Kerala, India.

Krishnamurthy K S, Dinesh R, Jayashree E, John Zachariah T, Rajeev P & Eapen S J 2018 International training programme on Value addition in spices. ICAR- Indian Institute of Spices Research, Kozhikode, Kerala, India, 90p.

Ph.D. Awarded

Student	Topic	University	Guide
Ms. Agisha V P	Deciphering responses of black pepper (<i>Piper nigrum</i> L.) to endophytic colonization by <i>Pseudomonas putida</i> BP 25	University of Calicut	Dr. Santhosh J. Eapen

Transfer

Name	Designation	From & To	Date of Joining/ Relieving
Mr. Honnappa Asangi	Scientist (SPMAP)	ICAR-NRCSS, Ajmer to ICAR-IISR RS, Appangala	24-06-2018
Dr. Narendra Chaudhary	Scientist (SPMAP)	ICAR-IISR RS, Appangala to ICAR-NRCSS, Ajmer	30-06-2018



हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agr search with a human touch

SPICES NEWS

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