



Spicing up the nation's progress



ICAR-Indian Institute of Spices Research
(An ISO 9001:2008 Certified Organization)



ICAR-Indian Institute of Spices Research

ICAR-IISR, Kozhikode, Kerala is a non-profit research organization under Indian Council of Agricultural Research (ICAR) that aims to serve the farming community by conducting research, training and knowledge transfer pertaining to 12 mandate crops viz., black pepper, cardamom, ginger, turmeric, nutmeg, garcinia, clove, cinnamon, cassia, allspice, vanilla and paprika.



Black pepper
(*Piper nigrum* L.)



Cardamom
(*Elettaria cardamomum* Maton)



Turmeric
(*Curcuma longa* L.)



Ginger
(*Zingiber officinale* Rosc.)



Nutmeg
(*Myristica fragrans* Houtt.)



Garcinia
(*Garcinia gummi-gutta* L.)
Robson



Vanilla
(*Vanilla planifolia* Andr.)



Clove
(*Syzygium aromaticum* L.)
Merr. & Perry



Cinnamon
(*Cinnamomum verum* J. Presl)

OUR MISSION

- ▶ Basic, applied and strategic research on genetic resource management, crop improvement, crop production and protection technologies for enhanced production of safe spices.
- ▶ Transfer of technology, capacity building and impact assessment of technologies.
- ▶ Coordinate research and validation of technologies under AICRP on Spices.

OUR MANDATE

- ▶ To extend services and technologies to conserve genetic resources of spices as well as soil, water and air of spices agroecosystems.
- ▶ To develop high yielding and high quality spice varieties and sustainable production and protection systems using traditional and non-traditional techniques and novel biotechnological approaches.
- ▶ To develop post harvest technologies of spices with emphasis on product development and product diversification for domestic and export purposes.
- ▶ To act as a centre for training and technology upgradation of spices and to coordinate national research projects.

- ▶ To monitor the adoption of new and existing technologies to make sure that research is targeted to the needs of the farming community.
- ▶ To serve as a national centre for storage, retrieval and dissemination of technological information on spices.

HISTORY

Intensive research on spices in the country was initiated with the establishment of a Regional Station of Central Plantation Crops Research Institute (CPCRI) at Kozhikode, Kerala, during 1975, by the Indian Council of Agricultural Research (ICAR). This Regional Station was upgraded as National Research Centre for Spices (NRCS) in 1986 by merging with it the Cardamom Research Centre of CPCRI at Appangala, Madikeri, Karnataka. The NRCS was further elevated to the present Indian Institute of Spices Research (IISR) during 1995.

HEADQUARTERS AND RESEARCH CENTRES

The laboratories and administrative offices of the institute are located at Chelavoor (50 m above MSL), 11 km from Kozhikode (Calicut), Kozhikode District, Kerala, on the Kozhikode - Kollegal road (NH 212), in an area of 14.3 ha. The research farm is located 51 km North East of Kozhikode at Peruvannamuzhi (60 m above MSL), on the Peruvannamuzhi-Poozhithode road in Kozhikode District, in an area of 94.08 ha. The Cardamom Research Centre, Appangala (920 m above MSL) is located at Appangala, Kodagu District, Karnataka, on the Madikeri-Bhagamandala road, 8 km from Madikeri, in an area of 17.4 ha.



IISR Regional Station, Appangala



IISR Experimental Farm, Peruvannamuzhi



KVK, IISR, Peruvannamuzhi

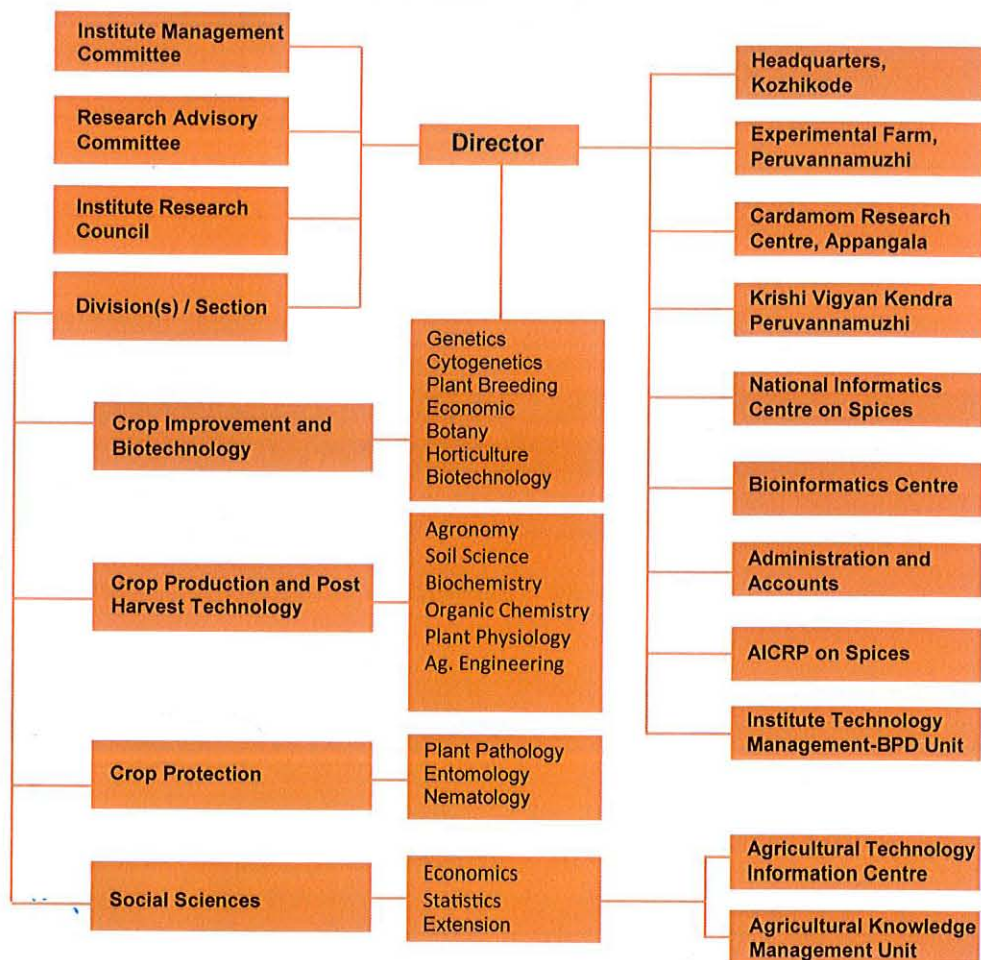


पावना भाहर
दिनांक Date Receipt Seal

05 JAN 2019

राष्ट्रीय सूचना केंद्र
National Informatics Center on Spices
ICAR-MSR, MARIKINNI
Kerala

ORGANIZATIONAL HIERARCHY



STRATAGEMS

- ▶ Conservation of genetic resources, bar-coding and crop improvement
- ▶ Increasing productivity of spices through,
 - ▶ Quality planting material production and supply
 - ▶ Productivity enhancement technologies and systems through better input management
 - ▶ Bio risk management
- ▶ Developing new market oriented technologies for secondary agriculture and value addition
- ▶ Effective transfer of technologies to the target groups

SALIENT ACHIEVEMENTS

- ▶ The Institute has been awarded twice (1999 and 2009) with the prestigious Sardar Patel Outstanding ICAR Institution Award
- ▶ The institute has the world's biggest germplasm collection of spice crops including wild relatives, related species and cultivated types of black pepper (3850), cardamom (439), ginger (665), turmeric (925), nutmeg (484), clove (225), cinnamon (408) and garcinia (116).
- ▶ The germplasm has been characterized for yield, quality traits and biotic and abiotic stresses and identified promising lines for yield, quality, and resistance to drought, pests and diseases.
- ▶ Twenty six high yielding varieties of spice crops (black pepper - 8, cardamom - 3, turmeric - 8, ginger - 3, nutmeg - 2 and cinnamon - 2) with desirable qualities have been developed and released which have substantially increased the productivity of spices in the country.
- ▶ Improved vegetative and propagation technologies have been developed in spice crops including soil less pro-tray method for production of black pepper rooted cuttings and bud sprouts in ginger and turmeric for planting.
- ▶ On-line database of soil fertility status for major, secondary and micronutrients for Kerala and site-specific nutrient management plans for targeted yield of spices have been developed.
- ▶ Crop specific micronutrient formulations have been developed for black pepper, cardamom, ginger and turmeric and commercialized.
- ▶ Efficient Bio-Control Agents and Plant Growth Promoting Rhizobacteria have been identified and novel delivery systems including encapsulation techniques (Biocapsule) have been developed for growth promotion, increased yield and management of pests and pathogens of spices crops.
- ▶ Whole genome sequencing of *Phytophthora capsici*, *Ralstonia solanacearum*, Banana bract mosaic virus, Cucumber mosaic virus and Piper yellow mottle virus infecting black pepper, ginger and cardamom to understand the transmission, virulence and host interactions of these major pathogens.
- ▶ Molecular diagnostic assays have been developed for detection of major viral diseases of black pepper, cardamom and ginger for production of healthy planting materials.
- ▶ The institute holds a large collection of multi-trait PGPR isolates with proven ability for biocontrol and growth promotion in spices
- ▶ Molecular methods to detect the presence of biological adulterants in traded market samples of spices have been developed to ensure quality and safety of export-oriented spice products.
- ▶ The institute has developed 15 online databases and eight software tools dealing with biodiversity, genomics and cheminformatics of spices
- ▶ The institute has Agricultural Technology Information Centre and Krishi Vigyan Kendra for transfer of technologies through on-farm trials, demonstration plots, training programmes and mass media.
- ▶ The institute also has a Business Planning and Development Unit for licensing of technologies and a state of the art spice processing facility and an Incubation Centre to transform farmers into rural agri-business entrepreneurs.



TOP TECHNOLOGIES/PRODUCTS/ SERVICES

Improved crop varieties

Black pepper : Sreekara, Subhakara, Pournami, Panchami, IISR Thevam, IISR Girimunda, IISR Malabar Excel and IISR Shakthi

Cardamom : Appangala 1, IISR Avinash, and IISR Vijetha

Ginger: IISR Varada, IISR Rejatha and IISR Mahima

Turmeric: Suvarna, Sudarsana, Suguna, IISR Prabha, IISR Pratibha, IISR Alleppey Supreme, IISR Kedaram and IISR Pragati

Cinnamon: IISR Navashree and IISR Nithyashree

Nutmeg: IISR Viswashree and IISR Keralashree



IISR Pragati



IISR Pratibha



IISR Malabar Excel



IISR Thevam



IISR Rejatha



IISR Varada



Appangala 1



IISR Viswashree

- ▶ Organic production technologies and GAPs for spices
- ▶ Crop specific micronutrient formulations for targeted yield in major spices.
- ▶ Biocapsules-A smart delivery system for PGPR and beneficial microorganisms.
- ▶ Microbial consortium for enhanced growth and yield in black pepper and ginger
- ▶ *Trichoderma harzianum* and *Pochonia chlamydosporia*- Biocontrol agents against fungal diseases and nematodes
- ▶ A new media for mass multiplication of entomopathogenic nematodes
- ▶ Green Technology for biocontrol of cardamom thrips
- ▶ Integrated technology for rejuvenating virus affected black pepper plantations
- ▶ Post-harvest technologies for processing and value addition of spices
- ▶ State of the Art Bioinformatics Unit
- ▶ Institute Technology Management-Business Planning and Development Unit for technology commercialization and licensing



TRIBAL FARMER EMPOWERMENT

Several demonstrations aimed at tribal farmer empowerment are undertaken under the Tribal Sub Plan. Varietal demonstrations in black pepper are underway in Kerala, Tripura and Arunachal Pradesh. Demonstration in collaboration with the Spices Board in black pepper and ginger is in progress in four districts of Arunachal Pradesh and in Shillong and Guwahati in Assam.



FUTURE THRUSTS

- ▶ The conservation of genetic resources, bar coding and crop improvement using cutting edge technologies and fast breeding strategies to develop climate-smart crop varieties.
- ▶ Development and refinement of GAPs and organic production techniques in spices with emphasis on tribal empowerment.
- ▶ Review of extant farming systems to explore the possibility of offering choices and alternatives to the farming community for enhancing the output in several spices through crop intensification, optimal intercropping strategies astute land use planning and value addition.
- ▶ Increasing focus on food safety for the spice farming systems and application of DNA bar coding technology for detecting adulteration in many spices.
- ▶ Prioritization of pesticide residue and contaminant problems in spices.
- ▶ Effective transfer of technologies to empower stakeholders
- ▶ Pro-active foray into non-traditional and tribal areas especially North Eastern States



TECHNOLOGY TRANSFER

The research achievements are delivered to the stakeholders through the Agricultural Technology Information Centre (ATIC) and Krishi Vigyan Kendra (KVK) through on-farm trials, demonstration plots, training programmes and mass media.

AGRICULTURAL TECHNOLOGY INFORMATION CENTRE

The ATIC deals with the production and distribution of superior quality planting materials, farm advisory services including crop diagnostic services, information dissemination through multimedia, video and interactive databases, providing audio visual aid support to the institute activities, organizing technology dissemination services like exhibitions, seminars to farmers and other users.

KRISHI VIGYAN KENDRA

Krishi Vigyan Kendra (KVK) established at the Experimental Farm, Peruvannamuzhi spearheads effective transfer of technology to the farming community of Kozhikode district. KVK organizes, training programmes and field demonstrations on proven technologies in farmer's fields, exhibitions and kisan meals on agriculture, animal husbandry, fisheries and home science for the benefit of farmers, unemployed women and youth and development workers. The KVK also operates a plant and animal clinic to cater various services to farmers.



CAPACITY BUILDING

IISR trains spice extension officers and scientist from all over the country to build knowledge, skills and scientific capacity. IISR also helps to educate tomorrow's scientists by providing opportunity to post graduate students in doing their summer training, M.Sc. project work, post M.Sc. training, M.Phil. and Ph.D. Many universities have recognized the institute as a centre for post graduate studies.

- Bharathiar University, Coimbatore
- Kannur University, Kannur
- Kerala Agricultural University, Thrissur
- Mangalore University, Mangalore
- Nagarjuna University, Nagarjunasagar
- Tamil Nadu Agricultural University, Coimbatore
- University of Calicut, Calicut
- Kerala University of Fisheries and Ocean studies, Kochi

Besides, advanced training programmes are organized periodically in frontier areas of molecular biology & biotechnology, biochemistry, bioinformatics etc. Need based training is also offered to officials from developmental and extension agencies in soil, manure and tissue analyses, nutrient management, processing and evaluation of chemical quality in spices, detection of adulteration in spices, pest and diseases management, biological control of diseases etc.



LINKAGES AND PARTNERSHIPS

The institute has linkages with other ICAR institutes and SAUs (State Agricultural Universities) and many collaborative research projects have been taken up. Besides, the institute works in tandem with the development agencies such as Spices Board, Directorate of Arecanut and Spices Development and State Department of Agriculture and Horticulture of Kerala, Karnataka and Tamil Nadu. A few institutions with which the institute has linkages are;

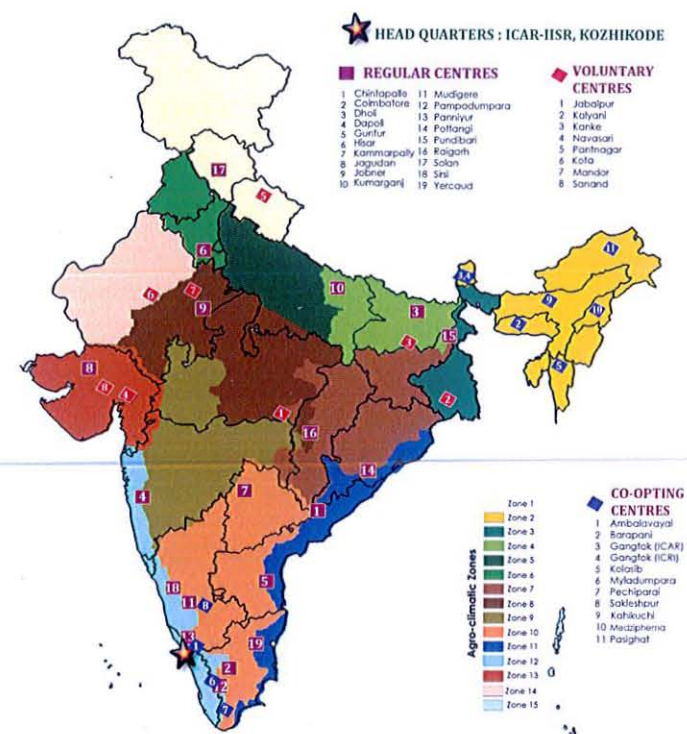
- ▶ Department of Biotechnology, New Delhi
- ▶ Ministry of Environment and Forestry, New Delhi
- ▶ Ministry of Food Processing Industries, New Delhi
- ▶ Indian Agriculture Research Institute, New Delhi
- ▶ Indian Institute of Horticultural Research, Bangalore
- ▶ National Bureau of Plant Genetic Resources, New Delhi
- ▶ National Bureau of Agriculturally Important Microorganisms, Mau
- ▶ National Bureau of Agriculturally Important Insects, Bangalore
- ▶ Central Research Institute for Dryland Agriculture, Hyderabad
- ▶ Central Plantation Crops Research Institute, Kasaragod
- ▶ Central Institute of Agricultural Engineering, Bhopal
- ▶ Project Directorate on Cropping Systems Research, Modipuram
- ▶ National Horticulture Mission, New Delhi
- ▶ Spices Board, Kochi
- ▶ Directorate of Arecanut and Spices Development, Calicut
- ▶ Kerala Agricultural University, Thrissur
- ▶ Kerala State Council for Science, Technology and Environment, Trivandrum
- ▶ Centre for Water Resources Development and Management, Calicut
- ▶ ERNET India, New Delhi
- ▶ DOEACC, Calicut
- ▶ National Institute of Technology, Calicut
- ▶ State Planning Board, Government of Kerala

CO-HOST @ IISR

The Indian Society for Spices (ISS) was founded in 1991 for the advancement of research and development in spices, aromatic and related crops. Journal of Spices and Aromatic Crops, which is the official publication of Indian Society for Spices, is published twice a year at present during June and December. It is an International journal devoted to the advancement of spices, aromatic and related crops (<http://www.indianspicesociety.in>, email: iss@spices.res.in)

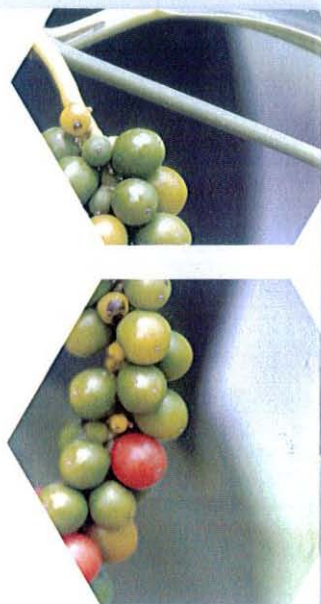
AICRP ON SPICES

ICAR-All India Coordinated Research Project on Spices (AICRPS), located at ICAR-Indian Institute of Spices Research, Kozhikode, Kerala has 38 centers (19 regular centers, 11 co-opting centers and 8 voluntary centers) representing 14 agro-climatic regions in 24 states including North Eastern States and Tribal areas. ICAR-AICRPS plays an important role in the development of varieties suitable to different agro-climatic regions and address the problems faced by the farming community on crop diseases, crop management practices during adverse and aberrant weather conditions. Presently, ICAR-AICRPS is working on 14 mandate crops viz., black pepper, small cardamom, large cardamom, ginger, turmeric, nutmeg, cinnamon, clove, coriander, cumin, fennel, fenugreek, ajowain and nigella.



AWARDS

ICAR Best Institute Award (1994-99)
ICAR Best Annual Report Award (1996-97)
ICAR Team Research Award (1994-96)
Hari Om Trust Award (1995-96)
Sardar Patel Outstanding ICAR
Institution Award (2009)
Best KVK Award (2011)
Chaudhari Devi Lal Outstanding All India
Coordinated Research Project
Award (2017)



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Krishi Vigyan Kendra

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IISR Experimental Farm

Peruvannamuzhi PO, Kozhikode, Kerala-673 528

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IISR Regional Station

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