

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION

LOK SABHA
UNSTARRED QUESTION NO. 3368
TO BE ANSWERED ON 16/03/2021

INDIAN INSTITUTE OF SPICES RESEARCH

3368. SHRI M.K. RAGHAVAN:

Will the Minister of AGRICULTURE AND FARMERS WELFARE
कृषि और किसान कल्याण मंत्री be pleased to state:

- (a) whether the Indian Institute of Spices Research (IISR), Calicut has achieved the growth envisaged by the Government and if so, the details thereof; and
- (b) the future plans and time-frame stipulated for growth of IISR, Calicut?

A N S W E R

THE MINISTER OF AGRICULTURE AND FARMERS WELFARE
कृषि और किसान कल्याण मंत्री **(SHRI NARENDRA SINGH TOMAR)**

- (a) Yes, ICAR-The Indian Institute of Spices Research (ICAR-IISR), Calicut (now Kozhikode) has achieved the growth envisaged by the Government.

Major achievements of IISR during last five years include:

- The institute holds the world's largest germplasm collection of spices that are being characterized for various traits (collected 1040 germplasm of different spice crops and characterised 1403 germplasm).
- The Institute has established an "Advanced Facility for Post-Harvest Technology on Spices" in 2018 to gear up research on processing, food safety, pesticide residue analysis and value addition of spices.
- Developed 55 pre-breeding lines and identified 68 promising/elite breeding lines.
- Identified and released 5 varieties/hybrids of Cardamom, Turmeric, Nutmeg, Cinnamon and Ginger.
- Standardised 63 technologies on crop production, crop protection, post harvest management and value addition.
- 180 Field Demonstration of technologies were given for framers/stakeholders.
- A total of 56 technologies/varieties were commercialized through non-exclusive licensing.
- A total of **14 patents and 1 trade mark** were filed/registered. Presently 3 patents were granted.

- Four mobile apps on black pepper, ginger, turmeric, cardamom, 09 online portals on bioinformatics and data management were developed.
- IISR Youtube Channel hosts more than 50 videos.

(b) The research priority and future plans of the institute is guided by priorities of the nation. The research targets and focal themes are planned in advance so that the research investments are utilized in the best possible manner. The future plans and time-frame stipulated for growth of IISR is given in the table (please see ***Annexure 1***).

Details of future plans and timelines for ICAR- IISR**Target for next 5 years (2020-25)**

Activity	Roadmap with timeline
Breeding spices varieties for climate resilience, yield enhancement and nutritional security	<ul style="list-style-type: none"> • Development/ selection and evaluation of hybrid progenies of black pepper/cardamom for disease resistance, high quality and yield (2020-2023) • Multi-locational testing of shortlisted lines and release (2022-2025) • Multi-locational testing of disease tolerant mutant and polyploidy lines of ginger/ seedling progenies of turmeric for desired trait (2020-2023) • Evaluation of promising lines of tree spices for yield and desirable qualities (2020-2025)
Genomic approaches for crop improvement in spices	<ul style="list-style-type: none"> • Whole genome sequencing of major spices (2020-2025) • Establishing an accredited facility for DNA fingerprinting (2020-2021) • Non-transgenic approaches like genome editing for pest and disease resistance of major spices (2020-25) • Proteomics and selection of functional peptide markers for disease resistance (black pepper and ginger) and drought in black pepper (2020-2023) • Developing an efficient technique for selection of non-transgenic mutants in ginger (2020-2023) • Developing techniques for identification of popular/ traded varieties of spices from India and abroad using DNA fingerprinting and molecular marker methods for unequivocal identification of spice varieties and barcoding (2020-2024)
Large scale multiplication of disease free quality planting material of targeted spice crop varieties (disease tolerant, high quality varieties).	<ul style="list-style-type: none"> • Multiplication and distribution of planting material of targeted spice crop varieties; high oil/ oleoresin (2020-2025) • Developing novel methods for mass multiplication of superior varieties/hybrids (2020-25)
Productivity enhancement through better plant health management	<ul style="list-style-type: none"> • Developing and multi-location testing of micronutrient formulation for improved spice quality and yield (2020-2023) • Crop-weather-soil relation based AI/simulation models for better input utilization under extreme climatic conditions (2020-2025) • Isolation and characterization of microbial antagonists and PGPMs for multi-traits (2020-22) • Testing the most promising strains and developing bioformulations (2023-2025) • Developing organic production packages for cardamom and ginger and large scale demonstration of organic farming models in spices under cropping system research models in identified hubs (2020-2025) • Vertical farming and protected cultivation of spices for

	<p>nutraceutical values under urban horticulture systems and also as immunity booster (2020-2025)</p> <ul style="list-style-type: none"> • Developing methods for abiotic stress management, yield and harvesting etc. in spices (2020-2025) • Developing AI/IOT based forecasting/ pest surveillance models for management of pests and pathogens (2020-2025)
Technologies on secondary agriculture exploiting renewable energy sources for food safety and value addition in spices	<ul style="list-style-type: none"> • Establishment of NABL accredited multi-residue analysis facility in spices targeting food safety (2020-2021) • Chemical profiling of targeted spices and identification of novel molecules (2020-22) • Screening of spice compounds for their nutraceutical and pharmaceutical properties for scaling up as health supplements and functional foods (2022-25) • Developing technology for effective management of mycotoxins in spices to improve their export quality (2020-2025) • Production of dehydrated spice products using renewable energy in spice processing (2020-2025)
Technology transfer and impact assessment	<ul style="list-style-type: none"> • Developing farmer collectivisation models and participatory seed production units through critical gap identification and policy development (2020-2022) • Develop models for research prioritization and hierarchical models for resource allocation in spice crops (2020-2023) • Establishment of supply chains in pepper/ginger/turmeric in identified hubs using block chain technology (2020-2025) • Identifying analogous and nontraditional areas for black pepper and cardamom cultivation for targeted production of trade oriented varieties and development of spice hubs (2020-2025) • Use of next generation ICT for knowledge updating of farmers to develop them as technopreneurs (2020-25) • Establishing 24 x 7 knowledge centres, providing price intelligence, technology incubation centres of major spices (2020-2025) • Empowering women and tribal farmers in primary processing and value addition in spices
