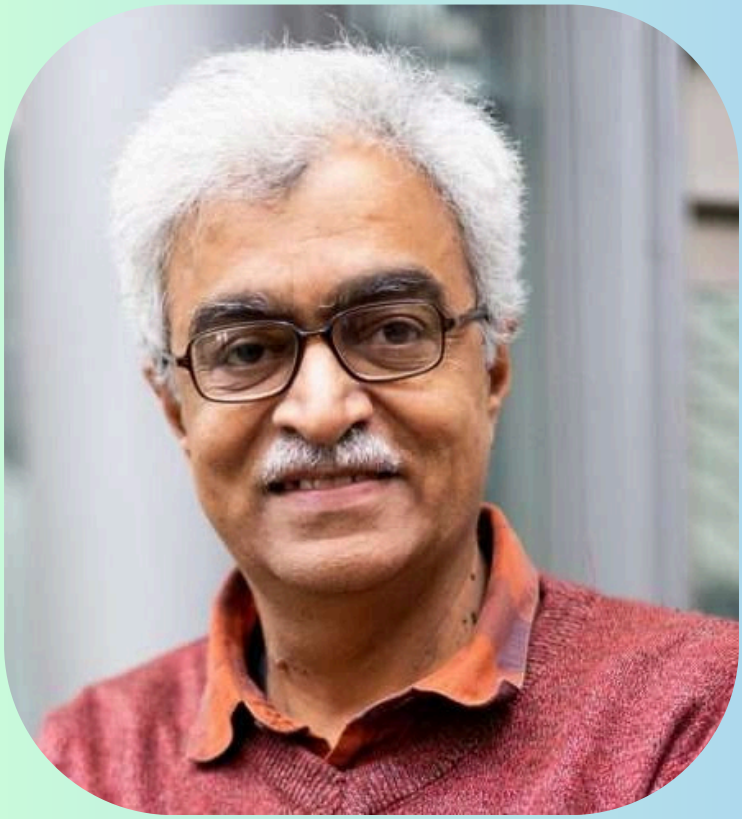
भारतीय प्रौद्योगिकी संस्थान मंडी

INDIAN INSTITUTE OF TECHNOLOGY MANDI

Institute Colloquium

BIOTECHNOLOGICAL TOOLS FOR CROP IMPROVEMENT



06 March, 2025

05:00PM

Auditorium, North Campus

Prof. Ramesh V. Sonti

Director

International Centre for Genetic Engineering and Biotechnology

New Delhi

Biotechnological tools for Crop Improvement

Dr. Ramesh V Sonti

International Centre for Genetic Engineering and Biotechnology, New Delhi

The world population today is around 8.2 billion people. It is expected to reach ~9.7 billion by 2050. Without anything else to be considered, there has to be an enhancement of 18%-20% in food production just to feed the expected increase in population. Moreover, the crops of the future must yield more on less land, with less water, less pesticides, less fertilizer and they must be more resilient to stresses. Specifically, they must be able to cope with changing climate, adverse weather events, newer pests and pathogens. Plant biotechnologists and plant breeders must use an array of technologies such as molecular marker/genomics-assisted selection (MAS), Mutation breeding, Transgenesis, and Genome editing for developing a new generation of crop varieties that will meet the above requirements. I will draw upon examples from work in my own group in the application of MAS and mutation breeding and cite examples of the work of colleagues at ICGEB in the application of transgenesis and genome editing for crop improvement. I will also discuss which particular tool can be applied in which particular situation. Finally, I will end my presentation by indicating that, besides newer crop varieties, the application of novel bioinoculants, precision agriculture technologies with inputs from novel sensors and IoT, artificial intelligence, big data and robotics as well as innovations in supply chain management will be needed for us to meet the challenges of 21st century agriculture.

Brief CV of Dr. Ramesh V. Sonti, Director, ICGEB New Delhi

Dr. Ramesh Sonti obtained his B.Sc. degree (Botany, Zoology and Chemistry) from Andhra University in 1980. He has obtained his M.Sc and M.Phil degrees in Plant Sciences from the University of Hyderabad and a Ph.D. in bacterial genetics from the University of Utah, USA. He did post-doctoral research on plant genetics at the Massachusetts Institute of Technology, Cambridge, USA. In 1993, he joined the CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad and worked there as a scientist and group leader. Between 2017 and 2020, he served as Director of the National Institute of Plant Genome Research, New Delhi. Subsequently, he was Professor and Chairperson of the Biology Department as well as Dean of faculty at IISER-Tirupati. Since January 2023, he has been Director of the International Centre for Genetic Engineering and Biotechnology, New Delhi. His research interests are in the area of plant-microbe interactions and in the application of biotechnological tools for crop improvement. Dr. Sonti has received a number of awards and fellowships, including fellowships from all three national science academies and the National Academy of Agricultural Sciences.