

# South Asia Biosafety Program

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## INDIA

### An Update on Discussions Around GM Potato at the National Symposium on “Harnessing Potato Innovations, Diversity for Food and Nutritional Security” Organized by ICAR-CPRI

Dr. Arlene Asthana Ali, Senior Project Executive, Biotech Consortium India Limited (BCIL)



Dignitaries and speakers at the National Symposium on “Harnessing Potato Innovations, Diversity for Food and Nutritional Security” (27 January 2025).

The National Symposium on “Harnessing Potato Innovations, Diversity for Food and Nutritional Security” was organized on 27-29 January 2025 at the ICAR-Central Potato Research Institute (CPRI) Regional Station, Modipuram, Meerut, Uttar Pradesh. This three-day event marked two significant milestones—the 75<sup>th</sup> anniversary of ICAR-CPRI and the 50<sup>th</sup> anniversary of the Indian Potato Association (IPA). With over 275 participants, including leading researchers, progressive farmers, students,

and industry professionals, the symposium provided a unique platform for stakeholders to exchange knowledge, discuss challenges, and explore future opportunities. The three-day event also included an exhibition and poster session for researchers and students.

The inaugural session included remarks by Dr. Brajesh Singh, Director of ICAR-CPRI and President of IPA, Dr. Sanjay Kumar Singh, Deputy Director General (Horticulture), ICAR, and other dignitaries. The need

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Dignitaries at the inaugural session (27 January 2025).

for innovative and research-driven solutions to enhance potato productivity and sustainability was highlighted by all the esteemed speakers, including the need to adopt genetically engineered and gene edited plants. Dr. Brajesh Singh also spoke about the work done on the development of late blight resistant GM potato and gene edited potato for various traits at ICAR-CPRI, Shimla.

The symposium featured six technical sessions, each addressing a critical aspect of potato research and industry development. The first session focused on genetic resource conservation,

**The need for innovative and research-driven solutions to enhance potato productivity and sustainability was highlighted by all the esteemed speakers, including the need to adopt genetically engineered and gene edited plants.**

advancements in potato breeding, and biotechnology, during which experts discussed ways to enhance the genetic diversity of potato varieties and leverage biotechnology for improved yields and disease resistance.

The two lead lectures included presentations by Dr. N. K. Singh, President of the Genomics Foundation and JC Bose National Fellow, on advanced genomic tools for crop improvement and by Dr. Vibha Ahuja, Chief General Manager of Biotech Consortium India Limited, on biosafety regulations for transgenics and genome edited crops.



Dignitaries at the inaugural session (27 January 2025).

## Promising Cytoplasmic Male Sterile Parents of Heat- and Drought-Resilient Maize (*Zea Mays* L.) Hybrids

Ayyanagouda Patil & Prakash H. Kuchanur, Department of Molecular Biology & Agricultural Biotechnology, University of Agricultural Sciences, Raichur



Figure 1: CAL1514 - Emergence of anther and pollen shedding.



Figure 1a: CAL 1514A - No emergence of anther and pollen shedding.



Figure 2: ZL153493 - Emergence of anther and pollen shedding.



Figure 2a: ZL153493A - No emergence of anther and pollen shedding.

The University of Agricultural Sciences, Raichur has developed and released two heat- and drought-resistant maize hybrids in collaboration with a scientist from the International Maize and Wheat Improvement Center (CIMMYT). The two hybrids, designated RCRMH-2 and RCRMH-3, are in the seed chain and have demonstrated robust performance under heat- and drought-stress environments. For maize hybrid seed production, a prominent step is detasseling, which is laborious and time-consuming. It can also lead to genetic contamination in the case of a handling error. Hence, to overcome this problem, inducing male sterility in the female parents of these hybrids was initiated using a cytoplasmic donor (VL192114). Marker-assisted backcrossing (MABC) was employed for assaying recurrent parent genome recovery in successive generations. Single Nucleotide Polymorphic (SNPs) markers assayed through DArTag- and KASP-based genotyping were employed during MABC (Patil et al., 2025).

**The introduction of these new CMS lines is anticipated to facilitate the efficient utilization of male sterility in the development of new maize hybrids, characterized by enhanced seed quality and breeding efficiency.**

The female parents (Figure 1 and Figure 2, left), viz. CAL1514 and ZL153493 of RCRMH-2 and RCRMH-3, respectively, were successfully converted to male sterile (Figure 1a and Figure 2a, right), viz. CAL1514A and ZL153493A) versions, which exhibited all the traits similar to their original female parents, as revealed through DUS testing and pollen viability study. The current focus is on the large-scale production of these male sterile lines, with the objective of utilizing them in the production of hybrid seeds, which are known to have a lower production cost. This initiative is expected to enhance the economic viability for farmers with limited means. The introduction of these new CMS lines is anticipated to facilitate the efficient utilization of male sterility in the development of new maize hybrids, characterized by enhanced seed quality and breeding efficiency.

#### Reference:

1. Patil A, Gowda K, Lakshman S T, Kuchanur PH, Saykhedkar G, Nair SK, Jadhav KB, Yeri S, Sunkad G, Nidagundi JM, Thayil VM, & Zaidi PH (2025) Transfer of Cytoplasmic Male Sterility to the Female Parents of Heat- and Drought-Resilient Maize (*Zea mays* L.) Hybrids. *Agronomy*, 15(1), 98.

## CALENDAR OF EVENTS

EVENT	ORGANIZED BY	DATE	WEBSITE
<b>INDIA</b>			
Second International Conference on Biological Control: Biocontrol Contributions to One Health (2icbc2025)	Society for Biocontrol Advancement (SBA) and the ICAR-National Bureau of Agricultural Insect Resources	25-28 February 2025 Bengaluru	<a href="https://www.nbair.res.in/">https://www.nbair.res.in/</a>
Workshop on Biotechnology Applications for Crop Improvement: Key Developments	Acharya N.G. Ranga Agricultural University (ANGRAU) and Biotech Consortium India Limited (BCIL)	28 February 2025 Guntur	<a href="https://angrau.ac.in">https://angrau.ac.in</a> <a href="https://www.biotech.co.in/en">https://www.biotech.co.in/en</a>
Refresher Course on Crop Improvement: From Breeding to Genome Editing	Agri Biotech Foundation (ABF), Federation of Asian Biotechnology Associations (FABA), and ICAR-Indian Institute of Rice Research (IIRR)	3-7 March 2025 Online	<a href="https://abfindia.org/">https://abfindia.org/</a> <a href="https://www.biofaba.org.in/">https://www.biofaba.org.in/</a>
Capacity Building Program on Harnessing the Crop Wild Relatives for Breeding Future Crops	ICAR-National Institute for Plant Biotechnology, Alliance of Bioversity International, and CIAT	3-8 March 2025 New Delhi	<a href="https://nipb.icar.gov.in/home">https://nipb.icar.gov.in/home</a>
Winter School on Climate Smart Maize Agriculture for Food and Energy Security of India	ICAR-Indian Institute of Maize Research & ICAR-Central Institute of Post Harvest Engineering & Technology	5-25 March 2025 Ludhiana	<a href="https://iimr.icar.gov.in/">https://iimr.icar.gov.in/</a>
National Conference on Emerging Innovations in Biochemistry and Biotechnology for Holistic Development of Agriculture	Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu, Society for Plant Biochemistry & Biotechnology (SPBB), and ICAR-IARI	6-7 March 2025 Jammu	<a href="https://www.skuast.org/">https://www.skuast.org/</a>
XVI II Shri Vasant Rao Naik Memorial National Seminar on Interventions of Climate Resilient Technologies for Regeneration of Farming Systems	Dr. Panjabrao Deshmukh Krishi Vidyapeeth	11-12 March 2025 Akola	<a href="https://www.pdkv.ac.in/?p=25186">https://www.pdkv.ac.in/?p=25186</a>
PAG ASIA2025	The Plant & Animal Genome Conference	18-20 March 2025 Gurgaon	<a href="https://intlpagasia.org/2025/">https://intlpagasia.org/2025/</a>
Hands-On Training in Carbon Capture and Biofuels	International Centre for Genetic Engineering and Biotechnology (ICGEB)	9-13 June 2025 New Delhi	<a href="https://www.icgeb.org/carbon-capture-and-biofuels-new-delhi-2025/">https://www.icgeb.org/carbon-capture-and-biofuels-new-delhi-2025/</a>
South Asian Biotechnology Conference	South Asian University and ICGEB	29 October-1 November 2025 New Delhi	<a href="https://sau.int/events/">https://sau.int/events/</a> <a href="https://www.icgeb.org/south-asian-biotechnology-conference-india-2025/">https://www.icgeb.org/south-asian-biotechnology-conference-india-2025/</a>
<b>INTERNATIONAL</b>			
2 <sup>nd</sup> Global Congress on New and Emerging Genetic Biocontrol Technologies	African Genetic Biocontrol Consortium	17-20 March 2025 Accra, Ghana	<a href="https://conference2025.genbioconsortium.africa/">https://conference2025.genbioconsortium.africa/</a>



SOUTH ASIA  
BIOSAFETY PROGRAM

**The South Asia Biosafety Program (SABP)** is an international development program implemented in India and Bangladesh by the Agriculture & Food Systems Institute (AFSI). SABP aims to work with national governmental agencies and other public sector partners to facilitate the implementation of transparent, efficient, and responsive regulatory frameworks for products of modern biotechnology that meet national goals as regards the safety of novel foods and feeds, and environmental protection.



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