

### Foundation Day Memorial Lecture # 3: “Rice Improvement: New Breeding Technologies” by Dr. T. R. Sharma, DDG (Crop Science) on December 18, 2021.



During the 7<sup>th</sup> Foundation Day, Dr. T.R. Sharma, Deputy Director General (Crop Science), Indian Council of Agricultural Research, delivered Dr. S.V.S. Shastry Memorial Lecture of 2021 at the ICAR-Indian Institute of Rice Research (ICAR-IIRR), Hyderabad. The Foundation day lecture was organized by ICAR-IIRR and Society for Advancement of Rice Research (SARR), Hyderabad. During his lecture, Dr. Sharma briefed about the area, production, and productivity of rice. He congratulated the Director, IIRR and rice scientists for the estimated rice production of 120.32 million tons in India for 2020-21, which is a new record. Innovations in agriculture, appropriate scientific interventions, quality seeds, better management practices, government policies together with the hard work of Indian farmers is helping India to achieve not only self-sufficiency in food production and feeding more than 135 billion people, but also to emerge as major rice exporter by exporting ~17.73 million tons of rice worth Rs. 65326/-crores. ICAR-DDG also presented the new challenges before the scientists, which include climate change, nutrition security, zero carbon emission, reducing agriculture resources (land, labor, water etc.), new pests and diseases, and changing pest dynamics, that need to be addressed together with the increasing productivity to achieve goal of 168 million tons of rice by 2050 to feed the projected 1.62 billion populations. Dr. Sharma briefed about the possible solutions by using genomics, marker assisted breeding, transgenic breeding and genome editing to accelerate the efforts towards India becoming a leader in agriculture produce and export. 43 rice varieties have been developed using marker assisted breeding including Improve Samba Mahsuri released from ICAR-IIRR in collaboration with CCMB that offers resistance to bacterial leaf blight. He commended the research efforts of IIRR in the area of marker assisted breeding and upfront research in biotechnology including genome sequencing, gene mapping and cloning, gene characterization and genome editing. He emphasized the significant contribution of IARI, NRCPB, NRRI, and IIRR in rice genomics and biotechnology. The young researchers need to accelerate the use of new technologies for novel genes characterization and deployment for rice improvement. During his address, DDG particularly emphasized to utilize genome editing tools to develop improved rice cultivars. Genome editing or gene editing, one of the important new breeding tools is the cleanest breeding technology, enabling the most precise modifications in genome. He praised the efforts of IARI, New Delhi, ICGEB New Delhi, NRRI Cuttack and IIRR Hyderabad for developing improved rice lines using genome editing tools, and showed confidence that Indian researchers are capable to utilize most advanced biotechnology techniques to make the crop more productive and profitable. In future, commercialization of these lines can enhance income of millions of farmers. While most of the world has given green signal to release of genome edited crops without or minimum biosafety regulations, India and few more Asian countries

are drafting the regulations. He urged and hoped that India will soon join the rest of the world to approve the release of genome edited crops for the benefit of farmers and related sectors. He concluded the talk by suggesting an integrated approach using new breeding techniques, better management practices, and use of AI, IoT, sensors and big data analytics for making the rice production more remunerative and market driven.