Contribution ID: **99** Type: **Poster**

CRISPR in Agricultural Biotechnology: Molecular tools for crop improvement, abiotic stress resilience, and yield optimization

In agricultural biotechnology, CRISPR-based genome editing is rapidly becoming an important tool that provides unmatched accuracy in altering plant genomes to meet global food production concerns. CRISPR allows for the targeted, efficient and cost-effective editing of particular genes, while traditional breeding methods, regardless of their effectiveness, are time-consuming and have a restricted reach. Through the development of features including increased nutritional quality, disease resistance, and herbicide tolerance, this technique has been widely used to promote crop improvement. In the context of climate change and sustainable agriculture, CRISPR has shown exceptional potential in engineering abiotic stress tolerance, allowing crops to tolerate temperature, salinity, and drought stress. Crucially, in addition to improving traits, CRISPR makes functional genomics research easier by assisting in the understanding of gene networks that control plant yield and growth. New developments like base editing and prime editing increase its usefulness even more by opening up new possibilities for precise changes without adding extraneous DNA. Regulatory frameworks, public acceptance, and off-target impacts continue to be obstacles despite its potential, requiring careful consideration and open communication. In general, CRISPR has enormous potential to transform agriculture by connecting molecular advancements with feasible farming solutions, ensuring food security, environmental sustainability, and economic resilience.

Authors: S , Dr.Krupa (Jain Deemed to be University); Dr KUMAR, Sandeep (Jain Deemed to be University); Dr C D, Vandana (Jain Deemed to be University)

Presenter: Dr KUMAR, Sandeep (Jain Deemed to be University)

Track Classification: Biological Sciences