

SEMINAR

Five seminars were organized in the year 2022 to 2023 with the participation of university faculty members, post graduate students and scientists from home and abroad. Executive summary of the seminar paper is given below.

SEMINAR-I

IDENTIFICATION OF REGULATORY GENE NETWORK FOR MOLECULAR BREEDING AND GENOME EDITING TO DEVELOP ABIOTIC STRESS RESILIENT CROPS: LINKING BASIC TO APPLIED RESEARCH

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Executive Summary

In the backdrop of unprecedented changes in earth's climate condition, the crops will encounter increasing abiotic stresses like high temperature, low temperature, drought, salinity etc. either in single or combined form in the future, which will substantially decrease the crop yield and put the world food security at risk. The most alarming issue is that it is happening against a backdrop of a continued rise in world population, with a projection of 9.1 billion people by 2050, raising the bar to feed additional 3 billion people with no more than 5% increase in agricultural land (FAO, www.fao.org). In contrast to biotic stress, which can be solved by manipulating single target genes or receptors, abiotic stresses are intertwined causing increased plants' susceptibility to the stresses and resulting in more damage. To secure the future global food security, it is imperative to dissect the mechanistic pathways of the stress responses and identify the gene regulatory networks that modulate the pathways. This knowledge can be used for molecular breeding or genome editing of crops to develop abiotic stress resilient plants of the future to secure global food production. In this talk, I will discuss our findings from a decade of work on high and low-temperature stresses and demonstrate the existence of novel pathways that integrate auxin, protein trafficking, and actin. I will also demonstrate how basic research can help us to identify the universal regulators of high and low-temperature stresses that can be manipulated in other crops to develop temperature stress resilient plants.

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