

**BROADENING THE GENETIC BASE OF CULTIVATED SUNFLOWER
(*HELIANTHUS ANNUUS* L.) IN INDIA THROUGH PREBREEDING**

***Hari Prakash MEENA*¹, *Sujatha MULPURI*², *PUSHPA H D*², *Varaprasad KODEBOYINA*³**

¹ ICAR-Indian Institute Of Oilseeds Research, Rajendranagar, Hyderabad, PAKISTAN

² ICAR-IIOR, PAKISTAN

³ Indin Institute Of Oilseeds Research, PAKISTAN

hari9323@gmail.com

ABSTRACT

In India, sunflower production is severely constrained by heavy yield losses due to diseases like *Alternaria* ster leaf spot (*Alternaria ster helianthi*), downy mildew (*Plasmopara halstedii* (Farl.), powdery mildew (*Golovinomyces cichoracaerum*), rust (*Puccinia helianthi* Schw.) and sunflower necrosis disease. Further, susceptibility to water stress in rainfed cultivation results in low yields. Hence, recent years have witnessed a decline in the acreage under the crop mostly in the traditional sunflower growing regions. Among the various approaches to manage these stresses, host plant resistance is the most reliable and economical to the end users. With its large potential for export as confectionary or non-oilseed, there is a need to develop genotypes with specific quality characteristics. However, plant breeding efforts to develop varieties/hybrids with the desired economic characteristics are constrained by the narrow genetic base of the cultivated sunflower. Concerted efforts are required to incorporate additional genetic variability from reliable sources by integrating modern biotechnological tools and conventional breeding methods. Wild *Helianthus* species are rich sources of genetic variability in terms of resistance to biotic and abiotic factors, altered plant architecture, high yield, oil content, maturity duration, oil quality and continue to serve as sources of cytoplasm and fertility restorer genes. Prebreeding is required to broaden the genetic material potential for increased heterosis and to integrate useful genes such as resistance to biotic and abiotic stresses, better oil quality and higher yield performance into developed inbred lines. Successful introgression of desirable genes from the distantly related wild *Helianthus* into cultivated sunflower requires a clear understanding of the genome relationships of the wild *Helianthus* species and the cultivated sunflower through extensive genetic, cytogenetic, and molecular investigations. This review is mainly focused on the current status of the ongoing prebreeding work and the utility of the prebreeding materials developed in India for sunflower improvement.

Key Words : Sunflower, prebreeding, Helainthus species