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Breeding stress resistant soybean varieties for sustained productivity under emerging climatic changes

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Through concerted research and developmental efforts since 1968, soybean has emerged as major oil seed crop in India where, it has played an important role in changing the socioeconomic status of soybean growers. Today soybean is being produced 14.1 m t from an area 11.4 m ha with productivity of about 1.2 t/ha. Climate change effects, resulting from higher level of atmospheric CO_2 and temperature, deviation in total precipitation and seasonal shifts alter the atmospheric scenario world over. Heavy emerging demand for edible oil and protein put enormous strain on soybean. Breaking seasonal boundaries by developing varieties for different seasons with broader adaption to sowing dates, identification of new maturity gene for their best combination for different location, breeding for photo insensitivity, response to nitrogen fixing ability under stress situation are important consideration to cope up the emerging situations under climatic changes. Search for the identification of source (novel gene) associated with abiotic stress specially tolerance to drought and high temperature and resistance against important diseases in genetic resource are in progress. Genetic resource viz. PI 416937, EC 538828 and JS 97-52 and PK 472 reported to have tolerance to drought / excessive soil moisture; PI 171443 (UPSM 534) and *Glycine soja* (a wild relative) landmark source for YMV resistance; EC 241778 and EC 241780 have been identified for high degree of resistance to rust. Efforts are also in progress for pyramiding/ accumulating the genes for both the important diseases in different high yielding genetic background. Germplasm accessions as santa maria, santa rosa, parana, *Glycine soja*, AGS 25 and DT 21 have been identified for long juvenality trait in Indian condition and are being utilized for developing the variety for this important trait. Soybean genotypes NRC 101, NRC 102 devoid of ‘kunit’ trypsin inhibitor; varieties with comparatively low level of lipoxygenases viz Pb 1 and Shilazeet; SL 525 with low level of oligosaccharide; Hardee & ADT 1 have been identified for high isoflavones. Breeding efforts are being focused on traits with greatest potential to increase yield specifically for the development of diverse smart climate resilient crop varieties through improving genotyping and phenotyping method and by increasing the available genetic diversity in breeding germplasm at various AICRP on Soybean breeding program in India.