

## Enriching Genetic Diversity in Wheat for Eastern Gangetic Plains

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India has firmed up its position as the second largest producer of wheat in the world after China. During 2003-04, the production of wheat was recorded to the tune of 71 million tones on the area of 26.4 million ha with an average productivity of 2.7 t/ha. It is projected that India must produce 109 million tones of wheat by the year 2020, when the population will be more than 1.3 billion. Among the six mega wheat growing zones, the northwest and north east put together, covers around two-third of the total wheat area in the country. The north eastern plains zone (NEPZ) comprising east UP, Bihar, Jharkhand, West Bengal and Assam accounts for more than 9.0 million ha, has the yield potential of 4.5 t/ha in comparison to the realized yield levels of about 3.0 t/ha. This simply means that there exists a yield gap of around 1.5 tones per ha over a sizeable area. This zone has however very diverse cropping systems, but rice-wheat is one of the most widely followed cropping sequences. The wheat sowings in this area are delayed due to the late harvesting of rice crop and again in the month of March, the wheat crop suffers from the high temperature and thus very short winter is available to wheat crop. Moreover, a different flora and fauna of weed and diseases are faced by the crop and hence the area has various small but diverse niches. Hence, for these conditions the requirement of varieties/ genotypes is also diverse.

The All India Coordinated Wheat Improvement Project has developed a large number of varieties for this zone but only few of them could percolate to the farmer's field. A preliminary survey based on farmer's feed back revealed that there was a need to develop wheat varieties with maturity duration of 100 days, good grain attributes, resistance to diseases (particularly leaf blight and brown rust) and moderately high yield. All this needs an easy access to the large number of diverse germplasm possessing desired attributes to tailor suitable genotypes for the area. Accordingly, the Directorate of Wheat Research, Karnal in close collaboration with CIMMYT, South Asia Regional Office, Nepal initiated a programme in which the germplasm from the SAARC countries namely India, Nepal and Bangladesh is pooled to constitute a nursery named "Eastern Gangetic Plains

Screening Nursery (EGPSN)" during the year 1997-98. The main goal of this nursery is to identify, select and share elite germplasm of appropriate maturity, high yield potential blended with tolerance to leaf blight, leaf rust and heat stress.

During the last eight years, a total of 1,140 genotypes were procured and shared with centers namely Shillongani, Cooch Behar, Pusa, Ranchi, Sabour, Faizabad, Varanasi and Kanpur to strengthen their wheat improvement programme. Through this nursery, every year about 150 genotypes are provided to the centers with pedigree and selection details for their evaluation and use. At DWR, Karnal these lines are evaluated for leaf blight and rusts resistance under both natural and controlled conditions and the information generated is provided to the centers so that they can selectively use the genotypes in their crossing programme. These efforts have been very fruitful in identifying the leaf blight resistant genotypes up to the level of 35 score. In all, more than 50 promising genotypes including Chirya 1, Chirya 3, Chirya 7, Mayoor, BL1473, BL1724, NL835, BL2034, BL1982 etc., were found highly tolerant to the leaf blight disease even at hot spot locations and are being utilized extensively in the hybridization programme. Some of the lines namely Bhrikuti, Achyut, Chirya 3 etc., have shown promise to both yield and resistance, are also good combiners as evident by the performance of segregating populations. It is worth to mention that few genotypes could show the yield potential up to 7.0 t/ha under well managed conditions. Since the germplasm is collected from different gene pool and the pedigree details also confirm the diversity, the high probability of getting heterotic combinations has been observed. The segregating populations coming out of these crosses are also being shared with centres located in eastern region through segregating nursery and shuttle breeding programme of DWR.

This approach in our view will help in bridging the yield gaps, increase the diversity in the material and provide additional production over such a large area to meet the projected demand of wheat for ever increasing population of India.