ITEMS FROM NEPAL

CIMMYT
Ramput, Nepal.

Development and identification of HLB and heat tolerant wheat germplasm for the Eastern Gangetic Plains (EGP) of South Asia.

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Close research collaboration was maintained with the National Wheat Research Program (NWRP) of NARC-Nepal.

About 200 new crosses were made in Bhairahawa, Khumaltar, and at the IAAS, Rampur, Nepal, during 2006–07. One hundred seventy-five new lines selected for resistance to Helminthosporium leaf blight and leaf rust, earliness, and heat-stress tolerance and with bold, white grain were incorporated and distributed in the EGPSN and EGPYT regional trials. During 2007, 12 sets of the 11th EGPSN and 10 sets of the 9th EGPYT were distributed to coöperators in Bangladesh, Nepal, and eastern and far-eastern India. The EGPSN and EGPYT material was distributed within the Eastern Gangetic Plains from 1997–2007. About 1,820 improved lines were distributed to 266 locations/years during that period.

Two wheat cultivars, **Bijoy** (= BAW-1006 = NL-297*2/Lr25; NC 1815-6B-020B-020B- 010N-1B-0B) and **Prodip** (= BAW 1008 = G162/BL 1316//NL 297), were distributed through these regional nurseries and released in Bangladesh in 2005. These two cultivars are under extensive seed multiplication with the aim to diversify the area under the popular wheat cultivar Kanchan. Another line, **WK-1204** (SW89-3064/Star, CMBW91Y016275-13Y-010M-010Y-010M- 3Y-0M) was released for commercial production in Nepal during 2007. Many promising lines distributed through these nurseries have been used in the crossing/breeding programs of Bangladesh, Nepal, and eastern India.

Yield stability and adaptation studies, using the EGPSN/EGPYT data, were conducted jointly with IAAS-Rampur, Nepal, and with BHU-Varanasi, India. The results of the 10th EGPSN and 8th EGPYT were analyzed and distributed electronically to cooperators in the region. Several lines in these two nurseries were identified with stability, HLB tolerance, early maturity, and sterility resistance. This material also is in national crossing programs.

Genotype-by-environment interaction of the 8th EGPYT. A combined ANOVA of the 25 entries in the EGPYT across the six sites revealed a significant 'genotype X environment' effect for grain yield, 1,000-kernel weight, days-to-heading and maturity, plant height, and HLB severity. The data were subject to biplot analysis (Yan and Kang 2002) to determine stability of the 25 genotypes for grain yield. Genotypes #10 (BL 3218, NC98B3060-13B-020B-020B-5B-0B) and #20 (SW89-5124*2/Fasan, CMBW91Y03050F-030TOPM-2Y-010M-010Y-010M) were the most stable among those lines with the highest yield as shown by their position close to the ideal cultivar. Bhrikuti (Entry #23), a commercial cultivar in Nepal, was the most stable among the four checks.

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ITEMS FROM PAKISTAN

COMSATS INSTITUTE OF INFORMATION TECHNOLOGY
Department of Environmental Sciences, CIIT, Abbottabad, Pakistan.

Wheat-improvement program: Overall goals.

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One of the major areas of concentration in research and development in the department of Environmental Sciences at COMSATS, Abbottabad, is the application of biotechnology in plants and environment. Work is in progress to manipulate genetic mechanisms underpinning biotic and abiotic environmental stresses, quality traits, and energy potential in a number of important plant species. Wheat, among the prime crops of Pakistan nourishing millions every day, is facing serious problems of low yield, poor adaptation, disease susceptibility, and abiotic stress. A lack of genetic understanding and complexity of the genome are the most important factors. The main objectives of our wheat-improvement program at COMSATS, Abbottabad, are to target the genetic basis of each problem using conventional and advanced techniques. Our immediate objectives are to explore the genetic diversity in the available germ plasm using conventional and molecular markers. Comparative genomics and association mapping were considered bigger potential tools for understanding and underpinning biotic and abiotic environmental stresses, quality, bio-fuels, and yield-related traits. Introducing and introgressing genes from wild relatives by understanding chromosome-pairing mechanisms, targeting specific homoeologous groups and chromosome bins or gene-rich regions, and transformation are some of the focus areas.

Targeting the Ph1 gene for wheat improvement.

M. Maroof Shah, A. Pervez, and Ummara W. Khan.

Pakistan has unique wealth of wild wheat germ plasm that can be used to transfer useful genes into cultivated wheat to broaden its gene pool. However, the genetic activity of the gene 'pairing homoeologous' (*Ph1)*, the chromosomes of wild relatives either do not pair or very poorly recombine with wheat, resulting in either no transfer or transferring of large segments of chromosomes with undesirable blocks of genes from the alien species. One option is to utilize deletion based mutant lines for *Ph1* locus available in Chinese spring wheat for transferring the alien genes into cultivated wheat. The main difficulties during such alien gene transfer experiments are scoring of the plants for the presence or absence of