tungro and grassy stunt viruses. Several donor sources used in breeding programme resulted in development of breeding materials with multiple resistance. Many sources for disease resistance such as Ram Tulsi (India) for blast; TKM 6 (India), DZ 192 (Bangladesh) for bacterial blight; *O. nivara* (India) for grassy stunt, and Adday selection (India) and Habigang DW 8 (Bangladesh) for resistance to tungro came from Indian subcontinent. Similarly excellent sources of resistance to insect-pests like stem borers, plant hoppers, leafhoppers and gall midge have been identified and varieties with multiple resistance have been developed. Most of the sources of insect-pest resistance were from India, TKM 6 for striped borer resistance; Mudgo, MTU 15, ASD 7, Ptb 18 and Co 22 for brown planthopper resistance; Pankhari 203, ASD 7, ASD 8 and Ptb 8 for green hopper resistance, and Ptb 10, Ptb 18, Eswarakora and ARC 1368 for gall midge resistance. Several donors for brown plant hopper resistance such as Rathu Heenati and Babawee came from Sri Lanka. Improved germplasm with moderate level of tolerance to salinity has also been developed at IRRI using donors from India such as Pokkali, Getu and Nona Bokra, and some of the lines with salinity tolerance has been released in the Philippines As most of the donors for disease and insect-pest resistance from India used in breeding programme had high amylose, the improved varieties developed at IRRI have high amylose and long slender and translucent grains. These varieties are highly acceptable in Indian subcontinent. There is considerable emphasis for developing improved germplasm with aroma. Basmati rices and Pankhari 203 from India are the main donors for this trait in the breeding programme at IRRI.

IRRI germplasm has been extensively shared with the national rice improvement programmes. Seeds of donor varieties, early generation breeding materials, fixed elite lines and named varieties are sent to national programme scientists at their request and through international nurseries. The breeding materials have been sent to 87 countries irrespective of geographical location or ideology. These were evaluated for local adaptation and subsequently released as varieties and also used as parents in national rice breeding programmes. More than 300 IRRI bred lines have been released as national varieties in Asia, Africa and Latin America. About 80 varieties have been released in Indian subcontinent alone. The gradual replacement of traditional varieties by improved ones has had a dramatic effect on the growth of rice output in Asia. Since 1966 when the first high yielding variety of rice was released, the rice area harvested has increased marginally, from 126 to 152 million hectares (20%), while the average rice yield has increased from 2.1 to 3.9 tons per ha. (86%). The total rice production increased from 257 million tons to 600 million tons (133%). The increase in per capita availability of rice and a decline in the cost of production per ton of output contributed to a decline in the real price of rice both in international and domestic markets. The decline in food prices has, therefore, benefited the urban poor and the rural landless, who are not directly involved in food production but who spend more than half their income on food grains.

Achievements and Opportunities of Plant Introduction in India– The Case of Wheat

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The wheat and wheat types originated in Middle Eastern region. Modern wheat types such as bread wheat and durum wheat are now grown worldwide on about 200 million hectare area with an annual production of 590 million metric tons. There has been continuous movement and introduction of original landraces across the globe during the last 500 years. India's modern wheat breeding programme is based on large germplasm introductions from CIMMYT since early 1960s to date. A number of lines and sets of international trials have been continuously introduced and evaluated in India each year and the CIMMYT-derived wheat germplasm is now the core of Indian Wheat Research Programme. About 50,000 genotypes from CIMMYT have been evaluated in India so far and a set of elite germplasm has been created. The CIMMYT-based wheat germplasm introductions during 1960s led to the establishment of the modern Indian Wheat Programme coordinated by ICAR. The two green revolution wheat varieties with dwarf stature and input responsiveness, Kalyansona and Sonalika, bred in Mexico by Dr Norman E Borlaug and his colleagues, played the catalytic role to spark the changes in technology adoption with small farmers in the North-Western region of the Indo-Gangetic Plains. Within ten years India experienced a dramatic impact and the country reached self-sufficiency in wheat. Consequently, ICAR created a coordinating centre of wheat research in India, the Directorate of Wheat Research located at Karnal in the state of Haryana. CIMMYT has ever since remained a partner of ICAR and continues to serve as a reliable provider of tailor-made germplasm suitable for Indian farmers' needs. Through this partnership a large number of CIMMYT germplasm has been adopted and over 100 varieties released for variable Indian conditions. Some of these varieties namely, Kalyansona, Sonalika, C 306, WH 147, HD 2009, Lok 1, HD 2189, WL 711, UP 262, UP 2003, HUW 234, HD 2329, WH 542 and PBW 343 occupied a large acreage in India with varying longevities. PBW 343, a line with a complex blend of pedigree called "Atilla" in Mexico and released by Punjab Agricultural University in 1995, is till continuing as a most predominant wheat variety in India. This variety is grown in about 7 million hectares in India with a yield gain of 5 q/ha over the popular variety HD 2329. It is estimated that additional benefits to Indian farming community have been in the range of at least 500 million dollars per year due to this variety alone. Further, PBW 343 is a descendent of Veery # 5 and would also be a germplasm of paramount importance in the future wheat breeding to capture stability and yield potential. The Indian Wheat Research Programme has also contributed in increasing wheat production in other parts of the world and many Indian wheat varieties have been released in other countries. India's wheat production statistics are very impressive. The overall yield has increased from 9.1 q/ha in 1965 to 27.5 q/ha in 2003. The area under wheat cultivation has been doubled from 1965 to 2003 with 6 times increase in production during the period. India now enjoys self-sufficiency in wheat but the projected statistics of 33.83 q/ha for 2020 is not that encouraging. According to International Food Policy Research Institute projection, India would still have to import 6,731,000 tons of wheat in 2020 which may cost about 1 billion dollars at current international price. To avert this situation the average national yield has to be increased to 36.24 q/ha in 2020 rather than 33.83 q/ha. To achieve this target, a cohesive science policy environment, suitable production incentives to farmers and appropriate financial support to regions where wheat productivity is still lagging is required. Future wheat yield gains would be made particularly in Eastern Gangetic Plains and Central Zone. The future wheat research priority in these zones include, maximizing yield potential and yield stability; removing disease susceptibility constraints; stabilizing high temperatures, drought and salinity tolerance through better adapted genotypes, and improving water use efficiency. To achieve maximum efficiency for these traits, a combination of both conventional breeding and biotechnological interventions, would be required. Germplasm from indigenous and exotic sources would be required. The indigenous germplasm has been tried with limited success. The alien species *Ae. squarrossa*- derivatives may be exploited for high temperature and drought tolerance. Yield stabilization in North Western Plain Zone is also important. We need to watch out evolution of rust pathotypes through monitoring within the country and other countries situated in Middle East, Central Asia, Nile Valley and East Africa which influence the epidemiological impact in India.