

EXECUTIVE SUMMARY

The year 2006-07 was marked by a number of milestone events in the history of PARC including: Silver Jubilee Celebrations of PARC inaugurated by His Excellency, the President of Pakistan in December, 2006 marking 25 years of excellence in agricultural research, structural reforms of PARC based on the Reform Agenda approved by the Prime Minister of Pakistan to make it a more efficient, vibrant and responsive organization, approval of mega research project in the amount of Rs. 2.97 billion for five years to upgrade its research infrastructure and fund high priority research projects, stronger linkages with the national and international agricultural research systems, accreditation of NARC Grain Quality Testing Laboratory for ISO 17025 by the Norwegian Accreditation Body, restructuring of BOG from 24 to 15 members, revival of the post of Member, Natural Resources, etc.

The research activities, with emphasis on research for development, were carried out in crop sciences, natural resources, animal sciences and social sciences sectors. The highlights of these research activities are given below:

- Wheat germplasm improvement research resulted in the development of a rust resistant advanced line NR 268 for rainfed ecologies, having 8% yield advantage over the local check, better chapatti quality and higher protein, and gluten content.
- Trap nurseries consisting of isogenic wheat lines and commercial varieties were planted in different ecologies across the country. The wheat cvs. Chakwal-86, Sindh-81 Inqilab-91 Kirin-95, Parwaz-94, Kohistan-97, Rohtas-90, Suleman-2004, Punjnad-1, and V-87094 exhibited complete, resistance to leaf rust.
- Genomic DNA of 75 land races/ cultivars of rice, 70 genotypes of pea and 32 accessions of Kalonji were isolated, quantified for DNA fingerprinting using RAPD/SSFI analysis.
- The wild rice germplasm of *Oryza australiensis*, *O. grandiglumis*, *O. rhizomatis*, *O. alta*, *O. meridionalis*, *O. nivara* and *O. brachyantha* were observed highly resistant to bacterial blight.
- Two Brassica varieties, Pakola (*Brassica napus*; average yield, 2600 kg/ha with oil content of 44.0% and erucic acid, 1.8%; suitable for northern Punjab and NWFP) and Canola Raya (*Brassica Juncea*; average yield, 2300 kg/ha with erucic acid, 1.6% were recommended by Varietal Improvement Committee for approval by the Seed Council.
- Sugarcane varieties released through Coordinated Sugar Crops Research Program were HSF-242 (early maturing, yielding 108 t/ha, with high sugar recovery and good ratooning) and CPF-243 (early maturing, yielding of 102 t/ha, and high sugar recovery)
- Two elite NARC maize hybrids (i.e., NARC-2704 and NARC-2705), performing at par with the best commercial hybrids, are being tested for adaptability.
- Three Kabuli gram varieties (i.e., CC94/99, NCS2001, and 90399) have been identified for relatively Stable performance across the country.
- Virus-free banana nucleus seed planted at Kalat (Balochistan) and Chiniot (Punjab)
- produced 30% more fruit compared to conventional materials.
- Out of 19 Mandarin hybrids tested NARC 05-6 and NARC 05-18 appeared promising
- in terms of early maturity as well as fruit TSS and juice content.
- TPS-produced potato crop matured in 45 days with maximum yield of 22.5 t/ha with TPS-9813 and 21.1 t/ha with TPS-9802.

- In balanced nutrient management research for sugarcane, one-half recommended nutrient dosage (i.e., 105-63-68 kg N, P205, K20 per ha) +Zn+B (7.5+1.5 kg/ha) + 10 t/ha pressmud gave maximum cane yield of 84.9 t/ha, followed by (83.8 t/ha) at recommended rates of NPK+Zn+B.
- Zinc application increased grain yield of Maize by 15%, of sorghum 20% and of millet 18%. Fertilizer zinc requirement was 2.0-2.5 kg/ha.
- More than 1000 accessions of medicinal herbs were rejuvenated, multiplied, characterized and field evaluated for quantitative and qualitative traits. Few elite lines have also been evaluated for yield and yield components as well.
- The Grain Quality Testing Lab at NARC has earned ISO 17025 accreditation from Norwegian Accreditation Body.
- Foliar sprays of 2% neem extract (*Azadirachta indica*) proved comparable. In effectiveness to recommended pesticides for controlling nematodes in chilli and mango
- A prototype Seeder was developed, introduced and commercialized in collaboration with private industry.
- A Mobile Flat Bed Dryer was designed and developed with drying capacity of 1.25 tons sunflower seed in 3 hours, with a drying cost of Rs. 1.25 per kg seed.
- Raised Bed planting technology for wheat and maize resulted in 30% irrigation water saving
- Live aerosol *Haemorrhagic septicaemia*. (*Galgootoo*) vaccine trials on cattle and buffalo revealed that a single dose of vaccine gives protective immunity for one year.
- 11 Avian Influenza Surveillance Centers were co-coordinated throughout the country for diagnosis control and monitoring of H5N1.
- Fingerlings of Channel Catfish imported from Thailand for introducing value-added aquaculture in the country achieved good survival
- Transfer of PARC developed agricultural technologies was promoted by conducting extensive demonstration trials, field days, Toll-Free PARC Kissan Help Line, PARC audio and video programs (i.e., radio & TV programs, training courses and popular articles
- The linkages and collaborations with national and international research systems were further improved and consolidated.
- Special attention has been given to develop capacity for research and development. 37 scientists/officers were sent for higher degree (12 abroad and 25 local) and 283 were imparted short term training (21 abroad and 262 local).

The details of these research highlights are provided in the text.