

PARC Develops National Wheat Screening System for Prevention of Rust Epidemic



Yellow Rust



Leaf Rust



Stem Rust

Challenge

- Wheat is the main staple food of the people of Pakistan. A gain or loss of 1% in yield is worth Rs. 6 billion.
- Wheat rusts pose the most serious threats to wheat production in country. Pakistan experienced severe epidemics of leaf rust in 1948, 1954 and 1978, causing 30-50% losses in yields. The rust epidemic in 1978 resulted in an estimated national loss of US\$ 86 million.
- Challenge was to prevent the epidemic in wheat through rust screening system at national level in future.

Interventions

- Since inception of CDRI under PARC in 1978, rust screening service is being provided by creating artificial rust epidemic through inoculation in two ways:
 - Testing advanced (local and exotic) wheat lines in National Wheat Diseases Screening Nursery (NWDSN) trials for two years at >14 locations.
 - Testing the candidate lines for rust virulence in National Uniform Wheat Yield Trial (NUYT) for two years at 17 locations.

Outcomes

- PARC has tested wheat lines (local and exotic sources) under NWDSN and has identified sources of rust resistance.
- More than 160 high yielding varieties having resistance genes of rusts have been approved through NUYT
- Since 1978, PARC in collaboration with national and international research systems has been able to prevent rust epidemic in the country through its rust screening mechanism, paying back several folds more than R&D investment.

Way Forward

- Strengthening rust screening system enabling NARS to overcome ever emerging virulence by correct deployment of genes for rust resistance