Seed priming through selected bio-control agents for the eco-safe management of leaf rust disease in wheat

Sabahat Ayub[1], Ayesha Jabeen[1], Aliza Iqbal[1], Muhammad Amjad Ali[2], Amjad Abbas[2*]

[1]Department of Botany, University of Agriculture, Faisalabad, Pakistan
[2]Department of Plant Pathology, University of Agriculture, Faisalabad, Pakistan

Abstract

Wheat (*Triticum aestivum*) is the staple food in Pakistan and is also one of the important crops in the world. It provides basic nutrition to a vast population as it is a good source of carbohydrates, proteins, and dietary fibers. In 2023, nearly 27 million tons of wheat were predicted to be produced in Pakistan. In Pakistan, fungal rusts are considered as major constrains in the wheat production. Wheat is affected by three types of rusts via; Leaf rust (Brown rust), Stem rust (Black rust) and Stripe rust (Yellow rust). Out of the three forms of rusts, leaf rust is the major fungal rust disease caused by *Puccinia triticina*. Under favorable environmental conditions, leaf rust causes yield losses up to 40%. The objective of the study was to investigate role of biocontrol agents (BCAs) in the control of leaf rust in wheat varieties. Natural and engineered resistance is reported in some of the famous wheat varieties which is compromised with time due to genetic changes in the rust pathogen for use of BCAs to enhance plant resistance against rust could be an interesting approach. In the current work, four wheat varieties were treated with different BCAs and were sown in the field conditions along with necessary control treatments. Seed of four different varieties were collected and seed priming with BCAs was carried out and seeds were sown by following randomized complete block design (RCBD) in the field conditions. Artificial inoculation of rust was applied by rubbing and spraying method at booting stage. Disease severity was measured with Cob's scale and other morpho-physiological plant characters were also recorded for comparison. Data for disease associated and morph-physiological traits were recorded and subjected to statistical software. For this purpose statistics 8.1 software was used. It was statistically examined for analyses of variance technique and comparison with treatment using Least Significance Difference (LSD) at probability level of 5%. The results showed significant impact of BCAs in the control of rust disease in commercial wheat cultivars. The results demonstrated that variety Akbar-19 showed highest resistance against leaf rust and application of *T. harzianum* led to maximum control of the disease. The present findings are a way forward for environment friendly management of leaf rust disease in wheat.

Keywords: Wheat, Leaf rust, biocontrol agents, seed priming, disease severity, morpho-physiological parameters, crop management.

433

Turkish Journal of Agriculture - Food Science and Technology
Türk Tarım - Gıda Bilim ve Teknoloji Dergisi
International Peer-Reviewed Journal | ISSN: 2148-127X
www.agrifoodscience.com
Turkish Science and Technology Publishing (TURSTEP)