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Source-sink association of flag leaf with brown rust resistance under the application of BCAs in bread wheat

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Abstract

Wheat (*Triticum aestivum*) is a staple food in Pakistan and is an important crop all over the world. It contains carbohydrates, proteins and minerals which are the main ingredients of human diet. The production per unit area of wheat in Pakistan is low due to a number of biotic and abiotic stresses. Among biotic stresses, leaf rust is very important which is infected by the *Puccinia triticina*. Under favorable environmental condition, leaf rust causes yield losses up to 40%. Flag leaf contributes in grain production and the objective of this study was to assess the source sink relationship between flag leaf and grain yield under leaf rust attack followed by application of different biocontrol agents (BCAs). In the current studies, four wheat varieties were treated with different BCAs and were sown under field conditions along with necessary control treatment. The experiment was conducted under randomized complete block design (RCBD) with three replications. The plants were inoculated with *P. triticina* both naturally as well as artificially. The result showed the presence of strong source-sink association of flag leaf with grain yield hence this trait could be used as morphological markers for selection of wheat genotypes having superior photosynthetic activity and higher grain yield. Collected data were statistically analyzed for analysis of variance technique and means were compared using Least Significance Difference (LSD) test at probability level of 5%. The result also showed the clear and significant impact of BCAs in the control of this very important wheat disease. The results demonstrated that variety Arooj-2022 showed highest resistance against leaf rust and application of *Trichoderma* sp. 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, seed priming, biocontrol agents, disease severity, morpho-physiological parameters, crop management.

