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Comparison of Beas Application Method for the Management of Leaf Rust in Bread Wheat

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Abstract

Wheat (*Triticum aestivum*) is a staple crop in Pakistan, an important member of the family *Poaceae*. Wheat is a key global product in terms of acreage and tradeable value and is a staple food. Wheat is a rich source of nutrients (contains protein, carbohydrates and dietary fiber). Wheat production in Pakistan during 2021/22 was 26.0 million metric tons, 3% higher than last year of Wheat production of 25.0 million metric tons. Wheat is invaded by many diseases commonly Wheat rust* causes more damage. Wheat rust is caused by a fungus named *Puccinia triticina* (an obligate plant pathogen) that lies dormant in the temperate zone. The three rust diseases affecting Wheat are leaf, stem and stripe rust. The most common is leaf rust commonly known as Brown rust. Leaf rust causes 50% yield loss annually in Pakistan. The disease is more active in the maximum temperature range of 23.8-27.15°C, while the minimum temperature range of 16-18°C also plays an important role in the development of disease. In this study, different BCAs (*Trichoderma harizianum*, *Bacillus subtilis* and *Arthrobacter sp.*) was applied at maturity via foliar and drench methods and analyzed, to determine which one is the best bio-control agent for reducing the severity of leaf rust disease. In this study, the five Wheat varieties (Anaj-71, Inqilab-91, Punjab-96, Chanab-2000 and Shakar-95) were taken for the research trial. These varieties were cultivated in Randomized complete block design (RCBD) in field conditions. The collected data were analyzed using the analysis of variance technique and the results were analyzed by using the Least Significance Difference (LSD) test at a 5% significance level. Bio-control agents enhance the Wheat morpho-physiological growth which was evident from the characters like height, root weight, leaf fresh and dry weight, number of awns, awns length, number of seed per spikes, number of nodes per plants, internodal length, weight of grain per plants, 1000-grain weight, peduncle length and total production.

Key Words: *Wheat production, Wheat Rust Control, Bio-Control Agents, Wheat Varieties, Crop Disease Management*

