Reaction of Wheat Varieties to Rust Diseases at Mid and Low Altitudes in Bhutan

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Abstract

Wheat rusts are the important fungal diseases that limit the production and downgrade wheat grain quality. There are three types of rust diseases that include stem rust, stripe rust and leaf rust. This study was conducted to determine the reaction of wheat varieties to rust diseases at different altitudes. Field experiments were conducted from December 2016 to March 2017 at Mendagang for mid altitude (1332 masl) and at Samtenling for low altitude (378 masl). The experiment followed a randomized complete block design with three replications and 15 varieties. Of the 15 varieties three were from Bhutan, eight from SAARC, and four from ICARDA. Disease assessments were performed approximately at 60, 90 and 120 days after sowing following the modified Cobb's disease rating scale. Only leaf rust was observed at both the sites and all 11 germinated varieties were evaluated. Leaf rust incidence ranged from 2.5 to 10% and 2.5 to 16% at mid and low altitudes respectively. Disease severity of 5 to 20%, corresponding to field response of immune to moderately resistant was observed at mid altitude; while 5 to 100%, with immune to susceptible was observed at low altitude. There was a significant difference in disease incidence by site (p=.038) but not in disease severity (p=.129). The disease severity was positively correlated (r=.359); (r=.034); with mean minimum and maximum temperature respectively and (r=.361) with mean minimum relative humidity. The correlation was highly significant (p=.003). This study found variety ICARDA 1, with 100% severity as highly susceptible to leaf rust at low altitude while Bajosokha Kaa remained immune in both the sites. The results indicate that leaf rust can occur in both low and mid altitudes; however selection of suitable leaf rust tolerant varieties requires more extensive studies.

Keywords: *Altitude; Resistant; Rust; Severity; Susceptible*

Biography

The Primary author has completed Bachelor Degree in Science in the field of Agriculture from renounced Agriculture College that is College of Natural Resources, Royal University of Bhutan, and Bhutan. He is the Plant Pathologist in National Plant Protection Centre, Department of Agriculture, Ministry of Agriculture and Forest, Kingdom of Bhutan.

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