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Min Review of Evaluation of Resistance Reaction of Maize varieties to Exserohilum turcicum(Pass) Leonard and Suggs Causing agent of Northern Corn Leaf Blight.

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Abstract

Northern corn leaf blight (NCLB) incited by the fungus Exserohilum turcicum is a ubiquitous foliar disease of corn (maize), the anamorph of the *ascomycete Setosphaeriais* a foliar disease that significantly limits maize production and productivity in world. Plant genetic resistant to infection by the pathogen is a safe, economical and eco-friendly disease management. The purpose of this research review article to find out Exserohilum turcicum is a fungus that causes northern corn leaf blight (NCLB) and has deleterious effects on maize production globally. The objective of this research article review was to assess the severity of NCLB disease on the growth and yield of various maize genotypes in different maize growing areas. In all tested trials those hybrids could be considered as potential sources of resistance or tolerance to NCLB for further validation for plant breeders.

Keywords: *Exserohilum turcicum, northern corn leaf blight, resistance*

Introduction

Maize (Zea mays L.) is widely grown staple crops in the world, ranking third after wahet and rice [1]. Turcicum leaf blight, commomnly known as Northern leaf blight (NCLB) caused by Exserohilum turcicum (pass.) Leonard and suggs reduced kerenel yield 28 to 91% [2].

The fungus Exserohilum turcicum is known to be highly variable in cultural characteristics, pathogenicity and genetic traits and the frequency of variation differs with each species and in all maize growing areas and invading the majority of maize varieties. Result in for lack of substantial durable resistance in the material may be attributed to the presence of variability in the population as the fungus Exserohilum turcicum is known to be highly variable in nature [3].

In the world, efficient disease control is achieved through the use of fungicide spray which offers the most consistent method of control Northern leaf blight [4,5 &6]. Another method used for controlling the disease is the use of cultural practices such as crop rotation, destruction of crop residues and closed seasons are being conducted to reduce inoculums in the soil debris and alternative hosts [5]. Research report indicated that Norther corn leaf caused devastating damage on most commercial varieties of maize released in Ethiopia [7]. Northern corn leaf blight varies in incidence and severity from year to year and from one locality to another depending largely on genetic makeup of the plants and prevailing environmental conditions. It is a multiple cycle disease and new repeated inoculations are needed for disease development making it highly dependent upon sporulation from other lesions [8].

The use of host plant resistance seems to fit African conditions. This method is cheap, effective and gives high results [9,10 &11]. Through maize breeding procedures, it is now possible to achieve durable resistance to control the disease [11]. This situation calls for breeding efforts to develop Northern leaf blight disease resistant cultivars. Therefore, introducing available control measures to the farmers is vital to increase production and productivity in maize growing areas. hereafter, this article seriously review effort was made for development of resistance against Northern leaf blight disease had large effect

on the maize crop improvement.

Review evaluation maize varieties for resistance northern corn leaf blight

A field evaluation study was conducted at Almora, india, 35 maize inbreeds were to identify resistance against turcicum leaf blight (TLB) result indicated that the inbreeds viz., V373, V398, V407, V418, VQL2 and CM 145 showed high degree of resistance to both TLB and Maydis [12]

[13] report indicated that the combined analysis over locations in 2014-2015 showed that among the 30 genotypes 25 genotypes were resistant (1.0-2.0 scale), and 5 genotypes were moderately resistant (2.1-3.0 scale). Similarly, the pooled analysis over locations in 2015-2016 showed that 7 genotypes were resistant and 3 genotypes were moderately resistant. The maize genotypes namely Z376-26, Z478-3, Z433-99, Z464-5, Z478-2, Z466-1, CAH1513, RML-95/RML-96, CAH1515, CAH1521, CAH1515, CAH151, CAH153, ZH114228, Z376-9, Z466-3, Z376-5, RML-32/RML-17, RML-86/RML-96 and 900M Gold were resistant with higher grain yield in both the years.

[14] also screened genotypes for resistance against *E. Northern* under field conditions study 36 early maturing inbred lines of maize were screened for resistance against E. turcicum under field conditions. When tested against ten isolates of E. turcicum under artificial conditions, twenty-seven genotypes were found moderately resistant. Nine genotypes were found moderately resistant.

Similar work also reported by [15] field experiment conducted in Ethiopia for Fifty inbred lines were evaluated for reaction to Turcicum leaf blight during the main cropping seasons of 2011 and 2012. Inbred lines were clustered into resistant and susceptible. Evaluation was performed to 125 new hybrids for their resistance to northern corn leaf blight and yield components in Garingging, District of Karo, North Sumatera, from October 2019 to March 2020. Disease parametrs significant association with AUDPC was seen in incubation period, ear diameter, ear length, and ear weight. High GCV was observed in disease resistance traits, while high heritability is estimated in incubation period, AUDPC, ear diameter, and ear length. Incubation period may be used in early selection [16].

An experiment conducted at Jinka Agricultural Research Center (Ethiopia) with objective of the study was to select a maize variety or varieties resistant to northern leaf blight evaluated 12 improved maize varieties and one local check used in the study. Among tested varieties BH660 variety was highly resistant compare to the other tested varieties. On the other hand, BHQPY545 and local check were susceptible to northern leaf blight. Therefore, the variety BHQPY545 is recommended maize production areas of South Omo zone [17].

A study on reaction of ten inbred lines of maize to northern leaf blight mainly caused by Exserohilum turcicum (Pass) Leonard and Suggs, was conducted under artificial epiphytotic conditions in green house. Among 10 inbred lines evaluated, three were found moderately resistant, five lines moderately susceptible and, the rest two, inbred were severely affected by TLB and rated as susceptible. The lines identified to possess low disease severity score against Turcicum leaf blight in the present study could be used successfully in developing genotypes having desirable level of resistance in disease endemic areas to aim for sustainable productivity [18].

A study of reaction of thirteen maize varieties to northern leaf blight mainly caused by Exserohilum turcicum (Pass) Leonard and Suggs, were conducted at three locations Gambella, Abobo and Bako during 2003 and 2004 crop seasons. Variation among maize varieties was observed for several disease variables and the host entries used in this study indicated that Kuleni was the most resistant to northern leaf blight across three locations, with low rating score [9 & 19].

Conclusion

In this literature review research conducted on Plant genetic resistance Turcicum leaf blight or Northern leaf blight of maize disease caused by Exserohilum turcicum (Pass.) Leonard and Suggs has been reported. All researchers investigated the reaction of different maize varieties to reaction to norther corn leaf blight disease maize grown in different areas. The literature review data were collected from 20 (Twenty) retrieved research papers. The results obtained from the current review proved that the E. turcicum showed different reaction to tested maize varieties. The current study recommendation is The resistant varieties will be further used in a crossing programme to develop high yielding and disease resistance varieties for different agro-ecologies.

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