Effect of different potassium rates on the severity of Northern Corn Leaf Blight caused by *Helminthosporium turcicum* in North Benin

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ABSTRACT
Objective: The overall objective is to develop a method to control the Northern Corn Leaf Blight caused by *Helminthosporium turcicum,* one of the major constraints in the worldwide maize production and particularly in Benin. Specifically, it aims to determine the optimal potassium rate to act effectively on the disease.
Methodology and Results: The study consist of subjecting three maize varieties to the effect of four different rates of K_2O (40, 48, 60 and 90 kg K_2O/ha abbreviated as K_{40}, K_{48}, K_{60} and K_{90}) in the field at Gogounou (North Benin) in 2015 and 2016 then in the greenhouse in 2016. The experimental design was a split plot with four repetitions with K fertilizer rate as main factor, and variety as secondary factor. The study revealed that the rates K_{48}, K_{60} and K_{90} respectively reduce the severity of Northern Corn Leaf Blight by 24.17%, 40.46% and 48.80% compared to the rate K_{40} in the greenhouse. In the field, the rates K_{60} and K_{90} respectively reduce the severity by 32.56% and 8.87% compared to the rate K_{40} in 2015. In 2016, the rates K_{48}, K_{60} and K_{90} reduce the severity respectively by 9.83%, 23.96% and 15.39% compared to the K_{40} rate. In addition, no significant difference was found between the severity values of the three varieties studied neither in the greenhouse nor in the field. In addition, no significant correlation was observed between severity and grain yield in the field during the two years.
Conclusions and application of findings: The application of potassium decreases the severity of Northern Corn Leaf Blight and the rate K_{60} is the optimal to reduce the disease. The availability of fertilizer at the K_{60} to farmers in the endemic zones could help for sustainable management of the disease.
Keywords: *Helminthosporium turcicum,* maize, Northern Corn Leaf Blight, North-Benin, potassium.