Risk Factors Associated with Epidemics of Coffee Leaf Rust (*Hemileia vastatrix* Be & Br.) in Ethiopia

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Introduction

Arabica coffee (*Coffea arabica* L.) is native in Africa, particularly in Ethiopia. It is the most susceptible for coffee leaf rust disease. Epidemics of coffee leaf rust (CLR), caused by the fungus *Hemileia vastatrix*, considered to be minor in Ethiopia, but have become more frequent and severe in the country accompanying the expansion of commercial coffee plantations and changes in climate variables.

Materials/Methods

Large scale survey was conducted in the major coffee-growing regions of Ethiopia. Percent disease intensity (incidence and maximum severity) and crop management data were obtained from 405 farms distributed over 27 districts, 9 zones of Oromia and Southern Nations Nationalities and Peoples (SNNP) regions. The data were analyzed using a mixed model by R software.

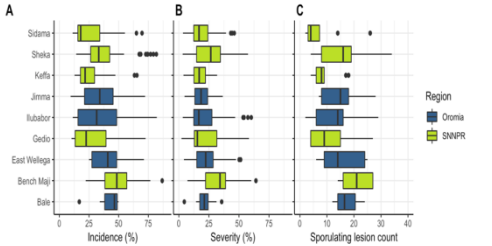

Figure 1: Distribution of three disease intensity for coffee leaf rust in major coffee growing areas of Ethiopia.

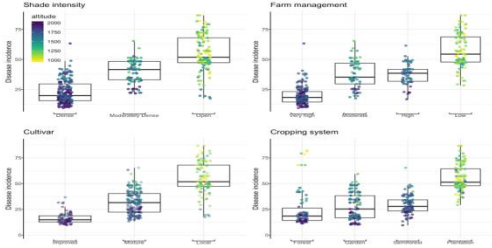

Figure 2: Coffee leaf rust intensity at different levels of shad field management, cultivar and cropping system in Ethiopia.

Results/Discussion

Based on the result, CLR was present in all farms with mean incidence ranging from 5 to 86.7% (mean = 35.3%) and severity ranged from 2.2 to 64.1% (= 22.5%). While CLR incidence did not differ among zones or districts based on a mixed model analysis, the effects of all agronomic factors and altitude, tested individually in the model, were significant.

There was general trend of decreasing CLR intensity with the increase in altitude, but the agronomic factors overlapped and were confounded with the reduction/increase of CLR intensity at higher/lower altitudes.

A multiple correspondence analysis showed the lowest incidence class (< 23%) associated with the use of intensively managed improved varieties grown at highest elevation class under shade. The highest incidence (>43%) was correlated with poorly managed local varieties grown under full sun at the lowest elevation class.

Conclusion/Perspectives

Our data confirmed that, CLR was widespread problem over the country. The work contribute knowledge for improving CLR management, thus serving as a warning for Ethiopian coffee authorities and growers to act towards a national plan to improve CLR management

References:

Garedew et al. 2019. Landscape context and plot features influence the epidemics of coffee leaf rust (*Hemileia vastatrix*) in southwest Ethiopia. Archives of Phytopathology and Plant Protection, 52:71-89.

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