Screening of Arabica Coffee Germplasm to Coffee Leaf Rust (*Hemileia vastatrix*) at TaCRI, Lyamungu, Tanzania

Aman, N. M*., Mwaipopo, R. E., Mtenga, D.J., and Kilambo D. L

Crop Improvement Research Programme, Tanzania Coffee Research Institute, P.O Box 3004, Moshi, Tanzania.

*corresponding author: nuhu.aman@tacri.or.tz

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Introduction

Coffee leaf rust (CLR) caused by *Hemileia vastatrix* Berk et Br. is among the most devastating diseases in coffee worldwide. In the 1960s, different arabica coffee cultivars were collected and planted at TaCRI, Lyamungu as germplasm materials. However, the level of resistance of these germplasms to CLR under field conditions is not well known. Therefore, this study aimed to identify accessions having resistance under natural disease infestation for genetic resource conservation and sustainable utilization.

Materials/Methods

Sixteen cultivars of Arabica coffee were assessed for CLR under natural infestation during March and July 2022 in a complete randomized block design with six replications. The disease severity followed a scale of 1 to 6 (Kilambo et al.,2013) at which 1-2.4 was considered resistant, 2.5-3.4 moderately resistant, 3.5-4.4 tolerant, 4.5-5.4 moderately susceptible and 5.5-6 susceptible. Data collected were subjected to GENSTAT software Version 16 to generate means, variance, standard error, and coefficient of variation. Means were separated using Tukey's HSD at $p \leq 0.05$.

Figure 1: Leaves reaction to CLR

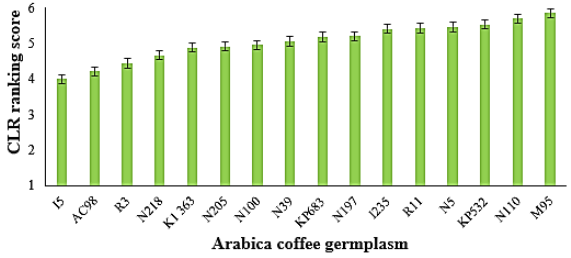

Figure 2: Response of the Arabica coffee accessions to CLR infestation under field condition

Results/Discussion

There were highly significant differences in CLR reaction ($p \leq 0.01$) among the 16 Arabica coffee cultivars, at which I5, AC98, and R3 were observed to have scores of 4.00, 4.21, and 4.44 respectively, qualifying as tolerant at field conditions. N218, K1 363, N205, N100, N39, KP683, N197, I 235, and R11 were observed to have mean scores of 4.67, 4.89, 4.92, 4.96, 5.06, 5.18, 5.20, 5.41, and 5.43 respectively (moderately susceptible) while N5, KP532, N110, and M95 had a disease score of 5.47, 5.53, 5.70, and 5.85 respectively (susceptible) (Fig. 1&2). These results agree with those obtained by Gichimu, (2012) and Kilambo et al. (2013)

Conclusion/Perspectives

The screened cultivars which are field-tolerant to CLR namely I5, AC98, and R3 can be used as female parents to be crossed with exotic male parents of known desirable traits, including resistance to the particular disease. However, more evaluation has to be done using inoculum, to establish their genetic diversity, cup quality test, and agronomical performances.

References:

Kilambo, D. L., Reuben, S. O., and Mamiro, D. P. (2013). Responses of compact coffee clones against Coffee Berry and Coffee Leaf Rust diseases in Tanzania. *Journal of Plant Studies*, *2*(2), 81.

Gichimu, B. M. (2012). Field screening of selected Coffea arabica L. genotypes against coffee leaf rust.