# Reactions of Bread Wheat (*Triticum aestivum* L.) Genotypes to Rust Diseases under Rainfed Conditions

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## INTRODUCTION

Wheat is one of the most important crops in the world with the largest production of any crop owing to its ability to adapt to environmental conditions. Bread wheat, a major cereal crop, is subject to several biotic stresses. These stresses affect the crop's yield, quality and yield components. Leaf rust (*Puccinia triticina*) and stripe rust (*Puccinia striiformis* f. sp. *tritici*) are mainly and widespread diseases of wheat in the Trakia region, Turkey. Therefore, the objectives of the study aimed to determine and compare the bread wheat genotypes and the effect of the rust disease factors under various environmental conditions.

## MATERIALS AND METHODS

The experiment was conducted in the 2018-2019 cycle in the Trakia region, Turkey, at three locations Burgaz (E1), Tekirdağ (E2) and Keşan) (E3). Twenty-five winter wheat advanced genotypes were examined under rainfed conditions with randomized complete block design (RCBD) with four replications. The severity and the response rating were scored for adult plant field reaction using the modified Cobb scale during the flowering period (Z60-69). Rusts severity is recorded as a percentage, according to the modified Cobb scale (Prescott et al., 1986).

## RESULTS AND DISCUSSION

Due to the variation in environmental conditions, the leaf rust and stripe rust epidemic varied and showed various degrees. There were differences in the infection coefficient between the locations with the effect of environmental factors. The infection coefficient was higher in leaf rust than in stripe rust across three environments. In leaf rust, while the highest infection coefficient was found in E1 ($R^2$=0.33), the lowest coefficient was determined in E2 ($R^2$=0.16). In stripe rust, the infection coefficients were very low in three environments.

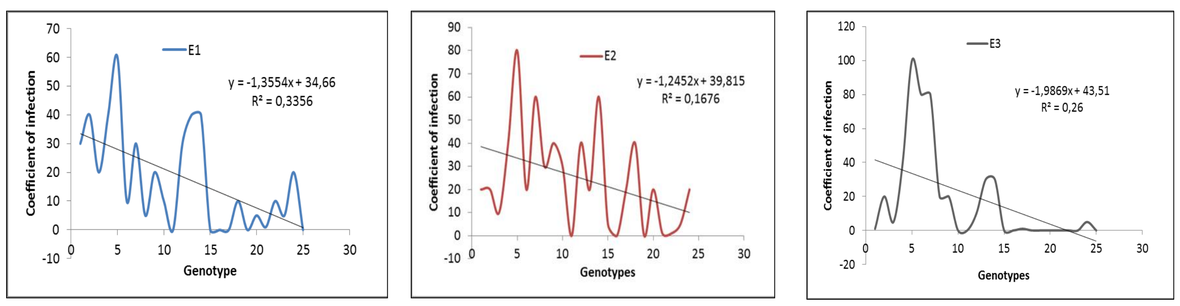


Figure 1. Infection of coefficients of leaf rust (LR) across three environment

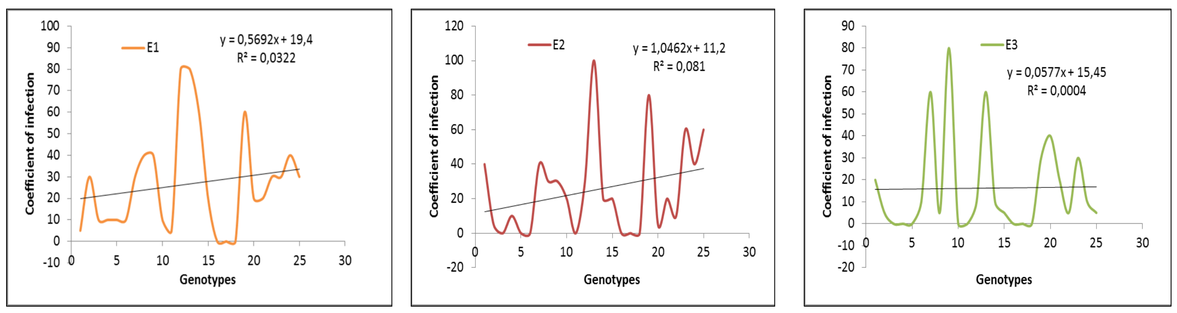


Figure 2. Infection of coefficients of stripe rust (SR) across three environment

It was assumed that the difference in the infection coefficients was due to the difference in climatic values such as precipitation, humidity and temperature, which were effective in the epidemic of leaf rust and stripe rust. The research was carried out in different locations under rainfed conditions and it was determined that there were significant differences in the infection rate, especially in sensitive genotypes according to the locations.

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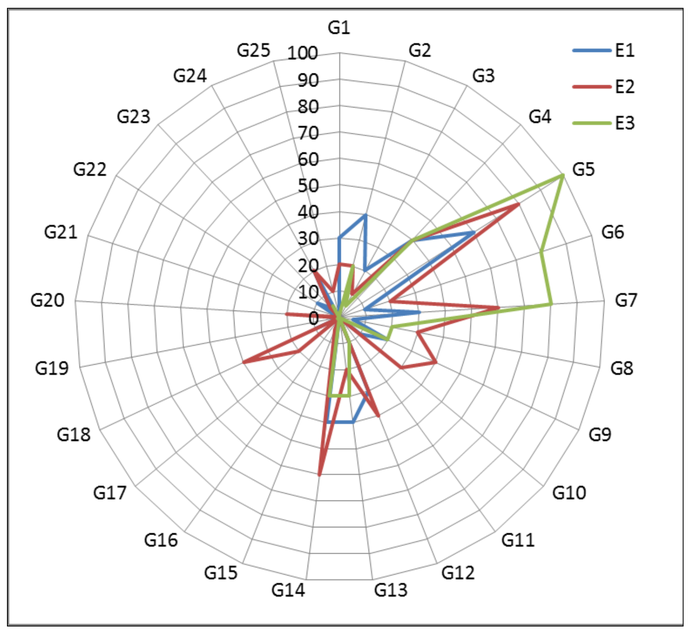


Figure 3. Severity of infection of leaf rust in genotypes across three environments

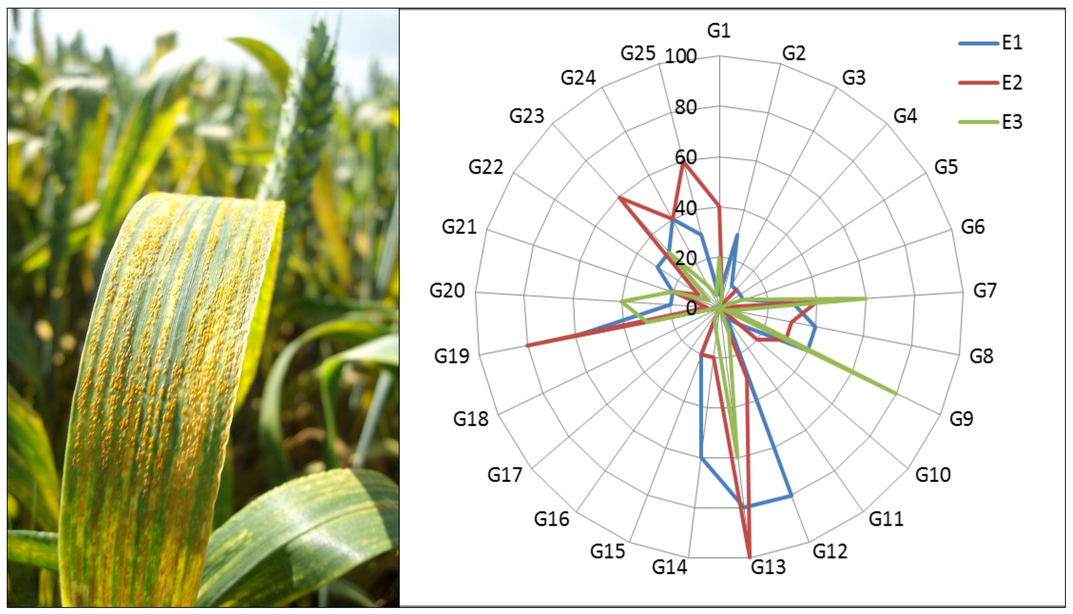


Figure 4. The severity of infection of stripe rust in genotypes across three environments

In the study, a significant difference was determined between genotypes according to leaf rust and stripe rust. In the study, 12 (48%) and 11 (44%) genotypes were tolerant to leaf rust and stripe rust, respectively.

## CONCLUSION

In the study, the genotypes G11 (cv Aldane), G16 (cv Yüksel) and G19 (cv Abide) are perfect parents for crossing with other slow-rusting lines that have better resistance to achieve high yield potential with a high level of resistance to leaf rust disease. For stripe rust in genotypes G16 (cv Yüksel), G17 (cv Damla) and G18 (cv Anafarta) performed better tolerance. Therefore, these genotypes were selected for use in breeding programs. In addition, research has shown the importance of the effect of the environment on the epidemic of biotic stress factors.

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