

# Comparing the Production Stability of Common Wheat Genotype

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## Abstract

In plant breeding, the aim is to obtain varieties that can be used in as wide areas as possible. Thus, cultivar comparison trials (cultivated varieties) tend to be integrated into networks. Given their robustness, the individual trials of these networks are often of the randomized block type. The new varieties of common wheat have a high productive potential, high technological quality, and even resistance to the main diseases and pests, which may create value in the grain sector in Portugal. Before selection, the new genotypes are evaluated in the Regional Trial in different environments (location combinations, period crop, and year). The variation of the environmental conditions makes the classification of genotypes different from one environment to another, that is, it is assumed that the interaction is significant. Different genotype responses to environmental variation make it difficult to identify the desired genotypes. Linear regression (LR) analysis has been frequently used to assess the stability of genotypes. The AMMI model is an alternative statistical procedure and is widely used. Given the relevance of these two models, it is important to compare them to determine which is the most suitable to select wheat genotypes with high and stable production. This work aims to compare the values of the GE interaction obtained using the AMMI model with those obtained through LR and, as proposed by Finlay and Wilkinson (1963), to compare the production stability of common durum wheat genotypes. Our results showed that The AMMI model is more efficient in describing the GE interaction of wheat genotypes evaluated in different environments than the analysis by LR. The CELTA cultivar is unstable but has the highest production; TE9206 is moderately stable and has high production; HELVIO and TROVADOR are the most stable, with production above average TE9008 and TE9204 are the most unstable, with production below average, TE9110 is unstable and has low production.

## **Keywords**

AMMI model, Environmental conditions, Linear regression, Stability of genotypes.

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