



Yield Stability and Adaptive Potential of the Two-Row Barley Variety Gorast under Agroclimatic Conditions in Bulgaria

Silviya Vasileva

Agricultural University – Plovdiv, Faculty of Agronomy, Department of Crop Science
Corresponding author: silviya.valentinov@gmail.com

Abstract: Long-term cultivation and changing climate conditions may affect varietal performance, making re-evaluation of established cultivars necessary.

The study aimed to assess the stability, productivity, and adaptive response of the Bulgarian winter barley cultivar Gorast based on historical and recent multi-environment trials.

Results show that Gorast maintains stable yield, good adaptability, lodging resistance, and acceptable grain quality under variable agroclimatic conditions in Bulgaria.

Keywords: barley breeding, *Hordeum vulgare* L., Gorast, re-evaluation, yield stability

• Introduction

Climate variability increases the importance of crop stability, especially for cereals grown under contrasting environments.

In barley breeding, the goal is not only high yield, but also consistent performance under stress and changing weather patterns.

Re-evaluating older cultivars helps identify varieties that still have practical value in modern agriculture.

• Material and method

Official state variety trials from 2010-2011 were used as historical reference data.

Re-evaluation of Gorast cultivar for the period 2023-2024 and 2024-2025 for the north part of the country, was conducted at the seed production fields of “Agrodimex” Ltd. For the south part - at the experimental field of the Department of Crop production at the Agricultural University - Plovdiv (Figure 1).

The study included assessment of yield, growing season, thousand-kernel weight, lodging resistance, disease response, and malting quality using standard statistical analysis.

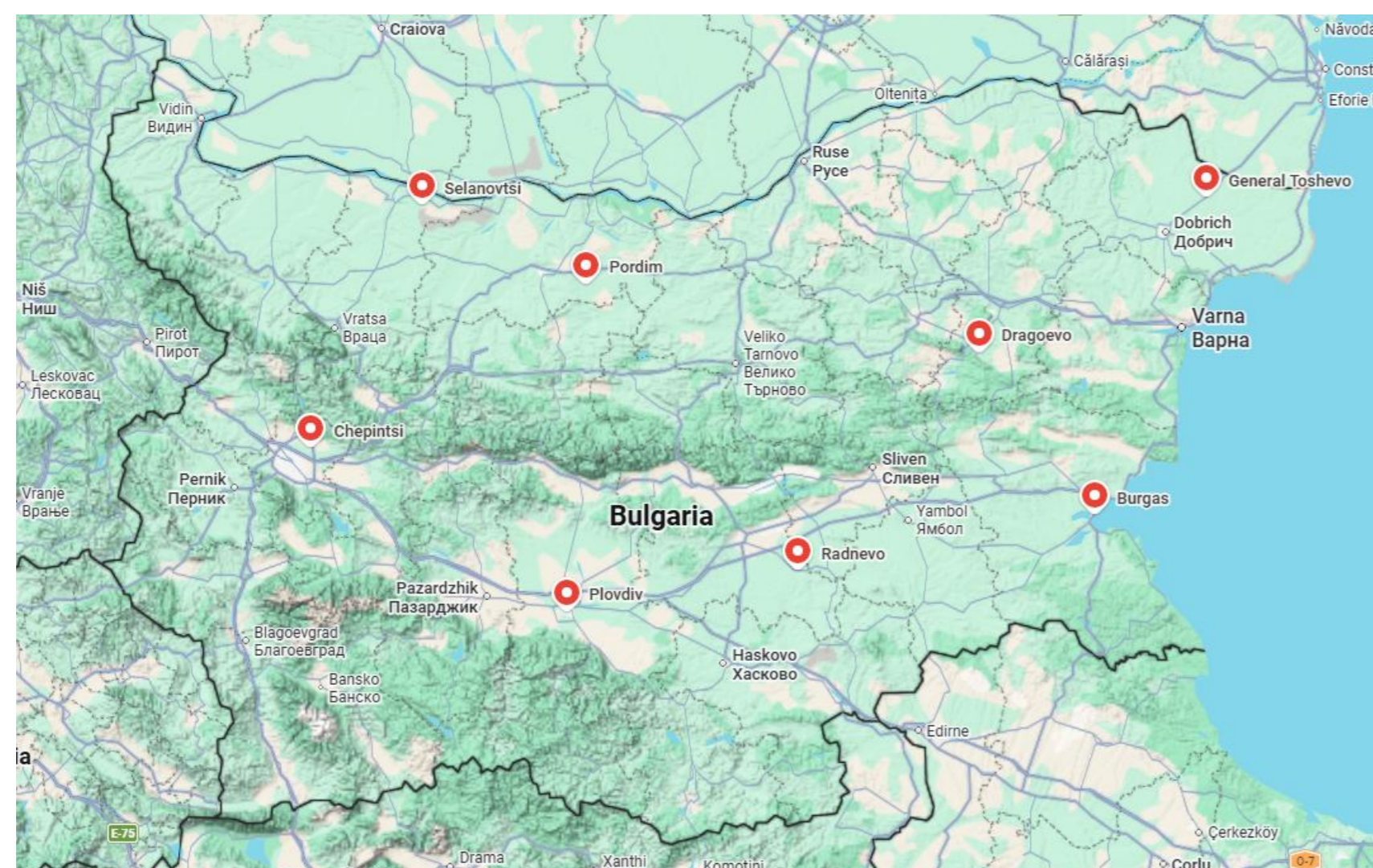


Figure 1. Field trials' locations in the territory of Bulgaria

• Results and discussions

Gorast showed stable agronomic performance across years and locations, with yield comparable to or higher than the standard varieties.

"GORAST"
breeding line 557D003

/Winter two-rowed, *Hordeum vulgare* L. sensu lato. Subs.



Figure 2. Gorast

Recognized pursuant to Article 16(2) of the Law on the Protection of New Plant Varieties and Animal Breeds, with the distinctive characteristic: technological qualities. The variety was registered since 2012 in list “A” of The Official Variety List of Bulgaria by the company “Agrodimex” Ltd., main department - Dobrich, Bulgaria (<https://agrodimex.com/>).

A comparative analysis between official IASAS trials (2010, 2011) and subsequent experiments (2024, 2025) demonstrates that the winter barley cultivar ‘Gorast’ has maintained stable agronomic performance over time. The cultivar achieved yields of 656.1 kg/dka during state testing and up to 755 kg/dka in recent trials, with advantages of up to +16% over standard cultivars. Key agronomic traits, including thousand kernel weight (~49-50 g) and lodging resistance, remained stable across environments and periods. ‘Gorast’ also exhibited consistent adaptability and disease tolerance under contrasting agro-climatic conditions. Grain quality parameters, including high extract content (up to 82.3%) and optimal protein levels (~11.3-11.4%), confirm its suitability for malting and support its renewed use in agricultural practice.

Conclusions: Gorast remains a valuable winter two-row barley cultivar with stable productivity and good adaptive potential under diverse Bulgarian agroclimatic conditions.

The results confirm that the cultivar has preserved its breeding value over time and can still be recommended for agricultural practice, especially in variable environments.