OPINION

on a dissertation submitted for the award of the educational and scientific degree **"Doctor"** in the field of higher education: **Agronomy**, professional field: **Crop Science**, scientific specialty: **Crop Science**

Author of the dissertation: **Georgi Stoyanov Raykov**
PhD candidate (independent doctoral training) Department of Crop Science, Agricultural University, Plovdiv, Bulgaria

Title of the dissertation: An effective methodology for the identification of high-yielding and stable winter wheat genotypes through the combination of traditional and innovative statistical approaches

Reviewer: **Prof. Dr. Margarita Ivanova Nankova,** Dobrudzha Agricultural Institute, General Toshevo, Scientific field 6.1 Crop Science, Agrochemistry

Appointed as a member of the Scientific Jury by Order No. RD-16-208 / 02.02.2026 of the Rector of the Agricultural University.

1. Relevance of the research topic

The doctoral dissertation is distinguished by a topical and integrated approach to the characterization of varieties with respect to the stability of their productivity under different growing conditions. These conditions include not only the applied production technology, but also resource management across different agrometeorological regions.

The research is fully aligned with contemporary global scientific trends related to this problem. The acceleration of genetic progress in the country requires approaches characterized by high critical rigor and comprehensive methodologies for evaluating yield stability under the strong dynamics of ongoing climate change.

2. Aim, objectives, hypotheses and research methods

The aim of the dissertation, as well as the tasks set for its achievement, are clearly formulated. The five working hypotheses are fully consistent with the stated objectives and research tasks. A wide range of research methods has been applied, which is a prerequisite for the depth of the study and the high level of reliability in ranking the tested breeding materials.

3. Visualization and presentation of the results

The obtained results are clearly presented, starting from the origin of the studied genotypes, through the characterization of individual traits, and reaching the final

ranking of the investigated genotypes. The visualization of the results is also of a high standard and fully consistent with the applied statistical models.

4. Discussion of results and literature used

The analysis and discussion of the results are conducted professionally and exceed the formal requirements for the educational and scientific degree. The newly applied approaches encompass the most recent statistical models for evaluation, whose applicability is compared with that of widely used regression and other traditional models. The combined application of these two groups of approaches constitutes the main focus of the dissertation.

The evaluation of varieties is based on multi-trait indices, whose effectiveness is convincingly demonstrated. Some of the applied models are still in the process of scientific development and wider adoption.

The literature used covers a broad time span, due to the extensive body of classical statistical studies related to genotype × environment interaction. At the same time, the majority of references are from recent years, demonstrating the doctoral candidate's excellent awareness of both national and international scientific advances in the field, particularly with regard to new analytical approaches and methods.

5. Contributions of the dissertation

The dissertation presents clearly defined contributions.

Scientific contributions

A multi-layered characterization of the main productivity traits of more than 100 genotypes originating from different parts of the world under varying environmental conditions has been conducted. The objective and highly critical evaluation have been achieved through the application of diverse but complementary statistical approaches. The integrated methodology unequivocally demonstrates the leading role of the trait *number of grains per square meter* in achieving high and stable yield under different environmental conditions.

Scientific and applied contributions

The dissertation provides a reliable and practical framework for the evaluation of genotypes of different origin with respect to their productivity and stability. The direction of selection has been clearly specified, enabling the identification of genotypes suitable as source material for breeding varieties combining high productivity and stability under variable environmental conditions.

6. Critical remarks and questions

In my opinion, the visualization of the obtained results could have been expanded further.

7. Published papers and citations

The candidate has two publications in the journal *Agricultural Science and Technology*, one co-authored and one single-authored.

At the present stage, the number of citations is seven.

The submitted Author's Abstract objectively reflects the structure and content of the dissertation.

CONCLUSION

Based on the applied research methods, the correctly conducted experiments, the summaries and conclusions drawn, I consider that the presented dissertation fully complies with the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations of the Agricultural University for its implementation. This gives me grounds to evaluate the dissertation **positively**.

I therefore propose to the honorable Scientific Jury to vote in favor of awarding **Georgi Stoyanov Raykov** the educational and scientific degree **"Doctor"** in the scientific specialty **Crop Science**.

Date: 09.02.2026

DAI, General Toshevo

(Prof. Dr. Margarita Nankova)