



OPINION

on the dissertation for the educational and scientific degree of “doctor” in: field of higher education 6.0. Agricultural sciences and veterinary medicine, professional field 6.1. Plant breeding, scientific specialty Viticulture

Author of the dissertation: **Hristo Shterev Kozarov**, full-time doctoral student at the Department of Viticulture and Fruit Growing of the Faculty of Viticulture and Horticulture at the Agricultural University of Plovdiv.

Title of the doctoral dissertation: *“Application of organic products and their impact on the growth and reproductive manifestations of the Merlot variety grown under non-irrigated conditions”.*

Reviewer: Prof. Dr. Kiril Todorov Popov
(Forestry Technical University - retired; field of higher education 6.0., professional field 6.1., scientific specialty - **viticulture**), appointed as a member of the scientific jury by order No. RD 16-775/23.06.2026 by the Rector of the University of Agriculture.

1. Relevance of the research problem.

The topic of the dissertation work "Application of organic products and their impact on the growth and reproductive manifestations of the Merlot variety grown under non-irrigated conditions" is relevant, scientifically significant and with practical applicability in the field of viticulture. The climatic changes that have occurred in recent years have led to a number of changes related to the need to increase the efficiency of production and limit the negative impact on the environment. In search of solutions, winegrowers are implementing various technologies and solutions to increase the optimal development and quality of grape production.

A special place among these solutions is occupied by technologies related to the use of organic matter. The use of such technologies is in line with the EU priorities set out in the European Green Deal. In this sense, the study of new organic substances and their application in practice has not only scientific value, but also significant practical importance for agricultural producers, agribusiness and institutions involved in the development of the agricultural sector.

The use of organic substances is a key factor for sustainable viticulture. It improves the structure of the soil and helps to increase the water-holding capacity of the soil, making it more resistant to drought. Organic matter nourishes soil microorganisms, which convert complex compounds into nutrients easily absorbed by the vine, supports and maintains an optimal alkaline-acid balance in the soil, gradually mineralizes, ensuring continuous nutrition for the vines throughout the growing season. This helps to achieve high-quality grape production and high quality of the wines produced.

In connection with the above, I believe that the chosen topic is relevant and corresponds to modern trends in the development of precision and sustainable agriculture.

2. Aims, objectives, hypotheses and research methods.

The aim of this dissertation is to establish the potential of organic products and their impact on the growth and reproductive manifestations of the Merlot variety, grown under non-irrigated conditions, which is directly related to overcoming stress conditions during the dormant and growing periods. To achieve his goal, the doctoral student has set himself 10 research tasks, using appropriate methods and approaches.

The thesis that the doctoral student argues in his work through the applied methods is that the use of organic substances in viticulture creates a prerequisite for increasing the efficiency of vine development, the quality of grapes and wine, as well as the resistance of vines to drought and extremely high temperatures.

3. Visualization and presentation and communication of results.

The dissertation is well structured. It includes all sections according to the requirements for the educational and scientific degree “doctor”. The obtained results are well illustrated. The dissertation contains 147 pages, 29 tables and 54 figures.

4. Discussion of the results and used bibliography.

I believe that the presented dissertation on the topic “Application of organic products and their impact on the growth and reproductive manifestations of the Merlot variety, grown under non-irrigated conditions” is a current scientific study with a clearly expressed practical focus and is related to the development of precision agriculture in Bulgaria. The dissertation was developed in accordance with the established scientific criteria and regulatory requirements for acquiring the educational and scientific degree “doctor”.

The research is characterized by a solid theoretical basis, appropriately selected and correctly applied methods as well as precisely formulated goals, objectives and research results. The developed scientific experiment has been examined consistently and in depth, and significant scientific and practically applicable results have been achieved.

The doctoral student has the skills to independently conduct scientific research, the ability to process and analyze scientific information, as well as the competence to draw substantiated conclusions and recommendations. This gives me reason to assume that Hristo Kozarov has the necessary scientific training, research culture and professional competence to develop a dissertation at the required academic level.

When developing his work, *the author has studied 275 literary sources, of which only 19 are in Cyrillic*. All of them are directly related to the topic of this work.

5. Contributions of the doctoral dissertation.

I accept the attached author's reference for the contributions of Hristo Kozarov, which realistically reflects the results of his scientific research work. The author defines the following scientific and scientific-applied contributions:

Scientific contributions

1. It was established that the application of a lower dose of the soil preparation “Humat Rost” in variant V5 leads to an increase in the functional diversity and metabolic activity of soil microbial communities, expressed through higher values of the functional indices summarized by statistical analysis (MANOVA).

2. In the treated variants, the absorption of amino acids by microbial communities is stimulated compared to the control variant V0. The established higher metabolic activity in V5, especially after the 96th hour, indicates a more efficient use of amino acids and suggests an enhanced functional potential of the microbial community.

3. The established significant dependencies between the applied foliar treatments with “Humat Rost”, the specificity of the harvest and the organoleptic characteristics of the resulting wines are also original. It has been proven that the tasting assessment varies significantly depending on both the year of harvest and the doses of treatment used in each variant.

Scientific and applied contributions

1. It has been established that the root treatment with a dose of 25kg/da maintains a consistently higher rate of absorption of “amines” compared to the other variants throughout the three-year study period. This reveals the specific metabolic reaction of the soil microbiota to the applied treatment.

2. The obtained results expand the scientific information on the application of organic foliar fertilizers, such as “Humat Rost” in viticulture. A tendency towards dose dependence in the manifestation of the effect has been proven, as well as the significant influence of climatic conditions on the variability of linear growth and the processes of shoot maturation in Merlot grapevines.

3. Practical guidelines have been developed to increase the viability of winter buds by optimizing the time for sampling and applying organic fertilization, leading to increased resistance to late spring cold snaps and preserving the reproductive potential of the vine.

4. The results obtained from the regression analysis reveal significant dependencies between nutritional regimes in the periods of feeding and the formation of reproductive and vegetative organs in the vine.

6. Critical comments and questions.

I have no critical comments on the dissertation work and questions to the doctoral student.

Some technical errors have been made, which I believe should be corrected on:

□ p. 27, line 6. In the sentence “Structurally, this is a stilbene derivative, occurring in both cis and trans forms”. The expression “stilbene derivative” should be written “stilbene derivative”;

□ p. 39 after the Fertility coefficient should be added in brackets (Kr);

□ p. 89, fig. 44 at the end of the text, “2023odina” is written merged;

□ p. 106, tab. 25 in the column “milirandiriali”, to write “milerandiriali”

I recommend that the doctoral student continue and expand his research work on the topic of the dissertation work.

7. Published articles and citations.

On the topic of this dissertation, the author has published one independent scientific article “Kozarov, H. ”(2025). Distruptions Caused by Abiotic Factors Affecting Inflorescence Development During the short Annual Growth Cycle of the Grapevine. Jurnal of Mountain Agriculture on the Balkan”.

CONCLUSION

Based on the scientific research methods applied by the doctoral student, the correctly conducted experiments, the generalizations and conclusions made, I believe that the presented dissertation meets the requirements of the ZRASRB and the Regulations of the Agrarian University for its application, which gives me reason to evaluate it **POSITIVELY**.

I would like to propose to the esteemed Scientific Jury to vote **POSITIVELY** and to award **Hristo Shterev Kozarov** the educational and scientific degree “doctor” in the scientific specialty “Viticulture”.

Date: July 20, 2026
city of Sofia

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