



## REVIEW

on the dissertation for the educational and scientific degree "**Doctor**" (PhD) in: field of higher education **3. Social, economic and legal sciences**, professional field **3.8 Economics**, scientific specialty "**Economics and Management (Agriculture)**"

**Author of the dissertation: *Dafinka Vasileva Grozdanova***

PhD student (part-time) at the Department of Economics at the Agricultural University, Plovdiv

**Topic of the dissertation:** "Economic assessment and future prospects for the use of unmanned technologies supporting ecological orientation and precision agriculture in Bulgaria"

**Reviewer:** Assoc. Prof. Radosveta Yordanova Krasteva-Hristova, PhD, D. A. Tsenov Academy of Economics – Svishtov, Department of Accounting, field of higher education: 3. Social, Economic and Legal Sciences; professional field: 3.8 Economics; scientific specialty "Accounting, Control and Analysis of Business Activity (Accounting)," appointed member of the Scientific Jury by Order No. RD-16-560/29.04.2026 of the Rector of the Agricultural University.

### **1. Brief introduction of the candidate.**

Dafinka Vasileva Grozdanova was born on 28.09.1979 in the town of Pazardzhik. In 2004, she graduated with a Master's degree in Plant Protection from the Agricultural University of Plovdiv with a professional qualification of an agronomist, which laid the foundations for her professional interests in the sustainable development of agriculture and innovative approaches in plant breeding.

The candidate has significant professional experience, combining expertise in the field of agriculture, public administration, European policies and project work. Her professional path has passed through the National Plant Protection Service and the Ministry of Agriculture and Food, where she successively held various expert positions related to phytosanitary control, organic production, European regulatory mechanisms and international cooperation.

Her academic and project activities are related to the Agricultural University - Plovdiv, where since 2021 she has been working as a chief expert in project and scientific activities, an assistant professor and a doctoral student at the Department of Economics, and is currently a chief expert in the administrative and legal department of the university. She actively participates in the development and management of

national and international projects, including under the Horizon Europe program. Dafinka Vasileva Grozdanova's scientific interests are focused on precision agriculture, unmanned technologies, digitalization and sustainable development in the agricultural sector. This thematic focus finds a natural continuation in the presented dissertation work.

## **2. Relevance of the problem.**

Modern agriculture operates in conditions of increased environmental, economic and technological challenges related to the need to increase production efficiency, limit resource losses and adapt to the requirements of sustainable development. In this context, the implementation of innovative solutions, including unmanned technologies, is established as an important prerequisite for the modernization of the agricultural sector and the development of precision agriculture.

The relevance of the study is also strengthened by the changing European institutional framework, including the Common Agricultural Policy, the European Green Deal and the drive for digitalization of agriculture, which place increasingly high demands on the sustainable management of production processes, the reduction of the ecological footprint and the more efficient use of natural resources. Unmanned technologies – drones, agricultural robots and autonomous systems – offer new opportunities for monitoring, management and optimization of agricultural activities, but their economic efficiency and applicability in the conditions of Bulgarian agriculture remain insufficiently researched.

Of particular importance is the focus of the dissertation work on the Bulgarian context, characterized by structural features such as different farm sizes, limited investment capacity, demographic problems and uneven degree of technological readiness. In this sense, the study goes beyond purely technological analysis and emphasizes the economic, institutional and organizational prerequisites for the implementation of unmanned technologies in precision agriculture. This gives the work not only scientific novelty, but also significant practical applicability, related to the formulation of guidelines for sustainable development and technological transformation of the Bulgarian agricultural sector.

## **3. Purpose, tasks, hypotheses and research methods.**

The purpose of the dissertation is clearly formulated and aimed at conducting an economic assessment of the use of unmanned technologies in precision agriculture in Bulgaria, as well as at analyzing the future prospects for their development.

The tasks set are logically related to the purpose of the study and include: analysis of the theoretical and political prerequisites for the digitalization of agriculture; systematization of scientific research in the field; economic assessment of the implementation of unmanned technologies; comparative analysis with conventional technologies; study of the attitudes of agricultural producers; identification of the factors for implementation and development of development scenarios.

The research thesis is well-reasoned and corresponds to the logic of the

dissertation. It is based on the understanding that the implementation of unmanned technologies creates prerequisites for increasing economic efficiency, sustainability and resource optimization in crop production, with the degree of their application depending on economic, institutional and technological factors.

The methodological tools are rich and adequate. Analysis and synthesis, comparative analysis, economic evaluation, survey research, SWOT analysis, scenario analysis, case study approach and statistical methods were used. A strong point of the work is the integrated analytical approach, through which the economic, environmental, social and institutional aspects of the problem are considered in their interdependence.

#### **4. Visualization and presentation of the results obtained.**

The dissertation work is distinguished by a good structure, logical consistency and rich visualization. The work is 193 pages long and includes 24 figures, 27 tables, 160 literary sources and 4 publications related to the topic of the dissertation.

The figures and tables are with the help of expedient and assist in the perception of the result. They do not only perform an illustrative function, but also have analytical value, as they present comparative assessments, results of empirical observations, technological dependence, SWOT analyses. A particularly good impression is created by the author's models and conceptual schemes, through which the logic of the study, the factors for the implementation of unmanned technologies and possible models for their application in different types of agricultural holdings are presented.

The strength of the work was the desire to present the results not only descriptively, but also through systematized analytical tools. I believe that the visualization of the research is of good scientific quality, which increases the scientific persuasiveness of the work and facilitates the drawing of practically applicable conclusions.

#### **5. Discussion of the results and used literature.**

The discussion of the results is carried out consistently and with arguments. The doctoral student demonstrates the ability to interpret the obtained results in the context of the set goals and tasks. The dissertation work is not limited to a description of the technological capabilities of unmanned systems, but considers them as an economic, organizational and institutional phenomenon.

It should be appreciated that the results are discussed through the prism of Bulgarian agrarian conditions. This gives concreteness and applicability to the study. Both the possibilities for implementing unmanned technologies and the barriers related to investment capacity, regulatory environment, organizational readiness and access to technological resources are analyzed.

The literature used is sufficient in volume and thematically relevant. The inclusion of 160 literary sources shows good knowledge of the scientific problem and existing research in the field. The work demonstrates a desire to combine a theoretical basis, regulatory context and empirical argumentation.

## **6. Contributions of the dissertation.**

The presented dissertation contains scientific and applied scientific results, which I accept as real, justified and arising from the conducted research. The doctoral student demonstrates the ability to independently develop a current scientific problem, combining theoretical analysis, empirical research and strategic modeling in an area with a high degree of practical significance for the development of Bulgarian agriculture. The aspiration for a comprehensive analysis of the economic, environmental, social and institutional aspects of the implementation of unmanned technologies in the conditions of precision agriculture should be assessed particularly positively.

### **Scientific contributions**

The following can be highlighted as more significant scientific contributions:

1. The development of an integrated conceptual framework for analyzing the implementation of unmanned technologies in agriculture, which unites economic, production, environmental, social and institutional factors.

2. Enriching the theoretical understanding of the role of the institutional environment in the implementation of innovations in the agricultural sector, including by applying concepts from institutional economics.

3. Arguing the thesis that the implementation of unmanned technologies does not follow a universal model, but is a differentiated process, depending on the size, mechanization, investment capacity and organizational readiness of agricultural holdings.

4. The attempt to develop a theoretical formulation for a hybrid model of technological integration, in which unmanned technologies are combined with conventional mechanization.

### **Scientific and applied contributions**

The following should be mentioned as scientific and applied contributions:

1. The economic assessment of unmanned and conventional technologies in the context of corn production.

2. The development of models and scenarios for the implementation of unmanned technologies according to the size and profile of agricultural holdings.

3. The derivation of practical recommendations for the sustainable implementation of unmanned technologies in Bulgarian agriculture.

4. The proposed author's tool for assessing the applicability of unmanned technologies at the farm level.

I believe that the contributions of the dissertation work have both scientific value and clear practical applicability. They can be useful both for agricultural producers and consulting structures, as well as for institutions engaged in the development and implementation of policies for digitalization, sustainable development and technological modernization of the Bulgarian agricultural sector.

## **7. Critical notes and questions.**

The presented dissertation is a comprehensive, up-to-date and well-structured scientific study. I have no significant critical notes that would cast doubt on its scientific value, methodological validity or applicability.

As a developmental recommendation, I would point out that in future studies the author could expand the comparative analysis by including more international case studies and by more in-depth monitoring of the economic effects of the implementation of unmanned technologies in different types of agricultural crops. Such an expansion would build on the achieved results and would allow for a broader generalization of the conclusions.

I would ask the doctoral student the following question: **What, in your opinion, are the most important institutional prerequisites that need to be created in Bulgaria in order to accelerate the practical implementation of unmanned technologies in small and medium-sized agricultural holdings?**

The above recommendation and the question posed do not reduce my positive assessment of the dissertation, but rather outline possible future directions for the development of the candidate's research work.

## **8. Published articles and citations.**

Four publications have been presented on the topic of the dissertation, which corresponds to the requirements for acquiring the educational and scientific degree "doctor". The publications are thematically related to the issues of the dissertation and reflect individual aspects of the doctoral student's scientific research in the field of agriculture, the institutional environment, transaction costs and agrarian policy.

The presented publications show that the results of the dissertation research have been tested in a scientific environment and have received the necessary publicity. This is an important indicator of the activity of the doctoral student and of the relationship between the dissertation work and scientific communication on the problem under consideration.

The presented abstract objectively reflects the structure and content of the dissertation work.

## **CONCLUSION:**

Based on the analysis performed, I believe that the presented dissertation on the topic "Economic assessment and future prospects for the use of unmanned technologies supporting ecological orientation and precision agriculture in Bulgaria" represents an independent, complete and up-to-date scientific study with clearly expressed theoretical, methodological and applied value.

The dissertation demonstrates good scientific preparation of the doctoral student, skills for conducting independent research, ability to systematize and interpret scientific literature, as well as the ability to apply complex methodological tools in solving a significant scientific and practical problem.

Based on all this, I believe that the presented dissertation meets the

requirements of the Law on Agricultural Research and Development of the Republic of Bulgaria and the Regulations of the Agricultural University for its application, which gives me reason to evaluate it **POSITIVELY**.

Based on the above, I give my positive assessment and propose to the esteemed Scientific Jury to vote positively and award **Dafinka Vasileva Grozdanova** the educational and scientific degree "**Doctor**" in the scientific specialty "**Economics and Management (Agriculture)**", professional field 3.8. Economics.

**20 May 2026**  
Svishtov

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