REVIEW

PhD thesis for defense of the educational and scientific degree "doctor" in 3. Social, business and legal sciences, professional field 3.8. Economics, PhD Program in Economics and Management (Agriculture).

Author of the PhD thesis: Dobri Mateev Dunchev , PhD student at the Department of Economics at the Agricultural University, Plovdiv

Title of the PhD thesis: EVALUATION OF INNOVATION TECHNOLOGIES IN PRECISION AGRICULTURE

Reviewer: assoc. prof. dr. **Zornitsa Dimova Stoyanova**, UNWE, Natural Resource Economics department, professional field 3.8 Economics, specialty Economics and Management (Agricultural management), a member of the Scientific Jury with Order № РД - 16 - 546 / 25.06.2020 of the Rector at the AU

I. General presentation of the PhD thesis

The PhD thesis of Dobri Dunchev consists of an introduction, an exposition in three chapters, a conclusion, recommendations and a list of references. The total volume of the dissertation is 218 printed pages. The dissertation contains 22 tables and 56 figures. 331 literature sources were used, of which 17 in Cyrillic, 294 in Latin and 20 web pages. The literature sources are arranged in alphabetical order, first the sources in Cyrillic and then in Latin. The PhD student uses the literature sources correctly. They are skillfully selected, focused on the research topic. The literature review is rich. This gives grounds for the conclusion that Dunchev is highly informed and well acquainted with the theoretical achievements in the issues studied in the thesis.

The topic of the dissertation is actual, focusing on two interrelated topics such as innovative technologies and precision agriculture. This is a significant issue that addresses the challenges facing the implementation of innovations in agriculture. This is also due to the spreading of the ecological element in agricultural production. This shows that the PhD thesis is dedicated to an actual problem with public importance. PhD student Dunchev skillfully presents his arguments for the topicality of the problem, paying special attention and connected the costs arising from the environmental problems and the need for implementation of innovations and innovative solutions in agriculture. The object and the subject of the dissertation are well defined. The soft fruit sector is determined as the object, and the subject is to assess the effect of the application of innovative technologies in precision agriculture.

II. Assessment of the form and content of the PhD thesis

The dissertation contents three chapters.

The first chapter presents the theoretical review of sustainable development and its dependence on innovations and technologies. It contents the essence of sustainable development. A positive moment in this part of the study is the theoretical review of innovations and innovative technologies related to the nature, features and types of innovations, as well as the speed of entry of innovations. In this part of the study, the PhD student includes the literature review of precision agriculture, considering its nature, components and basic technologies in it. This chapter includes the methodological framework of the study, presenting the effects and impact of innovation in the agricultural sector, methods and approaches for analysis of efficiency and analysis of the usefulness of technologies in precision agriculture.

The second chapter presents the technologies of growing soft fruits, analyzing the technical and economic efficiency in the production of blackberries for selected cases. The PhD student skillfully presents and analyzes the technologies of growing blackberries in four selected farms in the UK and one in Bulgaria. The analyzes of the technical and economic efficiency in the selected five cases deserve special attention.

On the basis of the carried out research and analyzes are determined the possibilities for technological development in Bulgarian agriculture through digitalization. The described opportunities for digitalization of agriculture in Bulgaria, as well as the review od national strategic documents in the field of information and communication technologies could be highly appreciated.

The PhD thesis is written in semantically and grammatically good language, in a high style with economic orientation. PhD student Dunchev uses a rich toolkit of methods for the purposes of his research. They are with general scientific, analytical, empirical and statistical nature. He skillfully analyzes and evaluates primary and secondary sources of information.

Dunchev is presented five publications - one independent article and four co-authored. From the presented publications, one is in Bulgarian and the others are in English. They are directly related to the topic of the dissertation and reflect the main parts of it. The publications are in the period 2019-2020.

The autoreferat presents correctly the content of the dissertation, containing the necessary logical sequence. It includes the general characteristics of the PhD thesis, structure and content and a briefly presents the dissertation, contributions, publications on the topic of the dissertation and a declaration of authenticity.

III. Scientific and practically applied contributions of the dissertation:

The following scientific and practically applied contributions can be outlined in the dissertation:

✓ The theoretical basis of innovation, innovative technologies and precision agriculture are more clarified.

✓ A methodology for evaluation of innovative technologies in precision agriculture in Bulgaria has been developed.

✓   An assessment of the technical and economic efficiency of the application of innovative technologies in the production of soft fruits has been made.

✓   Practical and applied directions for the technological development of the Bulgarian agriculture through digitalization have been developed.

I accept the contributions formulated by Dobri Dunchev in his autoreferat. They are correct.

IV. Critical notes and questions

The importance and the actuality of the topic raises questions that the PhD student could clarify during the thesis defense:

✓   What will be the main environmental benefits of the implementation of innovative technologies in precision agriculture?

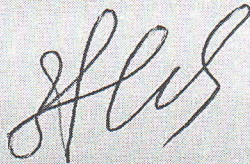✓   Has the thesis of your dissertation been confirmed and please give the main arguments for this?

V. Conclussion

Dobri Dunchev's dissertation is an independent study of an actual issue, elaborated deeply and containing all the necessary contributions to the required degree. The PhD student demonstrates in-depth knowledge in the innovation technologies in precision agriculture. The dissertation work meets the requirements of the LDASRB and the regulations for the implementation of the Law in the AU Plovdiv.

On the basis of the above mentioned reasons, I appreciate positively the PhD thesis and suggest to the honorable members of the Scientific Jury to decide to give Dobri Mateev Dunchev the educational and scientific degree "Doctor" in professional field 3.8. "Economics", scientific specialty "Economics and Management (Agriculture)".

Sofia
25.07.2020

Reviewer:
/assoc. prof. dr. Zornitsa Stoyanova/