



REVIEW

of a doctoral dissertation submitted for the award of the educational and scientific degree of Doctor (PhD)

Field of Higher Education 6. Agricultural Sciences and Veterinary Medicine, Professional Field 6.1. Plant Production, Scientific Specialty Fruit Growing (Pomology)

Author of the doctoral dissertation

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Title of the doctoral dissertation

INVESTIGATION OF SOME CULTIVAR–ROOTSTOCK COMBINATIONS FOR PLUM AND APRICOT

Member of the scientific jury

Prof. Boryana Mincheva Stefanova, PhD

Research Institute of Mountain Stockbreeding and Agriculture Troyan, PF 6.1. Crop production, Scientific specialty "Fruit growing". Appointed a member of the Scientific Jury according to Order РД 16-777/23.06.2026 of the Rector of the Agricultural University – Plovdiv.

1. Brief presentation of the candidate

PhD student **Todor Donkov Donkov** was born on 24 February 1996. He obtained his higher education at the Agricultural University – Plovdiv, where he graduated in 2020 with a Bachelor's degree in Agronomy (Field Crop Production) and, in 2021, obtained a Master's degree in Fruit Growing – Production and Management. Since 2022, he has been enrolled as a full-time PhD student in the scientific specialty Fruit Growing at the Agricultural University – Plovdiv.

His professional career has been entirely focused on fruit growing. Since 2022, he has been employed as an external inspector at the Control for Organic Production of the Agency for Organic Certification Ltd., where he carries out inspections, evaluates documentation and performs certification control of agricultural holdings.

Since 2025, he has held the academic position of Assistant at the Agricultural University – Plovdiv, where he conducts practical classes in the courses Fundamentals of Fruit Growing and Fruit Growing Technologies.

The candidate's research activities are focused on investigating the influence of different rootstocks on the growth, development and productivity of fruit crops. The results of his studies have been published in peer-reviewed scientific journals, including the *Journal of Mountain Agriculture on the Balkans*

and *Acta Horticulturae*, and have also been presented at international scientific conferences.

The PhD student actively participates in international scientific conferences and specialized training courses related to the processing of experimental data, scientific databases and teaching methodology, contributing to his professional and academic development. He is the winner of the „Agricultural excellent“ award for 2024 for high achievements in science and practice and encouraging the upcoming new generation in agriculture and agribusiness.

2. Relevance of the Research Topic

The topic of the dissertation is undoubtedly relevant and of great importance for the development of modern fruit growing. In the conditions of climate change, limited water resources and the need to increase the efficiency of production, the choice of appropriate cultivar-rootstock combinations is becoming increasingly important.

The dissertation examines two economically important fruit species – the plum (*Prunus domestica*) and the apricot (*Prunus armeniaca*), in which the rootstock has a significant impact on the growth force, early fruiting, productivity, fruit quality, adaptability to soil conditions and resistance to adverse factors. The doctoral student correctly argues the need for such research, taking into account the predominant use of seed stock in Bulgaria and the need to introduce more suitable clonal rootstocks for the creation of intensive fruit plantations. The desire to apply the results to the specific soil and climatic conditions of the country makes a particularly positive impression, which increases the practical value of the work.

3. Aim, Objectives and Research Methods

The main goal of the dissertation is clearly formulated and is aimed at studying the influence of different rootstocks on the biological and economic indicators of plum and apricot cultivars.

To achieve this goal, specific tasks have been set, related to the assessment of growth characteristics, the course of the main phenological phases, productivity, fruit quality and the interaction between the variety and the rootstock. The methods used are adequate to the tasks set. The author applies classical methods for field fruit growing experiments, phenological observations, biometric measurements and appropriate statistical processing, for a period of 3 years, which allows an objective interpretation of the results obtained. New results have been obtained for the conditions of Bulgaria and the dissertation has direct practical application.

4. Presentation and Illustration of the Research Results

The dissertation is developed in a volume of 148 pages and is structured in accordance with generally accepted requirements.

The chapter "Results and Discussion" covers 58 pages (pp. 46–103). The experimental data are presented through 28 tables and 36 figures, which illustrate the obtained results, support their comparison and interpretation and contribute to the better perception of the presentation.

The content follows the logic of the conducted experiments and allows for consistent tracking of the influence of the various cultivar-rootstock combinations on the studied morphological, physiological and economic indicators.

At the end of the dissertation, 18 conclusions are formulated, separated in accordance with the two main directions of the research – on plum and on apricot. They are logically structured and reflect the main results of the conducted research, corresponding to the set goal and tasks of the dissertation.

5. Discussion of the Results and Literature Review

The complex nature of the conducted research deserves high praise. The author has traced the influence of different rootstocks on the development of fruit plants already at the stage of production of the planting material and has continued the observations in fruit-bearing plantations. Such a comprehensive approach significantly increases the scientific and practical value of the dissertation work.

The obtained experimental results have been analyzed sequentially and discussed in comparison with literature data from Bulgarian and foreign sources. The doctoral student is not limited to presenting the established dependencies, but in most cases seeks their explanation by comparing them with published results for similar cultivar-rootstock combinations and different soil and climatic conditions.

The results of the research on plum and apricot have been considered independently, which allows to trace the specific features of the two fruit species and the influence of the rootstocks used on the growth, productivity and quality of the fruits. The analysis is logically consistent and follows the structure of the conducted experiments.

The literature used is voluminous and up-to-date. The bibliography includes 342 literary sources, the majority of which are publications in English. This indicates a good knowledge of international scientific research on the subject under consideration. The literature review covers the main areas related to the biological characteristics of plum and apricot, the characteristics of the rootstocks used and their influence on the growth, productivity and quality of the fruits. I believe that the presentation in this section is organized primarily as a sequential presentation of literary data. Its clearer structuring into separate thematic areas would facilitate the tracking of scientific research on the topics

under consideration and would argue more convincingly the need to conduct the dissertation research.

6. Contributions of the Doctoral Dissertation

The contributions presented by the author, in general, reflect the significance of the research conducted and I evaluate them positively. Some of them, however, reflect primarily specific experimental results or the conclusions drawn based on them, so I present them in a more generalized form.

Scientific contributions

- New experimental data have been obtained on the influence of different clonal and seed rootstocks on the growth, development, productivity and quality of fruits in domestic plum and apricot varieties grown under the soil and climatic conditions of Bulgaria.

- The specific features of the interaction between variety and rootstock have been established, taking into account differences in growth vigor, fruiting, yield and quality indicators of the fruits.

- The existing scientific knowledge regarding the behavior of the studied variety-rootstock combinations in the two fruit species has been expanded.

Scientific and applied contributions

- A comparative assessment of the prospects of the used rootstocks for modern fruit production has been carried out.

- The results obtained have practical value in the selection of appropriate varietal rootstock combinations for the creation of new fruit plantations.

- The recommendations made can be used both in production practice and in future scientific research on plum and apricot.

7. Critical Remarks and Questions

The dissertation demonstrates a good scientific and methodological level. The notes made are of a recommendatory nature and do not reduce its scientific value.

The text uses the non-standard abbreviation of the generic name (Pr.). According to the generally accepted rules of botanical nomenclature, it is recommended that after the first spelling of the generic name (*Prunus*) it be abbreviated as P. (e.g. *P. cerasifera*, *P. domestica*, *P. armeniaca*), and this style should be applied consistently throughout the text.

Synthesizing part of the tabular and graphic material and eliminating repetitive information or uninformative rows (table 11; table 13) can optimize the content. This would improve the clarity of the presentation without reducing the scientific value of the dissertation.

The conclusions correctly reflect the obtained results, but some of them represent a description of experimental observations, without summarizing them as scientific regularities.

E.g. conclusion 6 – Ishtara and Wavit rootstocks do not produce suckers (observation). The conclusion from this fact is that by using the Ishtara and Wavit vegetative rootstocks, the formation of root suckers is eliminated, which is a practical advantage in the cultivation of plum plantations.

Conclusion 8 - In (*P. cerasifera*) and Ishtara, we found a high percentage of interception (over 90%) - also an observation. The conclusion is that The high percentage of interception in seed (*P. cerasifera*) and Ishtara shows good compatibility with the varieties..., which makes them suitable for the production of quality planting material.

In plum, the author found that rootstocks do not significantly affect the size of the fruits. In apricot, it is exactly the opposite. GF 677 and Garnem increase the size. This is one of the strongest practical results. To sufficiently emphasize its importance, it can be continued that a larger fruit means a higher commercial value, better realization, higher economic efficiency.

Questions

Why is the Efficiency coefficient a more informative indicator than the yield itself in the evaluation of rootstocks?

What are the reasons for the same rootstock to exhibit a different Efficiency coefficient in different cultivars?

Regardless of the recommendations made, which are mainly of an editorial and interpretative nature, the dissertation represents a completed scientific study with a clearly formulated practical focus. The author demonstrates skills in planning and conducting long-term field experiments, in processing and analyzing a significant volume of experimental material and in drawing scientifically substantiated conclusions. The results obtained have scientific and applied value, and represent a useful contribution to research on cultivar-rootstock interactions in plum and apricot.

From the materials submitted to me for review, I am left with the impression that Todor Donkov is a hardworking and purposeful young scientist who has made significant efforts to realize the research tasks set. I am convinced that the experience gained and the results obtained will be a good foundation for his future scientific and professional development.

8. Published articles and citations.

The abstract in a summarized form of 58 pages objectively reflects the structure and content of the dissertation, through its 28 tables and 20 figures. It meets the requirements for form and content. It also reflects three scientific papers from the *Journal of Mountain Agriculture on the Balkans*, related to the dissertation, in which the doctoral student is not the first author, but they are directly related to the topic and are part of the results. This fully covers the national minimum requirements set by the regulations of the Agricultural

University of Plovdiv for the implementation of the Law for development of the academic staff of the RB.

CONCLUSION:

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

I propose to award **Todor Donkov Donkov** the educational and scientific degree of "**Doctor**" in the field of higher education 6. Agricultural Sciences and Veterinary Medicine, Professional Field 6.1. Plant Breeding, Scientific Specialty "Fruit Growing".

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RIMSA Troyan

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