Scientific opinion

on a dissertation for obtaining the educational and scientific degree **"Doctor"** in: Field of Higher Education **6. Agricultural sciences and veterinary medicine**, professional field **6.1 Crop Production**, the scientific specialty **Fruit-growing**.

Author of the dissertation: Mladen Nanev Petrov – full-time PhD student at the Department of "Viticulture and Fruit-growing" at the Agricultural University, Plovdiv

Dissertation topic: "A study on GF 677 and GXN 15 (Garnem) clonal rootstocks grown in nursery and peach and plum orchards"

Reviewer: Assoc. Prof. Svetoslav Malchev Malchev, Ph.D., Fruit Growing Institute – Plovdiv, Agricultural Academy, field of higher education 6. Agricultural sciences and veterinary medicine, professional field 6.1 Crop Production, scientific specialty Selection and seed production of cultivated plants

appointed as a member of the scientific jury by Order No. RD 16-1125 / 10.10.2024. by the Rector of the AU.

1. Relevance of the problem.

In recent decades, the development of rootstocks for stone fruit species has begun to shift from seedling to clonal types, many of which are of interspecific origin. The lack of suitable and compatible rootstocks limits the expansion of areas and increase in yields. Still in the country, a large part of the planting material production uses seedling rootstocks, which is the main reason for the low productivity. During last decades, a great progress has been done in the development of clonal rootstock in Prunus species, and to date various clonal rootstocks have been developed in different countries of the world which offered a great potential for cultivation in respect to production and productivity.

Evaluating them in specific soil and climatic conditions and implementing them in practice is essential for the competitiveness of farmers.

2. Purpose, tasks, hypotheses and methods of research.

The aim of the research is to study the growth characteristics of the rootstocks 'GF 677' and 'Garnem' ('GxN15') in a nursery and orchard under the specific soil and climatic conditions of Southern Bulgaria.

In the section "Material and methods" the experimental material with its origin is indicated. Compact, but accurately, the experimental design is described, as well as the indicators for observations.

3. Visualization and presentation of the obtained results.

The dissertation is written on 136 standard pages and is very well illustrated, containing 51 figures, 28 photographs and 25 tables.
The dissertation is written concisely, reads lightly and is terminologically sound.

4. Discussion of the results and used literature.

In connection with the literature review and discussion of the experimental results, a rich literature reference was made, including a total of 227 sources, of which 31 in Cyrillic and 196 in Latin, covering the period from 1956 to 2022. This shows that the PhD student is very familiar with the problems, and this allows him to make a precise analysis of the obtained results.
The main conclusions in the dissertation are formulated clearly and accurately reflect the results obtained, thus fulfilling the goals set in the development.

5. Contributions of the dissertation.

Based on the obtained results, 3 contributions of original scientific nature and 5 scientific-applied contributions have been formulated, the most important of which are:

Scientific contributions

1. The behaviour of the rootstocks 'GF 677' and 'Garnem' ('GxN15') and the influence they have on the growth and reproductive manifestations of modern peach and plum cultivars in a nursery and orchard have been studied.
2. Data have been generated on the influence of the rootstocks 'GF 677' and 'GXN15' on the development of phenophases of modern peach and plum cultivars under the specific soil and climatic conditions of Southern Bulgaria.
3. Information was obtained about the influence of 'GF 677' and 'GXN15' rootstocks on the chemical composition of the fruits of peach and plum cultivars.

Scientific and applied contributions

1. The compatibility of the rootstocks 'GF 677' and 'Garnem' ('GxN15') with the plum and peach cultivars participating in the study was established.
2. The yields obtained using the rootstocks 'GF 677' and 'Garnem' ('GxN15') compared to the seedling rootstock (*P. cerasifera*) are compared.
3. The ability to produce suckers of both rootstocks in plum orchards has been studied.
4. The yields per unit area between the rootstocks 'GF 677' and 'Garnem' ('GxN15') in peach and plum orchards are compared.
5. As a result of the study, it is recommended to use the 'GF677' rootstock (*P. dulcis* x *P. persica*) in the production of plum fruits, as an alternative to the widely used in the country myrobalan seedling rootstock (*P. cerasifera*).

6. Critical remarks and questions.

Highly appreciating the research work of the PhD student, I can give the following recommendations:

1. When performing phenological observations, in order to compare the results, the generally accepted BBCH methodology should be used (Meier, U., 2018. Growth

stages of mono- and dicotyledonous plants: BBCH Monograph. Open Agrar Repositorium. https://doi.org/10.5073/20180906-074619).

2. In the attached literature reference, the same style should be used for all listed publications.

7. Published articles and citations.

In connection with the dissertation, the PhD student has presented 3 scientific publications in co-authorship with the supervisor: 1 publication in a journal refereed and indexed in Scopus (SJR 0.235) and Web of Science, and the remaining 2 – in Web of science (all database).

The scientific publications cover the minimum national requirements of the Act on Development of the Academic Staff in The Republic of Bulgaria and the Regulations of the Agricultural University for its application.

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

CONCLUSION:

Based on the various research methods learned and applied by the PhD student, the correctly conducted experiments, the analysis and conclusions made, I believe that the presented dissertation meets the requirements of the Act on Development of the Academic Staff in The Republic of Bulgaria and the Regulations of the Agricultural University, Plovdiv for its application, which gives me reason to evaluate it **POSITIVELY.**

I take the liberty of proposing to the honourable Scientific Jury to also vote positively and award Mladen Nanev Petrov – a full-time PhD student at the Department of "Viticulture and Fruit-growing" at the Agricultural University, Plovdiv the educational and scientific degree **of "*Doctor*"** in the scientific specialty of **Fruit-growing**.

Date: 14.11.2024
Plovdiv

Signature: .....

(Assoc. Prof. S. Malchev, Ph.D.)