

## SCIENTIFIC OPINION

On a PhD thesis for obtaining educational and scientific degree "Doctor" in higher education 6. Agricultural Sciences and Veterinary Medicine, professional field 6.1. Plant growing, scientific speciality "Fruit growing".

**Author of the PhD thesis:** *Mladen Nanev Petrov*, PhD student of the "Viticulture and fruit growing" department at the Agricultural University, Plovdiv.

**Topic of the PhD thesis:** „A study on GF 677 and GXN 15 (Garnem) clonal rootstocks grown in nursery and peach and plum orchards”

**Prepared the opinion:** *Assoc. Prof. Marieta Kostadinova Nesheva* PhD, Agricultural Academy, Fruit Growing Institute - Plovdiv, 6. Agricultural Sciences and Veterinary Medicine, professional field 6.1. Plant growing, scientific speciality: Plant breeding and seed production of cultivated plants, appointed as a member of the scientific jury by order № ПД-16-1125/10.10. 2024 of the Rector of Agricultural University.

### 1. Relevance of the problem.

Plums and peaches are one of the country's main fruit species. Rootstocks in fruit growing influence the growth vigour, the plants' fruiting, fertility, and production quality, and they also determine the planting density and cultivation technology. In order to solve the main problems in the orchards and to intensify the cultivation of the two fruit species, introducing and testing new rootstocks is necessary. In this context, the dissertation developed by Mladen Petrov is relevant and aimed at accumulating new knowledge about the use of peach-almond hybrids, as rootstocks for plums and peaches in the conditions of our country.

### 2. Aims, tasks, hypotheses and research methods.

The aim of the dissertation is clearly formulated and is aimed at the accumulation of valuable knowledge about the specific growth characteristics of the clonal rootstocks GF 677 and GXN 15 (Garnem) in a nursery, as well as their influence on the vegetative and reproductive characteristics of three plum and three peach cultivars under the conditions of Southern Bulgaria and to determine the most suitable of them. The selection of tasks is precise and fully corresponds to the main objective of the study.

The methodology of the conducted trials is correctly established, and a sufficient number of indicators are included, which makes it possible to achieve the stated tasks and objectives. Soil and climate characteristics of the area for the period of the study are presented. The reliability of the results is supported by statistical processing through appropriate software, which contributes to the validity of the conclusions.

### 3. Illustration and presentation of the obtained results.

The dissertation is written on 136 pages and includes all the necessary sections. The results are well illustrated in 51 figures, 25 tables and 28 photos, which allows us to get a complete and real picture of the established trends.

### 3. Discussion of the results and references.

A very good impression is made by the detailed literary overview with 227 sources included, of which 31 in Cyrillic and 196 in Latin. The Results and Discussion section is based on a comprehensive and in-depth analysis reflecting the behaviour and influence of peach-almond hybrids GF677 and GXN15(Garnem) used as rootstocks in growing plum and peach cultivars in nursery and orchards. In addition, a detailed analysis of the chemical composition of the obtained product has been made. As a result, 19 conclusions are made.

#### **4. Contribution of the PhD thesis.**

Based on the obtained results, 3 contributions of an original scientific nature and 5 contributions of an applied nature were formulated. The most important ones are:

##### *Scientific contributions*

- For the first time in Bulgaria, extensive information was obtained concerning the behaviour of the clonal rootstocks GF 677 (*P. dulcis* x *P. persica*) and GXN15 (Garnem) on the vegetative and reproductive characteristics of modern peach and plum cultivars in a nursery and orchard.
- The influence of the rootstocks GF 677 and GXN15 on the phenological stages flow has been studied in an orchard of modern cultivars.
- Information was obtained on the influence of the GF 677 and GXN15 rootstocks on the chemical composition of the fruits of peach and plum cultivars.

##### *Contributions of applied nature*

- The rootstocks GF 677 and GXN15 rootstocks showed good compatibility with all investigated plum and peach cultivars.
- The rootstocks GF 677 and GXN15 do not form suckers in the plum orchards, unlike the myrobalan seedling.
- The rootstock GF 677 provides higher yields per unit area in peach and plum plantations than GXN15.
- The rootstock GF 677 is recommended for plum fruit production as an alternative to myrobalan seedlings.

#### **5. Critical notes, questions and recommendations.**

I have no critical notes or questions.

#### **7. Published scientific articles.**

In connection with the PhD thesis, the doctoral student has presented 3 scientific publications, 1 of them referenced in the world database Scopus, and the other 2 – in Web of Science (all databases). The scientific publications carry a total number of 30 points with which the doctoral student meets all requirements of the LAW ON THE DEVELOPMENT OF THE ACADEMIC STAFF IN THE REPUBLIC OF BULGARIA. The presented abstract is well structured and objectively reflects the content of the dissertation work.


#### **CONCLUSION:**

Based on the various research methods learned and applied by the doctoral student, the correctly performed experiments, the generalizations and conclusions made, I believe that the presented dissertation meets the requirements of the LAW ON THE

DEVELOPMENT OF THE ACADEMIC STAFF IN THE REPUBLIC OF BULGARIA and the Regulations of the Agrarian University for its application, which gives me grounds to evaluate it **POSITIVE**. I propose to the honorable Scientific Jury to also vote positively and award Mladen Nanev Petrov the educational and scientific degree "Doctor" in the scientific specialty "Fruit growing".

**Date:** 14.11.2024 г.  
Plovdiv

**PREPARED THE OPINION:**



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(Assoc. Prof. Marieta Nesheva)