



## REVIEW

On a dissertation work for obtaining an educational and scientific degree "doctor" in: field of higher education 6. "Agrarian sciences and veterinary medicine", professional direction 6.1. "Crop production", scientific specialty "Viticulture".

**Author of the dissertation:** As. ANELIA SVETOSLAVOVA POPOVA, doctoral student of independent training at the Department of Viticulture and Fruit Growing at the Agricultural University, Plovdiv.

**Topic of the dissertation:** "Comparative study of vegetative and reproductive manifestations of some branches of the Syrah variety".

**Reviewer:** academician Prof. Dr. Kiril Todorov Popov, higher education area 6. "Agrarian sciences and veterinary medicine", professional direction 6.1. "Plant breeding", scientific specialty "Viticulture" appointed by order No. RD - 16 - /07.06.2023 by the AU Rector.

### **Brief introduction of the candidate:**

As. Anelia Svetoslavova Popova was born in Karlovo on August 21, 1975. He completed higher education at the Agricultural University, Plovdiv in 2000, as a master's degree - Engineer-Agronomist with a specialty "Agroengineering tropical and subtropical agriculture". During his studies, he acquired two additional qualifications, a teacher in the specialty "Professional Pedagogy" and an economist in the specialty "Economics and Foreign Trade", at the Agrarian University in Plovdiv.

In 2003, he obtained a master's degree in "International Economic Relations" at the "Paisii Hilendarski" University, Plovdiv. In 2000-2004 he was an agronomist at EOOD "Maria 94" in Plovdiv, and from 2005 to 2010 he was an associate in the Marketing Department at BTC AD, Sofia.

From 2011 to 2019, he was the chief expert in the Department of Viticulture. During this period, he studied short-term under the Erasmus Program at the University of Maribor, Slovenia in 2017 and at the agricultural school "Alpefpa les sillons de haute Alsace" in Roufache, France in 2018.

In September 2019, through a competition, he held the academic position of "assistant" in the scientific specialty "Viticulture", at the department "Viticulture and fruit growing, Plovdiv. Exercises and practices in the disciplines "Fundamentals of Viticulture" and "Technologies in Viticulture", with students from full-time and part-

time forms of education, in the "Bachelor's College" were also assigned to be performed.

In the period 2020-2023, As. Popova participated in infrastructure projects, one of which he was the operational manager of.

He is the supervisor of 11 graduate students, two of whom have successfully defended their diploma theses. He is a member of the General Assembly of the Faculty of Horticulture, at AU, Plovdiv. Good command of written and spoken English and Russian languages.

On June 2, 2023, As. Popova was dismissed with the right of defense to acquire the ONS "Doctor", in the scientific specialty "Viticulture".

### **Timeliness of the problem.**

The supply of introduced vine varieties and branches in the country in the last 2-3 decades requires their testing to prove their biological and economic qualities.

The dissertation work of doctoral student Anelia Svetoslavova Popova complements the continuous aspiration of grape and wine producers to satisfy the variety of tastes and people's interest in high quality wines. In this sense, the research conducted on branches of the Syrah variety can be defined as particularly timely and relevant for the viticulture and winemaking practice.

The French Syrah variety is one of the world's most widespread red wine varieties, which has gained popularity with the undeniable taste qualities of the dark red, extract-rich, dense, harmonious taste and high-quality wines it produces. The interest in this variety, also called "aristocratic", leads to the emergence of a number of branches with different biological and economic qualities.

Due to its valuable qualities, the Syrah variety is quickly gaining popularity in Bulgaria as well. The first plantings were created on small areas in the area of Lyubimets and Sakar in 2001. In the following years, a rapid spread was made in other wine-growing areas, reaching an area of over 1000 hectares.

The studies included in the dissertation work are up-to-date, original and with a high potential for further applications of the obtained results.

### **Degree of knowledge of the state of the problem and creative interpretation of the literature review.**

In order to enrich the knowledge and to clarify the need to define and develop the topic, a comprehensive literature review was made, which covers 37 pages. 257 sources are cited, of which 12 are in Cyrillic and 245 are in Latin, consistently addressing the topics related to the dissertation work. The presentation of the literary

data is multifaceted and correct, which shows a good awareness of the doctoral student on the topic set for research.

**Purpose, tasks, hypotheses and research methods. Correspondence of the chosen research methodology with the set goal and tasks of the dissertation work.**

I consider the set goal of research - "vegetative and reproductive manifestations of clones with No.100, 174, 470 and 524 of the Syrah variety, with a view to improving the technology of growing vines and processing grapes" to be scientifically justified. The methodological part is formulated correctly and occupies an important part of the dissertation work. Appropriate agrotechnical, biometric, biochemical and statistical methods were used. A large number of indicators of the starting material, during the vegetation of the vines, the yield and the obtained wines were studied.

The tasks formulated by the doctoral student reflect the necessary activities to achieve the set goal.

**Transparency and presentation of the obtained results.**

The dissertation is well illustrated with 62 figures, 28 tables and 3 appendices, which show precision in the work of the doctoral student.

Each of the studied indicators corresponds to the set tasks and ends with a reasoned comment on the obtained results. The experimental work was carried out according to the accepted methodology, as a result of which the obtained data are representative. Due to the complex nature of the scientific development, a number of agrobiological, physiological and technological indicators and methods were used, which objectively reflect the results of the research activity. With this, all stages of growing and vinification of the production have been observed.

**Discussion of results and references.**

The experimental planting is located in the Educational and experimental and implementation base of the Department of Viticulture and Fruit Growing at the Agricultural University, Plovdiv. The plantation was planted in 2011. The vines are planted at a distance of 3x1 meters, formed high-stemmed with bilaterally located cordons.

The load on the vines in all variants was carried out by pruning plugs with two winter eyes each. In the scheme of the experiment, 8 variants with non-normalized and normalized yield were set with 8 grapes left on the vine in the pea phase, in order to show the peculiarities in the quality of the grapes and the resulting wine.

The experimental plantation is located in an area with a total temperature sum of 4,364°C, with a duration of the vegetation period of 230 days and with an average amount of precipitation over the three years of 618 mm. The soil is deluvial-meadow,

loamy-sandy to sandy-loamy. The clay content is 30-40%, and the acidity is slightly alkaline - Ph 7.6. The specified soil and climate parameters determine favorable conditions for growing vineyards and for obtaining quality red wines.

The obtained results are summarized according to the biological, physiological and technological requirements of the studied branches. In fulfillment of the set goal, the doctoral student used 4 branches of the Syrah variety - 100, 174, 470 and 524, grafted on Berlandieri x riparia SO4 rootstock, which possess valuable economic and technological qualities, but are distinguished by their biological potential.

#### **Dissertation Contributions.**

The conclusions in the dissertation objectively reflect the nature and essence of the obtained experimental data from the conducted comparative study.

The dissertation is the first of its kind agrobiological study of branches of the red wine variety Syrah in the Rhodope Neck region, which in itself is an important contribution.

#### **Contributions of a fundamental and scientific-methodical nature.**

Methodical and scientifically based approaches were used to process the experimental data. One-way analysis of variance (ANOVA) was applied. To determine the statistical significance of the differences between individual variants, Duncan's multiple range test was applied at a level of significance of the results  $P \leq 0.05(5\%)$ .

As an original contribution, I define the methodically correct and scientifically accurately assessed agroecological environment for conducting experiments under Polish conditions for the production of quality grapes and the scientifically based soil-climate-variety system.

For the first time, the reaction of clones No. 100, 174, 470 and 524 of the Syra variety, grown under the soil and climatic conditions of the Rhodope collar, was established. The Sira 100 and 524 clones have shown their biological potential to the greatest extent.

It has been proven that the wines of clone 524 with normalized yield are distinguished by the highest organoleptic qualities - high content of total and sugar-free extract, content of anthocyanins, total phenolic substances, higher intensity of color, aroma, body, harmony, finesse, length of flavor and fruitiness, followed by the wines of clones 174 and 470.

It has been established that the wines under the soil and climate conditions of the Rhodope collar are distinguished by a rich aromatic profile.

It has been proven that the content of C13-Norisoprenoids (beta-damascenone, alpha and beta ionone), responsible for the typicality and aromatic profile of the wine,

varies significantly, depending on the biology of the branch and the cultivation technology.

#### **Scientific and applied contributions.**

It was found that the growing season of vines from clones 174 and 470 started one week earlier than the other two clones, which feature allows them to be used in terrains with frequent recurrence of late spring frosts.

It has been proven that the studied branches have a high actual fertility of the vines, the highest being in clone 100 (Kr-1.72) and clone 524 (Kr-1.72). The two branches also have the ability to produce a higher percentage of fruit shoots from dormant buds, which allows the plants to recover after damage from late spring frosts.

With the highest content of coloring matter and trans-resveratrol, the wines of clone 524 and clone 100 with normalized yield are distinguished, which makes them suitable for the pharmaceutical industry for the production of drugs for blood sugar fluctuations, neurodegenerative, cardiovascular, cancer and other diseases related to age.

It was established that the quality of the obtained wines from all studied branches is much higher when summer pruning operations are applied - pruning and normalizing the number of bunches. To determine their optimal number as a mandatory practice.

The bioproductive and technological qualities of the studied branches have been scientifically proven, which is a prerequisite for their effective distribution with significant benefits from an economic and social aspect.

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

In the structure of the national economy, viticulture should be designated as a "sector" in the plant growing sub-sector, not a "sub-sector" (page 4 of the dissertation and page 3 of the abstract).

Contemporary foreign and our authors are used in the presented rich literary overview. It is noteworthy that the cited Bulgarian authors are relatively few, despite the numerous studies on the topics concerned.

The text of the used quotations from foreign authors is not sufficiently clear and understandable, i.e. it is not cleaned stylistically and terminologically.

On page 95 of the dissertation, paragraph 6 in the last sentence, an error was made. Data on the coefficient of actual fertility of the branches for the first year studied are indicated, instead of averaged data for the entire study period.

*A question.* If you had to recommend one of the studied branches, which of the studied indicators would you prioritize and in what microdistricts should it be grown?

*A question.* According to the latest NSI data, how many areas are occupied by the Syrah variety in the country?

**Published articles and citations.**

In connection with the dissertation work, the doctoral student has published 1 independent article in Horticulture magazine with IF (2,923), on the topic: "Influence of the biochemical composition of vine canes on cold resistance of buds in different "Syrah" clones".

Citations from the doctoral student are not indicated.

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

The obtained results are a personal contribution of the doctoral student and present him as a specialist with very good theoretical and practical training.

**CONCLUSION:**

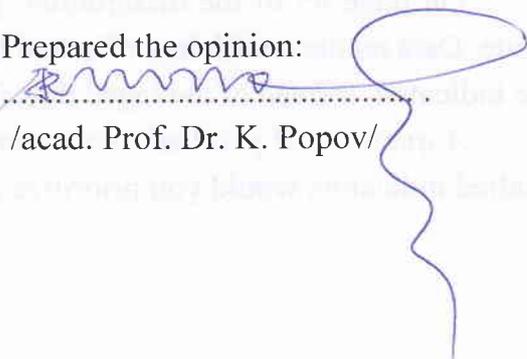
The dissertation submitted for review is the result of in-depth systematic work and represents an original, complex agrobiological study. Scientific development is current. Various research methods have been applied by the doctoral student with correctly performed experiments, generalizations and conclusions have been made. The obtained valuable and significant results contain data of a certain contribution nature, some of which are innovations in science and have both fundamental theoretical and applied value. They reflect good literary awareness and methodical preparation of the author.

The dissertation meets the requirements of the RSARB and the Regulations of the Agrarian University for its application, which gives me reason to evaluate it POSITIVELY.

I take the liberty of proposing to the honorable Scientific Jury to also vote positively and award As. ANELIA SVETOSLAVOVA POPOVA the educational and scientific degree "DOCTOR" in the scientific specialty "VITICULTURE".

Date: 20.06.2017.  
Sofia city

Prepared the opinion:

  
/acad. Prof. Dr. K. Popov/