



## OPINION

on a dissertation for obtaining the educational and scientific degree "PhD" in the field of higher education 6. "Agrarian sciences and veterinary medicine", professional field 6.2. "Plant protection", scientific specialty "Plant protection (Phytopathology)"

**Author of the dissertation:** Assistant **MARTIN GEORGIEV MARINOV**, full-time PhD student at the Department of Phytopathology of the Agricultural University /AU/ - Plovdiv

**Dissertation topic:** "EPIDEMIOLOGY AND CONTROL OF CYLINDROSPOROSIS OF CHERRY AND CHERRY /*BLUMERELLA JAAPII*"

**Scientific supervisor:** Chief Assistant **Zvezdomir Zhelev PhD**

**Member of the scientific jury:** Professor **Hristo Georgiev Bozukov, PhD**, from the Institute of Tobacco and Tobacco Products - Markovo, habilitated in the field of higher education: 6. "Agrarian Sciences and Veterinary Medicine", professional field 6.2. "Plant Protection", scientific specialty: "Plant Protection" (Phytopathology), appointed as a member of the scientific jury by Order No. RD 16-1330/22.11.2024 of the Rector of the Agrarian University.

### 1. Brief introduction of the PhD student

Martin Georgiev Marinov was born on 01.07.1992 in the village of Mihaylovtsi, Gabrovo region. He completed his higher education in 2015 at the Agricultural University of Plovdiv with a Bachelor's degree, majoring in Agronomy (Viticulture and Horticulture), and in 2016 he obtained a Master's degree after a one-year course of study at the Agricultural University of Plovdiv, majoring in Plant Protection in the International Master's Course in Plant Protection. From September 01, 2021 to now, Martin Georgiev is an assistant at the Department of Phytopathology of the Agricultural University of Plovdiv.

PhD student Martin Marinov has participated in two scientific forums:

1. 1-st International Symposium on Climate Change and Sustainable Agriculture, 14.11.-15.11.2019 – Plovdiv, Republic of Bulgaria.
2. VIII Congress on Plant Protection, 25.11.-29.11.2019 – Zlatibor, Republic of Serbia.

He has presented one publication in connection with the dissertation work:

Marinov, M. (2022). Development of the cherry leaf spot epidemics in different regions of Bulgaria. *Agricultural Sciences/Agrarni Nauki*, 14(32), 47-55. /Web of Science /

### 2. Relevance of the problem.

Cylindrosporiosis with the causative agent (*Blumeriella jaapii* (Rehm) Arx) is among the most common fungal diseases of cherries worldwide. Due to the lack of resistant varieties with organoleptic and technological characteristics comparable to those currently grown, control is mainly through chemical agents and some sanitary measures. As a result of long-term use of systemic fungicides, new resistant races of the causative agent have emerged, which poses a serious risk to the development of the sector in some regions of the world.

A basic principle underlying the control of airborne plant diseases is strict control in the initial phases of emergence and spread. In this sense, there is a need for more in-depth knowledge of the epidemiological characteristics of the disease and the introduction of modern control

strategies on this basis, which are part of a comprehensive and more effective plant protection for fruit species.

The issue of reducing the amount of pesticides used is addressed in the development of the European Commission's (EC) Farm to Fork Strategy, which is part of the European Green Deal. Forecasting models implemented in a Decision Support System (DSS) are considered one of the main methods for reducing chemical spraying.

In this aspect, the topic of the presented dissertation is interesting and relevant.

### **3. Purpose, tasks, hypotheses and research methods.**

The dissertation aims to study new epidemiological features, possibilities for prognosis and control of the disease cylindrosporiosis of cherry and sour cherry caused by *Blumeriella jaapii* (Rehm) Arx. The purpose and tasks are correctly formulated.

Five specific tasks are indicated for solving to achieve the set goal. The research methods are consistently and accurately described, in accordance with the activities carried out. The dissertation aims to study new epidemiological features, possibilities for prognosis and control of the disease cylindrosporiosis of cherry and sour cherry caused by *Blumeriella jaapii* (Rehm) Arx. The purpose and tasks are correctly formulated.

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### **4. Visuality and presentation of the results obtained.**

The dissertation is well structured, containing all the required sections - Introduction, Literature review, Aim and objectives, Material and methods, Results and discussion, Conclusions, Literature, Appendices. It is written on 184 pages, contains 41 tables and 59 figures. The studies were conducted during the period 2018-2020 at the Department of Phytopathology and the Center for Integrated Plant Disease Management at the Agricultural University-Plovdiv, in cherry and sour cherry plantations in the districts of Plovdiv, Stara Zagora and Sofia.

The volume and type of information collected meets the purpose of the study, the data processing is correct, the visualization of the results is at a good level.

### **5. Discussion of the results and used literature**

The literature review correctly presents the state of the problem. It includes 310 literary sources, of which 43 in Cyrillic and 267 in Latin. The developed literature review shows the good theoretical preparation of the doctoral student on the problems related to the object of the dissertation research. The discussion of the results is in-depth and is based on the conducted experimental work.

### **6. Contributions of the dissertation work.**

#### ***Original scientific contributions***

1. For the first time in the world, a precise (hourly) study of the amount of spores in the air was conducted using a high-class 7-day spore trap such as that of Burkard Manufacturing Co Ltd.
2. For the first time in the world, a differentiated reading of the amount of AS and SMC in the air was conducted, this allows determining their ratio and dynamics of dispersion during the day and the growing season.
3. For the first time in the world, a study was conducted on the use of a predictive model of Eisensmith and Jones with a built-in weather forecast, which allows a more flexible approach to decision-making and conducting prophylactic, not only curative, treatments.

4. For the first time in Europe, a study was conducted to prove infectious events under field conditions using control plants.

#### ***Applied contributions***

1. Epidemiological data on airborne AS and PMCs may be used to create a mathematical model that can be part of the assessment of the risk of primary infection.
2. The largest number of events with the first AS and SMC releases occurs immediately after the start of precipitation. A smaller but significant share falls on releases that begin one or two hours after the specified time. Such results indicate the appropriateness of conducting chemical treatments with contact products against germinated but not yet infected spores during or shortly after precipitation. Such practice is leading in the control of scab on apple or pear.
3. The use of the Eisensmith and Jones model in combination with a built-in weather forecast allows for optimal control of the disease after treatment when a high infectious index is reached, and this leads to a reduction in their total number. A similar strategy is applicable to technology with biologically permitted or conventional products.
4. Chemical treatments during flowering and afterwards, aimed at preventing infection on the stipules, are essential for the control of CS throughout the season. During flowering, AS and SMC have been established.
5. The main stock of primary inoculum is realized by the end of May, but a certain part of it is dispersed by the end of June. This proves the need for preventive spraying even during the harvest period and emphasizes the importance of all incl. sanitary measures before that, which would reduce the infectious pressure.

#### **7. Critical remarks**

I highly appreciate the work done and the results achieved by the doctoral student.

I have no critical remarks about the doctoral student's work. I will allow myself only one recommendation - when formulating the conclusions of the results of his scientific research, he should try to present them in a more generalized form.

#### **CONCLUSION**

Based on the various research methods applied by the doctoral student, the correctly conducted 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 reason to evaluate the dissertation **POSITIVELY**.

I propose that the esteemed Scientific Jury also vote positively and award **MARTIN GEORGIEV MARINOV**, a full-time doctoral student at the Department of Phytopathology at the Agrarian University-Plovdiv, the educational and scientific degree "PhD" in the scientific specialty "Plant Protection (Phytopathology)".

**01/30/2025**

**Plovdiv**

**PREPARED THE OPINION:**

**/Prof. Hristo Bozukov PhD/**