



STATEMENT

on dissertation work for obtaining the educational and scientific degree "Doctor" in: field of higher education 6. Agrarian sciences and veterinary medicine, professional field: 6.1 Crop science, scientific specialty: Crop science

Author of the dissertation: Svetlana Yordanova Manhart part-time PhD student at the Department of Crop Science at the Agricultural University, Plovdiv.

Thesis topic: " Varietal response of coriander (*Coriandrum sativum* L.) depending on the application of some foliar treatment products".

Reviewer: Prof. Dr. Ivan Hristov Yanchev, Agricultural University, Plovdiv. Crop Science Department, professional field: Crop science, scientific specialty: Crop science, appointed from the Rector of the Agricultural university as a member of the Scientific Jury with Order No. RD-16-515/04.05.2023

1. Relevance of the problem.

Coriander is one of the major essential oil crops grown in Bulgaria. The application of suitable agrotechnical practices in its cultivation is a prerequisite for the realization of the productive potential of plants. The use of growth regulators stimulating plant growth and development is of great importance for increasing the seed yield and essential oil content, as well as the ability of the crop to overcome some abiotic stress factors. These compounds affect the plants by enhancing metabolism, activating the absorption of nutrients and promoting their redistribution in the organism. In this connection, the presented dissertation is not only relevant but also important for agriculture, because it gives an answer for the influence of plant stimulants on the productivity and quality of coriander varieties.

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

The purpose of the dissertation is clearly and precisely formulated and in order to achieve it four main tasks are indicated. In accordance with the stated purpose and tasks, three annual field experiments were conducted on the experimental land of the village of Voivodinovo, Plovdiv region. Methodologically, the study is well-established. The examined factors and their levels are correctly indicated. In the study during the period 2020-2022 are included, five coriander varieties, created in different breeding centers, three products for leaf treatment - applied alone in the end of budding stage of the plants. To achieve the purpose of the thesis a sufficient number of indicators have been selected and tracked. The working methods under field conditions, the agricultural technology of the field experiment, as well as the methods for statistical data processing are described in detail. It should be noted that the extent of the study carried out is quite large, conducted under field conditions and valuable from a practical and applied point of view. A detailed soil-climatic and agrometeorological analysis has been made of the area where the experiment was conducted, as well as of the years of the research.

3. Visualization and presentation of the results obtained.

The dissertation is written on 190 standard pages and includes 10 main sections,

which in terms of volume, structure and balance between the separate parts fully meet the requirements for awarding the Doctoral degree. The results obtained are summarized and very well illustrated, by the skillful use of 37 tables and 36 figures, and show the ability of the PhD student to systematize scientific information.

4. Discussion of results and literature used.

On the topic has been made a detailed and immersed literature review, outlining the views of a number of our and foreign researches on the described problem. There have been used 238 scientific publications, indicating that the PhD student is well informed about the variety specificity of coriander, the culture's response to various growing conditions, as well as the impact of various foliar treatment products on seeds yield and quality in coriander varieties.

Discussion of the results has been done consistently, competently and thoroughly, by interpreting the results in accordance with the current scientific advances in these field. In the discussion the PhD student skillfully opposes, compares and comments the results obtained on the basis of other authors' data. The dissertation work shows that the PhD student can carry out an independent field experimental work and correctly interpret the large amount of data obtained, and the used statistical methods increase the precision when evaluating the results.

5. Contributions to the Thesis.

The results obtained allow to form two groups of contributions:

Scientific contributions

The vegetation period of coriander varieties of different origins, grown under the soil-climatic conditions of the Plovdiv region, was established and it has been proven for the first time that foliar treatment products prolong the flowering of coriander plants and increase the duration of the vegetation period. The influence of the treatment with leaf products on the structural elements of the yield of the tested varieties was monitored and an increase was found compared to the control of the indicators - number of umbels per plant, number of seeds per umbel, number of seeds per plant and weight of seeds per plant. It was found that the Isabion biostimulator increased the content of linalool in the essential oil of the Moroccan and Mesten drebnoploden varieties compared to the control, and the products Energy 20-8-60, Fulvin 40-22 and Isabion did not affect the linalool content of the essential oil in Yantar and Thüringen varieties, while the mineral gel fertilizer Energy led to a decrease in the linalool content of the essential oil in the Marino variety. The presence of the aldehyde 2E-Tridecenen-1-al under the influence of the treatment with foliar preparations was found in all tested varieties, which was absent in the untreated variants. It was established that the content of aldehydes in the essential oil of the Yantar and Marino varieties was significantly affected by treatment with the preparation Isabion. Correlation relationships were established between qualitative and quantitative indicators in coriander varieties. Regression models were built and the influence of the Isabion preparation on the chemical parameters of the Mesten drebnoploden variety with the highest coefficient of determination was proven.

Scientific and applied contributions

The positive effect of foliar treatment products has been proven Energy 20-8-60, Isabion and Fulvin 40-22 on seed and essential oil yield. It was found that the Isabion product increased the seed yield up to 9.9% and the Energy 20-8-60 and Isabion products increased the essential oil yield up to 18.3% compared to the control depending on the variety. It has been studied and found that foliar treatment products increase the essential oil content of the varieties studied (up to 11.8%), with the product Energy 20-8-60 being the most effective. The foliar treatments used increased the crude oil content of the seeds in all tested cultivars up to 10.0% compared to the controls. Crude fat content was highest when using the product Fulvin 40-22 in Yantar, Moroccan, Mesten drebnoploden and Thuringian varieties - from 6.4% to 9.8% compared to the control. The strongest effect was reported when the product Energy 20-8-60 was applied to the Marino variety - 14.68% compared to the control. It was established that the studied leaf products have a positive influence on the physical qualities of the seeds. The Isabion product has the strongest influence on the mass of 1000 seeds, with the increase being the highest in Mesten drebnoploden variety up to 16.4%. The increase in seed mass per 100 l volume compared to untreated variants varied from 5.5 to 13.2% depending on the variety. The results of the research make it possible to apply the products for foliar treatment- Energy 20-8-60, Isabion and Fulvin 40-22 in coriander cultivation technology.

6. Published articles and citations.

Two publications directly related to the dissertation are attached, one of which is self-published and one is co-authored with the supervisor. The total number of points is 45 (30 points required), i.e. exceeding the minimum required for obtaining the educational and scientific Doctor degree in accordance with the Law for the Development of the Academic Staff. No article citation has been submitted. The presented self-report objectively reflects the structure and content of the dissertation.

CONCLUSION:

On the basis of the various research methods, learned and applied from the PhD student, the correctly performed experiments, the summaries and the conclusions made, I consider, that the submitted dissertation meets the requirements of the Law for the Development of the Academic Staff of Republic Bulgaria and the Regulations of the Agricultural University for its application, which gives me a reason to evaluate it POSITIVE.

Taking into account the extensive experimental material, the originality of the results achieved and the importance of the scientific and scientific applied contributions in the dissertation, as well as the undoubted personal contribution of the PhD student, I dare to suggest to the venerable Scientific Jury also to vote positively and award Svetlana Yordanova Manhart the educational and scientific degree „**Doctor**” in scientific specialty Crop Science.

Date: 16.05.2023
Plovdiv

MADE THE
STATEMENT:.....

(Prof. Dr. Ivan Yanchev)