



REVIEW

regarding the competition for the academic position of *Professor* in the scientific specialty *Crop Science* announced in the State Gazette, issue 99, form 28.11.2023 and presenting a candidate – Assoc. Prof. Vanya Atanasova Delibaltova, PhD, completed by Prof. Nikolay Angelov Tsenov, DSc, *General Toshevo Dobrudzha Agricultural Institute*, assigned a member of the scientific jury according Order № ПД-16-145/30.01.2024 of the Rector of the Agricultural University Plovdiv

Reviewer: Prof. Nikolay Angelov Tsenov, DSc, *General Toshevo Dobrudzha Agricultural Institute*, in the field of higher education 6. Agrarian Sciences and Veterinary Medicine, professional area 6.1. *Crop Science*, scientific specialty: *Selection and Seed Production of Field Crops*, assigned a member of the scientific jury according Order № ПД-16-145/30.01.2024 of the Rector of the Agricultural University Plovdiv

1. GENERAL DATA FOR THE CANDIDATE'S CAREER AND THEMATIC DEVELOPMENT.

Vanya Delibaltova's professional development as a scientist and lecturer began in 1998, as a full-time doctoral student at the Agricultural University Plovdiv (AU Plovdiv). In 2002, she defended a dissertation work on the following topic: *Study of The Reaction of Cotton Varieties Grown on Soils Contaminated with Heavy Metals*, at the Department of Crop Science, AU Plovdiv. During the period 2002-2011, the candidate worked as an assistant professor, senior assistant professor and chief assistant professor conducting seminar and practical classes in crop science disciplines, teaching graduates, conducting field experiments and publishing the obtained results. Since 2011, she has occupied the academic position of *Associate Professor* in the Department of Crop Science at AU Plovdiv. During the last 12 years, she actively participated in the activities of the department developing the syllabus for the discipline *Medicinal, Essential-oil and Flavor Plants*. During this period, Assoc. Prof. V. Delibaltova took participation in 12 international and 6 national scientific conferences, where she presented several reports. She worked in 6 scientific projects, the last of which is continuing this year as well (*Intelligent System for Managing Technologies in Crop Cultivation 2021-2024*). As an associate professor of Plant Science she participated as a reviewer in scientific juries of 15 procedures for awarding academic degrees and positions. She is fluent in Russian and English languages. The candidate has technical skills and competencies in a number of specialized computer programs (Landscape Design, SPSS; CropWat, Biostat). She also demonstrates excellent coordination of activities, organization of joint scientific activities, distribution of functions and duties at work, flexibility, initiative, creativity, decisiveness, conducting intensive business correspondence. Since 2012 she has consistently published over 40 research papers, 6 scientific popular. She is the co-author of two Crop Science textbooks and three training handbooks used for classroom activities.

2. GENERAL DESCRIPTION OF THE PRESENTED MATERIALS.

With relation to the present competition, Assoc. Prof. Vanya Delibaltova participates with 97 works in total, which are grouped as follows:

❖ **Research publications under the nomenclature specialty – 97:**

- *publications related to the doctoral dissertation – 6 (6%)*
- *publications with Impact Factor (IF) – 10 (10%)*
- *publications with Impact Rang (SJR) – 5 (5%)*
- *publications in reviewed and referenced scientific journals – 25 (for occupying the position of Associate Professor) + 27 (for the position of Professor)=(65%);*
- *publications in conference collections – 9(for the position of Associate Professor)+15 (for the position of Professor) = (25%).*

The candidate's personal participation in the submitted 97 works is illustrated by the fact that in 11 of them (11%) she is an independent author, in 44 (45%) she is the first author, in 25 (26%) – the second, and in the rest 28 (29%) - the third and subsequent.

❖ **Textbooks – 2;**

❖ **Training handbooks – 2.**

Forty-one (41) scientific publications and four (4) training books are subject to analysis regarding the present review, which do not duplicate the works submitted for the PhD degree and the position of Associate Professor.

Twenty-nine 29 (71%) of the publications are written in English, and the rest 12 (29%) are in Bulgarian language.

The submitted 41 copies of publications have been printed in the following scientific journals: *Scientific Papers Series A. Agronomy* (Romania) - 8; *Agricultural sciences*, (AU Plovdiv) – 8; in scientific conferences – 7; *Journal of Mountain Agriculture on the Balkans* - 5; by two publications in: *Bulgarian Journal of Agricultural Science and Journal of Agricultural Sciences* (Turkey); *Journal for Research in Agricultural and Food Science* (India); by one publication in: *Romanian Agricultural Research and Universal Journal of Agricultural Research* (India); *Industrial Crops and Products* (Netherlands); *European Journal of Horticultural Science* (Germany); *Research Journal of Agricultural Science* (India); *Journal of Agricultural Science and Technology* (Iran) and *Agronomy Research* (Estonia).

The scientometric data show that the total number of required points by indicators have been considerably exceeded (presented in the brackets) as follows: research papers and reports - $B3+B4=135$ (100), $\Gamma7+\Gamma8 = 247$ (200), citations - $\Delta13+\Delta15=815$ (100), teaching work - $E17+E18+E22+E23=169$ (100) and a total number of points - 1416 (550) =257%

3. MAIN DIRECTIONS OF THE CANDIDATE'S RESEARCH WORK. SKILLS FOR CONDUCTING RESEARCH STUDIES (LEADING PROJECTS, ATTRACTING EXTERNAL FINANCING, ETC.).

The main directions in the candidate's research work is as follows:

3.1. Studies related to the effect of the predecessor crop and fertilization and other practices on productivity elements, seed yield of different crops and essential oil content of coriander seeds - 16 (*Publications No. 4, 5, 8, 11, 14, 18, 20, 22, 23, 24, 28, 30, 37, 39, 40, 41*)

3.2. Analyzing the influence of environmental conditions on quantitative and qualitative indicators in different field crops - 11 (*publications No. 1, 10, 13, 15, 17, 21, 26, 27, 31, 33, 36*)

3.3. Agro-biological evaluation of lavender varieties, wheat and maize hybrids - 7 (*publications No. 3, 7, 9, 12, 25, 29, 34*)

3.4. Studies on the influence of water deficit on the content and yield of the main chemical components in soybean and corn - 4 (*publications No. 2, 32, 35, 38*)

3.5. Studies on weed control and their impact on productivity in different crops - 3 (publications No. 6, 16, 19)

The scientific work of Assoc. Prof. V. Delibaltova is focused on the first two directions, in which total of 29 research papers have been written = 70% of all published. The research is the result of work on several scientific projects during the period 2012-2023:

1. *Intelligent Plant Crop Science* National Scientific Program, WP 3.1. *Intelligent System for Managing Technologies in Growing Crops*, 2021 - 2024.

2. Scientific research project under the title *Creation of New High-Yield Common Winter Wheat Varieties with a Complex of Economic Qualities and High Ecological Plasticity, Suitable for the Changing Climatic Conditions and Technological Solutions* - with external funding from the Agricultural Academy Sofia, 2021-2023.

3. Research project entitled *Status and Trends for the Development of Plant Crop Science* at the Research Center of AU-Plovdiv, 2012-2013.

4. EVALUATION OF THE CANDIDATE'S TEACHING WORK AND HER ROLE IN TRAINING YOUNG SCIENTISTS.

Assoc. Prof. Vanya Atanasova Delibaltova has more than 20 years of experience as a university lecturer in the Department of Crop Science at the Agricultural University - Plovdiv. She skillfully leads lectures and exercises to full-time and part-time undergraduates in several important disciplines: "Crop Science", "Medicinal, Aromatic and Flavor Plants", "Wheat and Leguminous Plants" and "Fundamentals of Crop Science". For the period 2018-2023 she has performed a total of over 2500 academic hours, which represents the classroom workload of approximately 500 hours per year.

She has taught compulsory disciplines in six undergraduate majors: *Agronomy – Field Crop Production, Agricultural Engineering, Ornamental Gardening, Ecology and Environmental Protection and Plant Protection* such as: "Crop Science", "Medicinal, Aromatic and Flavor Plants" as well as the optional disciplines: "Introduction to Crop Science", "Medicinal, Aromatic and Flavor Plants" and "Medicinal, Essential-oil and Flavor Plants".

The candidate's teaching work is complemented by active participation in the master's programs *Agribusiness and Mineral Storage and Fermentation* with lectures and seminar classes in the disciplines "Crop Science", "Biological Crop Production" and "Fundamentals of Crop Science".

In the period 2012-2023 under the candidate's leadership twenty-five (25) graduates successfully defended their diploma theses: 19 Bachelor graduates and 6 Master graduates.

Assoc. Prof. V. Delibaltova was the academic supervisor of two successfully defended doctoral students in 2020: Todor Gubatov with a dissertation entitled *Interaction Between the Conditions of the Environment and the Grain Yield in Common Wheat Varieties (*Triticum Aestivum* L. and in 2023 Svetlana Manhard with a dissertation entitled *Varietal Response to Coriander (*Coriandrum Sativum* L.) Depending on the Application of Some Leaf Treatment Products*.*

5. SIGNIFICANCE OF THE OBTAINED RESULTS PROVED WITH CITATIONS, PUBLICATIONS IN PRESTIGIOUS JOURNALS, AWARDS, MEMBERSHIP IN INTERNATIONAL AND NATIONAL SCIENTIFIC BOARDS, ETC.

Fifteen of the research studies have been published in prestigious scientific journals with an impact factor (IF) or an impact rating (SJR), according to the two international assessment systems Web of Science and/or Scopus. The observed (more precisely represented) citations are 63 in total. Forty-five (45) of them are cited in scientific journals with a high scientific rating 21=33% (Q1+Q2) or a medium high rating 24=38%, (Q3+Q4). Four of the publications were cited in top-ranked journals Q1 (17 times), which is 27% of all citations collected, and the citations in IF journals were 23=36%. These indicators in themselves give a very high assessment of the

candidate's research results.

Within AU-Plovdiv Assoc. Prof. Delibaltova is an active member of the following: Attestation Commission (2016-2019); the Faculty Council (2011–); the Academic Council (Scientific Secretary) (2020–); the Management Board of the Center for Scientific Research, Technology Transfer and Intellectual Property Protection (2020–); the Commission for Checking the Compliance of the Procedures with the Rules for Academic Staff Development (2020–). She is also the Coordinator of the Committee for verification of scientometric indicators in the professional field 6.1 Crop Science (2020–) and a Chairperson of the committee preparing the *Report - Self-assessment for the Program Accreditation of the Doctoral Program Crop Science*.

Assoc. Prof. V. Delibaltova has participated as a member in scientific juries of 15 procedures - 12 for the academic position of *Associate Professor*, 2 for the educational and scientific degree of *Doctor* and one for the scientific degree *Doctor of Sciences*.

6. SIGNIFICANCE OF SCIENTIFIC AND PRACTICAL CONTRIBUTIONS. A MOTIVATED ANSWER TO THE QUESTION: TO WHAT EXTENT THE CANDIDATE POSSESSES A WELL-DEFINED PROFILE OF HER RESEARCH WORK.

All research studies are related to the *Crop Science* discipline in which the candidate has also been working as a lecturer. The direct research and publication work of Assoc. Prof. V. Delibaltova is related to the assessment of the effects (influence) of a number of agricultural practices on a wide range of field crops against the background of diverse environmental conditions. These developments provide additional information on the agro-biological characterization of wheat, maize, lavender and coriander varieties and hybrids. Sixteen of the scientific developments deal with problems related to a detailed analysis of the effects of basic agricultural practices (fertilization, precursor, sowing time, sowing density, etc.): for coriander - 7 publications; triticale - 3; wheat - 2; per one publication for lavender, barley, sorghum and maize. As a separate line of research, there are studies related to the influence of herbicides on coriander, wheat and lavender. A total of 34 (=83%) scientific reports have been published in these three directions, which shape V. Delibaltova's scientific profile as a researcher of basic problems related to the role of agro-technics (technology) on the manifestations of productivity and quality of a wide range of crops, which are the subject of teaching and constant research in Crop Science. About 25% of the studies (11) are related to the influence of growing conditions in different regions on productivity, quality and some biochemical indicators in: common wheat - 6 publications, triticale, corn, sunflower, soybean and tobacco – per one publication.

Information was collected on the unique behavior of a large number of varieties and hybrids (from 10 field crops), their comparative characteristics under the natural change of conditions or under the influence of reclamation practices (with and without irrigation) - a total of 7 publications.

According to their importance, the results and conclusions of the scientific works submitted for evaluation could be summarized in the following several groups of contributions (*in brackets are the publications directly related to the contributions*):

6.1. ORIGINAL CONTRIBUTIONS

1). The application of Praxim herbicide at a rate of 25 l/ha in the early stages of coriander development provides effective control of weeds growing in its crops. This information is of great importance to horticulture as it is sufficient in quantity to effectively control broadleaf weeds, such as *M. chamomilla*, *S. arvensis*, *S. nigrum*, *A. Retroflexus*, and is safe to achieve high and stable yields as well as high essential oil content in coriander **(6)**.

2). Evapotranspiration (ET) of soybean is most intense in the soil layer 0-20 cm. Under irrigation conditions the average total water flow from this layer exceeds 200 mm. The 40-60 mm soil layer is also important for soybean water supply. The irrigation regime practically does not affect ET in the 60-80 cm layer. This gives reason to consider that soil moistening below 60 cm is ineffective in soybean cultivation. **(32)**

3). The application of different types of foliar fertilizers and bio-stimulants causes an increase in seed yield and the essential oil content in coriander **(11, 4)** and lavender **(5)**, which is very important for organic farming.

6.2. METHODOLOGICAL CONTRIBUTIONS

1). The ranking of varieties within a given stability group measured by each of the 18 selection indices used is various and inconsistent when compared to their respective grain yield. The strong and significant interaction between genotype and environment in wheat requires a mandatory evaluation of the variety's stability by preliminary verification of the most informative selection indices for this purpose **(10)**.

2). Canceling part of the watering during soybean reproductive period significantly lowers the content and yield of crude protein, as well as the content of lysine, and significantly increases the carbohydrate content of the seeds **(2)**. Cancellation of irrigation in maize does not affect hectoliter mass, and carrying out an optimal irrigation regime increases the value of its mass per 1000 grains **(38)**.

3). The influence of six sowing periods (October, November, December, February, March and April) on the yield and quality of coriander essential oil has been analyzed in detail. Sowing period combined with weather conditions over the years has a significant impact on coriander productivity. The highest yields of seeds and essential oil were recorded in October sowing, and the lowest - in April sowing. The essential oil content of coriander fruits is lower the later the sowing period is **(14)**.

6.3. SCIENTIFIC CONTRIBUTIONS

1). The influence of the environmental conditions (using the same agricultural machinery) is significantly stronger than that of the genotype as a factor on the investigated traits in different crops. This should also be taken into account in agrotechnical studies in order to make an objective assessment of each investigated variety regarding its productivity or grain quality and according to the different options of applied agronomic practices (fertilizing, watering, sowing - time and density, etc.) **(10, 13, 21, 37)**.

2). When studying the phenological development of soybean varieties in the conditions of Southern Bulgaria, it was found that in the period from sowing to the beginning of seed growth, there were no varietal differences in plant development. Genotypic differences in soybean development appear after the onset of bean formation. The conditions of the year have a smaller influence on the duration of the growing season in soybean than the direct effect of the variety. **(36)**.

3). Different regression equations were experimentally established for triticale varieties, with the help of which the theoretical grain yield and the increase to the yield of each nitrogen kg can be calculated in two different regions of the country. There is a gradual dependence between the rate of nitrogen fertilization and the additional yield in triticale. The results can be used to prepare a detailed economic analysis and establish economically justified rates of nitrogen fertilization of triticale **(31)**.

6.4. APPLIED CONTRIBUTIONS

1). The highest values of the structural elements of productivity (number of umbels per plant, weight of seeds per plant, weight of 1000 seeds) and seed yield in coriander are achieved at a nitrogen rate of 12 kg/ha and in October-November sowing. The sowing rate depends on the variety characteristics (for example, for Moroccan variety it is 250 hp/m², and for the Sandra variety - 300 hp/m²). When sowing in the period January-February, the sowing rate is reduced to 150 hp/m² (23, 24).

2). With relation to the study on five foreign coriander varieties, it was found that they differ significantly in terms of growing season length, fruit size and fruit yield. The American tall variety is the earliest to ripen, ahead of the other varieties by 8 to 22 days, and at the same time it is one of the large-fruited types (25).

3). Praxim herbicide, applied at a dose of 2.5 l/ha, is safe and can be used in the early stages of crop development for sufficiently effective control of various broadleaf weed species. High doses (3.5 l/ha) of the product are harmful to coriander and, despite their high efficiency, can reduce the development, yield and quality of coriander (6).

4). The best control of annual and perennial weeds in a young lavender field was reported for the options treated with herbicides based on the active substances napropamide at a rate of 400 ml/day and flumioxazin at a rate of 8 g/day. The use of these soil herbicides does not have a negative effect on the annual growth of lavender plants, which is an important point in their use (19).

5). Winter wheat was found to be a more suitable predecessor to coriander than sunflower. Here the highest results were obtained for the number of umbels per plant, diameter of umbel, number of umbels per umbel, number of seeds per umbel, seed weight per plant and weight per 1000 seeds. The highest essential oil content was observed after application of 12 kg N/ha, as well as the seed yield at the rate of 8 kg N/ha (8).

6). The application of various foliar fertilizers and bio stimulants increase not only seed yield and productivity elements, but also the essential oil content and the main ingredient – linalool in coriander (11, 4). A strong positive influence of the application of foliar treatment products on basic quantitative features and qualitative indicators of lavender has been established (5).

7). For the first time, in the conditions of North-Eastern Bulgaria, a research study was done with lavender. It was found that the highest yield of fresh lavender inflorescences was realized by the Druzhiba variety, which is due to the higher values of its structural elements - number of inflorescences per tuft, length of the flowering stem, number of flower spines and weight of tuft inflorescences compared to others. The highest percentage of essential oil, yield and randeman was obtained from the Sevtopolis variety, and the best quality lavender oil was reported from the Hemus variety, where all the main ingredients meet the Bulgarian standard (7).

7. CRITICAL NOTES AND RECOMMENDATIONS.

When analyzing the submitted documents, I did not find any omissions or inaccuracies. Nor do I have critical remarks about published scientific reports.

A careful comparison of the scientific production with which V. Delibaltova participated in the competitions for *Associate Professor* and *Professor* shows a certain "regression" in the number of published scientific reports from 50 to 41, which is about 18% less. The research papers published in English are about the same number - 26 to 28. The essential difference here is that 15 of them (=36%) are in journals with "impact" indicators (vs. 9 for the position of *Associate Professor*), which has allowed some of them to be repeatedly cited, also in "impact" journals, as being already mentioned above. This refinement of scientific production in terms of number and especially in terms of quality is correct and commendable. It is an indication of a constant and systematic process of accumulating scientific experience, in all its aspects. I wish that the colleague applies a similar approach in her future scientific work.

8. REVIEWER'S PERSONAL EXPRESSIONS AND OPINION.

I have known the colleague personally for several years, in connection with the defense of a doctoral thesis, from a colleague with whom we worked together and for whom she was the scientific supervisor. In the short time of personal contact with her, I gained very good impressions of her great responsiveness, decisiveness and expediency in quickly solving emerging issues. After her quick and decisive assistance, I was registered in the Academic Staff Register in the National Center for Information and Documentation. In perusing her entire scientific production, I found that she had been working on problems that I myself had been working on for years. The «*genotype x environment*» interaction is one of them. Here I found 18 citations of my personal publications. In this regard, I also received a lot of additional information on the multiple influence (G x E) on cultivars, traits, agronomic practices in a number of non-wheat crops. In return, I have cited only one of her publications in 5 papers, two of which were published in a **Q3** journal (not included in the procedure papers). I hope that in the future we will join forces to organize a joint scientific activity on a number of wheat problems.

CONCLUSION

Based on the analysis of the candidate's research, teaching and scientific-applied work, I believe that Assoc. Prof. Vanya Delibaltova fully meets the requirements of the Act on Development of the Academic Staff in Republic of Bulgaria (ADASRB), the Regulations for Application of ADASRB and the Regulations of AU Plovdiv for its application. The candidate has presented scientific production sufficient in terms of volume and quality. The obtained results are properly summarized in 16 theoretical, applied and methodological contributions related to research studies on ten field crops. This represents a high attestation for her field experiments, research work and related publications. Along with this, the candidate skilfully combines it with active and busy teaching work, as well as with co-authoring in important handbooks for several study programs. The points collected as a result of her professional work are two and a half times more than the required, according to the legal requirements for occupying the position of *Professor*.

All this gives me reason to **POSITIVELY** evaluate her overall scientific, teaching and social work.

I allow myself to propose to the honorable scientific jury to also vote positively, and the faculty council of the Faculty of Agronomy at the Agricultural University - Plovdiv to elect Assoc. Prof. Vanya Atanasova Delibaltova, PhD, for the academic position of **Professor** in the scientific specialty **Crop Science**.

Date: 05.02.2024
The town of Dobrich


REVIEWER:
(Prof. Nikolay Tsenov, DSc)