

## REVIEW



**REGARDING:** the competition for the academic position of “Professor” in the scientific specialty *Crop Science* announced in the State Gazette issue 99 from 28.11. 2023 with a candidate Assoc. Prof. Vanya Atanasova Delibaltova, PhD, from the Agricultural University - Plovdiv

**Reviewer:** Prof. Radka Veleva Ivanova, PhD, Agricultural University – Plovdiv, field of higher education 6. Agrarian Sciences and Veterinary Medicine, professional area 6.1. Crop Science, scientific specialty Crop Science, assigned a member of the scientific jury according Order № ПД – 16-145/30.01.2024 of the Rector of the Agricultural University – Plovdiv (AU Plovdiv).

The only candidate participating in the present competition is Assoc. Prof. Vanya Atanasova Delibaltova, PhD, from the Department of Crop Science. The submitted documents have been completed in conformity with the Act on Development of the Academic Staff in Republic of Bulgaria (ADASRB) and the Regulations for its application of AU Plovdiv.

### 1. General data regarding the candidate's career and thematic development

Associate Professor Vanya Atanasova Delibaltova was born on 16.01.1969 in the town of Elhovo. In 1992 she graduated from the Agricultural Higher Institute - Plovdiv, (now Agricultural University) majoring in Agronomy – Field Crop Production, as she obtained a Master's degree in Agro-engineering - Field Crop Production. From 1994 to 1998, she worked as a lecturer at the Private Agricultural College - Plovdiv. In 1998, after a competition, Associate Professor V. Delibaltova was enrolled as a full-time doctoral student in the Department of Crop Science at the Agricultural University - Plovdiv. In 2002, after a successful defense of the dissertation work entitled *Study of the Reaction of Cotton Varieties Grown on Soils Contaminated with Heavy Metals*, the candidate obtained the scientific and educational degree "Doctor" in the scientific specialty Crop Science. Since 2002 she has successively held the academic positions of assistant professor, senior assistant professor and chief assistant professor in the Department of Crop Science. Since 2011 to the present she is an associate professor in the same department. V. Delibaltova is fluent in written and spoken English and Russian. She works with specialized computer programs (3D Landscape Design; SPSS; CropWat 08 (FAO); Biostat, Microsoft, etc.

Associate Professor V. Delibaltova actively participates in the activities of the Agricultural University and the Faculty of Agronomy. Due to the established authority and organizational qualities among the lecturers, she was elected as a member of the Academic Council of AU-Plovdiv (a scientific secretary), a member of the Faculty Council, a member of the Attestation Commission, a member of the Commission for checking the compliance of the procedures and the rules for the academic staff development, a coordinator of the Commission for Verification of Scientometric Indicators in the professional area: 6.1 Crop Science, a chairman of the committee preparing a self-assessment report for the program accreditation of Crop Science doctoral program at the National Evaluation and Accreditation Agency.



## 2. General description of the submitted materials

With relation to the present competition Assoc. Prof. V. Delibaltova participates with **97 works in total**. They are grouped as follows:

- Publications related to the degree of **Doctor** – **6**;
- Publications related to the position of **Associate Professor** – **50**;
- Publications related to the academic position of **Professor**, which do not replicate those presented for the degree of Doctor and the position of Associate Professor - **41**.

Minimum number of points required for each indicator group regarding the occupation of the academic position of *Professor*:

- **Indicator A** - minimum requirements - 50 points, the submitted materials are estimated to **58,33** points;
- **Indicator B4** – 10 publications, minimum requirements - 100 points, the submitted materials estimated to **135,14** points;
- **Indicator Г7 and Г8**- 31 publications, minimum requirements - 200 points, the submitted materials are estimated to **247,5** points;
- **Indicator Д** - minimum requirements - 100 points, the submitted materials are estimated to **815** points;
- **Indicator E** - minimum requirements - 100 points, the submitted materials are estimated to **169,2** points.

According the minimum national requirements of ADASRB, the Regulations for its application and the Regulations of AU Plovdiv, the minimum points are **500**, and the candidate accumulates a total amount of **1425,17 points**, with which she exceeds over twice the minimum national scientometric requirements for the academic position of *Professor*.

There are **41 publications and works** which are subject to analysis in the present competition.

1. Scientific publications in referenced and indexed journals in world databases with scientific information (Web of Science or Scopus), Indicators B4 and Г7 – **27 (65,85 %)**.

- **Research papers with common impact factor (IF) - 7 - 8.8**
- **Research papers with impact factor (IF) and impact rating (SJR) in quartiles Q1, Q3 and Q4 - 4.**
  - **1** of them with very high impact factor (**IF-5.9**), *Industrial Crops and Products* (2022) Q1, SJR-0.90; IF - 5.9;
  - **3** - with common impact factor (IF-2.0) in quartiles Q3 and Q4; *Romanian Agricultural Research* (2023) Q4, SJR – 0.15, IF- 0.7, *Bulgarian Journal of Agricultural Science* (2022) Q3, SJR-0.22, IF - 0.4, *European Journal of Horticultural Science* (2022) Q3. SJR-0.25, IF - 0.9;
  - **3** – with only impact factor (common -IF-0,9) in quartile Q4, *Scientific Papers. Series A. Agronomy* (2023) Q4, IF - 0.3.
- **Reserch papers only with impact rating (SJR) in quartiles Q3 and Q4 - 5**, *Universal Journal of Agricultural Research* (2023) Q4, SJR-0.17, *Journal of Agricultural Sciences* (2022) Q3, SJR-0.19, *Agronomy Research* (2022) Q3, SJR-0.28, *Journal of Agricultural Sciences* (2021) Q3, SJR-0.21, *Bulgarian Journal of Agricultural Science* (2020) Q3, SJR-0.25.
- **Reserch papers in Web of science in quartile Q4 and Web of science CABI - 15.**
  - **5** in Web of science in quartile Q4 (*Bulgaria Scientific Papers. Series A. Agronomy*);
  - **10** in Web of science CABI – (*Agricultural sciences, AU – Plovdiv, Journal of Mountain Agriculture on the Balkans, Journal of Agricultural Science, Second Students' Scientific Session, Scientific Works – AU Plovdiv, Agricultural University – Plovdiv*).



2. Research papers and reports published in non-referenced journals with scientific review or in editor collective volumes, **Indicator Г 8 - 14 (34.15 %)**.

With relation to the mentioned 41 works, Assoc. Prof. V. Delibaltova has individual participation in 2 of them (4,87%); she is a first author in 11 (26,8 %); a second author – in 13 (31,7 %); a third and consecutive author – in 15 (36,58 %), 28 of them are written in English, 13 are in Bulgarian language.

- Textbooks – 2;
- Training handbooks – 2.

### **3. Main directions in the candidate`s research work, supervising work and participation in research projects, external financing, etc.**

Most of Assoc. Prof. Delibaltova's research is related to the improvement of individual units of the technology for growing field crops through weed control, influence of predecessor crops, regulation of the amount of mineral fertilizers, the period and density of sowing, etc., establishment of different methods for increasing the productivity and quality of the obtained production, as well as study on a number of Bulgarian and foreign varieties and hybrids grown in different regions of the country. In some research studies opportunities were sought to optimize irrigation regimes for soybeans, corn and sunflower, as well as opportunities for growing sorghum on soils contaminated with heavy metals. All this clearly outlines the candidate's profile in her research work.

The largest part of the publications are related to the issues of cereals (23 items/56.09%), and essential oil crops (13 items - 31.70/26%).

During the period 2012-2023 Associate Professor V. Delibaltova participated in 3 scientific research projects and led one infrastructural project at AU - Plovdiv. Associate Professor Delibaltova is also a member of the managing board at the Center for Scientific Research, Technology Transfer and Intellectual Property Protection at the Agricultural University - Plovdiv.

### **4. Evaluation of the candidate`s teaching work. Supervision of young scientists**

V. Delibaltova has over 21 years of teaching experience in her work with undergraduates and doctoral students.

According to the attached certificate (NOF5/06.12.2023) from AU-Plovdiv, Associate Professor Delibaltova's academic workload for the period 2018 - 2023 is 2558.25 academic hours including lectures, practical classes and extracurricular activities. The average workload in the last 5 years is 511.65 academic hours.

Prof. Delibaltova developed a significant contribution in the preparation of agronomy specialists. During this period she developed 4 syllabuses for mandatory disciplines for full-time and part-time students and 4 syllabuses referring to elective disciplines. Assoc. Prof. Delibaltova delivers lectures in "Medicinal, Aromatic and Flavor Plants" and "Crop Science" from the compulsory disciplines, and "Introduction to Crop Science" and "Medicinal Aromatic and Flavor Plants" from the elective ones.

The candidate has developed 2 syllabuses for Master students, one for the discipline "Biological Crop Science", and the other for the discipline "Fundamentals of Crop Science", included in "Digitalization and Management of Crop Production" Master program.

To facilitate the academic work of the students, Associate Professor V. Delibaltova participated as a co-author of two university textbooks (2013; 2019) and two training handbooks (2011; 2019).

After acquiring the academic position of "Associate Professor" under her supervision, 25 students defended their diploma theses, 19 of them from the Bachelor's degree programs and 6 - from the Master programs.

Assoc. Prof. Delibaltova has supervised two successfully defended doctoral students.



The candidate participated in 2 educational projects: "Student Internships" co-financed by the European Union and "Introduction of Electronic Forms for Distance Learning" at the Agricultural University - Plovdiv.

She was repeatedly elected as a member of the Scientific Jury for awarding academic degrees and positions in 15 committees, she also participated in committees for the admission of doctoral students, candidate minimums and state exams.

Taking into account the reference submitted for the scientific and teaching work under **indicator E**, Associate Professor Delibaltova collects a total of **169.2** points out of the required 100 points, as follows: Indicator E16 - supervisor of successfully defended doctoral students - 80 points; Indicators E18 - participation in national or educational projects - 75 points; Indicators E22 and E23 - participation in textbooks and handbooks - 14.2 points.

The materials presented at the competition prove her serious scientific and teaching activities. Therefore, she is renowned by her colleagues and students as a lecturer having significant contribution to their training in the agricultural science.

#### **5. Significance of the obtained results, citations, publications in prestigious journals, awards, membership in international and national scientific boards, etc.**

The significance of the results obtained by Assoc. Prof. V. Delibaltova's research work and her recognition among the scientific community is obvious by the number of citations in Bulgarian and foreign publications. Their total number is 63, of which 50 are in scientific publications, referenced and indexed in world-renowned databases with scientific information, and 13 are in non-refereed journals with scientific review. Of the citations provided, 20 are from Bulgarian and 43 from foreign authors, which shows the great interest in the scientific production of Associate Professor Delibaltova, both in the country and abroad.

The scientific quality of the production is also confirmed by the citation in foreign journals with a very high impact factor (25 citations are in journals with a total IF - 98.2, such as *Environmental Science and Pollution Research*, *Journal of Soil Science and Plant Nutrition Sustainability*, *Soil Systems*, *Frontiers in Crop Science*, *Waste and Biomass Valorization*, *Land, Agronomy, etc.*).

According to the presented report on citations for **indicator Д**, the candidate collects a total of **815 points**, exceeding the required 100 points, as follows: indicators Д13 - 750 points, and indicator Д15 - 65 points.

Participation in 6 national and 12 international scientific forums is a positive aspect of the promotion of the obtained results from the candidate's research work.

#### **6. Significance of the contributions with relation to science and practice. To what extent the candidate possesses a well-defined profile in her research work.**

I accept without reserve the candidate's contributions, which are grouped as follows:

##### **I. Scientific-theoretical contributions**

❖ Using modern statistical packages, the stability of grain yield from 40 winter wheat varieties depending on the region and growing season. The effectiveness of 18 different stability indicators in relation to grain yield was analyzed and established, in conditions where there is a strong interaction between variety and environment. The values of the indicators show significant differences in the resistance of the varieties. Measuring the variation in grain yield of the respective variety grown under different conditions is the basis for assessing its stability and a mandatory condition for determining its breeding value (*research paper 10*).



❖ To evaluate twenty lines and four varieties of common winter wheat for important economic characteristics, cluster analysis and principal component analysis were applied, according to which the different genotypes were divided into five major cluster groups. The applied analysis showed that components PC1 and PC2 explained 67.9% of the total variability of all traits by genotypes. MX 270/86 line and Enola variety located in the most distant parts of the coordinate system can be indicated as a source of strong variation and genetic difference (*research paper 12*).

❖ A regression analysis was made of the grain yield data of 5 triticale varieties, grown in two regions of the country (Thrace and Dobrudzha), with the help of which the theoretical grain yield and the addition to the yield of each kilogram of nitrogen is calculated (*research paper 31*).

❖ The most intensive evapotranspiration (ET) in soybean was found in the soil in 0-20 cm layer, 48% averagely. Under irrigation conditions, the average total water consumption from this layer exceeds 200 mm and forms from 47 to 55%. The irrigated layer of 40-60 cm is also important for the water supply of soybean, while the irrigation regime in the 60-80 cm layer does not affect ET, which gives reason to consider that moistening the soil below 60 cm is ineffective in growing soybean (*research paper 32*).

❖ When tracking the phenological development of two soybean varieties in the region of Plovdiv, genotypic differences in their development are observed after the beginning of bean formation. In soybeans, the conditions of the year affect the duration of the growing season less than the variety. (*research paper 36*).

## **II. Scientific-applied contributions**

❖ For the first time, research studies with lavender have been carried out in the conditions of North-Eastern Bulgaria. It has been established that the highest yield of fresh lavender inflorescences is realized from the *Druzhba* variety. The highest percentage of essential oil (131 l/ha), yield and randeman was obtained from the *Sevtopolis* variety, and the ratio between linalyl acetate and linalool - 1:0.7 for *Hemus* variety meeting the Bulgarian state standard, defines it as the highest quality lavender oil from the rest tested varieties (*research papers 9;7*).

❖ When testing five coriander varieties, 3 large-fruited and two small-fruited, it was found that the the *American tall* variety had the earliest ripening stage (by 8 to 22 days), the largest fruits (9.15 g) and the highest yield (2630 kg/ha) (*research paper 25*).

❖ It was established that for the conditions of Dobrudzha the highest grain yield from wheat was obtained from *Karat* and *Avenue* varieties, and the highest values of wet gluten yield were realized from the *Albena* variety. Under the agro-ecological conditions of Thrace, *Factor* variety is the most productive (*research papers 29,1,37*). In the region of South-Eastern Bulgaria, the tested wheat varieties do not show a tendency to lying. The highest grain yield was realized by *Todora* and *Geya 1* varieties, the highest mass per 1000 grains and hectoliter mass - by *Sadovo 772* variety, and the highest content of wet and dry gluten, gluten allocation and glassiness - by *Enola* variety (*research papers 33,26,34*). Under the agro-ecological conditions of Central-South Bulgaria, the highest yield was reported for *Avenue* variety, the highest values of the grain's physical indicators - for *Miryana* variety, and the highest wet gluten content - for *Annapurna* variety (*research paper 15*).

❖ Experiments with 5 sunflower hybrids tested in North-eastern Bulgaria, 5 maize hybrids and 5 new hybrids, first generation (F) large-leaf tobacco of *Burley* variety, tested in Central-south Bulgaria reported that the highest yield of sunflower grains (3523kg/ha), crude oil (1742 kg/ha) and fat content (49.3%) had *Neoma* hybrid (*research paper 21*), the highest yield of corn grain had *Iridium* hybrid (8007 kg/ha) (*research paper 17*) and with the highest yield of tobacco had *X-1553* hybrid, which exceeded the control by 29.8%. *X-1566* hybrid (*research paper 27*) stands out with the highest nicotine content (3.44%) and the highest quality of tobacco production.



❖ By analyzing the influence of six sowing periods (October, November, December, February, March and April) on yield and quality of coriander essential oil (*Alekseevski* variety), it was found that the highest yield of grains and essential oil in the region of South-Eastern Bulgaria was recorded when sowing in October, and the lowest - in April. Later sowings leads to a decrease in the essential oil content of fruits (research 14). In the same region, the highest yield of coriander grasins was observed for *Mesten Drebnoploden* variety when applying kg N/da (research paper 8). In the region of Plovdiv, the highest values of structural elements and grain yield were obtained at a fertilization rate of 12 kg N/day and sowing in the month of October. There are differences in the sowing rate depending on the variety, such as for the *Marokan* variety, 250 hp/m<sup>2</sup>, and for the *Sandra* variety, 300 hp/m<sup>2</sup> (research papers 23, 24).

❖ Winter wheat is a more suitable predecessor crop for coriander than sunflower (research paper 8), and wheat and barley - for coriander, the rate of fertilization with N12P8 is the most effective (research papers 28; 30).

❖ There was examined the effect of nitrogen fertilization on the elements of productivity and grain yield of two corn hybrids and 5 Italian triticale varieties for green fodder compared with the Bulgarian standard - *AD-7291* variety. For cultivation in the Plovdiv region, the *PR35P12* corn hybrid is recommended, with a fertilization rate of 24 kg/da nitrogen. (research paper 41), and in the case of triticale, when applying both nitrogen fertilizer rates (6 and 18 kg/da), a higher productivity was recorded in the Italian varieties (research papers 39).

❖ For the first time, the effectiveness and selectivity of coriander was tested with the *Praxim* herbicide. It was registered that when applied at a dose of 2.5 l/da, it controls the broadleaf weeds in the early stages of crop development, it provides effective control, but the higher dose of 3.5 l/da causes retardation of plant growth (research paper 6).

❖ The strongest effect after using herbicides *Devrinol 4 F* – 400 ml/da and *Pledge 50 VP* - 8g/da in a young lavender plantation was reported against annual broadleaf weeds, and weak effect - on perennials. Applied soil herbicides did not have a negative effect on annual growth of lavender plants (research paper 19). In mixed weeding in common wheat crops, the use of a mixture of *Secator* + *Puma Super* herbicides controls 90% of broadleaf and 100% of wheat weeds (research paper 16).

❖ It has been found that the cancellation of irrigation during the reproductive period in soybean lowers crude protein content and yield and lysine content and increases carbohydrate content (research paper 2). A single watering in corn during the period of cob growth until silk darkening can increase the mass of grains by more than 30%, and the hectoliter mass up to 7% (research paper 35).

❖ It has been found that the application of foliar treatment products in coriander affect both seed yield and essential oil and linalool content. The seed yield of the treated varieties exceeded the control by 8.3 to 13.4% (research papers 11,4). The examined organic biostimulants showed that the most effective are the samples based on lumbricogenic extract, which increase the yield up to 16%. and organic farming is suitable for use (research paper 18). A positive influence of the application of foliar treatment products on the quantitative and qualitative indicators of lavender was also registered (research paper 5).

❖ For the first time, a study was conducted on four varieties of common sorghum - sorghum for grain, industrial sorghum, sugar sorghum and sorghum for hay, grown in an industrially polluted area. The data show that sorghum varieties do not show a tendency to accumulate these elements in the grains and leaves above the MPC and can be used for animal feeding. Accumulation and retention of significant amounts of Pb, Cu, Zn and Cd in the root system protects the aerial parts from contamination and makes sorghum suitable for phytoremediation purposes (research paper 41).

## 8. Personal expressions and reviewer's opinion

I have personally known Assoc. Prof. V. Delibaltova since she was a doctoral student in the department. Even then, she showed herself as a hardworking, ambitious and capable person. In the following years she has developed and established herself as a good scientist and lecturer, respected and valued not only by her colleagues, but also by students. She is able to work in a team, showing ethics and correctness. In addition to being a good lecturer and scientist, Assoc. Prof. V. Delibaltova also shows qualities as an administrator, organizer and leader.

## CONCLUSION

Based on the analysis of the candidate's teaching, scientific and scientific-applied work, I believe that **Assoc. Vanya Atanasova Delibaltova, PhD**, meets the requirements of ADASRB and the Regulations of the Agrarian University - Plovdiv for its application.

**Assoc. Prof. Delibaltova** participated in the competition with a sufficient volume of scientific works published in local and foreign journals, as well as with a large number of citations in international specialized journals. As a lecturer, she developed a number of study programs, co-authored the writing of 2 textbooks and 2 handbooks. Under her leadership 25 graduates and two doctoral students defended their degrees.

All this gives me grounds to **POSITIVELY** evaluate the candidate's overall work and to propose the members of the Scientific Jury to vote positively, and the Faculty Council of the Faculty of Agriculture at AU - Plovdiv to elect **Associate Professor Vanya Atanasova Delibaltova, PhD**, for the academic position of "**Professor**" in the scientific specialty "**Crop Science**".

10.02.2024  
Plovdiv

REVIEWER:   
/Prof. Radka Ivanova, PhD/