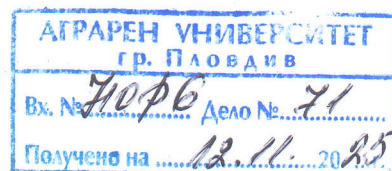


REVIEW



regarding a competition for occupying the academic position of **PROFESSOR**

in the field of higher education: 4. Natural sciences, Mathematics and Informatics; professional area: 4.5 Mathematics; scientific specialty: *Mathematical Modelling and Application of Mathematics*.

The competition was announced in the STATE GAZETTE, issue 65/08.08.2025, with an only candidate Assoc. Prof. Velika Nikolaeva Kuneva, PhD.

REVIEWER: Prof. Nako Angelov Nachev, DSc, *Paisii Hilendarski* Plovdiv University, field of higher education: 4. Natural sciences, Mathematics and Informatics; professional area: 4.5 Mathematics; scientific specialty: *Algebra and Theory of Numbers*, assigned a member of the scientific jury according to Order № ПД- 16-1018/ 08.10. 2025 of the Rector of the Agricultural University – Plovdiv.

1. Brief biographical data of the candidate.

Velika Nikolaeva Kuneva is a Bulgarian citizen born on 1st July, 1977. In 1996 she graduated from the High School of Mathematics and Natural Sciences in the town of Gabrovo, profile – mathematics and English language. In 2001 she obtained a Master's degree in the Faculty of Mathematics and Informatics at the Plovdiv University with the qualification "Teacher of mathematics, informatics and information technologies". In the period 2006 - 2012 Velika Kuneva was enrolled as a doctoral student in the Faculty of Mathematics and Informatics at the Plovdiv University under the guidance of Prof. Todor Zhelyazkov Mollov, DSc. The candidate defended a dissertation work on 10.01.2013 and was awarded the educational and scientific degree of *Doctor* specialized in *Algebra and Theory of Numbers*. The candidate's professional career began in 2001 as a mathematics teacher in *St. St. Cyril and Methodius* Primary School in the village of Parvenets, Plovdiv region. She also taught mathematics in *St. Constantin-Cyril* Vocational High School, Plovdiv. Velika Kuneva has been teaching mathematics in the Agricultural University – Plovdiv since October, 2008.

Her main activities and responsibilities are teaching and research work. She reads lectures on all mathematical disciplines and gives practical classes to students, she trains doctoral and graduate students and she is constantly being involved in publication activities. Velika Kuneva also conducts classes for foreign students under the Erasmus + program. Over the years she has held the following positions: Assistant Professor (October 2008 - January 2013), Chief Assistant Professor (February 2013 - December 2016), Associate Professor (December 2016 - present). In addition, she has occupied the following administrative positions: a faculty coordinator for the Erasmus+ program (March 2016 - May 2020), a deputy dean of the Faculty of Economics (February 2017 - September 2018) and (June 2020 - April 2024), a head of the Department of Mathematics and Informatics (July 2020 - December 2020). Currently Velika Kuneva is a dean of the Faculty of Economics at the Agricultural University – Plovdiv (AU).

I would like to note that Velika Kuneva possesses social, organizational and technical skills and competencies. It is also important to note that she is listed in the Register of habilitated teachers with scientometric indicators of the National Agency for Information and Documentation (NACID). Her native language is Bulgarian, she is fluent in English and Russian at a sufficiently high level.

2. General description of the presented materials and scientific works.

a) Associate Professor Velika Nikolaeva Kuneva has submitted a diploma for completed higher education in *Paisii Hilendarski* Plovdiv University.

b) She holds a Master's diploma attesting the professional qualification "teacher in mathematics and informatics" issued by *P. Hilendarski* Plovdiv University.

c) She holds a diploma for awarded educational and scientific degree *DOCTOR* in the field of higher education: 4. Natural Sciences, Mathematics and Informatics; professional field: 4.5 Mathematics; scientific specialty: *Algebra and Number Theory* obtained in the Plovdiv University.

d) She has also submitted a document from the Agricultural University – Plovdiv (AU-Plovdiv) for awarding the academic position of *ASSOCIATE PROFESSOR* in the scientific specialty "*Mathematical Modelling and Application of Mathematics (in Agronomy)*".

e) An Order of the Rector of AU-Plovdiv has been presented confirming the election of Chief Assistant Professor Velika Nikolaeva Kuneva, PhD to occupy the academic position *ASSOCIATE PROFESSOR*.

f) A copy of the State Gazette, issue No. 65/08.08.2025, announcing the competition for *PROFESSOR* for the needs of the University - Plovdiv, has been submitted.

g) A certificate of the accumulated teaching workload from 29th September 2008 to date at the Agricultural University -Plovdiv has been presented. It has been estimated to 16 years and 11 months.

The overall workload taken for the period 2020-2025 has been calculated to 4498.3 hours. It is proven with the reference issued by the Student Information Center of AU. It gives the candidate the right to participate in the present competition. A declaration of originality and reliability of the results and contributions of the scientific production of Assoc. Prof. Velika Kuneva has been presented.

The general list of scientific works of Assoc. Prof. Velika Kuneva, PhD, is divided into five parts, as follows:

- a) Scientific works for awarding the educational and scientific degree of *Doctor* – 6;
- b) Scientific works for holding the academic position of *Associate Professor* – 36;
- c) Scientific publications after acquiring the academic position of *Associate Professor* and used for the verification in the National Agency for Information and Documentation (NACID) in 2020 – 10;
- d) Scientific works published in proceedings of conferences, forums and symposiums – 25;
- e) Scientific papers with which Assoc. Prof. Velika Kuneva participates in the current competition, covering the national minimum scientometric requirements for acquiring the academic position of *Professor*, which do not repeat the papers submitted for acquiring the doctoral degree, the academic position of *Associate Professor* and for the verification in NACID – 33.

The overall scientific work of Assoc. Prof. Velika Kuneva to date consists of 110 scientific papers. It itself is quite enough to imagine the volume of her scientific activity. I must note that this research work has been achieved with a large galaxy of co-authors, which shows that Kuneva possesses skills for a teamwork

Further, all scientific works are distributed into 4 groups, as follows:

Group A - including the scientific works for the doctoral degree under point a) – 6;

Group B - including the scientific works under points b), c) and d) – 71;

The works under point e) are those with which Assoc. Prof. Kuneva applies for the present competition. I will pay special attention to them. They are classified into two groups, namely:

Group B - 5 works;

Group Γ - 28 works.

I consider this classification to be completely convenient and I will keep it in mind when considering the scientific and applied science contributions.

3. General description of the candidate's research and applied work.

The research and applied science activities of Assoc. Prof. Velika Kuneva are focused on the application of mathematical methods in agriculture and animal breeding. This is a noble cause that is directly related to real life and aims at improving the vital needs of people. The thematic field is relevant and interesting.

4. Evaluation of the candidate's teaching work.

In addition to her research work, Assoc. Prof. Kuneva is also involved in a wide range of teaching and pedagogical activities. She reads lectures and gives practical classes to undergraduate and master students in all mathematical disciplines. Assoc. Prof. Velika Kuneva has supervised two doctoral students who have already defended their doctoral dissertations. In addition, currently the candidate is supervising another two doctoral students, one of whom has reached their thesis defence procedure (3rd October, 2025). Her active work is an evidence that Assoc. Prof. Velika Kuneva possesses the qualities of a teacher, educator and specialist in the application of mathematics in human economic activities.

5. Main research and scientific-applied contributions.

Mathematics is a science that finds application in all spheres of modern human life. One of these spheres is agronomy. It does Velika Kuneva credit that she has chosen to work in this field. With her scientific and applied contributions she significantly raises the development of agronomic sciences. In this part I will focus on the contributions of Velika Kuneva embodied in those 33 scientific publications submitted in the present competition. I will examine these publications by following the directions and their grouping.

GROUP B

1. Kuneva, V., S. Manhart, V. Delibaltova, M., Dallev, H. Kirchev, E. Koycheva, 2024.

The main objective of this paper is to investigate the impact of foliar application products on seed yield, essential oil content and composition of coriander varieties in Central Bulgaria. The most significant impact on the concentration of essential oils is found to be the use of Energy 20-8-60. The two-factor analysis of variance model was used to investigate the effect of the different preparations on the studied coriander varieties.

2. Kolev, M., N. Netov, I. Nikolova, I. Naskinova, V. Kuneva, M. Milev, 2023.

An analysis of a kinetic model that describes the development of autoimmune diseases is made. This model is a nonlinear system of differential equations that takes into account the biological activity of interacting populations. Here the determining role of mathematics is already clearly visible. The modelling problem is also illustrated with numerical results.

3. Milev, M., V. Kuneva, 2023.

This publication presents a solution to a transportation problem using MS Excel software (Solver). It is also shown that data processing and the execution of computational operations can be solved with appropriate software.

4. Kuneva, V., M. Milev, 2023.

The topic of this paper is the same as in the previous one. An applied solution of the Leontief balance model using MS Excel software is presented.

5. Kuneva, V., M. Milev, M. Gocheva, 2021

A computer program is used - an electronic one - to solve a transportation problem.

GROUP F

1. Manhart, S., V. Delibaltova, V. Kuneva, 2025.

The topic of this publication is the same as in article 1 of GROUP B. However, more in-depth research has been done here. All stages of rapeseed cultivation have been followed. A large number of indicators of this plant have been determined. The yield of seeds, oil and crude protein has been studied.

Data have been obtained for several types of hybrids and a comparison has been made between the values of the indicators of the individual hybrids.

2. Yildiz, M., M. U. Altan, V. Kuneva, 2025.

Using mathematical methods, the effects of individual cultural dimensions and motivations of Turkish and Bulgarian participants were investigated. It turns out that Bulgarians are more affected by the motivation for pleasure, while Turkish participants are more affected by the motivation for sustainability.

3. Stoyanov, G., V. Kuneva, 2024.

Observations have been conducted on the productivity of hybrids for silage and grain and tracking the development of hybrids during the growing season. Three levels of foliar fertilization have been made. As a result of the dispersion analysis, a dominant influence of the factor A-hybrid has been established. This is most strongly expressed in the number of grains in one row with 42%.

4. Kuneva, V., Stoyanova, A., Cojocaru, J., Sturzu, R., & Meluca, C., 2023.

Eight varieties of common wheat have been characterized. Cluster analysis has been used, which showed that the wheat varieties were grouped into two new clusters. The influence of three main factors was established. The first factor is related to plant height, spike length, number of grains in one spike and hectoliter mass. The second factor is related to the number of spikes and grain weight. The third factor is related to the mass of 1000 grains.

5. Kuneva, V., V. Delibaltova, S. Manhart, M. Dallev, I. Mitkov, D. Razpopov, G. Hristova, 2023.

This paper presents real data on the production of coriander - an essential oil and aromatic crop.

6. Delibaltova, V., V. Kuneva, M. Dallev, D. Razpopov, S. Manhart, I. Mitkov, 2023.

Here, as in article 4 of this group, the productivity of some varieties of common wheat has been investigated. The results obtained are a new acquisition in the production of this major field crop.

7. Kuneva, V., M. Sabeva, 2023.

Here, 48 specimens of winter pea varieties taken from the Institute in Sadovo have been studied. The results obtained are of significant importance.

8. Kuneva, V., M. Dallev, 2023.

Here the issue of reducing the costs of delivering ornamental plants to nurseries has been considered. MS Excel (Solver) was used to solve the corresponding transportation problem and in this way the mathematical problem was solved.

9. Matev, A., G. Ilcheva, R. Petrova, V. Kuneva, 2022.

This paper discusses the issue of irrigation. This issue has always been problematic, but in this article it was solved in a good enough way.

10. Popova, A., V. Kuneva, I. Dintchev, V. Ivanov, 2022.

A mathematical approach (correlation and factor analysis) has been applied to study some indicators of the Syrah variety. Correlations have been established between phenological indicators such as: sap, bud branching, etc. The results obtained are good and can be applied in agriculture.

11. Stoyanova, A., V. Kuneva, F. Emuralova, D. Stoyanova, 2022.

This paper is focused on a study about the development of seven types of wheat obtained at the Thracian University in Stara Zagora during the period 2017-2019.

12. Matev, A., G. Ilcheva, V. Kuneva, R. Petkova, Z. Zhivkov, 2022.

Here, the development of common beans is studied. The experimental data are processed using the least squares method. The final results are supported by numerical characteristics.

13. Kuneva, V., N. Panayotov, A. Trayanov, 2021.

Using a mathematical approach (cluster, correlation and factor analysis), the main morphological and generative indicators of the carrot variety *Tuchon* are studied.

14. Sevov, A., V. Kuneva, A. Stoyanova, 2021.

The influence of various Reni preparations on the essential amino acids in the biomass of *Mnogolistna* variety has been evaluated. A mathematical approach has been used.

15. Stoyanova, A., V. Kuneva, M. Georgiev, S. Ivanov, F. Emurlova, D. Vasilev, 2021.

Questions about common wheat varieties have been investigated, similar to publication 6 in the current group. However, the present research is more in-depth and new results have been obtained.

16. Gocheva, M., V. Kuneva, G. Gochev, 2021.

The paper's main goal is to analyze the current state of the Internet of Things and its potential in the areas of rural development and agriculture in the Republic of Bulgaria.

17. Dallev, M., V. Kuneva, 2021.

The purpose of this paper is to find an option for reducing the costs of the fertilization technological operation.

18. Panaytov, N., V. Kuneva, A. Trayanov, 2021.

This publication also discusses the issue of fertilization. Now the focus is on the yield and quality of carrot seeds.

19. Dochin, K., V. Kuneva, L. Nikolova, 2020.

The aim of this paper is to analyze seasonal changes in dominant algae in shallow fishponds. The concept of functional groups proposed by Reynolds et al., (2002) has been applied.

20. Georgiev, M., A. Stoyanova, V. Kuneva, G. Delchev, Sturzu, R., Melica, C., Cojocar, JM., 2020.

The effect of some foliar herbicides for controlling weeds in common wheat (*Triticum aestivum* L.) has been studied.

21. Mineva, R., A. Stoyanova, V. Kuneva, 2020.

The effect of nutrition and irrigation on the productivity of the oil-bearing rose (*Rosa damascena* Mill) has been studied.

22. Kuneva, V., A. Sevov, 2020.

Through a mathematical approach (dispersion, regression and variation analysis), alfalfa yield and total green mass yield have been estimated and the influence of row spacing on yield has been determined.

23. Gospodinova, G., A. Stoyanova, V. Kuneva, 2020.

Correlation analysis has been used to assess the correlation between the main biometric indicators of three cotton varieties. The final results are given with numerical characteristics.

24. Kuneva, V., A. Sevov, 2020.

A correlation between biometric indicators has been established and a more objective assessment has been made to improve yield. A mathematical approach has been used.

25. Sevov, A., V. Kuneva, 2020.

The topic is the same as in paper 22. Here the result applies to alfalfa.

26. Stoyanova, A., V. Kuneva, 2019.

The issue of tomato irrigation has been examined. Significant results have been obtained.

27. Kuneva, V., E. Valchinova, M. Sabeva, 2018.

A variety test has been conducted on 54 rye samples from our country and abroad.

28. Kuneva, V., A. Stoyanova, N. Valchev, G. Pevicharova, 2017.

In the present paper, similar to publication 26, the issue of tomato watering (*Vitelio* variety) has been discussed.

I will note that the results obtained by Assoc. Prof. Velika Kuneva and her team of co-authors are new to science and have direct application in agriculture.

It is also important to mention that the main results have been obtained through specially selected mathematical methods (correlation, regression, dispersion, etc. analyses). We will also note that the research papers are written in accessible language.

The total Impact Factor of all publications of Assoc. Prof. Velika Kuneva is 11.4. This Impact Factor is collected from the papers in GROUP B and GROUP Γ.

The total number of citations of all publications is 26, 9 of them being in journals with IF.

Velika Kuneva has published independently 1 textbook on higher mathematics, one handbook on optimization methods co-authoring with Irena Ivanova and one textbook on applied mathematics together with Irena Ivanova and M. Milanova.

6. Participation at scientific forums.

Assoc. Prof. Velika Kuneva has presented papers at international conferences - 12 abroad and 6 in Bulgaria. She is a member of the Union of Scientists in Bulgaria. She participates as a member of the university's scientific jury for the selection of candidates for academic positions.

7. Participation in research projects.

Assoc. Prof. Velika Kuneva has participated in the following projects: *Intelligent Crop Science* National Scientific Program (2021–2024 – a leader and a participant). She is a member of working packages 1.1; 1.2; 1.4 and 3.1 of UNIGreen – the European Green University Alliance (2023- 2026)

8. Significance of the contributions to science and practice.

The scientific works of Assoc. Prof. Velika Kuneva are widely reflected in Bulgarian and foreign literature. This is clearly evident from the numerous citations. I believe that the quantitative indicators required for obtaining the academic position of PROFESSOR have been achieved.

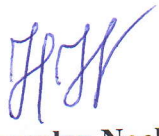
9. Critical notes and recommendations.

I have no critical remarks. I recommend that the candidate continue working on her chosen topic and obtain new results in this direction.

CONCLUSION

In the present competition Assoc. Prof. Velika Nikolaeva Kuneva, PhD, presents herself with the maximum quantity and quality of scientific production. She has remarkable scientific and applied scientific contributions, as well as extensive teaching knowledge and experience. Based on the presented scientific works, their significance, the scientific and applied scientific contributions contained in them, I find it reasonable to vote **positively** and to propose the Honorable Scientific Jury to also vote positively, and the Faculty Council of the Faculty of Economics at the Agricultural University - Plovdiv to elect **Assoc. Prof. Velika Nikolaeva Kuneva, PhD**, to occupy the academic position of **PROFESSOR** in the field of higher education: 4. Natural Sciences, Mathematics and Informatics; professional area: 4.5 Mathematics; scientific specialty: *Mathematical Modelling and Applications of Mathematics*.

7th November, 2025
Plovdiv

Reviewer: 
/prof. Nako Angelov Nachev, DSc/