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REVIEW

Concerning the competition for the academic position of "Professor" in the scientific specialty "Forage Production and Grassland Science", announced in State Gazette No. 65 of 17 July 2026, with candidate Atanas Veselinov Sevov.

by Prof. Dr. Hristina Georgieva Yancheva, appointed as a member of the scientific jury by Order No. RD-16-901/17 September 2026 of the Rector of the Agricultural University – Plovdiv

Reviewer: *Prof. Dr. Hristina Yancheva, Agricultural University – Plovdiv, Field of higher education: 6. Agricultural Sciences and Veterinary Medicine; Professional field: 6.1. Crop Production; Scientific specialty: Forage production and Grassland Science; Appointed as a member of the scientific jury by Order No. RD-16-901/17 September 2026 of the Rector of the Agricultural University.*

1. General information on the candidate's career and thematic development

Atanas Veselinov Sevov was born on 21 April 1976 in Plovdiv. In 2002, he graduated from the Agricultural University – Plovdiv with a Master's degree in Agricultural Engineering, specializing in Field Crop Production.

His academic career began in 2008, when he was appointed Assistant Professor in the Department of Crop Production, Faculty of Agronomy, after winning a competition. In 2011, he was promoted to Chief Assistant Professor and, in the same year, obtained the educational and scientific degree "Doctor" in the scientific specialty "Forage Production and Grassland Science". He acquired the academic position of Associate Professor in 2017. His research interests and professional expertise are in crop production, forage production, and grassland science.

Since 2020, he has served as Dean, with responsibilities for the management and coordination of the educational, research, and administrative activities of the Faculty of Agronomy.

He has communication, organisational, and leadership skills, experience in managing teams and projects, and the ability to work in multidisciplinary and international environments. Proficient in English and Russian, as well as office applications, electronic databases, and academic information systems.

2. General description of the submitted materials

In the competition for the academic position of Professor, Assoc. Prof. Atanas Sevov has submitted a total output of 68 works, grouped as follows:

- ✓ *Scientific publications in the relevant specialty – 68, including:*
- ✓ *Publications related to his doctoral dissertation – 2, which are not subject to assessment;*

- ✓ *Publications submitted in connection with his appointment as Associate Professor – 36, which are not subject to assessment;*
- ✓ ***Publications submitted for the academic position of Professor – 30, including:***
- ✓ *Publications with an impact factor – 10;*
- ✓ *Publications in peer-reviewed and refereed scientific journals – 18;*
- ✓ *Publications in conference proceedings – 2.*
- ✓ *Textbooks – 1.*

A total of 30 scientific publications are subject to analysis for the purposes of this review.

The candidate's personal contribution to the submitted scientific works is reflected in the authorship distribution: he is first author of 9 publications (30%), second author of another 9 (30%), and third or subsequent author of the remaining 12 (40%).

According to the submitted report on compliance with the minimum national requirements by indicator groups for appointment to the academic position of Professor in the field of higher education "Agricultural Sciences and Veterinary Medicine", pursuant to Article 2b, paragraphs 2, 3 and 5 of the Academic Staff Development in the Republic of Bulgaria Act, the candidate has accumulated 649.28 points, compared with the required minimum of 500. The points by indicator group are as follows: Group A – 50 points; Group B – 120.28 points (minimum required: 100); Group C – 215 points (minimum required: 200); Group D – 150 points (minimum required: 100); and Group E – 114 points (minimum required: 100). The data show that the candidate meets the minimum national requirements in all the listed indicator groups and exceeds the overall required number of points.

3. Main areas of the candidate's research. Demonstrated skills or potential for leading research (project management, external funding attracted, etc.)

Assoc. Prof. Sevov's research interests and professional expertise lie in crop production, forage production and grassland science, with an emphasis on sustainable agriculture, pasture and meadow management, organic production and the implementation of innovative technologies.

His research is characterised by an interdisciplinary approach that combines agronomic methods, mathematical analysis, remote sensing and machine learning to increase the productivity and quality of plant products while protecting natural resources and ecological balance.

Assoc. Prof. Sevov collaborates with established and early-career researchers on several main topics: the status and sustainable management of permanent grasslands in Bulgaria; smart management and digitalisation of pasture phytocoenoses; carbon balance and the ecological functions of grassland communities; soil fertility and biological technologies; agricultural technologies under climate change; plant protection and productivity; genetics and breeding; and engineering and robotic solutions in agriculture.

The research results contribute to precision management of agricultural systems, efficient resource use and adaptation to climate change. Particular attention is paid to optimising agronomic practices, selecting resilient varieties, managing water resources and protecting biodiversity.

Assoc. Prof. Sevov has experience in planning, organising and implementing research projects in crop production, forage production and sustainable agriculture. He has participated in two research projects, including the National Scientific Programme "Intelligent Crop Production" (2021–2023), in work packages related to robotic technologies, the Internet of Things (IoT), unmanned aerial vehicles and monitoring technologies. He also led a work package on intelligent systems for monitoring and analysing pasture and meadow productivity under the National Scientific Programme "Intelligent Animal Husbandry" (2021–2023).

4. Assessment of the candidate's pedagogical training and teaching activities. Role in training young researchers

The candidate has considerable teaching and academic experience, accumulated over more than 18 years at the Agricultural University – Plovdiv. As an Associate Professor, he actively participates in teaching, the development and updating of teaching materials and curricula, and the organisation and improvement of educational activities. His teaching is directly linked to his professional and scientific expertise in crop production, forage production and the sustainable management of meadows and pastures.

During 2020–2026, Assoc. Prof. Sevov completed a total teaching workload of 2875.3 hours, including 1320 lecture hours, 358 hours of practical classes and 1197.3 hours of extracurricular work with students enrolled in Bachelor's and Master's degree programmes.

His contribution to the education and scientific development of young specialists merits a positive assessment. The candidate has experience supervising undergraduate and doctoral students, helping them acquire practical and research skills, independently plan and conduct research, and analyse and interpret experimental data.

Under his supervision, 24 students have successfully defended their theses: 5 at Bachelor's level and 19 at Master's level. He is currently supervising four additional students whose thesis defences are forthcoming.

Two doctoral candidates have successfully defended their dissertations under his academic supervision:

- ✓ Georgi Stoyanov, who defended his dissertation in 2025, entitled "Investigating the Possibilities of Using Mathematical Models to Manage the Yield of Maize (Zea mays L.) Grown for Different Purposes".
- ✓ Ivelin Markov defended his dissertation in 2025, entitled "Investigating the Effect of Different Sustainable Grass-System Management Practices on Soil Carbon Sequestration under Intensive Maintenance of Sand-Based Putting Greens and on the Annual Carbon Budget". Following the successful defence of his dissertation, the doctoral graduate continued his academic career at the Agricultural University – Plovdiv.

Assoc. Prof. Sevov's participation in research projects creates opportunities for young researchers to become involved in an active research environment and gain practical experience in developing and implementing research tasks.

The candidate has developed 17 curricula for students in various Bachelor's and Master's degree programmes. Assoc. Prof. Sevov is a co-author of a Crop Production textbook (2019), in the section on forage crops. This demonstrates his active involvement

in the development and improvement of teaching and in providing quality education tailored to the requirements of the relevant degree programmes.

On the basis of the information provided, the candidate's pedagogical preparation and teaching activities fully meet the requirements for the academic position. The combination of teaching, research and management experience identifies him as an established lecturer and research supervisor who contributes to the training and development of young specialists.

5. Significance of the results, evidenced by citations, publications in prestigious journals, awards, and membership in international and national scientific bodies, etc.

The citations of the candidate's scientific publications demonstrate the relevance of his research, its significance, and the author's visibility in the academic community. A total of 10 citations of the author's publications have been identified in scientific journals indexed and abstracted in internationally recognised scientific databases, including publications with an impact factor in the Web of Science Core Collection and journals with a SCImago Journal Rank (SJR) indexed in Scopus. This confirms the presence of his research results in international academic exchange.

6. Significance of the contributions to science and practice. Reasoned assessment of whether the candidate has a clearly defined research profile

The candidate's research has a clearly defined and consistently developing profile, united by a common theme related to the sustainable management, productivity and resilience of grassland ecosystems and crop production. The submitted publications demonstrate the progression of his research from assessing the functional status and productivity of grassland ecosystems to the application of modern digital, remote-sensing and modelling approaches for their monitoring and management, as well as the study of climatic, soil and biological factors affecting the productivity and resilience of agroecosystems.

Three main research areas can be identified:

1. Sustainable management, productivity and functional status of grassland ecosystems – research into carbon exchange, the status and productivity of permanent grasslands, species composition, and factors determining resilience and degradation processes.
2. Application of modern digital and modelling approaches to agroecosystem monitoring and management – use of remote sensing, unmanned aerial vehicles, machine learning, statistical methods and probabilistic modelling to assess the condition, productivity and resilience of grasslands.
3. Effects of climatic, soil and biological factors on crop production – research into the role of climate, soil processes, biological agents and innovative technological solutions in improving crop productivity, efficiency and resilience.

The candidate's scientific works form a coherent and clearly recognisable research profile in which fundamental studies of ecosystem processes are combined with applied

developments and modern digital technologies for monitoring, assessing and sustainably managing grassland ecosystems.

The contributions presented by the candidate are an important component of the overall assessment of his research. They reflect the significance of the scientific problems addressed, the originality of the proposed solutions, the advancement of existing knowledge and the potential for practical application of the results.

Assoc. Prof. Sevov has declared that the results and contributions included in his submitted scientific output are original and have not been taken from research or publications in which he did not participate.

I. ORIGINAL CONTRIBUTIONS

1. For the first time in Bulgaria, the seasonal dynamics of carbon dioxide (CO_2) uptake by natural grassland communities have been established, demonstrating a significant relationship between uptake intensity and changes in climatic conditions.

2. Variability in CO_2 uptake capacity at different altitudes has been identified by monitoring photosynthesis, plant respiration, and soil respiration. Under favourable conditions, grassland communities function as net carbon sinks, whereas under adverse climatic conditions, including drought or temperature stress, they may become sources of CO_2.

3. The status of permanent grasslands in Bulgaria over the period 2015–2024 has been assessed by integrating statistical data and findings from scientific publications. Changes in area, productivity, species composition and forage quality have been identified. Clear regional differences and a trend towards a decline in the proportion of highly productive grass species in favour of more drought-tolerant but lower-yielding species have been established in association with increasing climate risk.

4. Grassland vegetation cover, photosynthetic activity and production potential have been assessed using the Normalized Difference Vegetation Index (NDVI) calculated from Sentinel-2 satellite imagery.

5. The use of unmanned aerial vehicles, visible-spectrum imagery and machine-learning algorithms has been substantiated for identifying and quantifying the degradation of semi-natural pastures. Object-based Random Trees and Support Vector Machine models were found to achieve higher classification accuracy.

II. METHODOLOGICAL CONTRIBUTIONS

1. A methodology for assessing greenhouse gas emissions in agriculture ("Greenhouse Gas Emissions Assessment Methodology in Agriculture") has been developed. It enables a comprehensive assessment of emissions at different stages of agricultural production, taking into account key factors such as technologies used, the level of mechanisation and agronomic practices. The approach allows comparisons between production systems and provides a basis for optimising agricultural activities to reduce the carbon footprint.

2. A conceptual and probabilistic framework has been developed for integrating scientific knowledge and empirical data into grassland management by combining natural language processing, machine learning and Bayesian networks. By converting information from scientific literature into structured causal relationships and combining it with data from IoT sensors, remote measurements and machine-learning models, the framework provides a basis for more transparent and adaptive management decisions.

3. An experimental model pasture system has been created that reproduces microclimatic conditions for the growth of grass mixtures with a certain degree of accuracy and enables remote access to data and the modelling of different growing conditions.

4. A practical framework for intelligent grassland management has been developed by integrating natural language processing (NLP), machine learning and Bayesian networks. Pilot implementation indicates the potential to reduce irrigation requirements by 14.9% while maintaining a 98% probability of acceptable grassland quality, and to reduce nitrogen inputs by 25%.

III. SCIENTIFIC CONTRIBUTIONS

1. Grassland phytocoenoses have been shown to play a significant role not only as carbon reservoirs but also in maintaining soil fertility, water balance, and biodiversity. The accumulation of organic matter in the soil improves its physical, chemical, and biological properties, thereby increasing the resilience of plant communities to climatic fluctuations.

2. Pasture management has been shown to directly affect the carbon balance. Intensive use associated with overgrazing reduces vegetation cover and consequently lowers carbon sequestration capacity. Conversely, sustainable practices, including regulated grazing pressure and appropriate vegetation-cover management, create conditions for increasing soil carbon stocks.

3. The impact of climate change on crop productivity has been analysed. Prolonged rain-free periods, high temperatures, heat stress and water stress have been identified as major factors limiting the development and productivity of spring crops. The need to optimise production regimes and apply differentiated approaches according to soil type, rainfall patterns and temperature conditions has been substantiated.

4. The potential use of microalgae in the remediation of oil-contaminated soils has been established, and the effect of the biological agent on soil processes and soil restoration has been investigated.

5. The effect of biofertilisers on wheat growth and development has been established, and their use has been substantiated as a means of improving plant nutrition and increasing production efficiency and sustainability.

6. The relationship between climatic conditions and phytosanitary risk has been investigated. Adverse temperature and water regimes at different phenological stages may worsen plant-health conditions and limit the possibility of obtaining high yields under non-irrigated conditions.

8. The interaction between genotype and environmental conditions in wheat under Bulgarian conditions has been investigated, with emphasis on genotype productivity and stability. The results demonstrate the importance of selecting suitable genotypes to adapt production to specific environmental conditions.

9. The need for an integrated approach to agroecosystem management has been substantiated, in which climatic factors, soil processes, plant responses, and technological

solutions are considered interrelated elements in improving the resilience and efficiency of crop production.

IV. APPLIED CONTRIBUTIONS

1. An approach for operational monitoring of grassland condition and degradation has been developed and applied using UAV imagery and machine-learning algorithms, enabling rapid and objective assessment of vegetation cover and degradation severity.
2. The MGRVI index has been applied for rapid biomass assessment using ground-level images captured with mobile devices, creating opportunities for accessible and operational monitoring of grassland productivity.
3. The use of microalgae for the remediation of oil-contaminated soils has been substantiated as a biological solution for restoring soil properties and limiting the adverse effects of contamination.
4. The potential use of biofertilisers in wheat cultivation has been demonstrated to improve plant growth and development and increase the efficiency of crop-production technologies.
5. Recommendations have been developed for adapting crop-production technologies to changing climatic conditions by optimising production regimes and tailoring agronomic decisions to soil and climate conditions.
6. Approaches to phytosanitary risk management under changing climatic conditions have been substantiated, including the need to align plant-protection measures with temperature and water regimes and the developmental stage of crops.
7. The applicability of silicon as a means of increasing plant resistance to pest attacks and supporting photosynthetic activity in crops has been established.
8. The potential for integrating UAV technologies and robotic systems into precision fertilization and aeration has been substantiated to improve resource efficiency and agroecosystem management.
9. Guidelines have been developed for applying TRIZ principles in the design and improvement of agricultural robots, addressing technological challenges and increasing the efficiency of mechanized and automated crop-production processes.

7. Critical comments and recommendations

I have no critical comments regarding the scientific works submitted. I recommend that, in his future research and professional activities, the candidate focus primarily on investigating and applying innovative methods and modern technologies for managing grassland phytocoenoses, increasing their productivity and improving the quality of forage crops.

8. Personal impressions and the reviewer's opinion

I have known the candidate since he joined the Department of Crop Production as a doctoral student, which has enabled me to follow his professional and scientific

development, his approach to assigned tasks, and his interaction with the academic community.

In his research, he demonstrates responsibility, consistency, and a thorough approach to the problems under investigation. In teaching, he shows commitment, discipline, and reliability in fulfilling his duties. His personal qualities include leadership skills, the ability to work effectively in a team, and a correct and ethical attitude towards academic staff and students.

CONCLUSION

Based on a comprehensive assessment of the teaching, scientific, and applied research activities of Assoc. Prof. Dr. Atanas Sevov, I consider that he meets the requirements of the Academic Staff Development in the Republic of Bulgaria Act, its implementing regulations, and the Regulations of the Agricultural University for their implementation. The scientific results, publication activity, and contributions in forage production and grassland science demonstrate sustainability in the candidate's research. The candidate has the necessary teaching experience in the education and professional development of students and doctoral candidates.

All of the above gives me grounds to assess his overall activity **POSITIVELY.**

I therefore recommend that the distinguished Scientific Jury also vote **positively** and that the Faculty Council of the Faculty of Agronomy at the Agricultural University – Plovdiv elect Assoc. Prof. Dr. Atanas Veselinov Sevov to the academic position of **Professor** in the scientific specialty "Forage Production and Grassland Science".

Date: 23.10.2026
Plovdiv

REVIEWER: .....
(Prof. Dr. Hristina Yancheva)