

OPINION

on the materials submitted for participation in the competition for the academic position of **Professor** in the field of higher education **6. Agricultural sciences and veterinary medicine**, professional field 6.5. Forestry, scientific specialty 'Technology, mechanization and automatization of forestry and woodworking and furniture industry' in the discipline 'Mechanization of forestry works'

In the competition for professor announced in the State Gazette, issue 35/19.04.2024 and on the website of the University of Forestry with the procedure code FOR-P-0324-128 for the needs of the Department of Forestry Technology and Mechanization at the Faculty of Forest Industry, as a candidate participates Assoc. Prof. Dr. Konstantin Ivanov Marinov, Faculty of Forest Industry, Department of Forestry Technology and Mechanization.

The opinion was prepared by Prof. Dr. Margarita Ilieva Georgieva, professional field 6.5 Forestry, Forest Research Institute - BAS.

1. Brief biographical details of the applicant

Associate Professor Dr. Konstantin Ivanov Marinov was born in Sofia on 10.11.1961. In 1988 he graduated from the Higher Institute of Forestry (University of Forestry), where he acquired the educational qualification degree (EQD) mechanical engineer in the specialty 'Complex mechanization and flow lines in forestry'. In 2007, he successfully defended his dissertation thesis on 'Technological research on the machine defoliation of seeds of some coniferous tree species' and acquired the educational and scientific degree 'Doctor' in the scientific specialty 'Technology, mechanization and automation of forestry and timber extraction'. He worked as a mechanic at the Kremikovtsi Machinery Plant (1982-1983) and as a researcher at the Research Sector of the Higher Forestry Institute (1988-1989).

During the period 1989-2024, the candidate held the academic positions of assistant, senior/main assistant and associate professor at the University of Forestry, Faculty of Forestry, Department of Forestry Technology and Mechanisation, where he conducted teaching and research activities, participated in the development of curricula, publication of textbooks and teaching aids in the field of forestry mechanisation and technology.

From 2016-2020 Assoc. Prof. K. Marinov is the Head of the Department of Forestry Technology and Mechanization at University of Forestry. He is a member of the Union of Scientists in Bulgaria; a representative of University of Forestry in the Bulgarian Institute for Standardization in the field of 'Road vehicles, internal combustion engines, tractors and machinery for agriculture and forestry' and 'Tractors and machinery for agriculture and forestry', a member of the Association for Energy Utilization of Biomass - Bulgaria, etc. He is a leader and participant in national and international scientific research projects and national educational programs, participant in national and international forums, etc. Assoc. Prof. K. Marinov is fluent in Russian with C1 level and English with B1 level.

2. Compliance of the submitted documents and materials of the candidate with the required ones according to the Regulations for the Development of the Academic Staff at the University of Forestry.

The documents and materials submitted by Assoc. Prof. K. Marinov for participation in the competition for the academic position of 'professor' comply with the national minimum requirements for this position and the requirements specified in the Regulations for the Development of Academic Staff at the University of Forestry in the field of higher education 6. Agricultural Sciences and Veterinary Medicine, professional field 6.5. Forestry.

3. Evaluation of the candidate's educational and pedagogical activities involving teaching (work with students and supervising PhD students)

In the period 1989-2024 Assoc. Prof. K. Marinov delivers lectures in the classes at the University of Forestry in the following courses:

- Mechanization of forestry works for the Bachelor's degree (full-time and part-time) and Technological design in forestry for the Master's degree (full-time) students of the specialty Forestry;
- Mechanization in Landscaping and Labour Protection for full-time students of the specialty Landscape Architecture.

Since 2022, he teach classes in the specialty of Mechanization of Afforestation Activities to students studying in the Master's degree in the specialty of Restoration of Disturbed Landscapes at the Mining and Geological University "St. Ivan Rilski".

Assoc. Prof. K. Marinov was a research supervisor of two PhD graduated students in 2022 and 2023 that have the right to defend.

4. Evaluation of the candidate's scientific, applied and publication activity 4.1. General description of the submitted materials

The candidate Assoc. Prof. Dr. Konstantin Marinov participated in the competition with a total of 48 publications, of which: monograph - 1 pc; textbooks - 3 pc; teaching books - 3 pc; study - 1 pc; publications in scientific journals and edited proceedings - 40 pc, and reference for leadership and participation in 9 scientific research projects.

In the submitted self-assessment report on the compliance of the candidate's scientific production with the minimum national requirements, 1281.32 points are indicated, accompanied by the relevant supporting material, with a minimum requirement of 550 points. For the individual groups of indicators, the distribution of the applicant's points is as follows:

- Group of indicators A - 50 points (minimum requirement of 50 points);
- Group of indicators B - one monograph submitted as a habilitation thesis, which awards the candidate 100 points (minimum requirement of 100 points).
- Group of indicators G - obtained points 386,32 points (minimum requirements of 200 points) by presenting 47 scientific works - articles, refereed and indexed in world-known databases of scientific information scientific publications in refereed journals, as well as articles, studies and reports in non-refereed journals with scientific peer review or published in edited collective volumes.
- Group of indicators D - 300 pts (minimum requirement of 100 pts) - 55 pts of positive citations are presented, in scientific journals and series indexed in Web of Science or Scopus, in non-peer-reviewed journals, in monographs and peer-reviewed collective volumes.

- Group of indicators E - 105 points (minimum requirement of 100 points) - participation in 11 national and international scientific or educational projects, and leader of two national projects; 3 university textbooks and 3 university teaching books published.

4.2 Participation in scientific, applied and educational projects

The candidate Assoc. K. Marinov has participated in 5 scientific, applied and educational projects and has led 2 national scientific research projects as follows:

- 18. Participation in national scientific or educational projects funded under the Operational Programme of the Ministry of Education and Science 'Science and Education for Smart Growth' and 'Human Resources Development', University of Forestry (4 pcs.).
- 19. Participation in an international scientific or educational project - scientific research project funded by the National Fund of Science (1 pc).
- 20. Leadership of national scientific and educational projects funded by the University of Forestry (2 pcs.).

4.3 Characteristics of published scientific results

Assoc. Prof. Konstantin Marinov presents one monograph 'Research of forest milling cutters for soil preparation for poplar plantation establishment' as a habilitation thesis, where original results of many years of experimental, theoretical and comparative research on the technological and operational properties of specialized forest milling cutters for soil preparation of forest areas for establishment of intensive poplar plantations are presented (3.1).

As an only author Assoc. Prof. K. Marinov published two textbooks on 'Mechanization of forestry works' (as one original, and one supplemented and revised edition), as well as one textbook 'Plant protection machinery' in co-authorship with Assoc. Prof. K. Stefanov (22.1-22.3). Three textbooks ('Plant Protection Machinery', 'Mechanization of Reforestation Activities' and 'Mechanization of Agriculture') have been published (23.1-23.3).

Out of 40 publications in scientific journals and proceedings, 14 publications are in Web of Science or Scopus refereed journals (7.1-7.14), the remaining 22 publications are in non-refereed journals and collections (8.1-8.26), and one study in an unrefereed edition (10.1).

4.4. Reflection of the candidate's scientific publications in the literature (known citations)

Assoc. Prof. Konstantin Marinov has submitted a list with a total of 55 citations, of which, according to the type of citation, they are divided as follows:

- Citations in scientific publications, refereed and indexed in world-known databases with scientific information or in monographs and collective volumes - 17 pcs.
- Citations in peer-reviewed monographs and collective volumes - 2 pcs.
- Citations in non-refereed journals with scientific peer review - 36 pcs.

4.5. Contributions to the candidate's works (scientific, scientific-applied, applied)

The candidate's contributions are structured thematically in the following areas: machines for densification of wood and non-wood forest products; technologies and machines for extraction of forest seed materials; technologies and machines for production of forest planting materials; technologies and machines for creation of forest plantations; technologies and machines for utilization of forest biomass and creation of forest plantations for energy purposes;

technologies and machines for wood extraction.

The most important scientific and applied contributions achieved are the following:

4.5.1. Scientific contributions

The theory of movement of material particles on the helical working surface of densifying machines has been completed (7.1, 8.3, 8.4, 8.26); the equations for movement of seeds of forest-wood species in the working bodies of densifying machines have been defined (8.22).

Technologies and machines applied at home and abroad for preliminary preparation of forest areas and clearings and basic soil treatment for afforestation with intensive poplar crops are analysed (3.1, 7.4, 7.6, 8.19, 8.21, 8.25, 20.1).

The influence of the diameter and density of stumps of main tree species for the region of Northeast Bulgaria - acacia, oak and ash, on the main operational parameters of forest cuttings was established (7.13, 7.14, 8.13).

The main operational properties of specialised forestry tractors TAF 690 PE and LKT-81T for transporting whole stems and long wooden sections of common beech in the Western Balkan Mountains and common spruce in the Western Rhodopes region (7.11, 8.8), and of a Bobcat TL 470 telescopic front loader in the conditions of the Teaching and Educational Forest State 'Petrohan' (7.7) were established.

The optimum technological speeds of forest milling machines under typical production conditions, typical for the lower forest belt of oak forests in our country (7.13); the optimum power of the drive units and the rotation speed of the milling cutters depending on the amount of processed wood mass (7.14) and the quality indicators for soil preparation of forest areas and clearings for afforestation with forest milling machines (8.13, 8.20).

4.5.2. Scientific and applied contributions

Graph-analytical dependencies for determination of the movement parameters and the average transport speed of wood particles in the screw mechanisms of the densifying machines have been developed (8.3); a methodology for determination of the length of the press channel of the screw press dies has been developed (8.4); the magnitude of the working pressure of the screw presses for briquetting of shredded straw and wood for the production of briquettes of a certain density has been defined (7.1, 8.4).

Analytical dependencies for the determination of the operational productivity of the pallet debarking machines for the extraction of seeds of forest tree species have been defined (8.22); the knowledge of the physical-mechanical and technological properties of forest seed materials of white pine, black pine, common spruce and white fir used in their processing has been enriched (8.2); the main parameters and functional dependencies in the process of seed debarking of forest tree species have been established (8.1) white pine with a small-size uncrossing machine 'Unitech' (8.16) and regression models were developed to determine the influence of the control of the seed cleaning machine 'VSS Cleaner & Seed Sizer' on the qualitative and quantitative parameters of the process, in seed production of white pine, black pine and common spruce (7.12, 8.23, 20.2).

A methodology for experimental investigation of the operational and technological properties of forest cutters for the preparation of poplar stands for reforestation with intensive poplar crops has been developed (3.1) and the technological, operational and techno-economic parameters of the FAE 300/S multifunctional forest milling cutters, aggregated on the PT-400 and PT-300 self-propelled milling units, for the preparation of poplar stands for afforestation, and deep soil preparation of sandy, sandy-clay and clayey alluvial soils of poplar stands were established (3.1, 7.4,

7.6, 8.21).

Methodology for experimental study of forest milling machines for deep soil preparation for afforestation of non-regenerated forest areas, clearings and field protection forest belts in the lower forest growing belt in Bulgaria was developed (7.13, 8.13).

5. Evaluation of the personal contribution of the candidate

In all the submitted materials the personal contribution of Assoc. Prof. Konstantin Marinov, his scientific interests in the field of forestry mechanization, use of technologies and machines for wood extraction, densification of wood and non-wood forest products, extraction of forest seed materials, production of forest seed materials, creation of forest plantation, etc. are outlined. In the submitted materials for the competition, out of 48 scientific papers, the candidate is an the only author in 17 of them, and in 22 of them he is the first author (over 80% of the submitted scientific production). In the remaining publications, the author is second or third. Of all the papers, 26 are in English and the remaining 22 are in Bulgarian.

6. Critical remarks

The report on the scientific contributions of Assoc. Prof. K. Marinov has been prepared correctly, as the scientific, scientific-applied and applied contributions are original and clearly outlining the candidate's scientific research activity. The presentation of the fields and contributions, however, could be more systematic and summarizing in order to highlight the most significant scientific and applied achievements of the candidate in the individual fields.

7. Personal impressions

My personal impressions of Assoc. Prof. Dr. Konstantin Marinov are related to his teaching activity, when he stood out as a calm, responsive and lecturer who deserved the respect and appreciation of his students. In his teaching and scientific career Assoc. Prof. K. Marinov stands out as an erudite scientist and lecturer, presenting his experience with high competencies in the application of knowledge in the field of mechanization, technology and automation in particular areas of forestry, etc.

8. Conclusion

The presented original scientific and applied contributions in the field of mechanization and automation in forestry and technologies for wood extraction, soil preparation, seed processing and plant protection machinery, the presented high quality scientific production and analysis of its significance, the long experience in teaching and expert activities of Assoc. Prof. Dr. Konstantin Marinov give me reason to positively evaluate the submitted materials for participation in the competition.

In connection with the above, I propose that Assoc. Prof. Dr. Konstantin Ivanov Marinov be elected '**Professor**' in the discipline of Mechanization of forestry works in the Professional field 6.5. Forestry, scientific specialty 'Technology, mechanization and automation of forestry and timber extraction'.

Drafted the opinion:

(Prof. Dr. Margarita Georgieva)

The opinion was submitted on 20.08.2024.