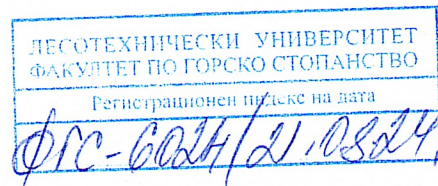


OPINION



on the materials provided for participation in a competition for the occupation of the academic position "professor" in the field of higher education 6. Agricultural sciences and veterinary medicine, professional direction 6.5. Forestry, scientific specialty "Technology, mechanization and automation of forestry and wood harvesting", in the discipline "Mechanization of forestry works".

In the competition for a professor, announced in the State Gazette, no. 35 of 19.04.2024 and on the website of University of forestry on 04.04.2024 with procedure code FOR-P-0324-128 in the department "Technologies and mechanization in forestry" at the faculty "Forestry", as candidate participates Associate Professor Konstantin Ivanov Marinov, PhD, Faculty of Forestry, Department of Technologies and Mechanization in Forestry.

Prepared the statement: Prof. Dr. Slavcho Asenov Sokolovski, Professor of Professional Direction 6.5 "Forestry" from the University of forestry, retired

1. Brief biographical data about the candidate

The candidate Associate Professor Dr. Konstantin Marinov was born on 10.11.1961 in Sofia. He graduated in 1980 from "Henry Ford" Vocational School of Motor Vehicles and Energy, majoring in "Internal Combustion Engines". He completed his higher education at LTU - Sofia in 1988 as an engineer majoring in "Complex mechanization and assembly lines in forestry". In 2007, he defended his PhD thesis on the Scientific specialty: "Technology, mechanization and automation of forestry and wood harvesting", on the topic "Technological research on machine de-winging of seeds from some coniferous tree species". In 1988 and 1989, he worked as a researcher in the Scientific Research Sector at University of Forestry. From 1989 to 2009, he was an assistant, senior and chief assistant at the "Technology and Mechanization in Forestry" department and conducted practical trainings to students from the faculty of "Forestry" (FF) and faculty of "Ecology and Landscape Architecture" (FELA) in educational disciplines, including "Mechanization of forestry works". Since 2009, he is an associate professor and gives lectures on the disciplines "Mechanization of forestry works", "Technological design in forestry activities", "Mechanization in landscaping and security", etc. From 2016 to 2020, and since 2024 he has been the head of the Department "Technologies and Mechanization in Forestry". The candidate is proficient in Microsoft Office and specialized software "QstatLab-6". Associate Professor Dr. Konstantin Marinov is a professional driver licensed to work with agricultural and forestry equipment, chainsaws and brushcutters. He speaks English and Russian. He is a member of the Union of Scientists in Bulgaria.

2. Conformity of the submitted documents and materials of the candidate with the required ones according to the Rules for Development of Academic Staff (DAS) at University of Forestry

The documents and materials submitted by Dr. Konstantin Marinov fully comply with the requirements according to the Regulations for DAS at University of Forestry. He presented a paper and electronic list of his works and publications and a reference to their summaries in Bulgarian and English, as well as a list of citations of his publications with annexes. He presented a report on the contributions in his works, a list of textbooks and teaching manuals, as well as official notes on educational employment, on the developed curricula, on participation in the activities of the Bulgarian Institute for Standardization, on participation in an examination committee at the Ministry

of Agriculture, food and forests, on participation in an European project, etc. The presented diplomas and their annexes are notarized. A total of 35 types of documents and materials are presented.

3. Assessment of the candidate's academic and teaching activities

The official note presented by Assoc. Professor Dr. Konstantin Marinov, for the pedagogic and teaching activities for the academic year 2023/2024, is mainly in the specialties "Forestry" (F) and "Landscape Architecture" (LA):

Academic and qualification degree (EQD) "Bachelor"

- Lectures on the discipline "Mechanization of forestry works", specialty Forestry - 100 hours of full-time education and 56 hours of part-time education;
- Practical training in the discipline "Mechanization of forestry works", specialty Forestry - 6 hours of full-time education;

Academic and qualification degree (EQD) "Master"

- Lectures on the discipline "Technological design in forestry activity", specialization "Forest protection and economics in forestry" - 18 hours of full-time education and 30 hours of part-time education;
- Lectures on the discipline "Mechanization in landscaping and security", specialty "Landscape architecture" - 56 hours of full-time education;
- Practical training in the discipline "Technological design in forestry activity", specialty "Forest protection and economy in forestry" - 9 hours of full-time education and 15 hours of part-time education ;
- Practical training in the discipline "Mechanization in landscaping and security", specialty "Landscape architecture" - 28 hours of full-time education.

The total planned academic load for the academic year 2023/2024 is 318 hours of lectures and 60.4 hours of practical training.

During the last 5 years, Dr. Konstantin Marinov has fulfilled the pedagogical load stipulated by the regulations of the University of Forestry. His academic activity is as follows:

- in the first four years, its performance was between 460 and 616 hours;
- in the last fifth year, his performance was 103 hours, due to long-term sick leave.

In the official notes submitted by the candidate from FF and FELA, information is given about the 5 study programs developed (3 for full-time and part-time education and 2 only for full-time education) in the disciplines lectured by him. Dr. Konstantin Marinov was the scientific supervisor of 2 doctoral students who were dismissed with the right of defense. Ordinance of the Rector of University of Forestry for their dismissal is presented.

The candidate for professor is an expert at the Bulgarian Institute for Standardization in BIS/TK23 "Tractors and machinery for agriculture and forestry". He was included by the Minister of Agriculture and Food (MAF) in the list of chairmen of examination commissions for acquiring legal capacity to work with agricultural and forestry equipment.

4. Assessment of candidate's scientific, scientific-applied and publication activity

General description of the presented materials.

Assoc. Professor Dr. Konstantin Marinov participated in the competition for professor with :

- Dissertation for obtaining the Academic and scientific degree (ASD) "Doctor", 2007, (A1);
- Monograph - 1 (B3);
- Publications - 40 (G7, G8);
- Study/article - 1 (G10) ;
- Citations- 55 (D13, D14, D15);
- Projects - 9 (E18, E19, E20) ;

- Textbooks – 3 (E22);
- Pedagogical manuals – 3 (E23).

4.1. Participation in scientific, scientific-applied and educational projects

Associate Professor Dr. Marinov participated in the competition with 9 scientific, scientific-applied and educational projects, of which: 2 educational projects financed under the Working Programs of the Ministry of Education and Science (E18.1); 2 scientific research projects financed by the University of Forestry, according to Ordinance No. 9 with funds from the State Budget (E18.2); 1 international research project, financed by the Scientific research fund of the Ministry of Education and Science (E19); head of 2 national scientific projects financed by SRC at the University of Forestry (E20); 2 University scientific-applied projects, financed by the Training and Experimental Forestries of the University of Forestry, and one of them was led by him.

According to group "E" indicators, Associate Professor Dr. Konstantin Marinov collects a total of 290 points, out of the required 100 points, which is 2.9 times more.

4.2. Characteristics of published scientific results

The total number of publications with which Dr. Marinov applied for the academic position of professor (after associate professor) is 48, including:

- ❖ One independent monograph on the topic : "Research on forest tillers for soil preparation for the creation of poplar crops", published by the publishing house "Intel Entrans" in Sofia in 2019 with a volume of 337 pages, which has been reviewed (B3). It represents many years of research on forest cutters used to prepare forest areas and clearings for afforestation with intensive poplar crops. The monograph is useful both for students and for specialists working in forestry.
- ❖ The candidate has submitted for participation in the competition, a total of 40 articles and reports published in Bulgaria and abroad :

Publications in scientific journals – 36, including:

- In Bulgarian journals, referenced in Web of Science and SCOPUS – 12;
- In international journals, referenced outside Web of Science and SCOPUS – 2;
- In Bulgarian, with peer review, not referenced in Web of Science and SCOPUS - 22;

Publications in scientific forums - 4, including:

- In international, referenced in Web of Science and SCOPUS – 2;
- In international, not referenced in Web of Science and SCOPUS – 1;
- In Bulgarian, not referenced in Web of Science and SCOPUS – 1;

The publications were published in the following editions:

- in referenced and indexed in world-famous databases with scientific information – 14 (i.e.35%) (G7);
- in non-referenced reviewed journals or published in edited collective volumes – 26 (i.e. 65%) (G8).

36 out of 40 scientific publications and articles presented, are in scientific journals and 4 are in sets of scientific forums, of which :

- 35 issues were published in our country and 5 issues abroad;
- 28 issues were published in English and 12 issues in Bulgarian.

According to the number of co-authors, the publications are divided as follows: independent - 17 articles, co-authored - 16, with two co-authors - 9, with three or more co-authors - 6. Dr. Konstantin Marinov is the first co-author in 11 publications, the second in 9 and the third in 5.

- ❖ Independent study – 1, on topic: "Technologies and machines for greenhouse production of saplings with a closed root system, "Avangard Prima" publishing house, S., 110 pages, reviewed (G10). It examines modern technologies, machines and equipment for greenhouse production of container saplings in forest nurseries. Data are also given on the necessary funds for the production of container saplings. The book can be used by forestry specialists, PhD students and students.
- ❖ 3 textbooks (E22), of which 2 are independent and one with 1 co-author. The textbooks are written according to the curricula of the disciplines on which the candidate gives lectures. Two of them completely match the discipline of the competition "Mechanization of Forestry Works" (one is a second revised and supplemented edition).
- ❖ 3 pedagogical manuals (E23), 2 of which individual and one co-authored. The self-learning materials are in electronic version. The manuals are considered an integral part of the issued textbooks

Aforementioned, together with the information filled in by the applicant in Appendix 2 of the National Center for Information and Documentation (NCID) on the compliance of his materials with the Minimum Scientific Requirements (MSR) shows that the scientific, scientific - applied and publication activity of the candidate is significant both in terms of quantity, as well as in quality, namely :

- Self-published books such as monographs and studies and 40 scientific publications provide modern knowledge on the subject of the competition, useful for students and practitioners. A characteristic feature of the data reflected in the books and publications is that they were obtained from the candidate's scientific research activity in the last 14 years;
- The 3 textbooks and 3 pedagogical manuals written and published will help students' education in the disciplines lectured by him.

According to group of indicators "G", Dr. Konstantin Marinov gathered a total of 386.32 points, out of the required 200 points, which is nearly 2 times more (193%).

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

To the competition, 55 citations in journals and sets of scientific forums have been presented, of which 17 in referenced and indexed in world-renowned databases with scientific information or in monographs and collective volumes (D13), 2 in monographs and collective volumes with peer review (D14) and 36 in non-refereed reviewed journals (D15).

According to group "D" indicators, Dr. Marinov collects a total of 455 points. The number of points required is 100 points, which exceeds by 4.55 times (455%) the minimum.

4.4. Contributions in the candidate's works (scientific, scientific-applied, applied)

In the present opinion, the object of evaluation of candidate's contributions are the monograph, scientific publications, studies, projects, textbooks and pedagogical manuals. Submitted report on the applicant's contributions is structured thematically in the following directions: Machines for densification of wood and non-wood forest products; Technologies and machines for extraction of forest seeds; Technologies and machines for production of forest plants; Technologies and machines for creating forest crops; Technologies and machines for utilization of forest biomass and creation of forest plantations for energy purposes; Technologies and machines for wood extraction. More important scientific, scientific-applied and applied contributions in the works are:

- *Scientific contributions*

- The theory of movement of material particles along the screw working surface of the densifying machines has been developed (G7.1, G8.3, G8.4, G8.26);
- Equations for the movement of seeds of forest-tree species in the working organs of the de-wing machines are defined (G8.22).

- *Scientific and applied contributions*

- Grapho-analytical relations have been developed to determine the movement parameters and the average transport speed of wood particles in the screw mechanisms of the densifying machines. Graphical functions have been developed to determine the operational performance of briquette production machines, depending on the working pressure and the rotation speed of working bodies. (G8.3).
- A methodology has been developed to determine the length of the press channel of the matrices of the screw presses (G8.4);
- The working pressure of screw presses for briquetting of shredded straw and wood for briquette production with a certain density is defined (G7.1, G8.4);
- Analytical relations have been defined for determining the operational performance of paddle unceasing dewingers for seeds extraction from forest-tree species (G8.22);
- The system for management and control of the technological process in regional forest seed production in Bulgaria has been further developed (G8.1);
- Existing knowledge about the physico-mechanical and technological properties of forest seed materials of white pine, black pine, common spruce and white mulberry, used in the process of their cultivation, has been further developed and enriched (G8.2);
- Main parameters and functional relations in the process of de-winging of white pine seeds with the "Unitech" de-winging machine were established (G8.16);
- Regression models have been developed to determine the influence of control bodies of the seed cleaning machine "VSS Cleaner & Seed Sizer" on the qualitative and quantitative parameters of the process, in the extraction of seeds from white pine, black pine and common spruce (D7.12, D8. 23, E20.2);
- A study and analysis of the technologies and machines applied in national and international aspect for preliminary preparation of forest areas and clearings, and basic soil treatment for afforestation with intensive poplar crops has been carried out (B3.1, G7.4, G7.6, G8.19, G8.21, G8.25, E20.1);
- Quality indicators of the preparation process of poplar clearings for afforestation with multifunctional and meliorative forest milling machines have been established (G8.14, G8.15);
- A methodology was developed for the experimental study of the operational and technological properties of forest milling machines for the preparation of poplar clearings for afforestation with intensive poplar crops (B3.1);
- Technological, operational and techno-economic parameters of multifunctional forest milling machines FAE 300/S, which are aggregated on self-propelled milling units PT-400 and PT-300, for afforestation of poplar clearings, and deep soil preparation of sandy, sandy-clay and clay alluvial soils of poplar habitats have been calculated (B3.1, G7.4, G7. 6, G8.21);
- A methodology has been developed for forest milling machines experimental study of deep soil preparation for afforestation of non-renewable forest sites, clearings and field protection forest zones in the lower forest vegetation zone in Bulgaria (G7.13, G8.13);

- Regression models and relations have been developed to determine the operational productivity, hourly and relative fuel consumption per unit area of forestry milling machines depending on: the frequency of rotation of the rotor; the diameter of the stumps; the density of stumps and the depth of soil tillage (G7.13);
- The way the diameter and stump density of main tree species from North-Eastern regions of Bulgaria - acacia, oak and ash, impact the main operating parameters of forestry milling machines has been established (G7.13, G7.14, G8.13);
- Optimal technological speeds of forest milling machines under typical production conditions, characteristic of the lower oak forests vegetation zone in our country, have been established (G7.13);
- The optimal power of driving units and rotation frequency of milling machines, in relation to the amount of processed wood mass, has been determined. (G7.14);
- Quality indicators for soil preparation of forest areas and clearings for afforestation with forest milling machines have been established (G8.13, G8.20);
- The current situation of wood biomass potential in Bulgaria and Slovakia has been studied (G7.2, G8.5, E19.1);
- Main energy characteristics of wood biomass have been studied according to its energy indicators; origin and sources, and methods of its use (G8.5, G8.6, G8.7, G8.10, E19.1);
- Main operating properties of specialized forest tractors TAF 690 PE and LKT-81T for transporting stems and long wooden sections of common beech in Western Stara Planina region and common spruce in Western Rhodopes region have been determined (G7.11, G8.8);
- Operational properties of a telescopic front loader Bobcat TL 470 at Training and Experimental Forest Range "Petrohan" have been determined (G.7.7).

• *Applied Contributions*

- Technological regimes have been developed for de-winging of white pine seeds with the small-sized "Unitech" de-winging machine in the seed harvesting and seed control stations in our country;
- Technological modes of operation of a wet dewinger BCC Wet Dewinger 800 and a seed cleaning machine BCC Cleaner & Seed Sizer have been developed for the extraction of seeds from white pine, black pine and common spruce for accurate nest sowing for the production of container saplings (G7.12, G8. 23);
- The current state of the technologies and machines used for greenhouse production of container saplings for afforestation was studied (E10.1):
- A study and comparative analysis of modern structures, equipment and machines used in the production of container saplings was carried out (E10.1, E22.1, E22.3);
- Favorable technological parameters of the working environment in the greenhouses have been established and optimal values of temperature and air humidity have been proposed, depending on plant development phases controlled and maintained by air conditioning installations (E10.1);
- It has been established that forest milling machines for soil preparation of forest areas and clearings, compared to the traditional machines used so far for afforestation in our country, in the lower forest vegetation zone, ensure a higher quality of work (G8.13, G8.20);
- It has been determined that the wood used for energy production in Bulgaria comes from the "wood" and "top branches" category and reaches an average of 3.2 million m³ annually. This part is about 57% of the total amount of wood production in our country (E19.1);
- It was found that the unutilized wood waste from cutting remaining is about 30% for coniferous and 20% for deciduous wood (E19.1);

- It has been established that compared to other EU countries and more specifically to Republic of Slovakia, the insufficient experience of energy suppliers and consumers in Bulgaria, in the field of Renewable energy sources (RES) technologies from dendromass and their relatively higher prices, lead to more low demand for these low power technologies (E19.1);
- It has been established that in our country there are favorable conditions for creating energy plantations from fast-growing tree species. With suitable habitats and timely care for growing these crops, they can realize a relatively high output of dry biomass (G8.9, G8.10, G8.11, G8.24, E19.1);
- It was established that the extraction of wood from these plantations should be carried out in the autumn-winter season, when the wood is fully stiffened and the relative humidity of the chips is up to 45-50% (G8.9, G8.10, G8.11, G8.24, E19.1);
- It has been established that the waste biomass that remains from the undigested shoots in the nursery departments of the Poplar Farm in Pazardzhik for the production of planting material and the technological waste from the production of cuttings can be processed into wood chips for energy production (G8.10, G8.11, G8.24, E19.1);
- It has been established that fast-growing forest-tree species of Euro-American hybrid poplar varieties, within a rotation between 2 and 4 years, on suitable habitats, can reach a height of 6÷12 m, at which time their wood is fully suitable for production of energy chips (G8.9, G8.10, G8.11, G8.24, E19.1);
- For more efficient use of renewable energy from wood biomass at national, municipal and local level, it is necessary to implement modern installations with higher efficiency, equipped with mechanized power supply and automatic control (G8.10, G8.11, G8.24, E19.1);
- It has been proven that an installation of combustion or gasification of dendrobiomass in order to be economically efficient, the delivery price of the raw material, in the period (2013-2014), should not exceed BGN 60/t. Taking into account the transport costs and the relatively low bulk mass of the raw material, this requirement is achievable when the raw material is delivered at a distance of no more than 30 km (E19.1);
- It has been calculated that the highest productivity of a TAF 690 PE tractor at Western Stara Planina climate conditions is achieved when the road slope is between 10° to 16° and haulage distances up to 550 m (G7.11);
- It has been established that the front jaw loaders are suitable for working in temporary forestry warehouses with limited sites dimensions and terrains inclined up to 12÷15° (G7.7).

5. Evaluation of the candidate's personal contribution

I assume that the most considerable part of scientific results achieved in the research activity, presented in the documents submitted for the "professor" competition by Associate Professor Dr. Konstantin Marinov, are his personal achievements. He has published individual monograph and study and 17 individual scientific articles, and in those co-authored he has a leading role (being the first co-author in 22 publications). I also consider that contributions presented by Dr. Marinov are his own personal work. The candidate has accomplished a significant success in pedagogical activities (3 textbooks and 3 manuals have been published). Achieved scientific, scientific-applied and applied contributions are significant for the scientific specialty in which the competition is announced and will be useful for the science and practice. Associate Professor Dr. Marinov is a highly qualified specialist and scientist.

6. Critical Notes

In the evaluated papers and very well-prepared materials, I did not find any significant omissions, such as incorrect approaches, methods, summaries and conclusions of the research

results. All publications are well laid out with an introduction, statement, conclusion and bibliography. As I positively evaluate all scientific and pedagogical activities of the candidate, I consider making the following recommendations. I would advise him:

- To develop his research work, by which he will increase the number of his publications in journals with impact factor and impact rank;
- To present in a more summarized form his future research contributions.

7. Personal impressions

I have known Associate Professor Dr. Marinov since his student years, as his lecturer, and I have excellent impressions of him. As a pedagogue, he is responsible, communicative and active, respected by his colleagues and students. Professionally, he is well prepared with significant quantity and quality of scientific research activity. In his work, he applies new modern methods and tools in teaching students. His participation in international scientific forums and the large number of citations prove his popularity in Bulgaria and abroad.

8. Conclusion

The relevance and significance of scientific and pedagogical results achieved by Assoc. Professor Dr. Konstantin Marinov, their importance for the educational process and practice, their citations in scientific publications abroad and in our country, give me reason to consider that all requirements of the Law on the Development of Academic staff in Republic of Bulgaria and Regulations for its application at University of Forestry for the academic position "professor" have been fully fulfilled. The total number of points gathered by the candidate for all groups of indicators is very high 1281.32 with a required 550, i.e. there is an overrun of 233%.

Considering the above stated, I strongly suggest Associate Professor Dr. Konstantin Ivanov Marinov to be granted the title "Professor" in the discipline "Mechanization of Forestry Works" in Professional Direction 6.5 Forestry, scientific specialty "Technology, Mechanization and Automation of Forestry and wood harvesting".

Prepared the opinion:



/Prof. Dr. Slavcho Sokolovski /

The opinion has been forwarded to: