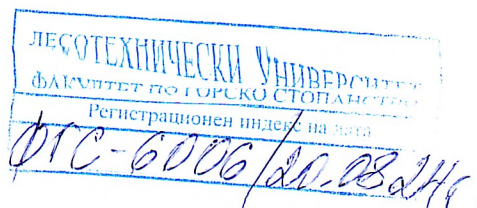


OPINION



On the materials submitted for participation in a competition for **"Professor "**in the field of education 6. Agricultural Sciences and Veterinary Medicine, Professional field 6.5. Forestry, scientific speciality Technology, Mechanization and Automation in Forestry and Timber harvesting in the discipline Mechanisation of Forest Activities

In the competition for a professor, published in the State Gazette issue 35/19.04.2024 and on the site of the University of Forestry with the code FOR-P-0324-128 for the needs of the Department of "Technologies and Mechanization in Forestry " at the Faculty of Forestry, as a candidate participate Assoc. Prof. Dr Konstantin Ivanov Marinov, Faculty of Forestry, Department of Technologies and Mechanization in Forestry

Prepared the opinion: Veselin Stamenov Brezin, Emeritus Professor PhD, in a Professional Field 6.5 Forestry, degree subject Technology, mechanization and automation of the woodworking and furniture industry from the University of Forestry/ retired

1. Brief biographical data for the candidate

Assoc. Prof. Dr Konstantin Ivanov Marinov was born on 10.11.1961 in Sofia. From 1976 to 1980, he graduated from the "Wilhelm Pieck" Technical School of Energy, Sofia, majoring in "Internal Combustion Engines". From 1983 to 1988, he was a full-time student at the University of Forestry, majoring in "Complex mechanization and assembly lines in forestry". In 1988, he graduated as a Master of Mechanical Engineering in Forestry and Logging Mechanization. For the period 1988 - 1989, he worked as a researcher in the research sector of the University of Forestry, specializing in "Research, design and construction of specialized forestry equipment". He was appointed as a full-time assistant at the Department of "Technology and Mechanization in Forestry", at the Faculty of Forestry, where he is still working. From 1992 to 1999, he was a senior assistant. Later, from 1999 to 2009, he was a senior assistant. In 2001, he defended his dissertation on the topic "Technological research on the mechanical de-winging of seeds of some coniferous tree species". From 2009 to the present, he has worked as an "Associate Professor" in the "Technology and Mechanization in Forestry" Department at the "Forestry" Faculty. From 2016 to 2020, he was elected as the Head of the Department "Technology and Mechanization in Forestry" at the Faculty of Forestry. Has good organizational and communication skills related to the management and control processes of educational activities and the quality of work of the faculty units. He works as a member of the committees for quality, educational activity and attestation. He holds an Internal Auditor Certificate: "Intertek"/ -International QMS Auditor, №106159 and Certificates for completed courses on: "Using modern teaching methods through ICT"; "Web Technologies"; E-Learning Methods and Systems"; "Academic Learning Methodology". He has very good digital competence. He is a representative of LTU in the Bulgarian Institute for Standardization - BIS, Technical Committee 14 (2016-2023) and 23 (from 2023): TK-14 "Road vehicles, internal combustion engines, tractors and machinery for agriculture and forests" and TK- 23 "Tractors and machinery for agriculture and forestry". He speaks English and Russian at a good level.

Member of the Union of Scientists in Bulgaria, "Forestry" section, Sofia. Member of the Association for Energy Utilization of Biomass - Bulgaria /AEOB -EUBA/. Member of an expert commission in the Ministry of Agriculture under Regulation 12, in connection with the Law on Agricultural and Forestry Equipment - 2016-2018. Member of an expert working group in the Executive Agency for Forests under the Ministry of Agriculture, under the Project "Regional policies for sustainable bioenergy - BIO4ECO", EU INTERREG Europe Programme.

He took part in nine national and international scientific conferences and seminars.

2. Correspondence of the submitted documents and materials of the applicant according to the Rules of the Development of Academic Staff at the University of Forestry.

The submitted documents and materials of the candidate, Associate Professor Dr Konstantin Ivanov Marinov, are under the requirements of Article 65, paragraph 1 of the Regulations for the development of the academic staff in the University of Forestry, as well as with the National requirements under Article 26, paragraphs 2, 3 and 6.

3. Assessment of the candidate's educational and pedagogical activities (work with students and PhD students)

The participant in the competition entered as a full-time assistant in 1989 at the University of Forestry, in the department "Technology and Mechanization in Forestry" at the faculty of "Forestry". From 26.01.2010, by decision of the Higher Attestation Commission under the Council of Ministers of the Republic of Bulgaria, he was given the scientific title of associate professor in the scientific speciality 02.13.01. "Technology, mechanization and automation of forestry and wood harvesting. Conducts lectures and exercises on the disciplines:

- Mechanization of Forestry Works for the students of the Faculty of Forestry;
- Technological design of forestry activities for master students from the Faculty of Forestry;
- Mechanization in Landscaping at the Faculty of Ecology and Landscape Architecture.

My assessment of the candidate is that he takes his duties as an assistant and academics seriously and conscientiously. He has been the academic supervisor of 10 graduates so far. He is the scientific supervisor of two PhD students, dismissed with the right of defence.

4. Assessment of candidate's scientific, scientific-applied and publishing activities

General description of the presented materials

Candidate Associate Professor Dr Konstantin Ivanov Marinov participated in the competition with:

- Monographs - 1 number;
- Textbooks - 3 numbers;
- Learning materials - 3 numbers;
- Books - 1 number;
- Publications - 48 numbers.
- Projects - 7 numbers.

4.1 Participation in scientific, scientific-applied and educational projects

Assoc. Prof. Dr Konstantin Ivanov Marinov has participated in the realization and implementation of seven projects, distributed as follows:

- International projects – 1 number, as a member of the working team;
- National projects financed by the University of Forestry – 4 numbers, of which he is the head of two of them;
- Projects funded by the Faculty of Forestry - 2 numbers.

4.2 Characterization of published scientific results

The publications can be classified as follows:

By type:

- Publications in scientific journals – 36 numbers;
- Publications in proceedings of scientific – 4 numbers;
- Scientifically popular publications - No number.

By significance

- Articles in magazines with Impact Factor - No numbers;
- Articles in journals referenced and indexed in Web of Science and SCOPUS - 12 numbers;
- Articles in journals without Impact Factor - 12 numbers;
- Papers in proceedings of scientific forums - 4 numbers;
- Plenary reports - No number.

Place of publication:

- Articles in Bulgarian and foreign journals referenced in Web of Science and SCOPUS – 14 numbers;
- Articles in reference Bulgarian and foreign journals referenced outside the Web of Science and SCOPUS - 22 number;
- Articles in non-referenced Bulgarian and foreign journals - 25 numbers;
- Publications in proceedings of international scientific forums - 2 numbers;
- Publications in proceedings of national scientific conferences, sessions and seminars - 1 number;
- Publications in scientific annals of universities and institutes - 1 number.

Publishing language:

- In Bulgarian - 22 numbers;
- In a foreign language - 26 numbers;

Number of co-authors:

- Stand alone - 17 numbers;
- With one co-author - 16 numbers;
- With two co-authors - 9 numbers;
- With three or more co-authors - 6 numbers.

4.3 Reflection of Candidate's Scientific Publications in Literature (known citations)

- Total – 55 citations.

By type of citations:

- In reference journals and proceedings of scientific forums - 53 citations;
- In teaching aids, monographs, dissertations, etc. - 2 citations.

4.4 Contributions to the candidate's work (scientific, scientific-applied, applied)

The scientific, scientific-applied and applied contributions are mainly related to technologies and machines used in forestry, for various forestry activities, for densification of wood and non-wood forest products, and technologies and machines for utilization of forest biomass and creation of forest plantations for energy purposes. They can be grouped into the following thematic areas:

- Machines for densification of wood and non-wood forest products;
- Technologies and machines for the extraction of forest seed materials;
- Technologies and machines for the production of forest planting materials;
- 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 harvesting.

Scientific contributions

1) A new approach is proposed for the theory of the movement of material particles along the screw working surface of the densifying machines ($\Gamma 7.1$, $\Gamma 8.3$, $\Gamma 8.4$, $\Gamma 8.26$);

2) The physical model for the movement of particles in screw presses for densification of wood and non-wood bulk materials has been determined ($\Gamma 7.1$, $\Gamma 8.4$);

3) Theoretical dependences are derived for determining the main kinematic parameters of the movement of bulk materials in the screw working bodies of the densifying machines, depending on the speed of rotation of the working bodies and the working pressure ($\Gamma 8.26$);

4) A methodology has been developed for determining the parameters of the movement of dispersed materials in densifying machines with screw-screw working bodies ($\Gamma 8.3$);

5) The equations for the movement of seeds of forest-tree species in the working organs of the de-wing machines are defined. ($\Gamma 8.22$).

6) Analytical dependences were obtained to determine the main kinematic and dynamic parameters of the movement of forest seeds along the screw working surface of the de-wing machines. ($G 8.22$).

7) Analytical dependences were developed to determine the seeds' axial and peripheral speed and the seed flow's average transport speed during their processing with finger-dye machines. ($\Gamma 8.22$).

Scientific-applied contributions

1) Graph-analytical dependencies have been developed to determine the parameters of movement and the average transport speed of wood particles in screw mechanisms of densifying machines.

2) Graphical dependencies have been developed to determine the operating performance of briquette production machines, depending on the working pressure and the speed of rotation of the working bodies. (Г8.3).

3) The size of the working pressure of the screw presses for the briquette production of crushed straw and wood for the production of briquettes with a specific density. (Г7.1, Г8.4).

4) It was found that to limit the energy and depreciation costs of screw presses for the production of briquettes, the maximum pressure in the press chamber should not exceed 120 MPa. For this purpose, it is recommended that the working pressure in the press chamber be in the range of 70 MPa to 120 MPa.

5) Analytical dependencies have been defined to determine the operational performance of finger-dewing machines for extracting seeds from forest tree species. (Г8.22).

6) The system for management and control of the technological process in regional forest seed production in Bulgaria has been further developed. (Г8.1).

7) The existing knowledge about the physico-mechanical and technological properties of the forest seed materials of white pine, black pine, common spruce and white mulberry used in their processing process has been further developed and enriched. (Г8.2).

8) Regression models were developed to determine the influence of the control bodies of the "BCC Cleaner & Seed Sizer" seed cleaning machine on the qualitative and quantitative parameters of extracting seeds from white pine, black pine and common spruce. ((Г7.12, Г8.23, E20.2).

9) The technological, operational and technical-economic parameters of the multifunctional forest cutters FAE 300/S, aggregated on self-propelled milling units PT-400 and PT-300, for preparation for afforestation of poplar cuttings and deep soil preparation of sandy, sandy- clayey and loamy alluvial soils of poplar habitats. (B3.1, Г7.4, Г7.6, Г8.21).

10) The quality indicators of the preparation process of poplar cuttings for afforestation with multifunctional and meliorative forest cutters have been established. (Г8.14, Г8.15).

Applied contributions

1) Technological regimes have been developed for the de-wing of white pine seeds with the small-sized de-wing unit "Unitech" in our country's seed collection and control stations.

2) Technological modes of operation of wet de-winger BCC WetDewinger 800 and seed cleaning machine BCC Cleaner & Seed Sizer have been developed for extracting seeds of white pine, black pine and common spruce for accurate nest sowing for the production of container saplings in Forest Nursery "Lokorsko". (G7.12, G8.23).

3) The current state of the technologies and machines used for producing container saplings for afforestation greenhouse production was studied (E10.1).

- 4) It has been established that the forest cutters 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 belt, ensure a higher quality of work (G8.13, G8.20).
- 5) It was established that the leading share of the wood used for the production of energy in Bulgaria is from the "wood" and "top" category and reaches an average of 3.2 million m³ annually. (E19.1).
- 6) It has been established that in our country, there are favourable conditions for creating energy plantations from fast-growing tree species. They can realize a relatively high dry biomass yield with suitable habitats and timely care for growing these crops. The average annual yield of energy chips from 1 ha plantation for poplar is 10 t/ha, for willow – 12 t/ha and for acacia – 18 t/ha. (Г8.9, Г8.10, Г8.11, Г8.24, E19.1).
- 7) It was established that wood extraction from these plantations should be carried out in the autumn-winter season when the wood is entirely woody and the relative humidity of the chips is up to 45-50%. At this humidity, the net calorific value of poplar energy chips is within 7.5-9.0 MJ/kg, the productivity of logging and transport equipment is maximum, and the negative impact on the soil is limited. (Г8.9, Г8.10, Г8.11, Г8.24, E19.1).
- 8) It has been established that the fast-growing forest-tree species of Euro-American poplar hybrid varieties, within a rotation between 2 and 4 years, in suitable habitats can reach a height of 6÷12 m, in which case their wood is entirely suitable for producing energy chips. (Г8.9, Г8.10, Г8.11, Г8.24, E19.1).
- 9) For more efficient use of renewable energy from wood biomass at the national, municipal and local levels, it is necessary to implement modern installations with higher efficiency, equipped with mechanized power supply and automatic control. Nowadays, in our country, for heating households and buildings, small installations with a power of 50÷150 kW, working with wood pellets, are more and more widely used. It has been found that to implement larger energy projects, and it is necessary to build plants with a capacity of more than 0.5 MW. (Г8.10, Г8.11, Г8.24, E19.1).

5. Assessment of the applicant's personal candidate

Contributions presented by the candidate in the competition for professor, Assoc. Prof. Dr Konstantin Ivanov Marinov, are undoubtedly the result of the candidate's active work. He is the author of two independent textbooks, namely: "Mechanization of Forestry Works" and "Mechanization of Forestry Works (2nd Supplement and Revised Edition)" and is a co-author of the textbook "Plant Protection Machines".

Assoc. Prof. Dr Konstantin Ivanov Marinov is an established academic in the field of machinery and equipment for forestry and logging, with active participation in national and international forums. Actively works to help forest districts.

I have known Assoc. Prof. Dr Konstantin Marinov since he was my student. His curiosity, goodwill, responsiveness, and modesty have always impressed me. Extremely communicative, well-intentioned but demanding, he enjoys authority among his university colleagues and students from the two faculties where he leads lectures and exercises. He is

recognized as one of the leading specialists in technology and mechanization in forestry. His good scientific and professional training enables him to be considered one of the best specialists in this field.

6. Critical remarks

The materials submitted by Assoc. Prof. Dr Konstantin Ivanov Marinov for the competition for the professorship has been carefully and precisely prepared, and I have no notes on them. While positively evaluating the candidate's overall activity, I allow myself to make several recommendations:

1) I believe that he should increase his publication activity and make efforts for more publications in Bulgarian and foreign journals referenced in Web of Science and Scopus.

2) I recommend that the candidate take the necessary measures, the doctoral students whose supervisor is to make efforts to defend the dissertation works.

The candidate has sufficient experience and knowledge, which enables him to participate in plenary reports at national and international scientific forums in the future.

7. Personal impressions

I have known Associate Professor Konstantin Marinov since his student years. He is a well-established teacher and scientist with significant contributions and potential in the research and development of scientific tasks related to innovative and cutting-edge methods in forestry technology and mechanization. Well-mannered, balanced, modest, and competent, with high knowledge of taught disciplines, make him a valuable and sought-after teacher and specialist.

Conducts conscientiously and at high-level lectures and exercises of the taught disciplines with bachelor and master students in the two faculties "Forestry" and "Ecology and Landscape Architecture".

His good professional training is highly appreciated, both by the scientific community and by practice.

8. Conclusion

In connection with the above, I propose that Associate Professor Dr Konstantin Ivanov Marinov be elected as a "Professor "in the discipline " Mechanization of Forest Activities "in the Professional field 6.5. Forestry, scientific speciality" Technology, Mechanization and Automation in Forestry and Timber Harvesting".

Prepared the opinion:

/Prof. Veselin Brezi, PhD/

Opinion delivered to: