

## REVIEW

ТЕХНОТЕХНИЧЕСКИ УНИВЕРСИТЕТ ФАКУЛТЕТ ПОТРОСКО УСТОЙЛИВОСТ
Регистрационен индекс на дата
for-5955/15.08.24.

on the materials submitted for participation in a competition for „Professor“ in the field of higher education 6. Agricultural Sciences and Veterinary Medicine, Professional field 6.5 Forestry, scientific specialty „Technology, mechanization and automation of forestry and timber harvesting“ in the discipline „Mechanization of forestry works“

In the competition for professor, published in the State Gazette No. 35 of 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 Forestry Technology and Mechanization at the Faculty of Forestry, as a candidate participate Assoc. Prof. Dr. Konstantin Ivanov Marinov, Faculty of Forestry, Department of Forestry Technology and Mechanization

**Reviewer:** Prof. Zhivko Bonev Gochev, Ph.D., Professor in a Professional field 6.5. Forestry, scientific specialty „Technology, mechanization and automation of the woodworking and furniture industry from University of Forestry – Sofia, Faculty of Forest Industry

### 1. Brief biographical data for the candidate

Assoc. Prof. Dr. Konstantin Ivanov Marinov was born on 10.11.1961 in. In 1980 he graduated from the Wilhelm Pick Technical School of Power Engineering (now Henry Ford High School of Motor Transport and Power Engineering) with a degree in Mechanical Technician (Internal Combustion Engines).

After his military service, in the period from 1982 to 1983, he worked as a mechanic - repair and maintenance of automotive equipment in the EA „Mechanization and Motor Transport“, EMP Kremikovtzi, town Sofia.

In 1983 he entered the Higher Forestry Technical Institute - VLTI (now Forestry Technical University - LTU). He graduated in 1988 as a master - mechanical engineer in „Mechanization of forestry and logging“. From 1988 to 1989 he worked as a researcher-engineer at the Research Sector at VLTI.

After a competition, from 1989 to 1992 he was a full-time assistant professor at the Department of Forestry Technology and Mechanization (FTM), Faculty of Forestry. From 1992 to 1999 he was a Senior Assistant Professor and from 1999 to 2009 a Chief Assistant Professor. From 2009 to the present he has held the academic position of Associate Professor.

From 1998 to 2001 he was a PhD student in the scientific specialty „Technology, Mechanization and Automation of Forestry and Timber Harvesting“ (TMAFTH) at the Department of FTM. In 2001, he defended his dissertation on „Technological studies on the mechanical de-winged of seeds from some coniferous tree species“ and obtained a PhD.

Assoc. Prof. K. Marinov has been successively the Head of the Department of Forestry Technology and Mechanization from 2016 to 2020 and from 2024 until now.

The candidate gives lectures and exercises in the following disciplines: „Mechanization of forestry works“ (lectures), full-time and part-time study, specialty „Forestry“, B.Sc. „Mechanization in Landscaping and Labour Protection“ (lectures and exercises), full-time study, specialty „Landscape Architecture“ (LA), Master's degree.

Assoc. Prof. Marinov speaks English (B1 level) and Russian (C1 level).

He is a representative of LTU in the Bulgarian Institute for Standardization - BIS, Technical Committee 14 (2016-2023) and 23 (from 2023): TC-14 „Road vehicles, internal combustion engines, tractors and machinery for agriculture and forests“ and TC-23 „Tractors and machinery for agriculture and forests“.



Assoc. Prof. K. Marinov is a member of:

- Union of Scientists in Bulgaria, Section „Forestry“, Sofia;
- Biomass Energy Utilization Association - Bulgaria (EUBA);
- The Expert Committee at the Ministry of Agriculture on Regulation 12, in relation to the Agricultural and Forestry Machinery Act - 2016-2018;
- The Expert Working Group at the Executive Forest Agency under the Ministry of Agriculture and Food, under the Project „Regional Policies for Sustainable Bioenergy - BIO4ECO“, EU INTERREG Europe Programme.

The candidate holds an Internal Auditor Certificate: „Intertek“ / International QMS Auditor, No. 106159 and certificates of completion of courses in: „Using Modern ICT Teaching Methods“; „Web Technologies“; „E-Learning Methods and Systems“ and „Academic Teaching Methodology“.

## **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 candidate for the academic position „Professor“ in the professional field 6.5 Forestry, scientific specialty TMAFTH has submitted all the necessary documents required by Article 65a (4) of the Regulations for the Development of the Academic Staff of the University of Forestry and Law on the Development of Academic Staff in the Republic of Bulgaria (LDASRB), including:

- European CV;
- A notarised copy of a university diploma;
- Notarized copy of diploma for PhD;
- Notarised copy of the diploma for the academic position of Associate Professor;
- Document of holding an academic position and experience in the specialty;
- Medical certificate;
- Certificate of criminal record;
- Self-assessment report on the fulfilment of the minimum national requirements under Article 2a, paragraphs 2, 3 and 4 for the academic post of „professor“;
- Information card in Bulgarian;
- Information card in English;
- Reference to the contributions made in the candidate's works;
- List of scientific works and publications;
- Copies of publications;
- Summaries of works and publications in Bulgarian and English;
- Reference of known citations;
- References of project participations;
- Documents and written materials certifying other professional and creative activities and appearances of the candidate.

All documents are uploaded electronically.

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

Assoc. Prof. Dr. Konstantin Marinov has been working as a lecturer at the LTU - Sofia for 34 years. After his habilitation in 2009 he is the holder of the following teaching disciplines:

- „Mechanization of Forestry Works“ – specialty Forestry, Bachelor's degree, full-time and part-time studies.
- „Technological design in forestry“ - speciality Forestry, Master's degree, full-time and part-time studies.



- „Mechanization in landscaping and labour protection“ - speciality LA, Master's degree, full-time study.

2022/2023 school year as he has been on long-term sick leave.

Assoc. Prof. Marinov has prepared the curricula of the disciplines „Mechanization of forestry works“ (2022); „Technological design in forestry activities“ (2022); „Mechanization in landscaping and labor protection“ (2021) and „Restoration of disturbed landscapes“ (2022), a hybrid specialty with University of Mining and Geology „St. Ivan Rilski“ - Sofia.

The candidate has been a supervisor of a total of 9 successfully defended graduate students, but no service note has been submitted.

Assoc. Prof. Marinov is a scientific supervisor of one part-time PhD student in the scientific specialty TMAFTH, discharged with the right to defend from 30.11.2022, according to the order of the Rector of the LTU № ZSD-532/16.12.2022.

Annually participates in a complex practice of students from the specialty of Forestry.

Since the academic year 2010/2011 he has been a member of the State Examination Committee of the specialty Forestry, „BSc“.

Assoc. Prof. Marinov has also published auxiliary literature for training: an independent monograph „Research of forest cutters for soil preparation for the creation of poplar crops“ (2019); published university textbooks (2 independent and 1 co-authored) and an exercise manual (co-authored). ); „Mechanization of Forestry Works (2nd supplemented and revised edition“ - textbook (2015), for the students of the specialization in Forestry; „Plant Protection Machinery“ - textbook (2014); „Mechanization of Agriculture“ - manual (2011), for the students of the specialization in Plant Protection (PP) and Agronomy, AF. „Plant Protection Machinery“ (lectures, exercise and tests), for the students of PP, AF and „Mechanization of Reforestation“, for the students of Forestry.

There are 10 official notes and certificates confirming the candidate's participation in various educational and scientific projects, committees, memberships in organizations and trainings.

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

General description of the presented materials

Candidate Assoc. Prof. Konstantin Marinov participated in the competition with:

- Monographs - 1 number;
- Scientific Study - 1 number;
- Textbooks - 3 numbers;
- Training aids - 3 numbers;
- Publications - 40 numbers;
- Projects - 7 numbers.

##### **4.1 Participation in scientific, scientific-applied and educational projects**

Assoc. Prof. Marinov has submitted a report on participation in 7 projects, of which 5 research and 2 educational projects. In 3 of the research projects he is a member of the working team and in 2 he is the team leader. One of the research projects is bilateral (Bulgarian-Slovak), funded by the Scientific Research Fund of the Republic of Bulgaria. The other 4 - funded by the Research Sector - University of Forestry through a grant from the Ministry of Education and Science.

##### **4.2 Characterization of published scientific results**

- ❖ The monograph presented in the competition includes the results of experimental, theoretical and comparative studies on the technological and operational properties of specialized forest



cutters, conducted in the area of the Northwest State Forest Enterprise, in forest areas and clearings located on typical poplar stands along the Danube River. The way of influence of the main factors of the working environment and management regimes of forest cuttings was established, and modern technology with a detailed estimated technological map for establishment and cultivation of intensive poplar crops in our country was developed.

- ❖ One scientific study was submitted to the competition, which included studies on the current status and prospects for the development of technologies, machinery and equipment for greenhouse production of containerized saplings for reforestation. A detailed analysis is made of the technical, operational and technological properties and parameters of the different container systems, with a separate appendix giving some modern facilities for greenhouse production of containerized saplings and promising container systems for growing saplings with a closed root system in Bulgaria.

The publications can be classified as follows:

**By type:**

- Publications in scientific journals - 36 numbers (90%);
- Publications in proceedings of scientific - 4 numbers (10%).

**By significance**

- Articles in journals referenced and indexed in Web of Science and SCOPUS - 12 numbers (30%);
- Articles in proceedings of scientific forums refereed and indexed in WoS and SCOPUS - 2 numbers (5%);
- Articles in scientific peer-reviewed journals not refereed in WoS and SCOPUS – 22 numbers (55%);
- Articles in proceedings of scientific forums - 4 numbers (10%).

**Place of publication:**

- Articles in WoS and SCOPUS refereed Bulgarian journals - 12 numbers (Innovations in Woodworking Industry and Engineering Design - 8; Forest Science - 3; Silva Balcanica - 1);
- Articles in proceedings of scientific forums abroad refereed in WoS and SCOPUS – 2 numbers (Chip and chipless woodworking processes - Slovakia);
- Articles in Bulgarian peer-reviewed journals not refereed in WoS and SCOPUS – 21 numbers (Management and Sustainable Development - 11; Forestry ideas - 2; Innovations in Woodworking Industry and Engineering Design - 7; Woodworking and Furniture Production - 1);
- Articles in proceedings of scientific forums in Bulgaria not refereed in WoS and SCOPUS - 2 numbers (Innovations in Forest Industry and Engineering Design - 1; Management and Quality - 1);
- Articles in foreign peer-reviewed journals not referenced in WoS and SCOPUS – 2 numbers (Journal of Agricultural Science and Technology (USA) – 1; Journal of Wood Science, Design & Technology (RN Macedonia) – 1);
- Articles in proceedings of scientific forums abroad not refereed in WoS and SCOPUS - 1 numbers (Wood Technology & Product Design - RN Macedonia).

**Publishing language:**

- In Bulgarian - 14 numbers;
- In English - 26 numbers.

**Number of co-authors:**

- Stand alone - 11 numbers;
- With one co-author - 14 numbers;



- With two co-authors - 9 numbers;
- With three or more co-authors - 6 numbers.

The scientific results published by Assoc. Prof. Dr. Konstantin Marinov and the data presented in Annex 2 of the NACID form a total of 100 points for group B3 with minimum requirements of 100 points, and a total of 386.32 points for group G with minimum requirements of 200 points. This makes 186.32 points more than the minimum national requirements for the academic position of Professor in the professional field 6.5 Forestry.

*No plagiarism has been detected in the applicant's published materials for the competition.*

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

The documents submitted by Assoc. Prof. Konstantin Marinov include a list of 55 known citations (excluding self-citations) of 28 of his works by other authors and copies of supporting material.

- Total - 55 citations.

##### **By type of citations:**

- In WoS and SCOPUS refereed journals and proceedings of scientific forums - 17 citations;
- In monographs and collective volumes with scientific review - 2 citations;
- In non-refereed peer-reviewed journals - 36 citations.

According to the report submitted by Assoc. Prof. Dr. Konstantin Marinov, the total number of points for indicators D13, D14 and D15 is 455 points with the requirement of 100 points for the academic position Professor in the professional field 6.5. Forestry.

*The scientific and applied activity of the candidate is well reflected abroad and in our country.*

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

In the present review, 32 scientific papers, as well as the monograph and the study, are the subject of evaluation for the candidate's contributions. The candidate's contributions in the following publications are not subject to evaluation due to my co-authorship in them: nos. G7.1.; G7.2.; G8.5.; G8.7.; G8.10.; G8.11.; G8.12.; G8.24. It should be noted that the listed publications contain results in the field of the announced competition in „Mechanization of forestry works“, in which publications Assoc. Prof. Konstantin Marinov has contributed to.

The candidate has united the scientific, scientific and applied contributions in the following six main areas:

- i. Machines for densification of wood and non-wood forest products.
- ii. Technologies and machines for forest seed extraction.
- iii. Technologies and machines for production of forest planting materials.
- iv. Technologies and machines for establishing forest crops.
- v. Technologies and machines for utilization of forest biomass and establishment of forest plantations for energy purposes.
- vi. Harvesting technologies and machines.

Assoc. Prof. Dr. Konstantin Marinov has stated claims, in the submitted works, for a total of 40 (forty) contributions, of which: 2 (two) scientific contributions; 22 (twenty-two) scientific and applied contributions and 16 (sixteen) applied contributions.

After analyzing the scientific works of the candidate and the scientific, scientific-applied and applied contributions declared by him in the competition, the following can be accepted:

##### **❖ Scientific contributions:**



- i. Based on the physical model of particle movement in screw presses, a methodology for determining the press channel length of screw press dies and a methodology for determining the movement parameters of dispersed materials in densifying machines with screw-screw working bodies are developed, and theoretical dependencies for determining the basic kinematic parameters of bulk material movement are derived.
- ii. The equations for the movement of seeds of forest-wood species in the working bodies of the dehulling machines are defined on the basis of which dependencies are derived for the determination of the main kinematic and dynamic parameters of the movement of forest seeds on the helical working surface of the dehulling machines.
- iii. A methodology for experimental study of the operational and technological properties of forest milling machines for preparation of poplar stands for afforestation with intensive poplar crops as well as a 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 belt of Bulgaria was developed.

❖ **Scientific and applied contributions:**

- i. The magnitude of the working pressure of screw presses for briquetting shredded straw and wood for the production of briquettes of a certain density has been established empirically.
- ii. Analytical relationships are derived for the determination of the operational performance of thumb-type defoliators for forest tree seed production.
- iii. On the basis of experimental studies, the angles and coefficients of friction of seeds of some coniferous tree species on the surface of the working bodies of forest seed harvesting machines used in the design and construction stages of forest seeding and planting machines were determined.
- iv. Regression models were derived to determine the influence of the seed harvesting machine controls on the qualitative and quantitative parameters of the process for harvesting white pine, black pine, and Norway spruce seeds, and the optimal operating modes of the pneumatic separator of the seed harvesting machine for precision sowing of containerized seedlings on an assembly line were established.
- v. The quality indicators of the process after preparation of poplar stands for afforestation with multifunctional and ameliorative forest milling cutters were established by determining the fractional composition of the shredded wood from wood waste, stumps and roots, and the granulometric composition of the treated soil after milling.
- vi. Based on experimental studies, regression models and dependencies are derived to determine the operational productivity, hourly and relative fuel consumption per unit area of forest milling machines for deep soil preparation for afforestation of non-regenerated forest areas, cuttings and field protection forest belts.
- vii. Regression models are derived to determine the performance of specialized tractors for hauling whole stems and long timber sections as a function of road slope, different course loads, and hauling distance.

❖ **Applied contributions:**

- i. Technological regimes have been developed for decryption of white pine seeds with a small-size decrypter in seed and seed control stations in Bulgaria.
- ii. Technological regimes for the operation of a wet destemmer and a seed extraction machine were developed for the extraction of white pine, black pine and common spruce seeds for accurate nest sowing for the production of container saplings.



- iii. It has been found that wood chips produced from energy willow plantations of *Salix viminalis*, clone 'ordis has relatively high energy characteristics and satisfies the market for energy chips, it is necessary to harvest no earlier than the third growing season of the plantation, resulting in a reduction of ash content from the bark of jewelwood.
- iv. It has been established that the main share of wood used for energy production in Bulgaria is from the „wood“ and „woodpile“ category and reaches an average of 3.2 million t<sup>3</sup> annually, which is about 57% of the total amount of wood harvested in the country. In addition, the unused wood residue from logging that remains in the forests is around 30% for softwood and 20% for broadleaf wood and is a potential energy source that should be exploited by our country.
- v. It has been established that in our country there are favorable conditions for the establishment of energy plantations of fast-growing tree species, which can realize a relatively high yield of dry biomass, for example, from 1 ha plantation for poplar dry biomass is in the order of 10 tons, for willow 12 tons and for acacia 18 tons. Harvesting of wood from these plantations should take place in the autumn-winter season when the wood is fully seasoned and the relative humidity of the chips is up to 45-50%.
- vi. It has been found that the highest performance of a specialized forestry tractor for choker hauling of whole stems and long sections of timber in mountainous conditions is achieved at road gradients of 100 to 160 and hauling distances up to 550 m. It is recommended that front-end telescopic front-end loaders be used for temporary forest storage operations with limited site sizes and sloping terrain up to 12°-15°.

## 5. Assessment of the applicant's personal candidate

The documents, scientific papers and evidence submitted by the applicant are well structured and no significant gaps have been identified. The main part of the results achieved are his personal work, 11 (eleven) of the papers are independent, and in 19 (nineteen) of the collective works he is in the first place. In addition, Assoc. Prof. Marinov has published an independent monograph and a study, as well as 6 textbooks and teaching aids. On this basis, I accept that the above-mentioned contributions to the competition for the academic position of Professor are the personal work of the candidate or have been achieved with his active participation.

## 6. Critical remarks

In the works of Assoc. Prof. K. Marinov and the presented creative achievements, with which he participated in the competition, I have not found any significant shortcomings, such as wrong formulations and approaches, incorrect methods and generalizations or incomplete analysis of the obtained results.

I would like to share some critical remarks and recommendations to the candidate:

- i. The 40 (forty) scientific, scientific and applied contributions claimed by the candidate can be summarized and presented in a more concise and generalized form.
- ii. The publications No. G7.3, G7.4, G7.5, G7.8, G7.9, G7.11, G7.12, G7.13 of the reference on the scientific and publication activity of Assoc. K. Marinov are in the journal „*Innovations in Woodworking Industry and Engineering Design*“, as well as the publications No. G7.6, G7.7, G7.10, which are in the journal „*Forest Science*“ are in the list of modern Bulgarian scientific journals, refereed and indexed in world-renowned databases of scientific information of NACID, in the category of WoS, but the articles published in these journals can not be found in the data of SCOPUS and WoS.



- iii. The publication number G 8.26. is in the scientific journal of the Republic of North Macedonia with the title „*Wood, Design & Technology*“ and not „*Wood Science, Design & Technology*“, which I accept as a technical error.
- iv. The citations for indicators D13, D14 and D15 must be to the material with which the applicant is entering the competition for indicators B3, G7, G8 and G10. In this regard, the publications cited under D13.1, D13.3, D13.10. D13.11 which are not included in the group of G7, G8 or G10 are not accepted, i.e. 60 points must be deducted from the total number of points.
- v. The textbooks and teaching aids cited under D13.5, D14.2, D15.4, D15.13, D15.14 and D15.15 are not included in the group under B3, G7, G8 and G10 and will not be accepted, i.e. 60 points must be deducted from the total number of points.
- vi. There is, I suppose, a clerical error in the title of the cited study under No. D14.1., which is titled „*Technologies and machines for the production of saplings with closed root system*“, and should be as indicated in the index under No. G10.1 „*Technologies and machines for greenhouse production of saplings with closed root system*“, which is evident from the publisher, year, pages and ISBN number.
- vii. I also suggest that the publication No. G7.6. „*Marinov, K., Stefanov, K., 2019. Operational Performance of Forestry Milling Brush Cutters for Poplar Clearings Cleaning. Forest Science, No. 1/2: 91-111. ISSN 0861-007X.*“, which is the correct title according to the evidence - G7\_Publications\_World Database and cited as No. D13. 14. has an incorrect title and incomplete bibliographic spelling, i.e. „*Operational productivity of forest milling shrub cutters for cleaning poplar*“.
- viii. For these two, in my view, technical errors (vi and vii) no points have been deducted, but on the basis of the citations referred to above, which are not included in the group under Nos. B3, G7, G8 and G10, a total of 120 points must be deducted from the total points under indicator D, which are 455 points. In this case, the applicant's points for indicator D would be 355, which exceeds the requirements for the academic post of professor in professional field 6.5. Forestry by 255 points, with a requirement of 100 points.
- ix. Research projects funded by NIS-LTU through the MES grant should not be in the National-Science Project category.
- x. I recommend Assoc. Prof. Marinov to continue his scientific research work, as well as to publish his independent and co-authored articles in journals with impact factor.
- xi. I recommend Assoc. Prof. Konstantin Marinov to continue to work actively and purposefully as a lecturer and scientist, passing on his experience to both students and PhD students under his supervision.

## 7. Personal impressions

I know Assoc. Prof. Konstantin Marinov from his student years, including as a colleague and lecturer, as well as from my personal good impressions from our joint work. Assoc. Prof. Marinov has established himself as a good lecturer and scientist, working actively with students, proof of which the graduates and PhD students are supervised by him.

Assoc. Prof. Marinov is also actively involved in the administrative and managerial work of the Department, as Head of the Department and also as a member of the Faculty Council of Faculty of Forestry.

Assoc. Prof. Dr. Konstantin Marinov has successfully entered, as a good professional, in the scientific field of the competition.



## 8. Conclusion

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

Signature of the reviewer:

/Prof. Zhivko Gochev, Ph.D./

Review submitted to: 15.08.2024