OPINION

On the dissertation for the degree of **"Doctor of Science"**, field of higher education 6. Agricultural Sciences and Veterinary Medicine, Professional direction 6.5. Forestry, scientific specialty "Forest, Plantations Selection and Seed Production"

Author of the dissertation: Assoc. Prof. Dr. Krasimira Nikolova Petkova-Tzokova, Department of "Forestry" at the University of Forestry, Sofia

Theme of the dissertation:: Potential for adaptation of Douglas-fir and Common beech provenances to climate change

Member of the Scientific Jury: Doctor, Associate Professor Emil Borissov Popov, Forest Research Institute-BAS, field of higher education 6. Agricultural Sciences and Veterinary Medicine, Professional direction 6.5. Forestry, scientific specialty "Forest, Plantations Selection and Seed Production"

(Academic title Scientific Degree name, middle name and surname, Higher School / Scientific Organization; field of higher education, professional direction, scientific specialty)

appointed as a member of the Scientific Jury with Order No. ZPC-636/28.11.2019 of the Rector of the University of Forestry.

1. Brief presentation of the candidate.

Associate Professor Dr. Krasimira Nikolova Petkova-Tzokova is a scientist with extensive teaching experience. Modest, talented, hardworking researcher with good forestry training and vision for scientific product. My impressions are of publications, the reviews I have made, as well as the work on a project from the European Science and Technology Cooperation Program "Non-native tree species for European forests - experience, risks and opportunities"

2. Actuality of problem.

The presented dissertation deals with important and current issues from the scientific and scientific-practical point of view. The relevance of the topic is logically founded.

3. Level of awareness of the problem and creative interpretation of the references review.

The applicant refers to 355 titles, 56 of which are in Cyrillic. Scientific papers related to the topic are covered. The information analysed is in line with the specific tasks set. The literature review is focused, up-to-date and interpretable. The texts show that the candidate is familiar with the achievements so far, and demonstrates the ability to analyse, synthesize, upgrade.

4. Purpose, tasks, hypotheses and methods of research. Compliance of the selected study methodology with the intended purpose and tasks of the dissertation work.

A competent literature review and analysis are followed by clear formulation of the purpose of dissertation as well as specific and relevant tasks. To achieve the objective of dissertation and the implementation of the research tasks, a number of methodological

approaches have been used, furthermore specific methodologies from forestry, plantation forestry, forest taxation, forest genetics and tree breeding, physiology, phenology, and the methodology of the field experiments and provenance research have also been unclouded. Analysis of variances, regression analysis, ABC analysis have been used for the processing and interpretation of the results. The toolbox of Microsoft's Office suite and specialized modules of the software product R are used. The methods covered are modern and suitable for achieving the purpose of the research.

5. Visualization and presentation of the results obtained.

The results of the study are summarized and shown in synthesized form using 55 figures and 32 tables. I consider them to be appropriate for the full and complete performance of the large volume of information. The visualization approach is balanced. Part of the material has been presented in 10 annexes. Upon approbation all essential parts of the dissertation have been presented very well.

6. Discussion of results and literature used.

The results of the research, their analysis and discussion are an essential part of the dissertation. They are complex but presented in a structured logical sequence. The data are correct. The work is analytically robust and the results obtained are compared with those of other authors.

7. Contributions from the thesis.

I accept the doctoral contribution report. A total of 14 scientific and applied contributions are presented. I greatly appreciate the contributions that shed additional light on issues related to the survival and productivity of Douglas-fir and Common beech.

7.1. Scientific contributions

The scientific contributions presented are 10 which I do not list here.

7.2. Applied scientific contributions

The applied scientific contributions provided are 4 of which I greatly appreciate contribution 2 "The phenological, survival and growth in height traits of the investigated Douglas-fir and Common Beech provenances can be used as criteria for selecting an appropriate provenance in the expected climate change".

8. Assessment of the degree of personal input of the author to the contributions.

The applicant's personal contribution can be traced clearly in her dissertation, contributions and publications. I consider it essential.

9. Critical remarks and questions.

I will refrain from such. I have no critical comments or questions on the materials presented.

10. Published articles and citations.

Associate Professor Petkova has 55 publications in national and international scientific journals in including 15 publications in journals with impact factor. The publications in the proceedings of scientific forums are 23, including 19 internationals. The total number of citations is 144.

11. Assessment of publications on the thesis: number, nature of the issues in which they are printed. Reflections in science - used and cited by other authors.

The author has published 13 dissertation publications. In most of the publications Assoc. Prof. Petkova is the lead author. There are 38 citations. A significant part of the dissertation publications is in the journals with impact factor or impact rank. The publications are cited in magazines with impact factor or impact rank. The published materials are presented to the scientific community as reports at scientific conferences.

The abstract reflects objectively the structure and content of the dissertation.

CONCLUSION:

Based on the scientific contributions and the various research methods applied by the dissertation, the correctly performed experiments, the summaries made and the conclusions drawn, I believe that the dissertation submitted meets the requirements of the LDASRB and the Rules of the University of Forestry for its application, which gives me reason to rated **POSITIVE**.

I allow myself to offer the venerable Scientific Jury also to vote positively and to award Assoc. Prof. Dr. Krasimira Nikolova Petkova-Tzokova

degree **"Doctor of Science"** field of higher education 6. Agricultural Sciences and Veterinary Medicine, Professional direction 6.5. Forestry, scientific specialty "Forest, Plantations Selection and Seed Production"

Date: 31.01.2020 г.
Sofia   **OPPINION BY:** ....
                                    (Assoc. Prof. Emil Popov)