



OPINION

on dissertation for obtaining the degree of Doctor of Science in scientific field 6. Agrarian Sciences and Veterinary Medicine, in professional direction 6.5. "Forestry", scientific specialty "Forest plantations, breeding and seed production"

Author of the dissertation: Assoc. Prof. Dr. Krasimira Nikolova Petkova - Tzokova

Dissertation topic: "The potential for adaptation of Douglas fir and common beech to climate change"

Member of the Scientific Jury: Prof. DSc. Ivan Alexandrov Iliev, University of Forestry, higher education 6. Agricultural sciences and veterinary medicine, professional field 6.5. "Forestry", scientific specialty "Forestry plantations, breeding and seed production"

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

1. Short CV data.

Assoc. Prof. Krasimira Nikolova Petkova - Tzokova was born on 16.06.1958 in Vidin. In 1976, she was accepted as a student at the University of Forestry, specialty "Forestry". In 1981 she completed his higher education and acquired the qualification of "engineer". From 1981 to 1988 she worked as a design engineer at IPPGSS "Agrolesproject". In 1989 she obtained a scientific degree PhD in Agricultural Sciences. She has been selected and consistently worked as an assistant (1988-1990), assistant professor (1990-2001) and associate professor (since 2001) at the Department of Forestry at the Faculty of Forestry at the University of Forestry.

Since 2001 she has been a member of the Faculty Council, and in the periods from 2005 to 2011 and from 2013 to 2016 she was the Deputy Dean of the Faculty of Forestry. She worked as secretary of the Forestry Sciences Section at USB (2009-2017). In 2002, she specialized in the Technical University of Munich and the Bavarian Forest Seed Production and Breeding Service for three months.

She is fluent in German, speaks English and Russian and has computer skills in word processing and statistical processing of research results.

2. Relevance of the problem.

Douglas fir and common beech are tree species of great economic and ecological importance because of their rapid growth and valuable timber. However, the opportunities for adaptation of these tree species to climate change in Bulgaria are insufficiently researched. Therefore, I believe that the assessment of the response of the researched provinces from Douglas fir and common beech to climate change in our country outlines the scientific and applied relevance of the thesis.

3. Degree of knowledge of the state of the problem and creative interpretation of the literature review.

The author of dissertation has used the results achieved in the creation of plantations of Douglas fir, common beech and other tree species from 355 publications, 56 of them in Cyrillic and 299 in Latin. They allowed her to interpret these results creatively.

4. Aim, tasks, hypotheses and methods of research. Conformity of the chosen research methodology with the stated aim and tasks of the dissertation.

The rich literary awareness enabled the author of dissertation to formulate correctly the main tasks for achieving the aim in the dissertation. On this basis, a combination of classical methods for research and statistical analysis of the obtained results was selected.

5. Visualization and presentation of the obtained results.

The dissertation presented has been developed on 186 pages, is structured in 3 chapters and includes 32 tables and 55 high quality figures. In addition, major chapters and recommendations are made in separate chapters. The results are properly presented and discussed. The dissertation corresponds to the article 38, paragraph 2 and article 39 of the Regulations for the Development of Academic Staff at the University of Forestry.

6. Discussion of the results and literature used.

The design of the experiments was properly arranged. On the basis of his literary knowledge and precise statistical processing of the results, the author correctly interpreted the

results of the research, which allowed her to make reliable conclusions and justified recommendations.

7. Scientific and applied contributions of the dissertation.

The contribution report is correctly drafted and reflects the scientific and applied developments arising from the research and the obtained results. The main contributions of the dissertation are as follows:

1. For the first time, regression models have been developed for the relationship between height growth of Douglas fir origins in northwestern Bulgaria and major climatic indicators.
2. A linear relationship between the average date of spreading and the autumn coloring of the leaves of the common beech origins and the geographical coordinates has been demonstrated.
3. The specificity of the phenological phases in Bulgarian origins of common beech has been established.
4. It is considered that, in the event of rapid climate change, native beech origins could be used to assist their adaptation.
5. It has been proven that the survival and growth in height of the researched origins of Douglas fir and common beech could be used as criteria for selecting the appropriate origins in the expected climate change.
6. It has been proven that with increasing age, the slowest growing Douglas fir origins retain their rank.

8. Assessment of the degree of personal participation of the author in the contributions.

The author of dissertation has correctly applied the methods he has learned and that the research done and the contributions mentioned in the dissertation and in the abstract are her own business.

9. Published articles and citations.

Assoc. Prof. Krasimira Nikolova Petkova - Tzokova has published 13 scientific papers reflecting major parts of her dissertation. Six of her articles have been published in English, three in German and four in Bulgarian. In 10 of the articles is the first author and in 3 is second author. Two of them have been published in Impact Factor journals (No. 7 and 10), 3 (with No. 5, 8 and

11) are with SJR, one is in conference proceedings (No. 4) and the others (No. 1, 2, 3) , 6, 9, 12 and 13) are in refereed journals and proceedings with scientific papers.

There are 38 citations of publications related to the dissertation. They can be grouped as follows:

- in refereed journals with Impact Factor: 8 in total (No 8, 10, 17, 19, 20, 29, 31, 35) - 120 points.
- in monographs and collective volumes with scientific peer review: a total of 1 (No 21) - 10 points.
- in non-refereed scientific peer-reviewed journals: 7 in total (No 5, 6, 13, 14, 18, 33, 34) - 35 points.

The above shows that the sum of the points under criterion D of the minimum national requirements for the professional field of Forestry is 165, not 120, as the author has indicated.

Of the documented citations, 16 are in Bulgarian (No 1, 2, 3, 4, 5, 6, 9, 12, 13, 15, 18, 21, 23, 32, 33, 34) and 22 (No 7, 8, 10, 11, 14, 16, 17, 19, 20, 22, 24, 25, 26, 27, 28, 29, 30, 31, 35, 36, 37, 38) in foreign scientific journals, monographs, books, dissertations and conference proceedings.

10. Questions and critical remarks.

1. Why did the author of dissertation choose *Pseudotsuga menziesii* and *Fagus silvatica* as the subject of his research?

2. The term "plasticity" (pp. 4, 5, 24, 26, 37, 146) was incorrectly used in the dissertation instead of "tolerance". The same is observed in the abstract.

3. The pages of the abstract are not numbered.

4. These contributions to the abstract are not sufficiently linked to climate change, and the scientific contribution in point 1 sounds like a conclusion.

5. In item 7, from the reference to the contributions mentioned in the abstract, the term "phenological forms" should be used instead of "phenotypes".

6. The articles of No 2, 4 do not list the editors of the proceedings.


7. The actual number of points for citation of the publications exceeds her indicated.

Assoc. Prof. Krasimira Nikolova Petkova - Tzokova presented all the necessary documents for the dissertation defense, according to the Rules for the Development of Academic Staff at the University of Forestry.

The abstract in summary form reflects the dissertation.

I have personal impressions of an Assoc. Prof. Dr. Krasimira Nikolova Petkova - Tsokova since 1990 as a teacher at the University of Forestry. Knows with competence and precision to plan and solve scientific and scientific-practical tasks. As a scientist, she manifest consistency and perseverance in the acquiring of scientific knowledge and in the conducting of scientific researches.

Based on the various methods of research applied by the author, the correctly performed experiments, the summaries and conclusions made, and my personal impressions of her hard and in-depth work, I believe that the dissertation submitted meets the requirements of "The Law for Development of the Academic Staff in Republic of Bulgaria", "Regulations for Development of the Academic Staff in Republic of Bulgaria", "Minimal National Requirements" in scientific field 6. Agricultural sciences and veterinary medicine and "Regulations for Development of Academic Staff at the University of Forestry". She correctly and accurately presented the necessary documents and I propose to the distinguished scientific jury to award Assoc. Prof. Dr. Krasimira Nikolova Petkova - Tsokova with the scientific degree "Doctor of Science" in professional field 6.5. Forestry, scientific specialty "Forestry plantations, breeding and seed production".

Prepared the opinion: 

Prof. DSc. Ivan Alexandrov Iliev