

REVIEW

Regarding the competition for academic position “Associate Professor” in scientific specialty “Land Reclamation (incl. Soil Erosion and its Control)”, announced in State Gazette No. 5 from 17.01.2020 with candidate Gergana Slavova Kuncheva

**By Prof. Dr Svetla Simeonova Rousseva, Agricultural Academy, Institute of Soil Science, Agrotechnologies and Plant Protection “Nikola Poushkarov”; Scientific specialty „Land Reclamation (incl. Soil Erosion and its Control)“
Appointed as a member of the Scientific Jury according to Order No RD 05-107/22.04.2020 of the President of Agricultural Academy**

There is one candidate – Chief Assistant Dr Gergana Slavova Kuncheva from ISSAPP “N. Poushkarov”, participating in the competition for the academic position “Associate Professor”, announced in State Gazette No. 5 / 17.01.2020 and on the internet sites of Agricultural Academy and the Institute of Soil Science, Agrotechnologies and Plant Protection “N. Poushkarov”, for the need of the scientific department “Physics, Erosion, Soil Biota” at ISSAPP “Nikola Poushkarov”. The documentation on the competition has been prepared according to the requirements of the Law for the Academic Staff Development in Bulgaria, the Regulation for its application and the Regulation for its application in Agricultural Academy.

1. Summary of the career development of the candidate.

Ch. Assistant Dr. Gergana Slavova Kuncheva was born on May 7, 1971. She is a graduate of the „Baba Tonka“ Mathematical High School in Ruse, graduating in 1989 as IT specialist. In 1995 she graduated from Sofia University "St. Kliment Ohridski" with a MS degree in biochemistry and microbiology, and in 2010 she received a MS degree in business administration from RU "Angel Kanchev", Ruse. After successful defence of a dissertation on "Soil protection and economic efficiency of improved minimum and non-traditional erosion control tillage for cultivation of crops on sloping terrain" in 2016 she received the Educational and Scientific Degree "Doctor" in professional field 6.1. "Crop production", scientific specialty "Land reclamation (incl. soil erosion and its control)".

Dr. G. Kuncheva works to improve her skills in various fields, completing courses in English and investment projects management at RU "Angel Kanchev"; specializes in the selection of corn at the Krasnodar Research Institute of Agriculture "P.P. Lukyanenko", Russia and at the Chisinau Institute of Maize and Sorghum, Moldova and new methods and technologies for research and reduction of greenhouse gas emissions from soil at the University of Helsinki, Finland.

The career development of Dr. Gergana Kuncheva began at the IZS "Obraztsov Chiflik" in 1996 where she was a research associate III-II degree and head of a biochemical laboratory, and later - organizer of production activities in the greenhouse of the institute. Between 2005 and 2011 she worked at Parkstroy EOOD, Ruse. Since 2011 she has been working in the laboratory for soil analysis and erosion research at ISSAPP “N. Poushkarov”, located on the territory of “Angel Kanchev” University, Ruse - initially as a chief expert, and since 2017 as a chief assistant.

Excellent computer skills when working in a Windows environment and a good level (B1 / C1) of proficiency in Russian and English are a guarantee for successful presentation of research results to national and international scientific forums.

2. Summary of the presented materials.

Ch. Assistant Dr Gergana Kuncheva participates in the competition for “Associate Professor” with a total production of 44 works, grouped as follows:

- ❖ *Scientific publications in the nomenclature specialty – 42, of which:*
 - *Publications related to the PhD thesis – 5, not subject to the review;*
 - *Monographs – 2;*
 - *Publications in peer reviewed editions (with impact factor) – 1;*
 - *Publications in non-peer reviewed editions, with scientific reviewing and edited collective editions – 33, incl. 25 publications in edited proceedings of scientific forums;*
 - *Studies, published in non-refereed editions with scientific reviewing and edited collective editions – 1;*
- ❖ *Teaching textbook – 1.*
- ❖ *Technology – 1.*

The review is based on analysis of 37 publications.

About a half (18) of the publications are in English language, and the rest of 19 are in Bulgarian. The personal share of Dr Gergana Kuncheva in the authorship of the reviewed 37 works is illustrated by the fact, that she is a single or leading author in more than a half (54%) of the publications: in 10 (27%) she is a single author, in another 10 (27%) she is first author, in 4 (1%) she is second author, and in the rest 13 (35%) she is third or subsequent author with equal in share authorship.

The assessments of the scientific metrics of the publications of Dr G. Kuncheva show that publications in positions G 5, 6, 7, 8, 10 with a sum of 305,93 points exceed with 53% the required minimum of 200 points while the citations in scientific editions in positions D 13, 14, 15 with a sum of 105 points exceed with 110% the required minimum of 50 points; after adding 7,14 points for participation in developing a technology (position E 24), the obtained sum of 568,07 exceeds the national minimum requirements of 400 points for acquisition of the academic position “Associate Professor” with 42 %.

3. Main directions in the research work of the candidate. Proven skills or talents for guiding research (project management, involved external funding, etc.).

Soil is a limited, non-renewable, irreplaceable natural resource with a number of key functions for nature and society. It is not only the main natural resource from which humanity obtains food, fodder, energy and raw materials, but also plays an important role in maintaining the ecosystems and climate systems of the Earth. The functioning of soils is under increasing threat as a result of degradation processes – erosion, decrease of soil organic matter, compaction, salinization, acidification, loss of biodiversity, sealing. The main area of scientific interest of Dr. Gergana Kuncheva is related to the protection of soils from degradation processes and preservation of soil functions – the basis for the sustainability of agricultural systems nowadays.

During her time in scientific positions (1996-2005 and since 2011), Dr. G. Kuncheva has participated as a task leader in teams for development of 12 research projects. Her work is directly related to the protection of soils from the most serious for the conditions of Bulgaria soil degradation processes – water erosion, reduction of soil organic matter and compaction, as well as reduction of greenhouse gas emissions from the soil. Thanks to her qualification as a biochemist-microbiologist, she includes new methodological approaches for agrochemical and microbiological analyses in the practice of the

Laboratory of Soil Analysis and Erosion Research. This allows her to extend the indicators for assessing changes in soil quality and its chemical and microbiological characteristics as a result of water erosion processes in the application of various soil protection technologies for growing cereals on sloping terrain. She has actively participated in the research program on soil protection from erosion, reduction of soil organic matter and greenhouse gas emissions of ISSAPP "N. Pushkarov" with research and improvement of practices for reduction of soil erosion, compaction and loss of soil organic matter within the project POZM 159 (2012-2014); study of the impact of non-traditional soil protection agro-technical measures for reducing water erosion and the loss of soil organic matter during the cultivation of agricultural crops on sloping arable lands under project POZM 206 (2015-2017); study of the impact of different ways of tillage on the loss of soil, organic matter and greenhouse emissions under the project POZM 240 (2018-2021). Dr. Kuncheva also participates in teams for carrying out research projects from "Angel Kanchev" University for development of a method and device for increasing the organic matter in the soil, research of a method and device for introduction of organic matter into the soil, research and validation of use of herbicides and technical means for their application in wheat, etc.; IZS "Obraztsov Chiflik" for the development of a plant protection system and measures for protection of soil fertility. She is very successfully involved in the team of the new department "Physics, erosion, soil biota" in the study of physical and biological parameters of soils with unfavourable soil texture.

Dr. Gergana Kuncheva is a sought-after and desired partner for joint research not only by the researchers from ISSAPP "N. Pushkarov", but also from RU "Angel Kanchev" and IZS "Obraztsov Chiflik", with proven skills to lead and bring to a successful completion the undertaken scientific commitments.

4. Significance of the obtained results, proven by citations, publications in prestigious journals, awards, membership in international and national scientific bodies, patents, implementations, etc.

Dr. Gergana Kuncheva participates in the competition with scientific publications in competent Bulgarian and international specialized scientific editions, including Scientific papers of the University of Ruse "Angel Kanchev", Journal of Mountain Agriculture on the Balkans, Acta Universitatis Agriculturae at Silviculturae Mendeliane Brunensis, Agricultural, Forest and Transport Machinery and Technologies, Finance and Management Sciences, International Journal of Economics and others. Dr. Kuncheva also presents two monographs and one study essay. She is a single author of one of the monographic works, and in the other has equal participation in the authorship. In addition, Dr. Kuncheva is part of a team that has developed advanced soil protection technologies for minimal and non-traditional tillage in the production of wheat and corn for grain on sloping terrains, approved by the Standing Committee on Innovation and Technology of AA and Decision of the Board of AA. The presented materials demonstrate a high level of scientific competence in her experimental work in field and laboratory conditions. The positive quotations of 8 of the scientific publications of Dr. Gergana Kuncheva by 3 foreign and 9 Bulgarian authors is evidence of the interest of the scientific community in her works.

Dr. Gergana Kuncheva conducts exercises in the disciplines "Plant Physiology" for the specialty "Plant Breeding" and "Physiology and Biochemistry of Plants" for the specialty "Agricultural Engineering" from the summer semester of 2015 until now, and since 2018 – also in "Soil Science", "Plant Breeding I" and "Genetics" for the specialty

"Plant Breeding" at RU "Angel Kanchev", Faculty of Agriculture and Industry, Department of Agricultural Engineering as a part-time lecturer. Dr. Kuncheva is a co-author of curricula in the disciplines "Reclamation Soil Science" for the Master's degree in "Land Reclamation" and in "Soil Science" for the Bachelor's degree in "Plant Breeding", where she includes knowledge on technologies for cultivation, harvesting and preservation of agricultural crops – result of current scientific research.

The contribution of Dr. Gergana Kuncheva to the popularization of scientific achievements as a co-author of a popular science paper and as a single author of 5 popular articles is also noteworthy.

5. Significance of the contributions to the science and the practice. Well-grounded answer to the question to what extent the candidate has a clearly defined profile of her research work.

The works with which Dr. Gergana Kuncheva participates in the competition for the academic position of "Associate Professor" have a complex nature, with a clear profile of research and teaching work in the field of scientific speciality "Land Reclamation (incl. Soil Erosion and its Control)". The publications are written in a good scientific language and present research with a well-grounded suitable methodological approaches for the aims of the studies and competent interpretation of the results. I accept the claims formulated in 14 points for contributions of the research and applied science of Dr. Gergana Kuncheva, insofar as they are supported by the publications submitted for the competition. I believe that the leading role of the candidate is indisputable. The main contributions can be attributed to the following main groups: a) development of new approaches (1, 2, 5, 6); b) obtaining and proving new and confirmatory facts (3, 7, 8, 9, 10, 11, 12, 13, 14); c) contributions for implementation: methods, technologies, preparations (1, 2, 4, 6, 9).

I. SCIENTIFIC CONTRIBUTIONS

1. Developed, studied and applied approaches for predicting the erosion losses of soil organic matter:

- 1.1. Parametric approach based on the coefficient of erosion washability of humus. Based on data from six-year field experiments, average values and median values for the erosion washability coefficient were calculated for different technologies for growing wheat and corn under the conditions of Carlsaric Chernozem from the Ruse region. (1, 12, 13, 17, 32)
- 1.2. Empiric approach based on empiric relationship of erosion losses of soil organic carbon from amount of eroded soil (1, 17, 32)

2. Developed methodologies for:

- 2.1. Application of advanced soil protection technologies for minimal and non-traditional tillage in the cultivation of corn for grain and wheat on sloping terrains have been developed (2, 37)
- 2.2. Economic evaluation of advanced soil protection technologies for minimal and non-traditional tillage using various mulching materials has been developed (2, 37)

3. New data have been obtained on:

- 3.1. The erosion losses of mineral nitrogen and available forms of phosphorus

and potassium depending on the amounts of surface water runoff and eroded soil, soil stocks, cultivated crops and tillage systems (1, 10, 12, 20, 29, 30, 31);

- 3.2. The changes in the microbiological activity of the soil as a result of erosion in the cultivation of agricultural crops on sloping terrains with traditional and soil protection technologies (11, 14, 22, 25);
 - 3.3. The changes in the microbiological activity of the soil as a result of degradation processes (erosion and reduction of soil organic matter) and the applied tillage (3, 11, 13, 26);
 - 3.4. The soil physical properties due to the influence of traditional and soil protection technologies for growing corn for grain and wheat on sloping terrains with the application of two types of mulching materials (ready compost and manure) with surface and vertical mulching (2, 11, 15, 22, 24, 27, 28);
 - 3.5. Impact of traditional and soil protection technologies on the volume of the surface water runoff and the amount of eroded soil (1, 2, 17, 23, 24, 27, 28);
 - 3.6. Content of nutrients in the surface water runoff and the eroded soil due to applied traditional and soil protection technologies for growing wheat and corn for grain on sloping terrains on Calcaric Chernozem (1, 2, 10, 20, 29, 30, 31, 35);
 - 3.7. Impact of traditional and soil protection technologies and different mulching materials on the plant growth and development as well as on the yield of the grown crops (2, 15, 23, 24, 27, 28);
 - 3.8. Impact of traditional and soil protection technologies and different mulching materials on the preserving of soil organic matter, its fractional content and spectral characteristics (2, 8, 11, 13, 14, 16, 17, 21, 22, 34)
4. Economic and ecological effects of the application of advanced soil protection technologies for minimal and non-traditional tillage has been established (2, 4, 18, 19, 27, 28).

II. APPLIED CONTRIBUTIONS

1. Approaches for prediction of erosion loss of soil organic matter have been developed:
 - 1.1. Parametric approach based on the coefficient of erosion washability of humus (1, 12, 13, 17, 32)
 - 1.2. Empiric approach based on empiric relationship of erosion loss of soil organic carbon from the amount of eroded soil (1, 17, 32)
2. The possibility for application of microbiological analyzes for assessment of changes in the soil due to soil degradation processes (erosion and reduction of organic matter) and the applied tillage has been established (3, 11, 13, 26)
3. Developed, studied and recognized as scientific product are Advanced soil protection technologies for minimal and non-traditional tillage for growing crops on sloping terrains (2, 37).
4. Soil protection and economic effect of traditional and soil protection technologies for growing corn for grain and wheat on sloping terrains with application of

two types of mulching materials (ready compost and manure) with surface and vertical mulching has been established (2, 8, 11, 13, 14,15, 16, 17, 21, 22, 23, 24, 27, 28, 34).

6. Critical notes and recommendations.

As a whole, the materials submitted for the competition are very well prepared, though the contributions could be presented in a more general way, as I did in the review, while the list of publications should be given in more details by grouping them according to the place of publication – magazines, collective volumes, etc. The publications have a broad literature base, well-presented results and well-founded conclusions, that's why I have no significant critical remarks. I recommend to Ch. Assistant Professor G. Kuncheva to publish her methodological studies in refereed international publications (with impact factor), as I believe that deserve finding wider popularization in the international scientific community.

7. Personal impressions and opinion of the reviewer.

My impressions of Ch. Assistant Dr. Gergana Slavova Kuncheva are specific and positive and start from the moment of her admission to ISSAPP "N. Pushkarov ". I know her overall scientific development. Over the years, she has achieved significant scientific and professional growth both in laboratory practice and in conducting erosion experiments using field plots. During this period she found a well-deserved place in the scientific program of the Institute and with her overall activity gained significant experience on one of the difficult and very important issues related to research and protection of degraded lands.

CONCLUSION

Ch. Assistant Dr. Gergana Kuncheva presents for the competition scientific work in which she considers significant and of present interest issues in the field of scientific specialty "Land Reclamation (incl. Soil Erosion and its Control)". Based on data from many years of field erosion research and laboratory analysis, she presents developments of a complex nature in the field of soil erosion and soil organic matter with a choice of methodology appropriate for the research purposes and competent interpretation of results. The metric science indicators of her scientific and publishing activity significantly exceed the minimum national requirements for holding the scientific position of "Associate Professor". Based on the analysis of the scientific, scientific-applied, publishing and pedagogical activity of the candidate, I believe that Ch. Assistant Professor Dr. Gergana Slavova Kuncheva meets the requirements of the Law, the Regulation for its implementation and the Regulations for its implementation in the AA.

All these give me grounds to evaluate **POSITIVELY** her overall activity

I propose to the esteemed Scientific Jury also to vote positively, and to the Scientific Council on General Agriculture, Soil Science, Agrochemistry and Land Reclamation at Agricultural Academy – to vote for **Chief Assistant Dr Gergana Slavova to hold the academic position “Associate Professor” in Land Reclamation (incl. Soil Erosion and its control).**

17.07.2020 r.

Sofia

REVIEWER:



(Prof. Dr Svetla Rousseva)