OPINION

on a dissertation for obtaining the educational and scientific degree **"doctor"** by : field of higher education 6. Agricultural Sciences and Veterinary Medicine, Professional Field 6.1 Crop science, Scientific Specialty Fodder Production, Meadow Farming.

Author of the dissertation: GEORGI KRAEV STANCHEV,
PhD student (full-time) at the Department of Crop science at the Agricultural University, Plovdiv

Topic of the dissertation:
RESEARCHING THE POTENTIAL CAPACITY OF NATURAL AND ARTIFICIAL GRASSLANDS FOR CO_2 ABSORPTION

Opinion from:
Prof. Dr. Hristofor Kirchev Kirchev, Agricultural University, field of higher education 6. Agricultural Sciences and Veterinary Medicine, professional field 6.1 Crop science scientific specialty Field crops.
Appointed as a member of the scientific jury by order No. RD-16-475/02.04.2026 by the Rector of the Agricultural University. Appointed as the author of an opinion at the first meeting of the Scientific Jury.

1. Relevance of the problem.

Carbon dioxide is one of the main components of the global carbon cycle and plays a key role in regulating the Earth's climate system. The carbon cycle is a complex system of processes in which carbon is exchanged between the atmosphere, hydrosphere, lithosphere, and biosphere.

The grasses communities occupy key place in this process because of efficiency on the absorption of CO_2 and the great potential for accumulation of organic carbon in the soil. The factors influencing the process of CO_2 exchange in grasslands are not studied well enough. The research on the carbon balance is focused mainly on stock assessment and the impact of land management. Studies on the potential of grasslands to absorb and accumulate CO_2 remain limited, which imposes the need for more in-depth and systematic research.

2. Purpose, tasks, hypotheses and research methods.

The aim of this dissertation is to investigate the carbon sequestration capacity of natural and artificial grasslands. To achieve this goal, the following specific tasks were completed:

1. The ability to absorb and store carbon in natural and artificial grasslands has been studied.
2. The relationship between climate, species composition and carbon accumulation in plants and soil has been established.

The object of the study are four different polygons, characterized by certain specificities.

Polygon 1 – artificial turf in the area of the experimental field of AU-Plovdiv
Polygon 2 – natural grassland in the area of the village of Rozino, Plovdiv region
Polygon 3 – natural grassland in the Beklemeto area, Troyan region

Polygon 4 – natural grassland in the area of the town of Devin

To achieve the set tasks, four permanent measuring stations were set up at each polygon with an area of 0.25 m^2. All measurements were carried out on them - gasometric, determination of species composition, collection of samples for chemical analyses.

The statistical processing of the experimental data was performed using the multiple regression method.

3. Visuality and presentation of the results.

The dissertation is written on 176 pages, including the standard format for this type of written presentation, namely: Introduction, Literature Review, Aim and Objectives, Material and Methods, Soil and Climate Characteristics, Results and Discussion, Conclusions, Contributions and References.

For better visualization of the obtained results, 37 tables and 61 figures have been attached. The dissertation ends with 15 conclusions, which systematically reflect the obtained results.

4. Discussion of the results and literature.

The data obtained from the experiment are interpreted in the Results and Discussion section, which for better clarity is divided into 9 subsections. The literature used includes 288 cited sources, of which 10 are in Cyrillic and 278 in Latin.

5. Contributions of the dissertation work.

Based on the results obtained and the conclusions drawn, the PhD student proposes nine scientific-theoretical and ten scientific-applied contributions, with which I agree.

6. Critical notes and questions.

I don't have any.

7. Published articles and other activities.

According to the minimum scientometric requirements specified in the Regulations for the Implementation of the Law on the Development of the Academic Staff at the Agricultural University, 3 publications (one independent and two co-authored) related to the dissertation are listed, which fully cover the required number of points. The presented abstract objectively reflects the structure and content of the dissertation work.

During his studies as a PhD student, Georgi Stanchev attended several courses – Databases, English 1 and 2 parts, Teaching Methodology and Statistical Data Processing. He also visited the Academy of Technology in Latvia, where he participated in the RTA International week under the Erasmus + program.

Since 2021, he has been appointed as an Assistant professor in the Department of Crop science, where he conducts exercises and teaching practices in disciplines related to the scientific specialty of Fodder Production, Meadow Farming.

CONCLUSION:

Based on the various research methods learned and applied by the PhD student, the correctly conducted experiments, the generalizations and conclusions made, I believe that

the presented dissertation meets the requirements of the Law on Agricultural Research and Development of the Republic of Bulgaria and the Regulations of the Agricultural University for its application, which gives me reason to evaluate it **POSITIVELY**.

I would like to propose to the esteemed Scientific Jury to also vote positively and award Georgi Kraev Stanchev the educational and scientific degree of "***Doctor***" in the scientific specialty of Fodder Production, Meadow Farming.

Date: 27.04.2026
city of Plovdiv

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