



REVIEW

Concerning the competition for occupation of the academic position "**Professor**", in the professional field 6.1. Crop Production, scientific specialty "Crop Science", announced in the State Gazette No. 93 of November, 26, 2019 by the Agricultural University – Plovdiv, Bulgaria

Candidate for the competition: **Assoc. Prof. Hristofor Kirchev Kirchev, PhD** from the Agricultural University – Plovdiv

Reviewer: **Prof. Svetla Stoyanova Kostadinova, PhD**, Agricultural University - Plovdiv, professional field: 6.1 Crop production; scientific specialty Agrochemistry, appointed as a member of the scientific jury according to order № RD 16-17/14.01.2020 of the Rector of the Agricultural University - Plovdiv.

In the competition for "Professor", announced for the needs of the department "Crop science" at the Agricultural University, Plovdiv, participates only one candidate - Assoc. prof. Hristofor Kirchev, PhD. The competition documents have been prepared in accordance with the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, and the regulations for the implementation of the law in the Agricultural University, Plovdiv.

1. General data on the career and thematic development of the applicant.

Hristofor Kirchev Kirchev was born on 30.05.1968 in Dobrich. In 1993 he graduated Agronomy at the Agricultural University of Plovdiv. From 1993 to 1994 he worked as an agronomist in an Agricultural cooperative in the village of Dubovik, Dobrich region. In the period 1994-1996 he was a teacher at the College of Agriculture, Gen. Toshevo and he taught plant breeding disciplines. In 1996 he started working as a researcher at the Dobrudzha Agricultural Institute - General Toshevo. Since 2002, Hristofor Kirchev has been enrolled as a PhD student in the Department of Crop Science at the Agricultural University of Plovdiv. In 2006 he successfully defended his dissertation and obtained his educational and scientific degree "Doctor" in the scientific specialty "Crop Science". In the period 2006 -2012 he was an assistant, senior assistant and chief assistant in the same department. In 2012, Hristofor Kirchev was awarded the academic position of Associate Professor in the field of Crop Production. At present Assoc. Prof. Kirchev has 13 years of teaching experience. He is fluent in English and Russian.

2. General description of the materials presented.

In the competition for the academic position "Professor" Assoc. Prof. Dr. Kirchev participates with a total production of 122 scientific works, grouped as follows:

2.1. Publications related to the educational and scientific degree "Doctor" - 9 publications (30.6 points), which cover the national minimum science-metric requirements for the acquisition of the Doctor degree. They are not subject to review.

2.2. Publications that have acquired the academic position "Associate Professor" - 59 publications (391.3 points), which cover the national science-metric requirements for the academic position "Associate Professor". Of these, 10 (191 points) are under indicator B4 of the PRASRRB - scientific publications in publications that are referenced and indexed in world-renowned databases of scientific information and 49 items under indicator G8 of the PRASRRB - scientific publications and papers published in non-refereed journals with peer review or published in edited collective volumes (200.3 points). They are not subject to review.

2.3. Publications, with which the candidate Assoc. Prof. Kirchev participates in the current competition for the acquisition of the academic position "Professor" - 46 items, which are subject to analysis and they cover the national minimum science-metric indicators for the acquisition of the academic position "Professor".

Assoc. Prof. Christopher Kirchev presented proven information on science-metric indicators according to the accepted groups of categories as follows:

Indicator A with minimum requirements 50 points - Submitted materials for 50 points. Compliance - 100%.

Indicator B with minimum requirements 100 points - Monograph presented - 1 item (100 points). Compliance - 100%.

Indicator Г with minimum requirements 200 points. - Submitted materials for 203.6 points. Compliance - 100%. Indicator Г points are formed by Indicator Г7. Articles and reports published in scientific journals, referenced and indexed in world-renowned scientific information databases - 1 publication (15 points), and by Indicator Г8. Articles and reports published in non-refereed peer-reviewed journals or in peer-reviewed volumes - 44 publications (188.6 points).

Indicator Д with minimum requirements 100 points - Submitted materials for 495 points. Compliance - 4.95 times above requirements.

Indicator E with minimum requirements 100 points - Submitted materials for 210.2 points Compliance - 2.1 times above requirements.

The submitted documents and materials of the candidate Assoc. Prof. Dr. Hristofor Kirchev indicate that they cover in Indicators A, B and Г, and exceed in Indicators D and E the requirements of the ZRASRB and the Regulations for the implementation of the ZRARRB in the Agrarian University - Plovdiv for participation in competition for the occupation of the academic position of "Professor" in the professional field 6.1. Crop production, scientific specialty "Crop science".

The publications of Assoc. Prof. Kirchev are grouped as follows:

- Monograph - 1 item

- Articles and reports published in scientific journals, abstracted and indexed in world-renowned scientific information databases - 1 issue
- Articles and reports published in non-refereed scientific peer-reviewed journals or in published collective volumes – 44 publications
- Published university textbook - 2 publications
- Published university study guide - 3 publications

Personal participation of assoc. prof. Kirchev in the stated 46 works is illustrated by the fact that in 21 (45.6%) he is a sole or leading author, in 11 (23.9%) he is second, in 14 (30.4%) he is third and the next author.

The submitted monograph from the candidate has a volume of 112 pages and meets the requirements of ZRABRB. The monograph deals with the overall agrotechnics of triticale culture and it is in the interest of producers, specialists and students studying in the agronomy faculties.

In the journals were published 31 (68.9%) of the scientific works of Assoc. Prof. Kirchev, and 14 papers (31.1%) in international conferences. Most articles were published in the journals: Journal of Mountain Agriculture on the Balkans (6), Research Journal of Agricultural Science (5), Scientia Agriculturae (4), Governance and Sustainable Development (4).

Candidate Kirchev's publishing activity is predominantly in English (67.4%), and the remaining 32.6% of publications are in Bulgarian and Russian (1 publication).

3. Main directions of the applicant's research work. Demonstrated research leadership skills or assets (project management, external funding involved, etc.).

The submitted scientific publications indicate that the research work of Assoc. Prof. Kirchev is in the field of crop science. The candidate has worked on the main scientific problems related to some elements of agricultural crop technology such as fertilization rates, effect of leaf fertilizers, growth regulators and biostimulants, influence of irrigation regimes and their influence on the productivity and quality indicators.

The scientific production on the crops is: triticale - 17 publications (37%); wheat - 11 publications (24%); soy - 6 publications (13%); corn - 4 publications (9%); barley - 2 publications (4%) and one each for oats, sunflower, sorghum, coriander, basil and rose (13%).

Assoc. Prof. Kirchev was a participant in a GYGA International Scientific Project - Global Yield Gap Atlas project (funded by the Gates foundation). The project provides a database and open access to all basic data on weather, soil and agronomy, as well as the impact of climate change on Europe's agricultural environment.

Assoc. Prof. Kirchev participated in the 4th Call for Proposals, measure "Projects for mobility in higher education", component "Mobility of teachers, researchers and administrative staff in higher education and science" of the program BG09 "European Economic Area Scholarship Fund". He has undergone a scientific specialization at the

Norwegian University of Natural Sciences in the city of Os.

4. Assessment of the candidate's pedagogical preparation and activity. His role in training of young scientific staff.

Assoc. Prof. Kirchev has 13 years of teaching experience in the Department of Crop Science. His academic load for the period 2014 - 2019 is 2953.8 hours in exercises or an average of 590 hours for each academic year.

He is active in agronomic training and he has developed 6 curricula for the bachelor's and master's students, and foreign students under Erasmus. Associate Professor Kirchev teaches the disciplines "Crops science" (in "Bachelor" and "Master" degree students), Field Crops, Tobacco Production and Grain Production (in "Bachelor" degree students). He gives lectures and exercises In English with students under the Cereal and legume crops program and Master degree students of Plant protection.

Under the supervision of Assoc. Prof. Kirchev, one full-time and two part-time PhD students successfully defended their doctoral dissertation. He is currently the head of one full-time PhD student and three PhD students from the Republic of Kazakhstan.

The role of Assoc. Prof. Kirchev in teaching of young people is also illustrated by the fact that after acquiring the academic position of Associate Professor, 13 students from Bachelor's Degree Program and 10 students from Master's Degree Program were successfully defended under his supervision.

Assoc. Prof. Kirchev co-authored the writing of two published university textbooks (2013 and 2019) and one Exercises Guide (2019). He is the author of two tutorials on practical training for foreign students - "Cereal crops" (2017) and "Legume crops" (2017).

In the period 2014-2019, Assoc. Prof. Kirchev was an academic mentor of students in two projects - "Student Practices" and "Student Practices - Phase 1", co-financed by the European Union. He has actively participated in the project "Introduction of electronic forms for distance learning at the Agricultural University - Plovdiv", funded by the Operational Program "Human Resources Development".

The analysis of the pedagogical activity and the materials presented by Assoc. Prof. Kirchev indicate that he makes a significant contribution to the education of undergraduate and doctoral students in the field of crop science and enjoys the respect of his colleagues and students.

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

For the period 2012 - 2019 (after habilitation for associate professor) Assoc. Prof. Kirchev presented a list with a total of 43 citations of 33 of his scientific publications. This indicates that a significant part of his research work has been reflected in the international scientific community. The candidate has scored 495 points in indicator Д

with a minimum requirement of 200 points, or has exceeded the threshold. The citations are distributed as follows:

Indicator Д 13: 28 citations (65.1% of all citations) = 420 points.

Indicator Д 15: 15 citations (34.9% of all citations) = 75 points.

The high percentage of citations in scientific publications, abstracted and indexed in world-famous databases (65.1% of all citations) proves a certain interest in the scientific results of Assoc. Prof. Kirchev and the importance of his experimental work for the development of crop science in Bulgaria and abroad. The applicant has participated in 12 national and 9 international scientific forums that contribute to the promotion of the results of his research activities.

6. Significance of contributions to science and practice. Reasoned answer to the question of whether the candidate has a clearly defined research profile

I. Scientific contributions

1. The theoretical grain yield of triticale varieties and the additional yield of one kilogram of nitrogen were established on the basis of a regression analysis. An economic model was developed in which the necessary grain yield was established to obtain maximum profit depending on the prices and the nitrogen rate. The degree of dependence between the rate of nitrogen fertilization and the additional yield of triticale was established. There was no relationship between the type of triticale and the parameters of the "supplementary yield - nitrogen rate" dependence (**1, 19, 34**).

2. The effect of nitrogen fertilization on the plasticity and yield stability of different triticale and oat varieties was studied. It was found that triticale varieties had high ecological stability at the highest nitrogen level, except for the Zariad variety. Rye type triticale varieties were more stable in grain yield than wheat type varieties. The Bulgarian oat variety Danube 1 showed a strong variation of yield over the years, unlike the Italian varieties Primula and Sonar (**13, 32**).

3. Differences in interphase periods of the development of triticale varieties grown in the Plovdiv and Chirpan region were proven after the end of the tillering stage (**6, 8**).

4. High correlation between soybean seed yield and structural elements was obtained under field trials found. Genotypic differences of soybean development were observed after bean formation stage (**28, 37**).

5. Evapotranspiration (ET) of soybeans was found to be the most intense of the 0-20 cm layer and soil moisture below 60 cm was ineffective in soybean cultivation. The soil moisture optimization increased the seed mass of soybean by more than 8%. It was demonstrated a positive relationship between the soybean seed mass and irrigation rate, while irrigation regime had a little effect on the test weight (**25, 30**).

6. In relation to optimization of irrigation regime, a degree dependence of the type $y = 1 - (1-x)^n$ of the additional yield and irrigation rate of sunflower was established. Similar dependencies were found between the additional yield of soybean seeds and the depth of irrigation, and the yield of blossom and yield of oil from the Kazanlak's rose and

the depth of irrigation, as well. A linear relationship between the yield of blossom and yield of oil of the Kazanlak's rose was proven, based on which the theoretical oil yield of the based on yield of blossom could be calculated (9, 43, 44).

7. It was proven that grain yield of common wheat was higher than that of the einkorn and kamut ancient wheats. The ancient wheats had low productive tillers, forming smaller and lighter grains in the spike and they were poorly responsive to nitrogen fertilization (11, 16).

8. The distribution of accumulated dry mass of triticale varieties in maturity was established. It was stated that the share of the straw was the highest, followed by the grain and the glumes. Nitrogen fertilization was a main factor for the length of the spike of triticale, and the variety factor had a slight effect. The harvest index of triticale increased with nitrogen fertilization. The foliar fertilization with Lactofol increased the number of grains in the spike by 6.5%. In the spike emergence phase, the stems occupied the largest proportion of triticale plants, followed by leaves and classes. In the maturity phase, the proportion of triticale grains grown after precursor wheat was 6.3% less than that of sunflower precursor, while the proportion of glumes was 17.4% higher (2, 5, 7).

II. Applied contributions

1. In field trials with triticale varieties conducted under different agro-environmental conditions, it was found that the Kolorit and Akord varieties were higher productivity in the conditions of Dobrudzha than in Trakia region (4, 15, 40).

2. High yields of triticale were obtained by $N_{12}P_6K_6$ combined fertilization, regardless of the growing region. The grain yield of triticale increased with the nitrogen rate. The lower proportion of grain in the non-fertilized variants was due to the smaller number of grains in the spike. Rye-type varieties were more productive because of their longer and more gritty spike. Under nitrogen deficiency, triticale Senatrite was higher in yield than others. Rakita and Trujillo demonstrated their productive potential at high levels of nitrogen fertilization. Foliar application of Lactofol and growth regulators had a positive effect on triticale productivity, without replacing mineral fertilization (4, 12, 22, 33, 40).

3. Coriander and sunflower were suitable predecessor to wheat and barley, and sorghum was an unsuitable predecessor. After the precursor coriander fertilization with $N_{12}P_8$ was recommended, and after sunflower with $N_{16}P_8$ (17, 31).

4. The highest grain yield of Karat wheat variety was obtained in the conditions of Dobrudzha region, followed by Albena and Enola. In the agri-environmental conditions of Trakia region, the varieties Vera, Laska and Factor were highly productive. The highest values of the structural elements of the yield were in the Todora variety, in which the grain yield was the highest (18, 38, 39).

5. The Coventry corn hybrid has been proven to have high grain yield when grown in Northern and Southern Bulgaria. The yields of maize hybrids were higher in the Dobrudzha region. Growing hybrids later than 400 FAO under irrigation conditions was

unjustified. Grain yields from the various maize hybrids did not significantly differ in years with unfavorable climatic conditions. (14, 41).

6. Fertilization had a positive effect on the physical and technological quality of the wheat grain. The amount of gluten and its quality was depended mainly on the conditions of the year, and it was decreased in heavy rainfall conditions. Higher nitrogen rate increased the crude protein content of the triticale grain. Rye-type triticale varieties were higher in protein content (3, 10, 27).

7. An optimum sowing rate of 250 g.s./m² and fertilization N₁₂ was recommended for coriander in the Plovdiv region. Nitrogen fertilization increased the yield of dry mass of basil, but an increased in nitrogen rates reduced the efficiency of fertilization (35, 45).

8. Single vegetation irrigations increased the grain weight of maize over years with prolonged summer droughts. Irrigation regime has been found to be decisive for the maize production, while the effect of fertilization was significantly less (21, 36).

7. Critical notes and recommendations

I have no significant comments on the presented scientific production by Assoc. Prof. Kirchev. I recommend Assoc. Prof. Kirchev to concentrate and deepen his future research work on the actual problems of field crops technology.

8. The personal impressions and opinion of the reviewer

I have known Hristofor Kirchev since 2006 and my personal impressions are that he is a good scientist and a good teacher. He is able to work in a team, in his relations with his colleagues he is ethical and correct.

CONCLUSION

Based on the analysis of the candidate's pedagogical, scientific and scientific-applied activity, I believe that Assoc. Prof. Dr. Hristofor Kirchev Kirchev meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations of the Agrarian University. The scientific production presented by him and his overall activity indicate that Assoc. Prof. Kirchev is a very well-trained teacher and a proven professional in the field of research.

All this gives me reason to appreciate **POSITIVELY** his overall activity and to suggest the members of the Scientific Jury to vote positively, and the Faculty Council of the Faculty of Agronomy at the Agricultural University - Plovdiv to select Assoc. Prof. Hristofor Kirchev Kirchev, PhD for "Professor" in the scientific specialty "Crop science".

Date: 05.03.2020
Plovdiv

REVIEWER:



(Prof. Svetla Kostadinova, PhD)