

## REVIEW

Created by Prof. Dr.Sci. Todor Simeonov Kertikov, Agricultural Academy, Field of higher education 6. Agricultural sciences and Veterinary medicine; Professional direction 6.1. Crop production; Scientific specialty „Crop Production”, appointed as a member of the Scientific Jury, according to Order No. RD-16-17/14.01.2020 of the Rector of the Agricultural University, Plovdiv

Competition to hold an academic position - "Professor"; Field of higher education 6. Agricultural sciences and Veterinary medicine; Professional direction 6.1. Crop Production; Scientific specialty "Crop Production", announced in the State Gazette no. 93/26.11.2019, with candidate associate professor, Dr. Hristofor Kirchev Kirchev.

In the competition for occupation of the academic position "Professor" for the needs of the Agricultural University of Plovdiv, one candidate - Assoc. Prof. Dr. Hristofor Kirchev Kirchev participated. The competition documentation has been prepared and presented in paper and electronic form in accordance with the requirements of the ZRASRB as well as in accordance with the requirements of the Rules for its application in the AU.

### **1. General information on the career and thematic development of the candidate**

Assoc. Prof. Dr. Hristofor Kirchev was born on 30.05.1968 in Dobrich. In the period 1988-1993 he was a student at the Higher Institute of Agricultural - Plovdiv, where he obtained the degree of Master - Agro-engineer - Field Breeder. Subsequently, until 1994, he worked as an agronomist in the Agricultural Cooperative in the village of Dubovik. Dobrich. From 1994 to 1996 he was a lecturer in crop disciplines at the Technical School of Agriculture - General Toshevo, and from 1996 to 2002 he was a research associate at the Dobrudzha Agricultural Institute, Gen. Toshevo. During the period 2002 - 2005 he became a doctoral student at the Department of Plant Production at the AU - Plovdiv, where after successful defense he obtained the Doctor of Science in Nursing. From 2006 to 2012 he consistently holds the academic positions of assistant, senior assistant and chief assistant, and from 2012 he is an Associate Professor at the Department of Plant Production at the AU - Plovdiv. His main activity during this period is teaching and research activities, including lectures and exercises in crop disciplines of Bulgarian and foreign students, training of graduates and PhD students, conducting field experiments, publishing. In addition, the applicant is involved in the implementation of a number of national and international projects. She is fluent in English, Russian and Spanish.

### **2. Comparison of the minimum national requirements with the results of the scientific activities of the candidate for the acquisition of academic position "professor"**

In accordance with the provisions of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for its implementation (PPZRASRB), as well as the Rules of the Agricultural University,



Plovdiv, minimum national requirements are regulated, which the candidates must meet occupation of an academic position.

Report presented by Assoc. Prof. Dr. Hristofor Kirchev on the fulfillment of the minimum national scientometric requirements for the academic position of "professor" in the professional field 6.1. Crop production shows that, based on the percentage of authors' contributions from published articles and the analysis of scientific production and the research activity of the candidate for the academic position of "professor", with a required minimum of 550 points, he has a total of 1058,8 points. In this case, it exceeds the national minimum requirements almost twice.

The table below shows which indicators the candidate has accumulated.

Groups of indexes	Indexes	Number of points according to the national requirements	Number of candidate's points
<b>A</b>	1. Dissertation thesis for the award of educational and scientific degree "Doctor"	<b>50</b>	50,0
<b>B</b>	4. Monograph	<b>100</b>	100,0
<b>G</b>	7. Articles and reports published in scientific publications, referenced and indexed in world famous databases with scientific information	<b>200</b>	15,0
	8. Articles and reports published in non-refereed scientific peer reviewed journals or in peer reviewed collective volumes		188,6
<b>D</b>	13. Citations or reviews in scientific publications, referenced and indexed in world famous databases with scientific information in monographs and collective volumes	<b>100</b>	420,0
	15. Citations or reviews in non-refereed scientific peer reviewed journals		75,0
<b>E</b>	17. Leadership of successfully defended doctoral student (n is the number of supervisors of the doctoral student)	<b>100</b>	80,0
	18. Participation in a national scientific or educational project		60,0
	19. Participation in an international scientific or educational project		20,0
	22. Публикуван университетски учебник или учебник, който се използва в училищната мрежа		8,0
	23. Published university textbook or textbook		42,2
Total number of points:		<b>550</b>	<b>1058,8</b>

### 3. General description of the presented materials

In the competition for "Professor" Assoc. Prof. Dr. Hristofor Kirchev participated with a total production of 132 works, grouped as follows:

1. Papers covering the minimum national requirements for obtaining a doctoral degree - 9 - are not subject to review.



2. Papers covering the minimum national requirements for acquiring an academic position of associate professor - 59 - are not subject to review.

Papers with which the candidate participates in this competition, covering the minimum national requirements for acquiring the academic position of "professor":

1. Monograph
  2. Articles and reports published in scientific publications, referenced and indexed in world-renowned scientific information databases - 1.
  3. Articles and reports published in non-refereed scientific peer-reviewed journals or in published collective volumes - 44.
  4. Popular science articles - 7.
  5. Published university textbook or textbook used in the school network - 2.
  6. Published university textbook or textbook used in the school network - 3.
  7. Study programs - 6.
- 46 publications are subject to review for review.

The personal participation of Assoc. Prof. Dr. Hristofor Kirchev in these 46 works is illustrated by the fact that 8 (17,4%) are independent, in 13 (28,3%) is the first, in 11 (23,9%) is second, and in the remaining 14 (30,4%) is the third and next author.

#### **4. Main directions of the candidate's research work. Demonstrated research leadership skills or assets (project management, external funding involved, etc.)**

The main scientific directions in the research activity of Assoc. Prof. Dr. Hristofor Kirchev are in the field of plant science. The submissions for the "Professor" competition relate to the study of biological and economic characteristics and elements of agricultural crop technology such as: triticale, wheat, soybean, corn, barley, oats, sunflower, sorghum, coriander, basil and Kazanlak rose. Study on the plasticity and stability of the yields realized by different crops and varieties depending on the agro-technical factors, phenological development under different agro-ecological conditions. Investigation of evapotranspiration in soybean, leaf fertilization with Lactofol in triticale varieties. Examination of different precursors (sunflower, wheat, sorghum and coriander) in wheat, barley, etc. From the presented information it is evident that during the evaluated period Assoc. Prof. Kirchev participated in five projects, namely: BG051PO001-3.3.07-0002 Student Practices; BG05M20P001-2.002-0001 Student Practices - Phase 1; BG051PO001-4.3.04-0032 "Introduction of Electronic Distance Learning Forms at Agricultural University - Plovdiv"; "Higher Education and Science Mobility Projects", component of "Teacher, Researcher and Administrative Staff Mobility in Higher Education and Science" component; GYGA - Global Yield Gap Atlas project (funded by the Gates foundation).

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

From 2014 - 2019, the average annual classroom employment of Assoc. Prof. Kirchev is 590,8 hours, ie, the department has the need for the academic position of "Professor". What is striking is the enormous workload and commitment to additional (non-teaching) activities. The applicant has been actively involved in the training of young researchers and students in relation to student placements, distance learning, mobility projects and more. Assoc. Prof. Hristofor Kirchev is the scientific adviser of 13 protected graduates at Bachelor of Arts and 10 at the Master's Degree Program. There



are three successfully defended PhD students. He is currently the scientific director of four other, three of which are foreign nationals. For the short teaching experience of 13 years, the co-authorship candidate participated in the publication of five textbooks, textbooks and books. He has taught in Bulgarian and English languages lectures and exercises for students in full-time and part-time study at Master's degree and Bachelor's degree programs. In the disciplines field production, crop production and grain production the applicant has developed 6 school programs. The aforementioned can be praised for its competence, workload and its role in the education of students, young researchers and doctoral students.

**6. Significance of the obtained results, proofed by citations, publications in prestigious journals, awards, membership in international and national scientific organizations, etc.**

In order to participate in the competition, the applicant submits a significant number of scientific publications. They are published in prestigious foreign and Bulgarian specialized journals. Of these in Impact Magazines such as: Bulgarian Journal of Agricultural Science; Journal of Environmental Protection and Ecology; Journal of Agricultural and Food Chemistry; European Journal of Agronomy - 7 with a total score of 6,981, and in journals with impact rank - 2 with a total score of 0,32. Other scientific papers have been published in Bulgarian and international specialized journals and at scientific conferences. The candidate participates in a competition with a monograph on the culture of triticale. The published materials show a high scientific level of competence, experimental and analytical activity. The scientific value of the published works is proved by the Citation for Scientific Production submitted by the applicant. The quotations noted amount to 43, of which 15 are in journals with an impact factor. Many of the candidate's publications are referenced in the international databases Abstracts, Scopus and others.

**7. Significance of contributions to science and practice. A motivated answer to the question how much the candidate in competition has a clearly defined research profile**

The results of the retrospection of the materials submitted by the applicant for participation in the competition show that he conducted a high level of teaching and in-depth research. The experimental activity was carried out methodologically correctly, the results obtained were interpreted and presented in good scientific style. They are processed with modern computer mathematical programs and models. The candidate's ability to work successfully and fruitfully in a team with other scientists is evident.

The scientific production presented by Assoc. Prof. Dr. Hristofor Kirchev corresponds to the nomenclature specialty 6.1. Crop Production. I fully accept the contributions provided. For the sake of transparency, I have allowed myself to make some cuts.

**I. SCIENTIFIC CONTRIBUTIONS**

1. The regression equations for the triticale varieties are derived, with the help of which the theoretical grain yield and the yield supplement for each kilogram of nitrogen can be calculated. The economical application of optimal nitrogen fertilization for different triticale varieties has been studied. The results can be used to prepare a



detailed economic analysis and to establish economically justifiable nitrogen fertilizer rates for triticale (34, 1, 19).

2. The plasticity and stability of the yields of different varieties of triticale depending on nitrogen fertilization rates have been studied. Almost all triticale varieties exhibit high environmental stability at the highest nitrogen fertilization rate, except for the Charge variety. Rye triticale varieties are more stable in grain yield than wheat. Primula and Sonar varieties have been shown to be more stable in productivity (13, 32).

3. The phenological development of triticale varieties under the conditions of Plovdiv and Chirpan was studied. Differences in the interphase periods of triticale development were observed after the end of the breeding phase in all triticale varieties in both study areas (6, 8).

4. High field correlations between soybean seed yield and structural elements have been found in field trials with soybeans. No varietal differences were observed in the development of soybeans in the period from sowing to the beginning of seed growth. Genotypic differences in soybean development occur after the onset of bean formation (28, 37).

5. Evapotranspiration (ET) of soybeans has been found to be the most intense of the 0-20 cm layer. This gives grounds to consider that soil moisture below 60 cm is ineffective in soybean cultivation. Soil moisture optimization increases soybean seed mass by more than 8%. There is a positive relationship between the mass of soybean seeds and the irrigation rate. Irrigation regime of soybeans has no proven effect on hectolitre weight (30, 25).

6. In attempts to optimize the irrigation regime, it was found that the relationship of additional yield - irrigation rate in sunflower is expressed by a power dependence on the type  $y = 1 - (1-x)^n$ . Similar dependencies have been found between the additional yield of soybean seeds and the depth of irrigation, as well as the yield of color and oil from the Kazanlak rose and the depth of irrigation. There is a linear relationship between color yield and essential oil yield, according to which the theoretical yield of essential oil based on color yield can be calculated (44, 43, 9).

7. In experiments with two types of ancient wheat (spruce and camut), it has been found that for single-grain spruce (*T. monococcum*) the vegetation period is longer by 8 days and for camut (*T. turanicum*) by 3 days than ordinary wheat. Grain yield for common wheat has been shown to be higher than in the two types of ancient wheat. Nitrogen fertilization has little and unproven influence on yield in ancient wheat (16, 11).

8. In studies related to the influence of certain agro-technical factors on the structure of triticale varieties, it has been found that the share of triticale straw in the ripening phase is highest, followed by grain and weeds. Nitrogen fertilization has a strong influence on the length of the triticale class, while the differences between the varieties are insignificant and unreliable. Leaf fertilization with Lactofol increases the number of grains in the class by 6.5% and nitrogen fertilization increases the harvest index of the class. In the ripening phase, the proportion of triticale grains grown after precursor wheat was 6.3% less than that of sunflower precursor (5, 7, 2).



## II. SCIENTIFIC AND APPLIED CONTRIBUTIONS

1. In field trials of triticale cultivars conducted under different agri-environmental conditions, it was found that the Kolorit and Akord varieties were higher in the agri-environmental conditions of Dobrudzha than in Thrace (40, 15, 4).
2. In field triticale fertilizer trials conducted under different agri-environmental conditions, it was found that the highest yields, irrespective of the region, were obtained with the N12P6K6 macronutrient ratio. Triticale grain production increases with increasing nitrogen. The proportion of grain is lower in the non-fertilized variants due to the smaller number of grains in the class. In terms of nitrogen deficiency, triticale Senatrite is higher in yield than others. Rakita and Trujillo varieties exhibit their productive potential at high levels of nitrogen fertilization. Leaf fertilization with Lactofol leads to an increase in grain yield, but it is not statistically significant, which confirms the thesis that it cannot replace mineral fertilization (40, 22, 12, 4, 33).
3. In field trials with wheat and barley in the conditions of Southeastern Bulgaria, after different precursors (sunflower, wheat, sorghum and coriander), it was found that the most suitable precursor of wheat and barley was coriander, followed by sunflower and stubble. Sorghum is an unsuitable precursor (17; 31).
4. In Polish varieties of wheat, conducted at three different agri-environmental points, it was found that, in the cultivation of wheat varieties in Dobrudzha, the highest grain yield was obtained from the Karat variety, followed by Albena and Enola. In Thracian agri-environment, the tested wheat varieties are ranked in the following descending order of productivity - Faith > Grace > Factor. In the agro-ecological conditions of southeastern Bulgaria the varieties studied do not tend to lie down. The highest values of the structural elements of the yield are in the Todora variety, in which the grain yield is the highest (18, 39, 38).
5. In field trials with maize conducted in northern and southern Bulgaria it was found that in both study areas (Dobrudzha and Thrace), the highest maize grain yields were obtained from the Coventry hybrid and in the Dobrudzha region the yields are higher than those obtained in Thrace. Growing hybrids later than 400 FAO under irrigation conditions is inappropriate. In years with adverse climatic conditions, grain yields from different maize hybrids do not differ significantly (41, 14).
6. In the study of some qualitative indicators of the grain, it was found that all the wheat varieties formed a grain that had similar values per hectolitre weight, indicating that this indicator was more influenced by the weather than by the variety. The mass of 1000 grains depends on the genotype. The amount of gluten and its quality depend mainly on the conditions of the year, with heavy rainfall decreasing in heavy rainfall. Fertilizing has a positive effect on the physical and technological quality of wheat. Increasing the nitrogen fertilization rate leads to an increase in the crude protein content of the triticale grain. Rye-type triticale varieties are higher in protein (3, 10, 27).
7. In field fertilizers with wheat, it has been found that, at low nitrogen fertilization rates for durum wheat, the varieties show proven differences in the use of nitrogen to form grain yields. With a triple increase in the nitrogen rate, the varieties are leveled in productivity. It has been found that with increasing nitrogen to 16 kg / da, productivity and quality of wheat increase. Further increase of the nitrogen fertilizer rate is unjustified as it does not significantly increase the yield and quality of the grain (42, 23, 20).
8. In field fertilizer experiments with essential oil crops it was found that in the Plovdiv region, the most suitable nitrogen norm for growing coriander is N12, and the



optimum sowing rate is 250 hp / m<sup>2</sup>. In such growing conditions, the highest yields are obtained. Nitrogen fertilization leads to an increase in the production of dry mass of basil, but an increase in nitrogen norms reduces the efficiency of fertilization (35, 45).

9. In the irrigation periods tested during different periods of maize vegetation, it was found that the efficiency of the irrigation phases in milking and milky maturity was approximately the same. In order to clarify the degree of influence of irrigation and fertilization on maize, the dominant influence of irrigation regime on the yield of maize has been established, while the effect of fertilization is much smaller (36, 21).

#### **8. Critical notes and recommendations**

I have no comment on the materials suggested for review.

#### **9. Personal impressions and opinion of the reviewer**

My personal impressions of Assoc. Prof. Kirchev are completely positive. He has a high sense and ability to work together with other colleagues. He shows ethics, initiative and above all honesty to his colleagues.


#### **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 ZRASRB, the Ministry of Regional Development and Public Works and the Regulations of the Agricultural University for its application. The candidate demonstrates a large volume and in-depth scientific and teaching activity. All scientometric criteria for occupying the academic position of Professor have been exceeded. The quality of his teaching is exemplified by well-developed curricula and teaching aids, as well as by the considerable number of doctoral students and graduates successfully defended under his direction. Research has been conducted methodologically correctly; the data has been interpreted in a high scientific style. Shows close integration with similar specialists from AU - Plovdiv and other scientific units in the country.

All of this gives me reason to evaluate **POSITIVE** his overall activity.

I allow myself to propose the Honorable Scientific Jury to vote positively, and the Faculty Council of the Faculty of Agronomy at the Agricultural University - Plovdiv to choose Assoc. Prof. Dr. Hristofor Kirchev the academic position "Professor", in the scientific specialty "Crop Production".

25.02.2020  
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Reviewer:   
/Prof. Dr.Sci.Todor Kertikov/