



REVIEW

on the competition to hold the academic position of Associate Professor, Field of higher education 6. Agricultural Sciences and Veterinary Medicine, professional direction 6.1. Crop production, Scientific specialty Agrochemistry, announced in State Gazette No 62 of 21.07.2023 with candidate Chief Assist. Prof. Dr. Nedyalka Nikolova Yordanova

by Assoc. Prof. Dr. Galya Dimitrova Panayotova - Trakia University, Stara Zagora, field of higher education 6. Agricultural Sciences and Veterinary Medicine, professional direction 6.1. Crop production, scientific specialty Agrochemistry, appointed as a member of the Scientific Jury according to Order No RD-16-903/25.09.2023 of the Rector of the Agricultural University – Plovdiv

In the announced competition for the position of Associate professor of scientific specialty Agrochemistry, documents were submitted from one candidate - Chief Assist. Prof. Dr. Nedyalka Nikolova Yordanova. The submitted documents and materials required for the announced competition comply with the legal requirements arising from the Law for Development of Academic Staff in the Republic of Bulgaria (Art. 29, para. 1), the Regulations to it (Art. 60) and the Regulations of the Agricultural University- Plovdiv.

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

Ch. Assist. Prof. Dr. Nedyalka Nikolova Yordanova was born on 31 August 1979 in Plovdiv. In 2002 she graduated the Agricultural University - Plovdiv with awarded educational and qualification degree of Bachelor and major in Agronomy (Farming), agronomist qualification. In 2002 she gained the professional qualification of Consultant on agrarian-legal issues at the Agricultural University. In 2003 she acquired the educational and qualification degree of Master in Plant Biotechnologies at the Agricultural University. Since 2007 she has worked at the Agrochemistry and Soil Science Department at the AU-Plovdiv. In 2012 she successfully defended her doctoral degree at the Agricultural University - Plovdiv, professional field 6.1. Crop production. The professional interests of the candidate are related to agrochemistry, soil fertility, plant nutrition and fertilization, mineral and organic fertilizers, agrotechnology for major crops.

The candidate has increased her competencies through participations in international and national scientific forums, in national, university and implementation projects. According to the candidate, she has an excellent command of the French language, uses English at a good level in his scientific work and is competent in using various computer programs.

2. General description of the presented materials

In order to participate in the competition for the position of Associate Professor in

specialty Agrochemistry, Ch. Assist. Prof. Dr. Nedyalka Yordanova has submitted scientific works grouped as follows:

- *Dissertation for the award of educational and scientific degree of Doctor - 1 paper, which is not subject to review;*

- *Articles related to the doctoral dissertation - 7 publications, which are not subject to review;*

- *Articles in journals with an impact factor – 3 publications in Q3 (C8, C9, C10);*

- *Articles published in peer-reviewed and refereed world-renowned scientific information databases - 14 publications (C1, C2, C3, C4, C5, C6, C7, D7.1, D7.2, D7.3, D7.4, D7.5, D7.6, D7.7);*

- *A book based on defended dissertation - 1 book (D6.1);*

- *Articles and reports published in non-refereed scientific peer-reviewed journals or published in edited volumes - 9 publications (from D8.1 to D8.9).*

I do not accept publication D8.5 which is identical in content to D8.2.

For the preparation of the review **I accept a total of 26 scientific publications.**

Under **Indicator A**, the minimum requirements have been met - a dissertation was successfully defended (50 points) and 8 publications with a total number of 30.82 points have been submitted with a requirement of 30 points. These publications are not subject to discussion.

Under **Indicator C3**, 10 scientific publications in peer-reviewed and refereed issues in world-renowned scientific information databases with a total of 132 points, which cover the required 100 points.

Under **item D6**, the candidate presents a published book, which is assessed at 40 points.

Under **item D7** - Articles and reports published in peer-reviewed and refereed world-renowned scientific information databases, the candidate submitted 7 publications with a total of 130 points.

Under **item D8**. Articles and reports published in non-refereed journals with scientific review or published in edited collective volumes for the total for the 8 publications submitted for discussion is 37.48 points.

For indicator **D**, the minimum requirements are for a total of 200 points. The total number of points for the candidate's performance (**D6 + D7 + D8**) is 207.48 points, i.e. the overfulfillment is by 7.48 points (1.04 %).

With a total amount of scientometric indicators for an Associate Professor of 400 points, the candidate's performance is assessed at 420.3 points.

The personal participation of Ch. Assist. Prof. Dr. Nedyalka Yordanova in the 26 publications in this competition is illustrated by the fact that 5 scientific papers (19.2%) are individual, she is the first author of 6 papers (23.1%), second author of 7 (26.9%), and in the other 8 publications she is the third and following author. The reports were printed in full text, proof of the quality of the presented materials.

The well-rounded scientific publications have been published in refereed journals and conference proceedings such as Bulgarian Journal of Agricultural Science; Agronomy Research; Scientific papers of AU – Plovdiv; Journal of Mountain Agriculture

on the Balkans, 2021; Scientific Papers Series A. Agronomy, 2015, 2016, 2019, 2022; Proceedings 50th Croatian & 10th International Symposium on Agriculture, Opatija, Croatia; Zbornik radova - 52 hrvatski i 12 simpozij agronoma, 2017, Dubrovnik, Hrvatska.

Articles and reports have been published in non-refereed journals and and collective volumes with scientific review such as the Crop Sciences, 2013; Journal of Mountain Agriculture on the Balkans, 2014; International Journal of Research in Agriculture and Forestry; Collection of Papers 3rd Conference VIVUS, Naklo, Slovenia; Management & Sustainable Development: society, man, nature, University of Forestry-Sofia, 6th Agricultural Symposium "Agrosym 2015", Jahorina, Bosnia and Herzegovina, KNOWLEDGE International Journal Scientific papers.

3. Main directions in the research work of the candidate. Demonstrated skills and talents for conducting scientific research (project management, attracted external funding, etc.).

The candidate's research work is diverse, but the main directions are within the scientific specialty of the competition and are related to studying the impact of fertilization on growth, yield, and the quality of production in various crops. Nitrogen fertilization was extensively studied in 5 publications (C4, C10, D8.2, D8.3, D8.4), phosphorus fertilization was examined in 2 publications (C2 and D8.1), potassium fertilization – in 1 article (C1), NPK fertilization – in 2 articles (D7.2, D7.4), foliar fertilization – in 2 scientific works (C8, C9).

Agrochemical assessments in 7 publications determined the concentration, output, consumption, and reutilization of major macroelements, as well as any changes in the overuse of stem reserves in wheat and barley when altering the donor-acceptor ratio (C2, D7.1, D7.2, D7.3, D7.4, D7.5, D8.4).

Six articles (C3, C5, D7.6, D7.7, D8.6, D8.7) present studies related to the suitability of land for cultivating vineyards, fruit, and medicinal plants, along with corresponding recommendations and a methodology for melioration of acid soils.

Ch. Assist. Prof. Dr. Yordanova has conducted research on a wide range of agricultural crops. Results from her work on common wheat are reflected in the most publications – 8 in total (30.8%) (D6, D7.1, D7.3, D7.5, D8.1, D8.2, D8.5, D8.8), analyzing yield, yield structure, quality, genotypic specificity under the influence of soil and foliar fertilization. Studies on barley in 4 scientific papers (16%) are related to determining dry matter, yield, and nutrient element uptake (C2, D7.2, D7.3, D7.4). In three publications (11.5%) on maize hybrids, the impact of nitrogen fertilization level, type of nitrogen fertilizer, and planting density on growth, structural elements and yield were established (B4, B6, B7). Research on potatoes regarding yield, quality and nutrient content under the impact of nitrogen and potassium fertilization was published in 3 articles (C1, D8.3, D8.4). Results on the impact of foliar fertilization on growth, flower yield and quality of lavender essential oil were popularized through 2 scientific papers (C8, C9). In one work (C10), the influence of predecessor and nitrogen rate on yield and essential oil content of coriander was analyzed. In one publication (D8.9), a fertilization model for permanent plantations and vineyards was presented.

It is impressive that the publications are well-motivated, with appropriate literary references, in-depth analytical part and conclusions. There are 19 publications in English and the remaining 6 are in Bulgarian.

Participation in Scientific Projects. Ch. Assist. Prof. Dr. Nedyalka Yordanova has enhanced her competencies and skills through involvement in 1 national project related to the development of young scientists and post-doctoral fellows, as well as in 2 research projects at AU-Plovdiv. Her participation in the execution of 12 implementation projects with companies for testing liquid, solid, organic, and organo-mineral fertilizers, as well as biostimulants for wheat, maize, sunflower, rapeseed and lavender has been exceptionally active. The involvement in these projects serves as a testament to the significance of the candidate's research activities and her growth and development as a scientist.

4. Evaluation of the candidate's pedagogical training and activities. Her role in educating young scientific personnel.

The total professional experience of Ch. Assist. Prof. N. Yordanova as a university lecturer at the Department of Agrochemistry and Soil Science is 16 years. The lecture courses and laboratory and practical exercises taught fall within the field of the competition specialty of Agrochemistry. The candidate has conducted classes with students in the bachelor's and master's programmes in disciplines such as Agrochemistry, Fundamentals of Agrochemistry, Soil Fertility and Fertilization, Plant Nutrition and Fertilization, Mineral and Organic Fertilizers, and Organic Farming.

Over the past 5 academic years, the taught lecture courses have ranged from 16 to 108 hours, with an average of 54 hours per year. The overall annual workload ranged from 426 hours (2019/2020 academic year) to 637.5 hours in the 2021/2022 academic year, an average of 500 hours, i.e. the candidate's classroom engagement significantly exceeded the required hours.

The teaching activity is complemented by training young scientific personnel, as the candidate served as the supervisor for 5 successful graduates of the educational and qualification degree of Bachelor. The certificate presented does not reflect the topics of the thesis works in order to assess the area of research. Starting in 2022, the candidate has also been supervising two new thesis students.

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

The candidate has submitted 4 citations of 2 of her publications, documented with copies of the articles in which the citations are included. These citations show the interest to the topic and scientific results of the candidate. The citations are in The Journal of Animal & Plant Sciences (Q3), Journal of Applied Sciences Research (Q4), Journal of Applied Phycology (Q2) и в Scientific Papers Series A. Agronomy. The total number under indicator E13 is 60 points out of required 50 points.

The candidate has increased her competencies by participating in the work of 12 international and 2 national scientific forums: 50th Croatian & 10th International

Symposium on Agriculture, Opatija, Croatia; 52. hrvatski i 12. međunarodni simpozij agronoma, Dubrovnik, Hrvatska; Conference "Agriculture for life, life for agriculture", Bucharest, 2015, 2016, 2019; Sixth International Scientific Agricultural Symposium "Agrosym 2015", Jahorina, Bosnia and Herzegovina and others.

6. Importance of contributions to science and practice. Motivated answer to the question to what extent the candidate has a clearly defined profile of the scientific research work;

I accept the reference submitted by the candidate on the contributions from performed research and her scientific output.

I. Scientific contributions

1. The positive impact of increasing levels of nitrogen fertilization, in balance with phosphorus and potassium fertilization, on yield, its structural elements, and the quality of plant production in wheat, barley, and maize has been confirmed. The exclusion of phosphorus fertilization from the fertilizer combination reduces grain yields, while the exclusion of potassium does not have an adverse effect on the yields of wheat and barley (C4, C7, D7.1, D7.2, D7.4).

2. Specific responses of wheat varieties to phosphorus fertilization levels have been identified. Varieties Svilena and Factor exhibit increased dry matter formation during the tillering phase as the phosphorus level increases up to 400 mg P₂O₅/kg soil. Varieties Aneta, Vyara, Laska, and Sadovo 1 show a decrease in dry matter at levels above 200 mg P₂O₅/kg soil, while varieties Neven, Prelom, Pobeda, Katya, and Bononia only weakly change the biomass quantity at levels above 200 mg P₂O₅/kg soil. Phosphorus fertilization increases dry matter in plants during the tillering phase by an average of 39% (D8.1).

3. Wheat varieties Avenue and Anapurna achieve higher yields compared to the standard Sadovo 1, while the productivity of the Airbus variety is similar to that of the standard, regardless of the fertilization rate and year conditions. The introduction of nitrogen rates up to N₁₆ increases nitrogen uptake. The highest nitrogen uptake is observed in the Avenue variety due to the accumulation of more dry matter and higher yields (D8.8).

4. It has been established that nitrogen uptake in maize significantly varies depending on the fertilization rate, while phosphorus and potassium uptake depends on the genotype and climatic conditions during the year (C6, C7).

5. It has been proven that wheat and barley accumulate a significant amount of biomass after the flowering phase. As a result of reducing the spike (acceptor), the efficiency of nitrogen reutilization increases, as well as the share of pre-flowering nitrogen in the grain. Changing the acceptor significantly affects the overall uptake of macronutrients, reducing it by almost half (C2, D7.3, D7.5).

6. Nitrogen fertilization has been found to increase the content of chlorophyll and carotenoids in potato leaves. Increasing the nitrogen rate from 0 to 1000 mgN/kg soil decreases dry matter in potatoes and starch content. Nitrogen fertilization does not

affect the content of reducing sugars, as the values at all fertilization levels are around 0.4%. The content of vitamin C in tubers is lowest without fertilization (D8.3, D8.4).

7. It has been demonstrated that by increasing the levels of KCl, the content of dry matter, starch, and vitamin C in potato tubers significantly decreases compared to K_2SO_4 fertilization (C1).

II. Scientific-applied contributions

1. It has been established that nitrogen fertilization of wheat at 8 kg/ha has been proven to increase yields, while with fertilization at 16 kg N/ha, yields increase by 200-225 kg/ha. Applying nitrogen rates beyond 16 kg/ha in wheat is economically unjustified because it does not lead to a significant increase in yields and grain quality (D7.1, D7.4, D8.2, D8.8).

2. It has been proven that the highest grain yields in wheat (varieties Avenue, Anapurna, Airbus, and Sadovo 1) are achieved with fertilization at 16 kg N/ha. Including nitrogen feeding (N_8) during wheat cultivation increases yields by about 100 kg/ha compared to unfertilized, while with N_{16} fertilization, the productivity of the tested varieties increases by around 300 kg/ha (D8.1, D8.8).

3. It has been demonstrated that the greatest increase in wheat grain yields is obtained with moderate nitrogen fertilization at 12 kg/ha along with 7.5 kg/ha of phosphorus and 5 kg/ha of potassium (D7.1, D7.2).

4. It has been established that nitrogen fertilization, as NH_4NO_3 , in maize with a scheme of 1/3 - pre-sowing, 1/3 - 5th leaf, and 1/3 - at the beginning of heading, increases yield by 40-80 t/ha, as well as its structural elements (C7).

5. Increasing the level of nitrogen from 0 to 120 kg/ha has a positive impact on the essential oil yield of coriander grown in Southeast Bulgaria. The highest yield of the crop and the highest content of essential oil is observed after applying 120 kg N/ha (C10).

6. It has been proven that increasing the nitrogen rate (0, 200, 400, 600, 800, and 1000 mg N/kg soil) reduces potato yields, with the highest rate completely suppressing tuber formation (D8.3, D8.4)

7. It has been established that foliar fertilization (Fertileader Gold - 3 l/ha; Fertiactyl Trium + Fertileader Vital - 1.5 + 1.5 l/ha; Fertileader Viti - 3 l/ha; Fertileader Vital - 3 l/ha) of lavender variety Yubileyna significantly increases the number of flowering stems, flower yield, and essential oil yield, regardless of conditions. High values are observed for fertilization with Fertileader Gold, with a 15.8% increase above the standard (C9).

8. It has been proven that application of foliar fertilizers and biostimulants (Fertigrain foliar fertilizer 1.5 l/ha, Amalgerol 3.5 l/ha, Fertileader Vital 3 l/ha, Siapton 3 l/ha, and Untreated control) on lavender variety Sevtopolis increases flower yield from 69 to 580 kg/ha compared to the unfertilized control. The highest flower yield is achieved after application of Siapton 3 l/ha - 6280 kg/ha. Foliar fertilization increases the content of essential oil compared to the control, with the highest values observed with Fertileader Vital - 3 l/ha (C8).

9. It has been found that the type of potassium fertilizer (KCl or K_2SO_4) does not significantly affect potato productivity and does not influence the content of reducing sugars in tubers (C1).

10. The suitability of lands located in the areas of the town of Kavarna, vill. Archar and vill. Chernogorovo for growing vine varieties with the aim of producing high-quality white and red wines has been established. The cultivation of late and very late vine varieties is not recommended. The areas in Chernogorovo are more suitable for cultivation of vine varieties for the production of high-quality red wines. The analyzed soil parameters of the lands in the area of Elena show that they are suitable for creating plantations of berry and medicinal-aromatic species (C3, C5, D7.6, D7.7, D8.6, D8.7).

7. Critical remarks and recommendations

1. I recommend that the candidate publish more independent articles, with the results of future research primarily appearing in SCOPUS and Web of Science-indexed publications.

2. The candidate has no published teaching materials under the competition. While the rules of the Agricultural University of Plovdiv do not make it a mandatory requirement for candidates for the academic position of Associate Professor to have developed teaching materials or textbooks, I believe that when participating in a competition for this position, the candidate should be the author (co-author) of educational materials.

3. I recommend that the candidate focus their research activities mainly in the field of agrochemistry as related to the scientific specialty for which they are competing.

4. I believe that publication D8.9, "A Fertilization Model for Perennial Crops," could be much more specific. The title gives the idea of an in-depth study. Recommendations for fertilization cannot be the same for different fruit species.

8. Personal impressions and the reviewer's opinion

I am not well acquainted with Ch. Assist. Prof. Dr. Nedyalka Yordanova. My impressions are that she is a diligent, fair scientist, and I believe that she has the potential to develop as a promising researcher and lecturer in the field of agrochemistry.

CONCLUSION

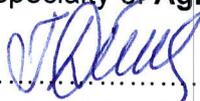
Based on the analysis of the candidate's teaching, scientific, and scientific-applied activities, I believe that Ch. Assist. Prof. Dr. Nedyalka Nikolova Yordanova meets the requirements of the Law for Development of Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations to it and the Regulations of the Agricultural University-Plovdiv for its implementation.

The candidate presents an extensive scientific production, meeting the criteria of Indicator A and exceeding the requirements of Indicators B, C, and D under of the Law for Development of Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations to it and the Regulations of the Agricultural University- Plovdiv for participation in a competition for the academic position of Associate Professor in

professional field 6.1 Crop Science. The research tasks undertaken are topical with scientific and scientific-applied contributions. All of this gives me reason to evaluate her overall performance **POSITIVELY**.

Having considered the above, I would like to recommend the honorable Scientific Jury also to vote favorably and for the Faculty Council of the Faculty of Agronomy at the Agricultural University of Plovdiv **to assign Nedyalka Nikolova Yordanova** at the academic position of **Associate Professor** in the scientific specialty of **Agrochemistry**.

Date: 24.10.2023

REVIEWER:.....

(Assoc. Prof. Dr. Galya Panayotova)