REVIEW

with relation to the competition for holding the academic position of "Associate Professor" in the scientific specialty ***Mechanization and Electrification of Crop Science***, announced in State Gazette, edition 35/27.04.2021, with a candidate - **chief assistant eng. Manol Angelov Dallev, PhD**

Reviewer: *assoc. prof. DIMITAR KIROV KEHAYOV, PhD, from the Agricultural University of Plovdiv (AU - Plovdiv), field of higher education: 5.0 Technical Sciences; professional area: 5.1 Machine Engineering; scientific specialty: Mechanization and Electrification of Crop Science, appointed a member of the scientific panel with Order № РД-16-745/30.06.2021 of the Rector of AU – Plovdiv.*

1. General data about the candidate`s career development.

Chief assistant eng. Manol Angelov Dallev was born on 19.01.1984. In 2006 he obtained a bachelor`s degree in Agrarian Engineering, and in 2007- a master`s degree in Landscape Design at AU – Plovdiv with a professional qualification "Agronomist". In 2013, after a successful dissertation defence entitled "Study on a Working Body for Soil Surface Tilling", he was awarded the educational and scientific degree of "Doctor" in field 5.0 Technical Sciences, 5.13 General Engineering.

From 2011 to 2015 he was appointed a professor assistant in the Department of Mechanization in Agriculture at the Faculty of Viticulture and Agriculture, AU – Plovdiv. Since 2015 up to the present he has been working as a chief assistant.

In the period 2006-2008 he passed training in the University Centre for Continuing Education and obtained the qualification *PROFESSIONAL PEDAGOGY – TEACHER.*

In 2010 and 2011 he participated in 3 training modules for additional qualifications under the operative program "Human Resources Development": *STATISTICAL PROCESSING OF EXPERIMENTAL DATA; ETHICS IN SCIENCE; BASIC PEDAGOGICAL SKILLS AND TECHNIQUES.*

He is an author and has copyright of three products: 1 in 2017 and 2 in 2020.

Chief assistant M. Dallev, PhD, is a member of the Scientific and Technical Union of Mechanization. He actively participates in the management of AU – Plovdiv as a member of the Faculty Council at the Faculty of Viticulture and Horticulture, a member of the General Assembly and a member of the Social Commission.

2. General description of the submitted materials.

The materials have been submitted with an incoming application to the Rector of AU: personal documents required by the Act for Development of the Academic Staff in the Republic of Bulgaria (ADASRB) and the Regulations for its application (RAADASRB), certificates, a list with publications and research works, an author`s reference for contributions, references for citations and participation in scientific forums. there have also been submitted the abstracts of all research papers translated in Bulgarian.

Chief assistant eng. Manol Angelov Dallev, PhD, participates in the present competition with total production of 31 scientific works, grouped as follows:

❖ *Scientific publications under the nomenclature specialty – 31:*

- Publications related to the doctoral dissertation – **4**, which are not subject of consideration in the present review; impact factor publications – **4** (№ B.6, B.7, B.8 и BI.10); publications in reviewed and referenced scientific journals – **17** (№ B.1, B.2, B.3, B.4, B.5, B.9, Г7.1, Г7.2, Г7.3, Г7.4, Г7.5, Г7.6, Г7.7, Г7.8, Г7.9, Г7.10 и Г7.11); publications in conference collections - **5** (Г8.1, Г8.2, Г8.3, Г8.4 и Г8.5); popular science publications – *not submitted.*

- A published book based on the dissertation work (Г6.1) – **1**.

❖ *Student`s books and handbooks – not submitted*

The personal participation of chief assistant eng. Manol Angelov Dallev, PhD, in the above mentioned 27 works is obvious with the fact that in 1 he is an individual author, in 8- a first author, in 10 – a second author, in the rest 8 – a third and subsequent author.

The scientific works under the nomenclature specialty, which are subject of the present review, are 27 in number and are divided as follows:

- Impact factor publications – 4;
- Publications in reviewed and referenced journals – 17;
- Publications in conference collections – 5;
- A published book based on the defensed dissertation work – 1.

The submitted materials exceed the minimum science-metric indicators for holding the academic position of "Associate Professor" in the professional direction 5.13 General Engineering.

3. Basic directions in the candidate`s research work. Demonstrated skills and talents for research studies management (project leadership, attraction of outer financing, etc.).

The research work of chief assistant eng. Manol Angelov Dallev, PhD, is related to studies of the influence of active disk working bodies for soil tilling on the management of its aggregate composition; the application of modern methods (GIS) in soil tilling; study of the ultrasound influence on vegetable seeds, technological solutions for soil maintenance and application of different soil improvers in the production process of planting material and subsequent economic assessment; study of wheat yield at different technological solutions of soil tilling, without deep tilling.

The applicant has participated in 13 projects, of 3 of which he is the head.

4. Evaluation of the candidate`s pedagogical preparation and work. His role in the training of young scientific experts.

Chief assistant eng. Manol Angelov Dallev, PhD, has working experience of 9 years and 10 months as a lecturer at AU – Plovdiv. According to the submitted reference, his workload for the period 2015-2020 was 2920,3 h /averagely 584,06 h per academic year/.

In 2018-2019 he read lectures in the University of Perugia, Italy, under the ERASMUS program. In 2013-2014 he provided training mobility under the same program in the Polytechnic University of Portalegre, Portugal, in 2016-2017- in the University of Pannonia, Hungary, and in 2017-2018 – in the Czech University of Life Sciences, the Czech Republic.

Chief assistant eng. Manol Angelov Dallev, PhD, has supervised 26 successfully defended graduates in the bachelor`s and master`s degree at AU – Plovdiv.

5. Significance of the received results proved with citations, publications in prestige journals, awards, membership in international and national scientific bodies, etc.

There are **27** of the submitted research publications, being subject of the present review. They are grouped as follows: research publications referenced and indexed in world databases with scientific information (Web of Science and Scopus) – **21**, including impact factor journals – **4**; publications in non-referenced journals with scientific reviews or in edited collections – **5**; a published book based on the dissertation work for awarding the educational and scientific degree of "Doctor" – **1**.

There have been published 5 works in Bulgarian language and 22 in English. In 1 of them the candidate has been an individual author, in eight – a first author, in 10 – a second author, in the rest 8 – a third or subsequent author. 33% of the submitted publications evidence for his leading role in them, and 67% of them show his qualities for team work.

The list of citations contains 7 citations: 1 in a Bulgarian edition and 6 in international editions (2 of them are impact factor journals, which proves the actuality of the submitted scientific works).

6. Significance of the contributions for science and practice.

As a result of the whole research work of chief assistant eng. Manol Dallev, PhD, the following groups of contributions can be formulated:

I. ORIGINAL AND METHODOLOGICAL CONTRIBUTIONS

The development of new working bodies for soil tilling I consider as significant and original contribution. The new bodies combine the operational work of soil cutter with a horizontal shaft of rotation and horizontal soil shifting from a disk working body. This combination allows the machine, being integrated with the working bodies, in one run to control the aggregate composition of soil to the desirable technological parameters.

In the field of soil tilling, the author has examined a machine with the new working bodies and has traced the aggregate composition of soil. The received results have been entered in GIS environment. Depending on soil moisture and the progressive speed of aggregate, it has led to soil layers of different parcellation giving possibility for achieving optimum aggregate composition at particular soil moisture and choice of appropriate speed.

Eng. M. Dallev has developed in collaboration with other authors original methodology for graphic projecting of a plough body with grid mouldbar. In the operational work of the

plough body with minimum traction force it is necessary that the direction of lamellas to follow the direction of soil sliding on the plough surface. In the creation of mouldbar from lamellas, it is more appropriate that lamellas in the body`s vertical projection to be adjusted in the direction to the tangent towards the radius of rotation of the soil layer. The angles of lamella twisting are determined in relation to one final section, the one that borders the lamellas and the chest of the plough body.

It has been conducted an original study of HHO gas as a possibility for its use for cleaning carbon depositions in internal-combustion engines. HHO gas has been mixed with the fuel at the time when it flows to the engine. As a result, the mixture of gas and carbon depositions and their burn-out lead to the cleaning of the burning camera and the suction and discharge engine systems. After this operation it has been determined the quantity of harmful emissions of worked-out gases. It has been established that these emissions have sensitively decreased.

II. SCIENCE-APPLIED CONTRIBUTIONS

There have been created mathematical dependences describing the functional relationship between the moving speed of soil aggregate, soil moisture and its aggregate composition. It has been studied the influence of the disc type (in a machine, which combines the work of a cutter with horizontal axis of rotation and disk harrow) on the extent of ameliorant shifting in heavy sand-clay soil types. It has been established that the cut disk distributes the improvers deeper and more uniform than the saw disk.

There has been studied the influence of ultrasound treatment on vegetable seeds. It has been established that seed treatment with ultrasound influence on their quality. Ultrasound with appropriate duration increases the energy for germination, as well as the germination in the lab.

It have been established technical parameters of a seed box equipped with an arch-forming mixer, being part of a sowing machine for grass mixtures. In order to determine the volume of the seed box, there have been applied the principles of dynamic building and engineer modeling of sectional technical elements. It has been defined the exact parameters of the newly built arch-destroying mixer, its position in the seed box and its way of drive.

In his research work, chief assistant eng. Manol Dallev, PhD, has paid attention to the use of straw as an effective renewable energy resource. It has been studied the influence of the technological factors on the heating value of waste biomass containing lognocellulose. It has been examined the formation of briquettes from straw at different technological regimes. It has been proved that the addition of 20% sawdust in straw increases the briquette thickness at the same strength of briquette making.

There have been observed the losses of fruit in mechanized harvesting of Bulgarian peanut varieties - Kalina, Kremena and Tsvetelina at three different technologies. It has been established that the total fruit losses vary from 9,7% to 30,6%. In order to lower the losses in the mechanized harvesting, it is recommended selection of varieties with increased gynophore strength.

There have been studied basic indicators of 25 seasame genotypes intended for mechanized harvesting. It has been received a statistically adequate regression model

for seed percentage kept in the boxes. The average number of plant nodes has effect on the percentage of kept seeds. It is observed that with the increase of plant nodes in a plant, the seed boxes constrict.

It has been studies the growth of some root sprouts received from rootstocks M9 and MM106 in a mother plantation, grown by a classical technology, with the use of moisture-absorbing polymer in quantity from 1 500 to 3 500 kg/dka and the addition of natural humates and pyrolysis residues. With relation to the examined vegetative parameters, it has been obtained very good rootstock rooting, improved formation of nodes, more developed root system at the application of absorbent - 3500 kg/dka. Regarding the addition of natural humates and pyrolysis residues, improvement in the values of some growth indicators has been observed when being combined in a higher dose with soil.

The influence of soil tilling has been studied and established (with or without ploughing) on wheat and sunflower yields cultivated in Northern Bulgaria. Wheat yields vary from 665 to 770 kg/dka. For sunflower yields, seed yields are from 316 to 352,3 kg/dka, and oil yields – from 145,6 to174,2 kg/dka.

7. Critical marks and recommendations.

In my opinion, it will be better that the numbering of the publications, submitted for a review, to be consecutive. The present numbering impedes the marking of a particular publication.

There is a lack of confirming information (Screen Shot) for the impact factor publications.

All submitted research papers of eng. M. Dallev, PhD, are co-authored. The topics are divergent at great extent. I recommend that the candidate to direct his studies to a more narrow field of the agricultural machinery (soil tiling, for example) and to direct his energy and great potential to this scientific field, as well as to work more independently.

8. Personal impressions and reviewer`s opinion.

I have known personally chief assistant eng. Manol angelov Dallev, PhD, since he was a student among the first graduates in Agrarian engineering, followed by his master`s and doctoral training at AU - Plovdiv. Over the years, eng. M. Dallev has actively participated in the teaching process and academic life. As a result, he has formed himself as an intelligent scientific specialist, highly qualified lecturer, honest colleague.

CONCLUSION

On the base of the conducted analysis of the candidate`s pedagogic, scientific and science-applied work, I consider that MANOL ANGELOV DALLEV meets the requirements of ADASRB, RAADASRB and the Regulations of AU - Plovdiv for its application. The submitted documents and materials exceed the minimum science-metric indicators for the position of "Associate Professor" in the professional area 5.13: General Engineering.

All this gives me grounds to evaluate **POSITIVELY** the candidate`s whole work.

I allow myself to propose to the honorable scientific panel to vote positively, and the Faculty Council of the Faculty of Viticulture and Horticulture to elect **MANOL ANGELOV DALLEV** for the academic position of "Associate Professor" in the scientific specialty: ***Mechanization and Electrification of Plant Science***.

30.07.2021

Plovdiv

REVIEWER and MEMBER of
the SCIENTIFIC PANEL: .....
(assoc. prof. Dimitar Kehayov, PhD)