



## REVIEW AND OPINION

With relation to the competition for holding the academic position of "Associate Professor" in the field of higher education: 5. Technical sciences, professional area: 5.13 General engineering, scientific specialty: "Mechanization and Electrification of Crop Science" announced in State Gazette, edition 35 from 27.04.2021, with a candidate - chief assistant eng. Manol Angelov Dallev, PhD – Agricultural Mechanization Department at the Agricultural University of Plovdiv /AU - Plovdiv/

**Reviewer:** prof. eng. Georgi Ivanov Valchev, PhD – University of Food Technology – Plovdiv, field of higher education: 5. Technical Sciences; professional area: 5.4 Energetics, appointed a member of the scientific panel with Rector's Order № ПД- 16-745/30.06.2021 of the Rector of AU – Plovdiv – prof. Hristina Yancheva, PhD.

### 1. General data for the career development of the candidate.

Chief assistant professor eng. Manol Angelov Dallev was born on 19.01.1984 in the town of Parvomay. In the period 2002-2006 he was a student at the Agricultural University of Plovdiv and he obtained the EQD of "Bachelor" in Agrarian Engineering with a professional qualification "Agro-engineer". In the period 2006-2007 he continued his education in the Master's program "Landscape Design" and he obtained the professional qualification "Agronomist". In 2013 he successfully defended a dissertation work entitled "Studying a Working Body for Soil Surface Tilling" for awarding the educational and scientific degree of "Doctor" (Diploma № 33/22 April, 2013 for ESD "Doctor", field of higher education 5. Technical Sciences; professional area 5.13 General Engineering – "Mechanization and Electrification of the Crop Science" under the scientific supervision of assoc. prof. eng. Ivan Braykov, PhD. From 2011 to 2015 he was appointed a professor assistant. Since 01.06.2015 after a successful competition he has been working with a permanent employment contract as a chief assistant professor in the field of higher education 5. Technical Sciences; professional area 5.13. General Engineering; scientific specialty "Mechanization and Electrification of Crop Science" at the Agricultural Mechanization Department, Faculty of Viticulture and Horticulture, AU Plovdiv. In the period 2006-2008 he obtained qualification "Professional Pedagogy - Teacher" in the Center for Continuing Qualification at AU Plovdiv. Between 2010-2011 he enhanced his qualification with the operative program "Development of Human Resources" in three modules – "Statistical Processing of Experimental Data", "Ethics in Science" and "Basic Pedagogical Skills and Techniques".

With relation to the procedure, the present competition was announced in conformity with the Act for Development of the Academic Staff in the Republic of Bulgaria /ADASRB/ and the Regulations of AU – Plovdiv.



## 2. General description of the presented materials.

The candidate for the academic position "Associate Professor" has applied all necessary documents /18 pieces/ in conformity with the Regulations of AU – Plovdiv in the required form /electronic and paper carrier/. In the present competition chief. assist. eng. Manol Angelov Dallev, PhD, participates with total production of research publications by the nomenclature specialty – 31 pieces: publications related to the doctoral dissertation work entitled "Studying a Working Body for Soil Surface Tilling" – 4 pieces (Ia №1, Ia №2, Ia №3, Ia №4), which are not subject of examination; publications with impact factor – 4 pieces (IB №6, IB №7, IB №9, IB №10); publications in reviewed and referenced research journals – 17 pieces; publications in collections from conferences – 6 pieces.

The personal participation of chief assistant eng. Manol Angelov Dalev, PhD, in the above mentioned 27 research papers is proven with the fact that in 1 publication he is an individual author, in 8 – a first author, in 10 – a second author, in 8 – a third or subsequent author.

He is presented with a book entitled "Studying a Working Body for Soil Surface Tilling" (Ia №1) on the base of the dissertation work, being reviewed by the corresponding member prof. eng. Hristo Beloev, Doctor of Technological Sciences and prof. eng. Sava Mandradzhiev, PhD, - ISBN: 978-619-7220-58-2, Plovdiv, 2019. The book describes an analysis of the methods and sources for management of soil aggregate contents in mechanical tilling. The research aim was set up and the tasks for its achievement were determined. Common methodology for experimental studies was defined on the base of mechanical-mathematical modeling. The optimum value of the established angle was determined; the stability of the indicator *depth* of the newly created working body was examined with a multi-factor experiment.

With relation to the present review, 27 research publications are subject of analysis. The author's summary of the dissertation and the research publications referred to ESD "Doctor" shall not be reviewed, as well as the participation in projects. Nevertheless, in the formation of the candidate's complex assessment the reviewer shall take into account all of the presented materials.

Because of the fact that the candidate has not submitted a dividing record for the co-authored publications, I consider that there is equal contribution by all authors.

Chief assistant eng. Manol Angelov Dallev, PhD meets the minimum requirements for holding the academic position of "Associate Professor" listed in ADASRB and the Regulations of AU – Plovdiv for its application in the scientific field: 5. Technical Sciences, professional area: 5.13 General Engineering, scientific specialty "Mechanization and Electrification of Crop Science".

The candidate's total number of points is 530,18 at minimum requirements of 400 points in groups of indicators for the academic position of "Associate Professor". The points by each group of indicators are as follows: 50 in group A from 50; 165 in group B (B4) from 100. The sum of points in group Г (Г6, Г7, Г8) is 245.18 from the minimum 200. The sum of pints in group Д (Д1) is 70 from the required 50.



### **3. Basic directions in the scientific and research work of the candidate.**

The candidate for the academic position of "Assoc. Prof." submits 10 research publications (IB №1, IB №2, IB №3, IB №4, IB №5, IB №6, IB №7, IB №8, IB №9, IB №10) presented as equal to a habilitation work, which are referred and indexed in world famous databases of scientific information (B.4 Category).

The publications submitted for the academic position of "Assoc. prof." are related to the mechanization in agriculture, as well as with different technologies being important for the contemporary development of agricultural production. There has been conducted an analysis of popular publications of researchers in this field. The submitted scientific production can be classified in the following sections:

\* Research publications related to soil tilling.

Soil tilling requires the technological operations to be conducted at optimum conditions – expenses reduction at increased quality, preserving the soil fertility. A basic parameter influencing plant growth and soil composition is the aggregate contents of soil with measuring soil moisture and choosing the appropriate speed for aggregate movement (IB №1).

Soil tilling represents mechanical impact of the working bodies of agricultural machinery for a particular period of time on a particular soil size in order to reach a composition complying with the agro-technical conditions for crop cultivation (IB №2).

There have been examined two new working bodies representing disks in different forms. They combine the kinematics of a soil tilling cutter with a horizontal axis of rotation and horizontal soil displacement by a disk working body. There have been examined processes on the crushing and replacement of meliorants in two soil types in the area of the village of Bryagovo, Plovdiv region. They are representatives of middle-heavy and heavy soil types used for cultivation of vegetable crops at parametrical instability (IB №3).

There has been studied the possibility for prevention of soil erosion with an active disk working body (IB №19, IB №21).

There have been studied the types and coefficients of auto-co-relation functions of the isolated area in longitudinal and transversal direction and the area after pre-planting tilling.

\* Research publications related to precise agriculture and construction of agricultural machinery.

There has been studied the possibility for application of geographical information systems for optimization of the soil aggregate composition at different soil types with changeable moisture (IB №2).

Producers of agricultural machinery propose ploughs with classical mould boards, as well as ploughs with grated /grid/ boards. In their advertisements, companies, producers of grated mould-boarded ploughs, show that in certain conditions these ploughs have lower tractive strength up to 5 % than the classical ones and in working mode they make better crushing /parcellation/ of soil.



There are no data found in the research literature that deal with such types of plough and the relevant results, which prove their lower tractive strength /resistance/. Information about methodology for building the surface of the separate buses /bus-bars/ is little or almost misses. Such information is necessary for the creation of prints, matrixes, foundry models, as well as for patterns which to control their form. (IB № 2 ).

The specific characteristics of planting complex grass mixes require the use of specialized seed-drills. One of the most important characteristic is the creation of working bodies for these machines. The present research publication aims at working out and establishing the parameters technical for the seed box – equipped with an arc-disrupting mixer /agitator/ in order to become an element of the newly created combined seed-drill - STS-80 (IB №9).

\* Studies related to mathematical processing of the experimental results. It has been studied the detainment of seeds in the boxes from 25 sesame genotypes intended for mechanized picking. It has been obtained a statistically adequate regression model for the percent of seeds kept in the box (I B №15).

There has been examined the losses from mechanized picking of peanuts, Bulgarian varieties – Kalina, Kremena and Tsvetelina. Analyses recommend the choice of varieties with stronger gynophores in order to decrease the losses from mechanized peanut harvest (IB №14).

There have been studied the productive qualities of five wheat varieties in the region of Slatina through the use of un-ploughing technology for soil tilling (a single disking at 10-12 cm after harvesting the previous crop and double disking after main fertilization, before planting). A statistical data processing has been made (IB №17).

\* Studies with technical developments related to ultrasound and the production of planting material.

Two parallel experiments have been set out with sufficient number of repetitions. One of the experiments aims at studying the influence of ultrasound on seed germination, and the other studies the influence of liquid environment on seeds (IB №4, IB №5).

It has been studied the influence of different soil improving components (soil absorbent, humates, pyrolysis residue) on the production of apple rootstocks at a particular technological solution (IB №13).

\* Studies related to technological developments with renewable energy sources.

There has been studied the technological process of production of briquettes and pellets from waste straw for energy needs. It has been explored the influence of the technological factors on the heat of biomass burning; it has been demonstrated a technology for biomass use at maximum burning heat. It has been based a construction for thermal decomposition of biomass (IB №18, IB №25).

It has been examined an innovative option for decreasing the harmful components from the worked off gases of internal-combustion engines (I B №7).



A certificate has been submitted under outgoing № 17/09.06.2021 by the Vice-Rector of the Research and Project Work attesting that chief assistant eng. Manol Angelov Dallev, PhD, has co-participated in 6 research projects financed by competition, as well as in a project entitled "Use of Natural Components for the Creation of Functional Foods" for the period 2019-2021 in the Institute for Tinning and Food Quality at the Agricultural Academy- Sofia. The candidate has proven his success in a team work during the project realization.

**4. Evaluation of the candidate's pedagogical preparation and work. His role in the training of young scientific specialists.**

Chief assistant eng. Manol Angelov Dallev, PhD, has pedagogical experience of 9 years and 10 months as professor assistant and chief assistant. For the period from 2015-16 to 2019-20 the candidate has had lectures and seminars, as well as extracurricular work of 2920,3 hours or 584,06 hours average per year. In 2018-2019 he has read lectures in the Perugia University, Italy, under the ERASMUS Program. In an earlier period – 2013-2014 he has provided training mobility under the same program in the Polytechnic University of Portalegre, Portugal; in 2016-2017 – in the University of Pannonia, Hungary; in 2017-2018 – in the Czech University of Life Sciences, The Czech Republic.

Chief assistant eng. Manol Angelov Dallev, PhD, has been a scientific supervisor of 26 bachelor and master graduates in AU Plovdiv who has successfully defended their diploma theses: in the Faculty of Viticulture and Horticulture – 16; in the Faculty of Plant Protection and Agro-ecology – 5; in the Faculty of Agronomy – 5.

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

The candidate's research publications have become generally known to the scientific community at home and abroad, which are thoroughly described in point 2 of the present review. From the submitted information it is obvious that the candidate has 4 publications in impact factor journals, as well as 7 citations in Bulgarian impact factor journals and foreign journals. He is a co-author of 3 certificates issued by the Chamber of the Independent Evaluators in Bulgaria of the author product № 054/30.05.2017 entitled "Application of Moisture-absorbing Polymer in Apple Plants"; the author product №072/ 05.10.2020 - "Application of Natural Humates in the Production of Apple Rootstocks" and the author product IC №073/05.10.2020 - "Application of Pyrolysis Residue in the Production of Apple Rootstocks".

**6. Significance of the contributions to science and practice. A motivated answer to the question: Does the candidate have a clearly shaped profile of his research work?**

The research and applied work of chief assistant eng. Manol Angelov Dallev, PhD, is extremely topical for the present day because of the fact that it is related to



the agricultural mechanization (soil tilling with modern agricultural machinery, participation in technological developments with the use of mathematical models for experimental data processing, developments related to the production of planting material, as well as renewable energy sources for agriculture). The candidate has clearly shaped profile in the training of students and supervision of graduates in AU – Plovdiv.

I accept the author's check-up for research contributions in the publications submitted as equal in value to a habilitation work in correspondence with category B.4. The contributions of the presented research publications taking into account the received experimental studies can be characterized as clearly scientific and applied.

### **SCIENTIFIC CONTRIBUTIONS**

\*On the base of experiments and analytical studies there have been received mathematical dependences for the influence of the progressive speed of the tractor aggregate on the work stability of newly created bodies (IB № 2).

\*It has been studied the possibility for application of the geographical information systems (GIS) for optimization of soil aggregate composition in different soil types with changeable moisture. There has been created a system for management of the aggregate composition of different soil types based on GIS technologies (IB №1, IB №2).

### **APPLIED CONTRIBUTIONS**

\*There have been studied newly created working bodies combining the kinematics of a cutter with a horizontal axis of rotation and horizontal soil shifting with a disking body (IB №3, IB №19, IB №20).

\*There has been studied the influence of the absolute soil moisture with different percentage content of clay on the aggregate composition of soil and the transposition of meliorants in surface tilling (IB № 3).

\*There have been determined the ranges of progressive speed for optimal soil parcellation of soils with different clay content (IB №21).

\*A methodology has been created for the design of barred plough bodies. It have been established the technical parameters of a seed box for a new experimental combined seed-drill – STS-80 (IB № 9).

\*It has been received an adequate model for the percentage of sesame seeds kept in the box. The model shows that the distance of capsule constriction towards its axis is influenced most by the percentage, followed by the strength of the placenta for seed keeping (IB №15).

\*There have been defined the losses from the mechanized harvesting of Bulgarian peanut varieties – Kalina, Kremena, Tsvetelina. It has been established that it is necessary to choose varieties with increased gynophore brightness in order to decrease the losses from the mechanized peanut harvesting (IB №14).

\*It has been studied the potential of yield of 5 tested sunflower hybrids with the use of the block method in 4 repetitions after the predecessor - winter wheat. It has been proved that Neoma hybrid is the most appropriate for cultivation in the conditions of North-eastern Bulgaria (IB №16).



\*It has been studied the potential of yield of 5 common wheat varieties with the help of a block method in 4 repetitions after a predecessor crop – sunflower. It has been proved that the highest wheat yield is obtained from Pirineo variety in the cultivating conditions of Central Bulgaria (IB №17).

\*It has been studied the influence of ultrasound with frequency of 43-45 kHz and different exposition on the germination of vegetable seeds (IB № 4). It has been defined the influence of the working liquid for seed treatment with ultrasound (IB №5).

\*It has been studied the influence of different soil enhancers (moisture absorbent, humates and pyrolysis residue) on the production of apple rootstocks through applied mechanized technology for soil tilling (IB №6, IB №10, IB №11, IB №12, IB №13).

\*It has been studied and optimized the process of straw briquetting. It has been grounded a construction for thermal decomposition of biomass (IB №18, IB №25).

## **7. CRITICAL NOTES AND RECOMMENDATIONS.**

The analysis of the submitted materials related to the competition for holding the academic position of “Associate Professor” shows a lack of gaps. The reviewer considers that it is not necessary to give critical notes. I allow myself to give some recommendations for the candidate’s prospective teaching work at AU – Plovdiv: to publish more research publications on his own; to continue working in a team; to conduct leadership of research projects; to conduct supervision of doctoral students in the professional direction 5.13.

## **CONCLUSION**

On the base of the conducted analysis of the candidate’s teaching, scientific and applied work, I consider that chief assistant eng. Manol Angelov Dallev, PhD, meets the requirements of ADASRB, RAADASRB and the Regulations of AU – Plovdiv for its application. The above mentioned gives me grounds to evaluate **POSITIVELY** his complete work.

I would like to propose to the honorable scientific panel to vote positively, and the Faculty Council of the Faculty of Viticulture and Horticulture at AU – Plovdiv to elect chief assistant eng. Manol Angelov Dallev, PhD, for the position of “Assoc. Professor” in the field of higher education: 5. Technical Sciences; professional area: 5.13. General Engineering in scientific specialty “Mechanization and Electrification of Plant Science”

Data: 15.08.2021

Plovdiv

**REVIEWER:** .....

(prof. eng. G. Valchev, PhD)