

POSITION



on a thesis for obtaining the educational and scientific degree "Doctor" (Ph.D.) in: field of higher education Agricultural sciences and veterinary medicine, professional field 6.1. Plant growing, the scientific specialty "Vegetable production".

Author of the thesis: **Alexander Kirilov Trayanov**, regular PhD student at the Department of Horticulture at the Agricultural University, Plovdiv

Title of the thesis: "Productivity and quality of the seeds of carrot by optimization of the nutrient regime in their seed production"

Reviewer: Prof. Dr. Ivan Manolov, Agricultural University, Plovdiv, field of higher education - Agricultural Sciences and Veterinary Medicine, professional field - 6.1 Plant growing, scientific specialty - Agrochemistry, appointed a member of the scientific jury by order № RD-16-282 / 15.03.2021 by the Rector of AU.

1. Relevance of the problem

The production of quality seed material largely guarantees the success of the grown vegetable crops. Carrots are the main root crop. The production of quality carrot seeds for sowing in Bulgaria has been neglected in recent years. Therefore, research related to the production of good quality seed is of great importance for the success cultivation of this crop. An important element of seed production technology is the optimization of the nutrition of plants grown for seed, an element that is the basis of this study.

2. Purpose, tasks, hypotheses and research methods

The main goal of the thesis is to increase the yield and improve the quality of carrot seeds. In order to achieve the goal, the author solves three tasks: testing of different levels of fertilization with one-time and two-time application of fertilizers; study of the influence of fertilization on the vegetative and generative development of seed plants and its influence on seed yield and quality.

3. Visualization and presentation of the obtained results

The thesis is written on 218 pages and contains 60 tables and 21 figures. The inclusion of more figures facilitates the perception of the emerging trends as a result of the applied fertilization. The tables and figures are very well designed, and the discussion of the results is done in clear and precise scientific language.

4. Discussion of the results and used literature

The list of cited literature includes 158 titles, of which 37 in Cyrillic and 121 in Latin. The description of the literature is very well done, following a single bibliographic

standard. In the section Results and discussion there is a very good discussion of the results obtained by the author with the published similar data by different authors.

In the conducted three-year field fertilization experiment the influence of fertilization with nitrogen, phosphorus and potassium was studied. The fertilizers were applied by two ways. The whole rates were applied before transplanting of plants. At the second way, one-half of the phosphorus and potassium rates were applied with the main tillage, and the other half before the planting of the crop. Half of the nitrogen rate is applied before transplanting, and the other half at the beginning of flowering carrots. A total of 18 variants were included and studied in the experiment, which on the one hand requires a lot of work by the Ph.D. student, but on the other hand allows highlighting the effect of fertilizer rates and their combinations on the growth and fruiting of the studied crop.

The results show that the double application of fertilizers has an advantage over the application of the entire fertilizer rate once, and the increased fertilizer rates accelerate the generative development of the plants. Almost all studied indicators show better values after split application of fertilizers.

The conclusions at the end of the dissertation fully reflect the results obtained, as they are written very concisely and understandably.

5. Contributions to the thesis

Scientific contributions

From the scientific contributions I can note that it has been established that seeds with better sowing qualities are formed from the seeds laid in the umbel of the first and second order. Strong positive correlations have been found between the vegetative and generative manifestations of carrots and seed yield.

Scientific and applied contributions

From the scientific and applied contributions mentioned by the author it can be noted the recommendation for the practice that the best productivity from carrot seeds can be obtained by double application of $N_9P_9K_{10}$ fertilizer rates and one application of $N_9P_9K_{20}$, and the storage of carrot seeds is improves most strongly as a result of a single application of $N_5P_{19}K_{20}$, as well as double fertilization with $N_9P_9K_{20}$ and $N_9P_{19}K_{20}$.

6. Critical remarks and questions

I have only one small technical note: when citing a literary source in the text of the thesis only the surname of the first author and the year of publication are indicated, and not the first name of the author.

7. Published articles and citations

In connection with the thesis, Ph.D. student Trayanov presented 4 publications, in one of which he is a co-author with two other lecturers from the Agricultural University, and the other three are independent. The total number of points that the Ph.D. student collects from the publications is 53.33, which is quite enough to meet the requirements for this scientific degree.

The presented abstract in a volume of 40 pages, objectively reflecting the structure and content of the thesis. The results of the research in the abstract are summarized in 22 tables and 16 figures.

CONCLUSION:

PhD student Alexander Trayanov has put a lot of work to perform the experiments, trace, report and summarize the information from the numerous indicators included in the study related to germination, growth, seed formation and quality of the obtained seeds. In the process of working on the thesis he has mastered the methods for planning and establishment of field fertilizer experiments. He has learned and applied various methods of plant research, correctly performed the experiments, made reasonable summaries and conclusions, which is why I believe that the presented thesis fully meets the requirements of ZRASRB and the Rules of the Agricultural University for its application, which gives me reason to rate it **POSITIVE**.

I allow myself to suggest to the esteemed Scientific Jury also to vote positively and to award the Ph.D. student Alexander Kirilov Trayanov with the educational and scientific degree "Doctor" in the scientific specialty "Vegetable Production".

Date: 5.04.2021

Plovdiv

REVIEWER:


(Prof. Ivan Manolov)