THE IMPORTANCE OF MICRO AND MACROELEMENTS IN MICROCLONAL PROPAGATION OF POTATOES.

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Potatoes and potato products make up about 30% of the daily food ration of the population of many countries in the world. Many high-quality and high-yielding varieties of potatoes have been created in the leading potato growing countries: China (70 million tons), Russia (38.6 million tons), India (23.9 million tons), the USA (19.7 million tons), Ukraine (19.5 million tons), and Germany (10 million tons). In these countries, the use of effective methods of biotechnological and fertilization in the cultivation of pathogen-free potato seeds has been established, so the average yield is 36.6-43.7 tons per hectare.

In many major research centers around the world, special attention is currently being paid to the selection, creation and cultivation of varieties of agricultural plants suitable for soil and climatic conditions in connection with food issues. In this regard, special attention is paid to the development of potato cultivation, which has food value, and to obtaining high and high-quality yields. Taking into account the importance of the element phosphorus in determining the quality indicators of potato tubers, studies have been conducted on the state of assimilation of relative indicators of potassium and phosphorus in the soil composition. In particular, the cultivation of pathogen-free potato seedlings in vitro using biotechnological methods, along with the provision of sufficient amounts of phosphorus and potassium, is an urgent task.

In our country, a number of measures have been taken to fully satisfy the population's demand for potatoes. In this regard, a large volume of seed potatoes is imported from foreign countries every year. However, a number of problems arise in adapting the imported seed potatoes to the climate of the republic, importing seeds free from quarantine diseases and pests, as well as foreign exchange costs. Therefore, one of the urgent issues of today is the creation of disease-resistant and high-yielding varieties suitable for the country's soil and climatic conditions, and the organization of their local seed production on a scientific basis. The Strategy of Actions for the Further Development of the Republic of Uzbekistan includes issues such as "expanding scientific research on the creation and introduction into production of new selection varieties of

agricultural crops and highly productive animal breeds that are resistant to diseases and pests, adapted to local soil-climatic and environmental conditions," and the Resolution of the President of the Republic of Uzbekistan No. PP-4704 dated May 6, 2020 "On measures to expand potato cultivation and further develop seed production in the Republic" sets out specific tasks for the development of potato growing to meet the food needs of the population.

In order to implement the tasks set out in paragraph 3.3 of the Decree of the President of the Republic of Uzbekistan No. PF-4947 “On the Strategy of Action for the Further Development of the Republic of Uzbekistan” dated February 7, 2017 and the Resolution No. PP-4239 “On Measures for the Development of Agricultural Cooperation in the Fruit and Vegetable Sector” dated March 14, 2019, on the modernization and accelerated development of agriculture, the Resolution No. PP-4704 “On Measures to Expand Potato Cultivation and Further Develop Seed Production in the Republic” dated May 6, 2020, and other regulatory legal acts related to this activity, it is advisable to develop methods for microclonal propagation of potatoes in vitro to create potato varieties adapted to a specific region.

The influence of the relative assimilation indices of nutrient elements, in particular phosphorus, with other elements in potato cultivation on yield and crop quality has been studied by many foreign researchers. The reasons for the decrease in the formation of plant root hairs in cases of phosphorus deficiency were studied by B.G. Hopkins, while taking into account the physicochemical properties of the soil and the level of assimilation of phosphorus in it, Mayer et al. and B.G. Hopkins recommended phosphorus fertilizer rates from 100 to 400 kg per hectare for potato cultivation. S.J. Rosen and his colleagues proposed appropriate fertilization rates based on the observation that differences between different soil types were noted, and that the phosphorus content in loamy soils showed high yield responses, while in sandy soils it was lower. Fardeau (1996) showed in his research that the concentration of phosphorus in soil is very low, varying from approximately 0.002 to 2 mg/l in agricultural soils. Elke Pavelzik, Mirjam Koch, Marcel Naumann, Andreas Gransee, Heike Thiellar studied the effects of micro- and macronutrients on potato growth and development. C.J. Rosen, K.A. Kelling, J.C. Stark, G.A. Porter (2014) showed a method for optimizing phosphorus fertilizer management in potato cultivation, and LinguSrun Chea showed in their studies that some potato varieties can respond positively to phosphorus deficiency conditions.

Extensive scientific research has been conducted on potato seed production and cultivation technologies in Uzbekistan by N.N. Balashev, D.T. Abdukarimov, V.I. Zuev, T.E. Ostonakulov, I.T. Ergashev, H.C. Buriev, B.B. Azimov, S.Kh. Khushvaktov, M.K. Abdurakhimov, A.Kh. Khamzaev, A. Rasulov, O. Kadirkhozhaev, Z. Isakov, A. Elmurodov, Sh. Jabbarov, S.T. Sanaev, D. Normurodov, E. Kholmurodov and other scientists.

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