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Cultivation of Cherry and Plum Grafts from Green Cuttings on Artificial Substrate

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Abstract: Creating a garden, creating fruit varieties with high productivity and resistance to various diseases and pests is one of the urgent tasks facing fruit growers today. We are carrying out scientific research in order to create orchards based on intensive technology by selecting suitable clone grafts for cherry fruit.

Keywords: Cherry, nematode, graft, disease, cherry, plum, intensive technology, plants, resistant, clone graft, selection, fertility, plants.

The task of increasing the number and quality of seedlings grown and reducing their cost as much as possible is urgent for the specialists of our republic's nurseries. In this case, the seedling production process will be effective only if the optimal cultivation technology is used in accordance with modern conditions. Therefore, it is an important task to develop and apply promising, innovative and cost-effective technologies that allow the mechanization of labor-intensive processes related to the cultivation of seedlings in nursery farms. It is known that various methods of vegetative reproduction are used to preserve the valuable economic and biological characteristics of productive plants. Among them, from the point of view of biology, agrotechnics and economic economy, green grafting is the most promising. Correct selection of artificial substrates with sufficient amount of nutrients is an important element of this technology in the reproduction of plants in this plant. In addition, these nutrients of the substrate

An important element of the technology for growing plants using this method is the correct choice of a nutrient artificial medium that has a sufficient content of basic nutrients and improves the sorption properties of the substrate, and, accordingly, the level of their availability for use by the root system of developing plants. In our study, we used vermicompost as an artificial substrate, which, in comparison with other types, has higher nutritional properties and the absence of weeds, the presence of which subsequently affects the quality indicators of the development of cultivated plants and the economic indicators of the cultivation technology using this method.

In our study, to grow cherry and plum rootstocks from green cuttings, we used as an artificial nutrient medium such components as coarse river sand, well cleared of silt (fraction 2.0-2.5 mm) and various masses of vermicompost from 1.0 up to 7 kg/m2 mixed with each other. The layer of artificial substrate for growing from rootstock cuttings was 15 cm. The rootstock cuttings were placed according to a 15x15 cm pattern. The study showed that the accumulation of basic nutrients (NPK) in the organs of regenerating cherry cuttings of the Shpanka Chernaya variety varies depending on the rate of addition of vermicompost to river sand .

In our experiment with the P-3 cherry rootstock, the highest content of basic nutrients accumulated in the leaves and roots, which was 3.4 and 1.8 times higher, respectively, compared to the stems.

This trend in NPK content persisted in both the control and experimental variants using different rates of vermicompost as a nutrient substrate. As one might expect, the aerial parts of plants contained the least amount of basic nutrients when pure river sand was used as an artificial substrate. Growing

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cherry rootstocks in such a substrate allowed developing plants at an early stage of development to accumulate in the aboveground part of total nitrogen from 0.22 to 0.36% by dry weight, mobile phosphorus - 0.09 to 0.13% potassium from 0.25 to 0 ,thirty%. In the experimental variants where different norms of vermicompost were used, the characteristics of the nutrient content were significantly greater and they increased from the minimum norms of vermicompost use - 1000 g/m2 to the maximum 6000 g/m2, respectively, in leaves from 0.56 - 0.81% for nitrogen, roots - from 0.29 to 0.53%, stems - from 0.22 to 0.40%. The absolute value of phosphorus content of these nutrients in individual parts of plants was approximately the same as nitrogen. Analysis of the potassium content in vegetating rootstocks showed that this element most actively accumulates in leaves and roots, respectively 2.04 - 3.04 and 0.30 - 0.93% per dry weight of substances.

Planting green cuttings of P-3 cherries in artificial substrates containing different contents of vermicompost in river sand had a certain effect on the regeneration processes of green cuttings of cherries of the root and aerial parts.

From the data in Table 2 it is clear that with an increase in the content of vermicompost in the sand, the phase of the beginning of root formation in green cuttings accelerates in the context of variants by 1-3 days. Relative to the control version of the experiment, this value of the physical indicator is 2-5 days.

Of the studied norms for the use of vermicompost, the best indicators for the initial phase of regeneration of the root system of P-3 cherry cuttings were obtained when vermicompost was added to the “river sand” substrate at a rate of 6000 g/m2. In this case, the beginning of root formation in the cuttings was observed on the 17th day after they were planted on the substrate. Increasing the rate of application of vermicompost to 7000 g/m2 of sand provided the same conditions for the onset of root rhizogenesis. The overall development of the root system by the end of the current growing season, as one would expect, was the highest in the variants of increased rates of vermicompost use (6000-7000 g/m2 of sand) - 4.7 points (based on a 5-point assessment).

The height of the rootstocks and the diameter of the development of the root collar, as well as the previous development factors, were directly dependent on the nutritional level of the substrates. The growth rates of cherry rootstocks, as well as rhizogenesis and development of the root system, increased from the minimum norms for applying vermicompost - 1000 g/m2 of sand to the maximum - 6000-7000 g/m2. So, if in the experimental variant using 1000 g/m2 of vermicompost as an additional nutrient medium to the main one (river sand), the height of the rootstocks by the end of the growing season was 43.1 cm, then in the control variant (river sand substrate) it was only 39.4 cm Optimally 600 gr. vermicompost, respectively, 50.7 cm.

The development of the root collar in diameter is one of the important criteria for the suitability of the rootstock for high-quality grafting of varietal buds and growing seedlings. In our experience, the standard sizes of this trait by the end of the growing season were achieved in cases of using vermicompost as a nutrient element at rates from 6000 to 7000 g/m2. When using such norms of nutrient substrate, the diameter of the root collar of the rootstocks was 7.0-7.1 mm.

The yield of cherry rootstocks grown from green cuttings using river sand as an artificial substrate against a background of 6000 grams of vermicompost per 1 m2 of area of a special installation for growing rootstocks was 44 pieces, which translated into 341 thousand pieces per 1 hectare. In comparison with the control version of the experiment and the minimum rate of vermicompost application, this indicator of cherry rootstock production was correspondingly 141 thousand pcs/ha higher.

It is known that the set of external conditions (aeration, nutrition and moisture supply) has a great influence on the size of the root system, the nature of its distribution along the soil layer and the formation of the active part capable of maximum absorption of nutrients. The interaction of the root system with the external environment, its assimilation of nutrients from the soil is an active physiological process related to the vital activity of the whole organism. In this, agrotechnical measures, first of all, the method of fertilizing, which allows creating a strong absorption surface of the roots, plays a big role. And it is absolutely important for mineral nutrition of plants. The roots of

leguminous plants develop in a large volume of soil and extend far ahead of the surface. Therefore, when developing agrotechnical measures for plant care and soil cultivation, it is necessary to take into account the nature of the location of the root system, which can penetrate deep into the soil, even to its lower layers. This shows that the roots are capable of rapid growth and strong branching. Nitrogenous fertilizers are of great importance among all fertilizers for fruit plants. It is known that nitrogen is included in the composition of the most important nitrogenous substances - amino acids and nucleic acids, which are primarily present in the nucleus of chlorophyll and play an important role in the process of photosynthesis. The growth and development of plants largely depends on the nature of nitrogen exchange. In plants, phosphorus is mainly included in complex proteins and other organic compounds that play an important role in the structure of the cell nucleus. It accelerates a number of enzymatic processes. Lack of phosphorus slows down the growth of shoots. Fruit plants belong to the type of plants that require a lot of potassium and are highly sensitive to its deficiency in the soil. potassium is of great importance in the life of plants, it increases the resistance of plants to diseases, improves the quality of hsil.

Organic fertilizers are the main means of maintaining soil fertility. it enriches the soil with humus and increases the vital activity of organisms. However, despite the positive qualities of organic fertilizers, it is important to find ways of more rational use of organic fertilizers in many farms due to its many shortages. The results of our experiments on the use of fertilizers showed that the growth of the active root part of plum SVG 11-19 grafts largely depended on the type of fertilizer used. In our experiments on the effect of fertilizer types, the highest effect was obtained with nitrogen fertilization. When phosphorus fertilizer was given, up to 46 growth points were formed in one meter of root system. Compared to the control, this figure was 145%. The lowest formation of active roots (128%) was recorded only when potassium fertilizers were applied. Plants showed the highest sensitivity to nitrogen-phosphorus fertilizers in pairs. The reaction of active roots to nitrogen-potassium and phosphorus-potassium fertilizer compounds was very close, and the nitrogen-phosphorus mixture was slightly dominant. In these fertilizer combinations, the average amount of growing points developed per 1 m root was 147, 163 and 143%, respectively, compared to the control.

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