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Growth Characteristics of a Collection of Vegetatively Propagated Cherry and Plum Cuttings in the Nursery

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Abstract: Studies conducted on cherry and plum grafts have shown that the diameter of the stem of cherry and plum grafts grown from seed at the time of bud grafting.

Keywords: The growth and development of plants depends on the genetic, agrotechnical and ecological conditions of the place where they grow. It is known that sexually propagated plants have a much longer developmental period in ontogeny than vegetatively propagated plants. In this case, the development of the above-ground part of plants and the root system is significantly different.

Consequently, vegetatively propagated plants form conditional tuberous roots, which develop in a layer of soil up to 50-60 cm. Unlike them, plants grown from seeds have a strongly developed root system that penetrates to a depth of 2.5-3.0 meters of soil. Therefore, such plants by themselves in most cases also form a strongly developed surface part of the earth. Due to the rapid development of the horticultural industry, special attention has been paid to plants with a limited above-ground habitat in recent years. The use of such plants allows placing them at a very high density per unit area. At the expense of B, the natural productivity of plants and the economic efficiency of cultivation will increase significantly. According to our research conducted in the collective nursery, the Shubinka, Lyubskaya and Podbelskaya varieties of cherry grown from seeds, as well as grafts of low-growing cherry, were all distinguished by their strong growth (63.7-72.9 cm) in the annual growth circle. In contrast to them, the plants of the collection of vegetatively propagated cuttings differed significantly in the development of the above-ground part. Therefore, the average growth strength among them was observed in the grafts OVP-1, OVP-4 and VP-1, in which the annual growth height of the central branch was 60.6-63.7 cm, while in VSL-2, SAVR-6R, Krymsky- 5, OVP-5, P-3 and P-7 grafts were characterized by slow growth. The height of these welds was in the range of 45.6-56.7 cm. The formation of lateral branches within the framework of annual development in the graft plants was also studied according to the experimentally studied graft roots. The highest production of side branches was recorded in the types of grafts propagated by vegetative means - from 4.0 to 5.3 units. In seed grafts, this biological indicator was 3.1-4.0 units, that is, it was 22.5% less.

This qualitative indicator of development in plants is very important for their rapid propagation by vegetative means. The size of the development of the stem of fruit crops in the first year of vegetation is important in graft material cultivation. In order to successfully graft fertile plants to them, the diameter of the stem near the root neck should be around 8-12 mm during bud grafting according to standard requirements. Studies conducted on cherry and plum grafts have shown that the diameter of the stem of cherry and plum grafts grown from seed at the time of bud grafting was 9.9-10.5 mm. Shpanka chernaya - 9.9 mm, Lyubskaya - 9.7 mm, Podbelskaya - 9.6 mm and Shubinka - 9.5 mm were distinguished from the vegetatively propagated grafts by their well-developed body. Among grafts of plum propagated by vegetative means, the best indicators for this characteristic were recorded in grafts such as OPA 15-2 (9.3 mm) and AP-1 (8.7 mm). In addition, it is worth noting that, although smaller in size, the remaining grafts fully met the morphological parameters of grafting.

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The further observation of the development of mother plants and the growth of plants during vertical grafting in them showed that in the first year after the establishment of the mother nursery of cherry, the beginning of the differentiation of the root system in grafted branches was recorded on 22-27 days depending on the type of graft. The latest formation of the root system in lateral branches was observed in the Shubinka cherry grown from seeds on day 37, which means 10-15 days later than in grafts propagated by vegetative means.

During the growing season, rapid growth of root mass was observed in such species as VSL-2, OVP-4, Krymskiy-5 from cherry grafts and VP and OVP5 from plum grafts, where the average value of this sign was in the range of 3.0-4.0 points.

Observation of the development of the above-ground part of the cuttings showed that in the first year of establishment of the mother seedlings, they branch slowly. The branching coefficient of all vegetatively propagated grafts was equal to 1.0-1.7 points on average.

At the end of the growing season, these cuttings reached a height of 43.3-56.3 cm, and the diameter of the stem in the main types of cuttings reached 6.2-7.3 mm. The best developed body near the root neck - 8.5-9.6 mm Shubinka cherry and vegetatively propagated SAVR-6R graft was noted. It should be noted that all the grafts studied in terms of the development indicator of the body diameter at the conditional root neck were of a size that fully met the standard requirements (appendix) It should also be noted that during the phenological observations and biometric measurements in the specific soil-climatic conditions of the beginning of October, it was found that the vegetation is still continuing in most of the grafted species, that is, the process of transition from vegetation to the winter rest period was observed in them. Therefore, the ripening length of the branches was 66.0-77.0% in grafts VP-1, Krymsky-5 and OVP-4, which were the best options. In VSL-2, P-7, P-3 grafts, this indicator was 53.4-62.4%, and its smallest expression - 12.5-23.2% in Shubinka graft grown from seeds (12.5%). The growth and ripening of branches in grafts was completed at the end of October.

In plum grafts, as in cherry grafts, the plants did not differ as much in branching characteristics in the first year of planting in the mother nursery. In practice, the degree of branching in all of them was around 2.4-2.8 points (on a five-point scale), the exception was the seed graft Kara Olu, which had a branching coefficient of 1.1 points.

The growth height of the central branch of the studied plum grafts was in the range of 34.4-49.3 cm, and this growth index was 56.7 cm in the seed black plum graft. The diameter of the conditional root neck was in the range of 8.3-9.5 mm in all grafts of plum, and even up to 10.6 mm in the graft of black plum. According to this important morphological indicator, all grafts fully met the standard requirements for grafting materials of pome fruits. Ripening of both the central branch and side branches in plum grafts was much faster than in cherry grafts. By the beginning of October, the percentage of ripeness of the above-ground part of the plum grafts was 68.4-79.9%, only in the Black plum seed graft, this indicator did not exceed 19.2%. It should be noted that during October, the above-ground part of all vegetatively propagated plum grafts had fully matured branches. Drought resistance of fruit plants is an important environmental factor affecting their developmental characteristics in all growth periods of ontogenesis. the lack of biological resistance of the plant to this factor prevents the use of this species as a dominant and wide spread in the industrial cultivation of fruit plants. Therefore, when choosing such species, it is necessary to pay special attention to physiological factors such as moisture retention in water deficit conditions, transpiration and turgor recovery in leaf cells depending on growing conditions. In order to study this issue, we conducted research on local and introduced clone grafts of cherry and plum, propagated by seeds and vegetatively. The research conducted in these plantations shows that in the conditions of the Tashkent region, the temperature of the air in the summer often reaches the physiological level where fruit plants grow. During this period, the lack of moisture in the soil has a negative effect on plants (especially in the young period), this situation is expressed by the withering of leaves during daylight hours, their collapse (cell plasmolysis). The reaction of fruit plants to this factor depends on the type of graft, the method of cultivation, the morphological structure and physiological state of the plant and many other factors. The results of the experiment presented in Table 3.4 below show that the physiological

resistance of plants to lack of moisture depends on the method of its cultivation and the type of graft. In laboratory experiments, it was found that after a long time of high temperature during the day, the grafts grown from the seeds of cherry and plum stood out with the best restoration of activity in leaf cells. It was noted that they used the least amount of water for transpiration in the summer period, that is, from 23.4 to 29.3%, correspondingly, the water deficit of leaf cells was 18.7-21.2%. In the plants grown from seeds, after daytime plasmolysis, the restoration of the turgor state of leaf cells was at the highest level in about 92.3-94.7% of the total number of plants in the experiment.

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