Influence of burning methods on the growth development and qualitative yield of apricot seedlings

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Abstract. This article presents the results of an experiment to determine the optimal height to increase the level of resistance of apricot seedlings with a bud grafting method. In the experiment, a method was tested for grafting the buds of fruitful local varieties of grafted apricot to modern low-growing scions of different heights. In this case, apricot seedlings of the varieties Yubileiny Navoi, Subkhany, Isfarak and Ak Kandak were grafted onto Mirobalan rootstocks. According to observations, the number of dead shoots before the first observation period when grafting the best grafting height of shoots onto scions Morabolan and Morabolan 29C, propagated by vegetative means, is 5 cm and is 9-10%, respectively. The largest number of dead buds was observed in the apricot variety Ak Kandak (up to 13%) in this variant of the experiment.

1. Introduction

In Uzbekistan, fruit trees are the second largest in the country after seed fruits in terms of area and gross yield. In recent years, fruit orchards have been transferred to intensive orchards based on weakly growing grafts [1]. For this purpose, weakly growing apricot seedlings are brought mainly from foreign countries [2, 3]. The territory of Uzbekistan is one of the centers of origin of many agricultural crops, including fruit crops [4]. In ancient times, valuable local varieties of apricots, plums, cherries and other fruit crops were preserved in this area. Apricots are very important among stone fruits in Uzbekistan [5]. Fresh apricot fruit contains 18.4-19.0% sugar, 0.3-0.7% acid, 0.1-0.6% pectin and vitamins A1, B1 and C. Dried fruits contain up to 80% sugar. Most varieties have a sweet pith. They contain 40-45% fat and up to 28% protein [4-7].

Karshiev [6] studied the fact that apricot trees acclimatized to new conditions grow very well, bloom, bear quality fruit, tolerate the dry hot air and bitterly cold days of the Kashkadarya oasis, and gave recommendations. In the research of Israilov [2], information on the phenological phases of apricot varieties, i.e. bud formation, flowering, ripening periods, disease resistance levels and productivity of the varieties, and promising varieties are recommended. In the research conducted by Ismailova and Toraev [3], there are phenological phases of apricot varieties, distribution, importance, soil and climate conditions of the region, disease resistance levels of varieties, selection of suitable rootstocks for legumes in modern intensive garden establishment, and research results.

It is known that apricot is a hard-growing fruit. The height of its trees often reaches 10-12 m. This complicates agrotechnical activities such as tree care, aging and pest control, fruit picking, and autumn pruning. Due to the fact that the fruits on the upper branches are left unpicked, the productivity also decreases significantly.

In nursery practice, there are many methods of agrotechnical measures that are carried out to increase the resistance of the bud graft. These include carrying out bud grafting in optimal periods, sufficient watering of grafting and grafting plants before and after grafting [8-10].

2. Materials and methods

Research on the selected topic was carried out at the experimental site of the Information and Consultation Center (Extension Center) of the Tashkent State Agrarian University.

This study on the effect of grafting height on the resistance was carried out in the following scheme:

• Placing the bud graft in the root neck
• Placing the bud graft 5 cm above the root neck

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• Place the bud graft 10 cm above the root neck.

As in the previous experiment, after the completion of bud grafting, one week later, in late fall and early spring, the number of buds that took hold and died, and at the end of the growing season, the number of seedlings and their quality were counted. The experiment was performed in 4 replicates.

Based on the above-mentioned scientific hypothesis, we conducted research on the height of grafting of apricots of Yubileiny Navoi, Subkhani, Isfarak and Aq kandak varieties to the weakly growing Mirobolan graft. For this purpose, the last 10 days of July, the full month of August and the first 10 days of September, the graft shoots were placed in the "T"-shaped crack of the graft bark. Experiments on grafting buds of the grafted variety to the root neck of the grafted material, observing their retention and development, as well as the emergence of ready-made seedlings, were developed by Buriev, Yenileev et al. method of calculations and phenological observations [1].

The statistical analysis of research results is calculated in Excel 2010 and Statistica 7.0 for Windows computer programs according to the Dospekhov method with a confidence interval of 0.95%.

3. Results and discussion

Studies on the effect of the height of the bud grafting on bud retention were carried out by testing the grafting of promising varieties of apricot on vegetatively propagated grafts. It should be noted that the height of placing the grafted bud on the grafted plant during bud grafting also plays an important role in its retention. You can find different opinions about this in literary sources. Therefore, grafting shoots should be placed in the root neck of the grafted material. Many scientists claim that grafting the shoots higher (8-10 cm) will preserve their resistance and better survival in adverse winter conditions. But in the conditions of Uzbekistan, there is no information about the in-depth analysis of the height of the placement of graft buds on grafted plants in accordance with a specific type of fruit plant. Based on these considerations, we conducted experiments with the apricot varieties and grafts used in our previous experiments in order to determine the height of the graft that can ensure the highest retention of grafted shoots and their good preservation in the winter.

Table 1. Effect of height of bud grafting on graft bud retention, 2020-2022.

<table>
<thead>
<tr>
<th>№</th>
<th>Varieties</th>
<th>Preservation of graft buds depending on the height of grafting, %</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Root canal-grafted - control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dead shoots during the autumn inspection</td>
</tr>
<tr>
<td>1</td>
<td>Isfarak</td>
<td>15.6</td>
</tr>
<tr>
<td>2</td>
<td>Subkhoni</td>
<td>14.9</td>
</tr>
<tr>
<td>3</td>
<td>Yubileyniy Navoiy</td>
<td>14.7</td>
</tr>
<tr>
<td>4</td>
<td>Oq qandak</td>
<td>18.2</td>
</tr>
</tbody>
</table>

Experiments showed that the height of grafting the grafted bud to the grafted plant had a significant effect on its retention. Consequently, the highest death rate of the grafted shoots was observed when they were grafted to the root neck of the grafted plant (control) until the initial (20 days after the grafting of the shoot) until the time of examination. In this case, the total number of dead graft buds in apricot varieties grafted on Morabolan rootstock was 14-18% by variety. The highest number of dead buds was recorded in the Aq Kandak apricot variety (up to 18%).
Before, as recommended in a previous study, there was a clear advantage in the results of the first autumn grafted shoots, as the yield of fertile seedlings was 14% higher compared to the control option. The winter preservation of the grafted shoots had a significant impact on the yield, with a decrease of 10% in the winter period compared to the autumn period.

According to the data in the table, when the height and trunk diameter of the seedlings of the local variety grown on the 29C rootstock were measured, the diameter of the seedlings grown in the experimental option was 35 cm, while the variety’s diameter was 140 cm. It was observed that the seedlings of Isfarak and Yubileynyy varieties were weakly growing:

- The experimental option grafted at a height of 5 cm showed a low yield of seedlings compared to the control option,
- The highest seedling yield when grafted at this height was 81% in the Jonathan variety,
- The experimental variant grafted at a height of 10 cm took an intermediate place in terms of seedling emergence.

Observing the winter preservation of the grafted shoots made it possible to note a trend in the control and experimental variant grafted at a height of 10 cm. The low yield of seedlings compared to the winter period made it possible to note a clear difference in seedling emergence.

The experimental variant grafted to a height of 5 cm showed a slightly higher yield than the control option, but it was far behind the experimental option grafted at a height of 10 cm.

The low yield of fertile seedlings did not exceed 63% in relation to the total number of grafted shoots when grafted at a height of 5 cm. In this option, the yield of fertile seedlings did not exceed 63% in relation to the total number of grafted shoots. In this option, the yield of fertile seedlings did not exceed 63% in relation to the total number of grafted shoots.

The difference in the winter preservation of the graft buds was also noted when grafting apricot varieties to the root neck. In this grafting, the most death of grafted buds was observed when the shoots were placed at a height of 10 cm, and it can be attributed to the negative effect of the winter frost air flow on the graft buds. In our opinion, the refreezing of the snow water that melted during the day hours may have had a negative impact on the graft buds. In this case, the highest number of dead shoots was in the Aq kandak variety, which was 18%. In the rest of the varieties, this number was much lower. The death of shoots grafted to the root neck increased especially in severe winter conditions.

It should be noted that when the height of the bud grafting is 10 cm above the neck of the root of the graft, although the grafting efficiency is significantly lower, it does not create a negative situation in their retention. The low yield of seedlings at this height was due to the negative effect of the winter frost air flow on the graft buds. In this case, the highest number of dead shoots was in the Aq kandak variety, which was 18%. It is likely that the refreezing of the snow water that melted during the day hours may have had a negative impact on the graft buds. In this case, the highest number of dead shoots was in the Aq kandak variety, which was 18%

The number of dead shoots before the first autumn inspection was about 10% for the experimental variant grafted at a height of 5 cm. The highest number of dead buds was observed in this experimental variant. When transplanting grafted shoots slightly higher than the root neck of the graft (10 cm), their preservation did not differ much from the previous experimental option (grafting at a height of 5 cm), but the yield of seedlings was slightly lower due to the negative effect of the winter frost air flow on the graft buds. In our opinion, many of them died in the winter due to excess moisture in the soil during autumn watering, as well as snow melted in winter. The main reason was that it was damaged due to suffocation. In our opinion, the refreezing of the snow water that melted during the day hours may have had a negative impact on the graft buds.

The rate of bud death in the experimental variant grafted at a height of 5 cm from the root neck of the scion provided better preservation of the shoots. When the shoots are placed at a height of 10 cm, they are more vulnerable to winter frost conditions, which leads to an increase in the number of dead buds. In this case, the mortality rate of the grafted shoots was higher than in the experimental variant grafted at a height of 5 cm. The difference in the winter preservation of the graft buds was also noted when grafting apricot varieties to the root neck. In this grafting, the most death of grafted buds was observed when the shoots were placed at a height of 10 cm, and it can be attributed to the negative effect of the winter frost air flow on the graft buds. In this case, the highest number of dead shoots was in the Aq kandak variety, which was 18%

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The effect of weakly growing grafts on the growth of seedlings of local varieties of apricot and pear varieties in Jizzakh region.

In conclusion, it should be noted that the highest yield of high-quality seedlings was obtained in these varieties compared to the total number of grafted buds. The yield of fertile seedlings was around 60% in the experimental variant, the number of fertile seedlings was about 53% in this type of graft. The lowest yield of seedlings was recorded in this type of graft in the version graft to a height of 5 cm in the variety Yu. In this case, the amount of fertile seedlings was around 60% compared to the total number of grafted buds.

Shaping seedlings is one of the important issues. As soon as the branches grown from the bud reach 30 cm above it, excess branches are thinned or their tip is removed. Depending on the growth of seedlings, their upper part is removed from May 25 to June 10. Therefore, when their height reaches 75 cm from the root neck, 5 branches are left on each seedling, the angle formed by them should be greater than 450, such seedling is selected. Their branches should grow in all directions.

Table 2. Effect of weakly growing grafts on the growth of seedlings of local varieties of apricot and pear varieties in Jizzakh region.

<table>
<thead>
<tr>
<th>Apricot varieties (options)</th>
<th>Seedling height, cm</th>
<th>Body thickness, cm</th>
<th>Side branches, pcs</th>
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</table>

4. Conclusions

In general, significant changes were observed in the annual growth dynamics of branches when growing weakly growing grafts. The seedling growth is cut off. After that, under the influence of the given fertilizer and water, side branches begin to grow from the buds in the leaf axils. The leaves left at the base of these lateral branches help the young shoots to thicken. Side branches grow faster. Shaping seedlings is one of the important issues. 4 branches are left in the first tier, 2-3 branches are left 25 cm above it. Excess branches are thinned or their tip is removed. Depending on the growth of seedlings, their upper part is removed from May 25 to June 10. Therefore, when their height reaches 75 cm from the root neck, 5 branches are left on each seedling, the angle formed by them should be greater than 450, such seedling is selected. Their branches should grow in all directions.

References


A collection of articles of the republic-wide scientific and scientific-technical conference on the topic "The importance of innovative agro-technologies in the prospective development of horticulture, viticulture and winemaking" (Karshi, 2019). pp. 147-150. ToshDAU Press.