Cultivation of columnar varieties of apricot using agrotechnological methods and biotechnology on loamy soils

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Abstract. This article studies the state of modern columnar apricot varieties of domestic selection in the ecological zone of Chechnya. Modern apricot varieties have become possible thanks to the breeding work of scientists. The application of the latest technologies contributes, first of all, to the production of healthy planting material with a high level of resistance to natural anomalies, diseases and pests, as well as productivity. Along with economically valuable traits, morphological features play an important role in the growth and development of seedlings. In this connection, scientific research was conducted on chernozem-light clay soils of the Chechen Republic using agro-technological methods and biotechnology. These activities allowed us to select the most adaptive and effective hybrid apricot varieties of domestic selection, with a more compact crown and a branched root system. With good winter hardiness and normalized yield.

1 Introduction

The fruit tree apricot, genus (Prunus), belongs to the order Rosaceae, family Rosaceae, subfamily Plumaceae. Rosaceae, family Rosaceae, subfamily Plumaceae. Apricot is also called the fruit of the common apricot and other species of apricot, from which several other varieties of apricots are obtained. of this crop, from which several other varieties are obtained - duck, apricot, apricot and kaisa. The number of species of apricot is controversial and varies from 5 to 12, and the number of varieties - more than 1 thousand. The number of varieties exceeds 1 thousand.The diversity of apricot varieties is characterized by their morphological features[3]. It is possible to establish varietal authenticity by approbation of morphological traits of the crop. One of the most important properties of apricot fruit crop is its ability to resist natural factors. Apricot is one of the most widespread species among stone crops, it is rich in a complex of positive properties such as drought resistance, winter hardiness and frost resistance. It has a wide area of distribution.

In this regard, the purpose of our research was: to study
columnar apricot varieties of domestic selection-Amur, Lel and Peach.
The following tasks were set:

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1. Allocation of the most stable columnar-shaped apricot seedlings of domestic selection.
2. Determination of the influence of agro- and biotechnology on the formation of hybrid varieties of apricot.
3. Justification of selection of modern varieties of apricot with high productivity

2 Research Methodology

The objects of our research work were apricot varieties of domestic selection - Amur, Lel and Peach. The research was carried out according to the well-known methodology of studying fruit, berry and nut crops [4.p.6 06]. Cultural variety of apricot Amur - is a popular variety domestic selection, late ripening, created in the Far Eastern Research Institute of Agriculture, more than 70 years ago. It is ideal for growing in the conditions of the North Caucasus, the middle strip of the Russian Federation. In addition, apricot is also productive in the climatic conditions of the Far East, the Urals and Siberia. Columnar variety Lel-relates to the domestic selection, is the brainchild of the Main Botanical Garden. Modern variety of apricot Peach - medium-late variety of apricot, refers to hybrid crops, that is, the variety was obtained as a result of the merger of two fruit trees: peach and apricot. Bred variety took the best of both forms, which ensured its considerable popularity. This variety is located in the North Caucasus, in the Chechen Republic, as well as in the middle belt of Russia. Columnar trees are one of the recent achievements of breeders. New varieties of apple, pear, cherry, peach and apricot have been developed through breeding. They got their name due to the fact that the trees resemble a column up to 2-2.5 m high and no more than 25-30 cm in diameter. The length of the lateral shoots is about 10-15 cm, so during flowering the "column" is literally covered with buds, and in late summer - with fruits. It looks very spectacular and unusual. Column-shaped apricots have many undeniable advantages. The main advantage is the compactness of the plant. Thanks to the compactness, it is easier to care for the tree: pruning, treatment against diseases and pests, fruit harvesting. On the garden plot "columns" take up very little space. The small size of the tree does not affect its yield. The varieties Amur, Lel and Peach, reflected in this work, as well as many columnar varieties, the main reproduction - grafting. They are well compatible with grafted varieties. Seedlings have a wide, branched root system and better anchored in the ground, have a high degree of winter hardiness. Grafting by cuttings or buds[7]. Very rarely grown from seeds. Trees show quite enviable resistance to low temperatures, especially for colonial trees. They easily withstand -35-38°C, even in strong winds and high humidity, which makes them available for cultivation in the harsh conditions of the middle zone. [C.68-75]. Varieties are considered conditionally self-fruiting. Excellent fruiting. Modern apricot varieties take root on fertile, moisture-intensive soils, rich in humus, with a good moisture coefficient, as well as chernozems, light clay soils. It is very important to control alkalinity (Rn, should not exceed the norm), and in case of its shortage, it is necessary to liming the soil. This culture also takes root well on sandy, sandy loam, light and medium loamy soils. According to this indicator, columnar apricots are not inferior to "classic". The taste qualities of the fruit, from the compactness of the tree, also do not suffer. The color of apricots varies from pale yellow to red-purple, almost black, including all shades of orange. There are some disadvantages inherent in the culture. This apricot blooms too early, so in areas with temperate climates, it often falls under return spring frosts. It requires annual specific pruning and mandatory rationing of the harvest (removal of "extra" fruit ovaries). If the procedure is neglected, the tree will lose its characteristic appearance and turn into an ordinary apricot, with a very low yield. Fruits will be formed only at the base of the lateral shoots. Columnar apricots occupy a much smaller area than ordinary apricots, but even in this case it is necessary to adhere to the

planting scheme. Two-year-old seedlings take root best and fastest in a new place. The average height of such apricots is 1-1.2 m. It is obligatory to have a developed system of lobe roots. They bend easily, do not break, the tissues on the cut are creamy beige. The bark of healthy specimens is smooth, elastic, without roughness, flaking, spots resembling mold and rot. The root system of columnar apricot trees, unlike ordinary apricot trees, is superficial. Consequently, for planting a seedling, a depth of 50-55 cm and about the same diameter is enough. If the planting of the tree is planned for late summer, then the planting pit should be ready no later than 2-3 weeks before it. To stagnant water in the soil, the culture is extremely intolerant. Accordingly, a drainage layer is required. Its minimum thickness is 4-5 cm. Claydite, pebbles and crushed stone can be used for this purpose.

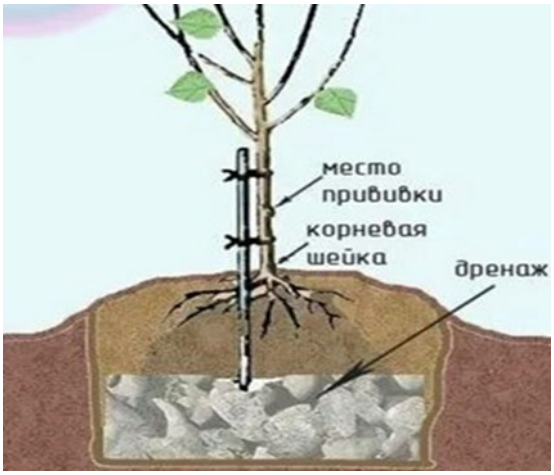

Fig. 1. Planting a columnar apricot seedling.

Drainage at the bottom of the planting pit prevents moisture from lingering at the roots. The most fertile soil is the top layer of soil (15-20 cm). It is mixed with approximately the same volume of humus or overmixed compost and half as much coarse river sand. In acidic dolomite flour, slaked lime or crushed to a powdery state shells are also added to acidic soil. powdered chicken egg shells (200-500 g). Need and fertilizers - 80-100 g of urea, 70-80 g of potassium nitrate and 120-150 g of simple superphosphate (or half the rate of double). norm double). An alternative to mineral fertilizers containing potassium and phosphorus -ordinary wood ash (1,2-2 liters). Humus - a natural remedy for increasing the fertility of the soil. Ready nutritious substrate is poured back to the bottom of the pit, forming a kind of hill. A little away from its top, fix the support for the tree. Its length is determined based on the height of the apricot. It should be more than him by 15-20 cm. After that, the pit is covered ruberoid, slate, other material that does not allow water to pass, and leave it until spring. Wood ash is a source of potassium and phosphorus and is a natural fertilizer. Apricot is a very water-loving crop, but it does not tolerate stagnant water at the roots. The best time to water a seedling is early morning or late evening. The crop prefers sprinkling, imitating natural precipitation. Droplets of water left on the leaves can act as a lens and cause sunburn. Only use water heated to room room temperature. Also, you can practice drip irrigation or watering in circular furrows in the in the bush.In mid-fall, about 6 to 7 weeks after the entire Harvest, the plant may need watering. It is carried out in the event that precipitation in the fall was little, and the weather was warm. The norm of water consumption - 50 liters per tree. The procedure is necessary so that it can store moisture on the threshold of cold weather. Dry soil freezes harder. Pouring water under the base of the trunk of the columnar apricot is not recommended, as the roots of the apricot are is not recommended because its roots are superficial, they quickly become bare and dry up. With

its compact size, the columnar apricot produces almost the same yield as a regular apricot. as a normal apricot. Consequently, it requires a lot of nutrients. The amount of nutrients put into planting hole, the plant is enough for two or three seasons, until the first fruiting. The high yield of columnar apricots determines its great need in nutrients. nutrients. Therefore, the apricot is fed every five to six weeks throughout the growing season. vegetative season. It is obligatory - in 7-10 days, after flowering and after a month, before the end of fruiting. the end of fruiting. As soon as the soil under the tree thaws, gently loosen it, simultaneously spreading urea, ammonium sulphate or another fertilizer, mainly consisting of nitrogen (10-12%).consisting mainly of nitrogen (10-12 g/m2). You can prepare a solution by diluting the specified amount in 10 liters of water. of water. Such a procedure helps the tree to "wake up" faster from winter hibernation and begin to build up the green mass. Once every two years, about a week after watering with a nutrient solution, spread under the tree. solution, under the tree spread 12-15 liters of humus to increase the fertility of the substrate. substrate. Urea, like other nitrogen-containing fertilizers, in the right dosage activates the process of tree green mass growth.the process of building up green mass, but excessive nitrogen is harmful to the crop. An important role in the vitality of trees, plays pruning, with the help of which you can form not only the crown, but also ration the harvest. Pruning for any columnar tree is a strictly obligatory procedure. It is carried out in the end of March or in October, when the tree is in hibernation and the processes of sap movement are almost at a standstill. are practically at a standstill. The temperature at the time of agro-technological work must necessarily exceed 0oC. When pruning, only sharp, well-sharpened and sterilized tools are used. sterilized tools. "Wounds" are treated by washing with a 1% solution of copper sulfate. copper sulfate or Bordeaux liquid. Then they are covered with sifted wood ash or chalk. crushed chalk and thoroughly smear with garden varnish, or cover with several layers of of oil paint. In spring, remove branches that are frozen or broken under the weight of snow. If frosted apex buds, to replace the main shoot leave one of the regularly of the regularly forming vertical branches. To be on the safe side, you can leave one or two of these shoots every year. two such shoots each year, shortening them to the second or third growth bud.

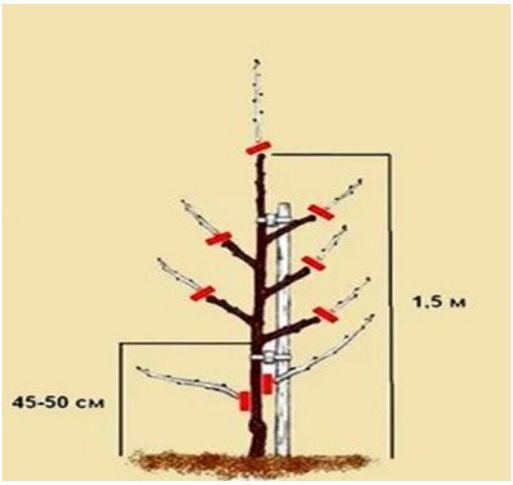

Fig. 2. Pruning of columnar apricot seedling.

The pruning scheme for columnar apricots is very different from that required for conventional varieties. In addition to pruning, it is also necessary to ration the crop. Apricot is not able to shed "excess" fruit ovaries, and "feed" the whole tree is not able to. In the first year, after planting, it is necessary to cut off all the flowers, so that they do not interfere

with the process of rooting. In the future, remove every fifth ovary, choosing the least successfully located. In columnar apricots, the top is not cut off, even if it freezes. From the replacement shoots choose the strongest and leave as the main one. Formation of apricots is as follows: up to a height of 40-45 cm, the trunk is completely cleared of any shoots. For fruiting leave branches located at a slight angle to it. The interval between them is about 15 cm. The optimal length of such shoots is 12-17 cm. Such shoots yield for 3-4 years, then need to be replaced. The productivity of the orchard stabilizes, starting from the 6th year and the yield averages 15-17kg per tree. Apricot fruits consist on average of: dry matter 13.8%, sugars 7.2%, acids 1.9%, vitamin C 8.2mg/100g, pectin 0.59%. Caloric value of apricots - 40-45 kcal in 100 g, proteins - 0.85 g, carbohydrates - 10.9 g, fats - 0.2 g. In general, there are enough varieties of apricot-hybrids, obtained by merging two trees-peach and apricot, which are considered the most popular and effective for industrial plantings. Due to high resistance to stress caused by biotic and abiotic factors, the fruit crop has high yields. [21.C. 132-137]. The quality and efficiency of the obtained products depend largely on the agro-biotechnologies introduced during the period of horticulture intensification.

3 Results and Discussions

Unfavorable weather conditions, which contributed to temperature changes, air humidity,contribute to the spread of infectious diseases –curly leaves, moniliosis and perforated spotting (clusterosporiosis). The susceptibility of the studied peach varieties to fungal infections, in the Chechen Republic, a field assessment of the resistance of varieties to leaf curliness, moniliosis and hole spotting (clusterosporiosis) was carried out. The prevailing climatic conditions and biological data in the region determined the degree of harmfulness of diseases.

Table 1. The degree of damage to the leaves of peach varieties by the main diseases (scale from 0 to 5 points).

Variety	Curly leaves	Moniliosis	Clusterosporiosis
Redhaven	3.5	2.0	2.0
Favorite Morettini	2,0	2.5	2.5
The White Swan	2.5	3.5	3.5

From this table it can be seen that the development of moniliosis and clusterosporiosis was recorded in the range from 2.0 to 3.5 points. The greatest lesion was found in peach varieties more susceptible to these diseases: Redhaven-curly 3.5 points and White Swan, in which infection with moniliosis and clusterosporiosis was also 3.5 points each.The introduced Redhaven peach variety showed good resistance equal to 2.0 points to diseases such as moniliosis and clusterosporiosis, The variety of domestic selection White Swan turned out to be slightly less resistant to these diseases and the lesion level was 3.5 points each, when resistance to the disease of curly leaves was at a fairly good level and showed 2.5 points. The cultured peach variety of foreign selection, Morettini's Favorite, turned out to be less susceptible to these diseases: leaf curl-2.0 points, moniliosis and clusterosporiosis 2.5 points each, which indicates its economically valuable signs. Like many fruit trees, all the peach varieties studied are prone to fungal infections. The resistance of the varieties to these diseases corresponded to the average and above average levels. The disease spread by spores and droplets. The ideal conditions for the disease are a rainy, prolonged spring. In this regard, it is recommended to carry out timely preventive work in order to preserve garden plantings and yields. If the cultivation technology is broken, and the humidity is increased, then problems arise constantly. Pests also cause great damage to trees and fruits.

In order to obtain high-quality products with a complex of economically valuable signs, it is necessary to develop new methods of protection to combat viral and bacterial infections.

4 Conclusions

1.As a result of the conducted research, hybrid varieties of apricot of domestic selection, distinguished by good resistance to natural conditions.

2. The application of biotechnology, along with agro-technological methods, contributed to the high rooting ability of the columnar varieties of apricot reflected in the work. Warm, temperate climate of the cultivation zone, favorably influenced the growth and development of seedlings. The use of drip irrigation and sprinkling filled the moisture deficit.

3.In measures to renew industrial orchards in the Chechen Republic, productive hybrid apricot varieties of domestic selection are recommended: Amur, Lel and Peach. These varieties are also recommended for cultivation in the North Caucasus, Stavropol and the middle belt of Russia. Hence, the conducted research work has shown that the fruit culture of apricot of domestic selection is diverse, it has varieties of different ripening dates, containing economically valuable features, thanks to which it is easy to select a variety for different natural-climatic zones of Russia.

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