

PEAR VARIETAL-GRAFTING COMBINATIONS WHEN CREATING INTENSIVE ORCHARDS.

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main factors that allow to significantly increase the amount of fruits produced in small apple and pear orchards, radically improve their quality and increase the level of production . At present, scientists and specialists engaged in intensive fruit growing in Uzbekistan plan to radically change the economy of this industry, namely, the correct use of variety-grafting combinations and the density of planting seedlings in fruit growing, expansion of the area of small orchards and a sharp increase in production productivity.

Therefore, the technology of planting intensive pear orchards, their scientific maintenance, as well as types of grafting have been practically not studied. In the studies that were conducted taking into account the above, changes in pear tree varieties over the years, the productivity of photosynthesis, water and food regime, light indicators, biological and economic productivity were not studied on a deep scientific basis. The procedures for transplanting seedlings of fruit crops, as well as the compatibility of varieties and grafting in intensive orchards have not been studied enough .

The main goal of improving agro-experimental work and scientifically based care for the development of fruit growing is the creation of intensive gardens, the creation of fruit-bearing gardens that produce consistently high and high-quality yields, the use of low-cost factors and the achievement of high efficiency with proper care and construction of gardens (V.A. Dosnekhov, 1979; R.P. Kudryavy, 1972; V.A. Korovin, 1979; Yenilev N.S.Kh., 2019).

In this case, it is necessary to fully utilize the factors of scientific and technological progress in fruit growing and to observe: selection and use of varieties and grafts that, under production conditions, quickly begin to bear fruit

after the transfer of fruit seedlings to the garden, consistently produce an abundant and high-quality harvest, belong to the category of low-growing trees and are aimed at scientifically based low-growing intensive cultivation of the entire area of the garden (Grinenko N.V., 1976; Agafonov N.V., 1982).

Slow- and medium-growing pear varieties occupy a leading position among rootstock combinations, which is desirable to ensure abundant and high-quality harvests in newly planted orchards, as well as to ensure medium- and compact trunks. The first varieties of the pear variety "spur" were discovered in the United States in 1921, but they did not make a significant contribution to the development of the fruit growing industry. This was impossible due to the intensive cultivation of fruits over large areas. Currently, the world is experiencing rapid growth of young dwarf pear trees that produce intensive, abundant and high-quality crops. In recent years, dwarf pears have been widely studied, and the areas of their cultivation are rapidly expanding. The widespread use of dwarf pear varieties in the soil and climatic conditions of the world and Uzbekistan, as well as their high yield and quality indicators, determine the scientific development of this area. The rapid growth of dwarf pears is mainly due to their compactness and high yield.

dwarf pears are their compactness and slow growth. On one hectare of intensive pear orchards it is possible to grow up to 2500-3000 pears of short-fruited varieties. It should be noted that the high and consistently abundant and high-quality yield of this category of trees is the result of moderate annual laying of fruit buds in them. This variety of small, low-growing pear tree produces high-quality fruits early and quickly, that is, already 2-3 years after transplanting into the garden, and the yield is 150-180 c/ha per hectare.

The fruiting period of compact, intensive pear trees begins in the 2nd-3rd year and begins to bear fruit early, starting from the 3rd-4th year, they begin to give high-quality and high-yielding fruits. These indicators create scientifically sound conditions for growing small-fruited and compact varieties of pears, which in turn guarantees an abundant harvest and will significantly increase the economy of the industry.

The combination of varieties and grafts of dwarf pears creates conditions for enhancing photosynthesis in dwarf pear varieties, promotes the formation of high-quality and high-yielding elements, and ultimately, the formation and development of large skeletal branches in small areas, which in most cases are more common in tall trees.

In the small-fruited Williams pear variety, 26-28 fruits are formed and developed on one branch, while in the Abbay variety this is less common and corresponds to the formation of 10-14 fruits.

According to many fruit scientists, in the first year after transplanting compact intensive pear trees into the garden, more than 29-91% of the fruits are formed on short-cut branches, i.e. on 2-3-year-old branches. It should be noted that the formation of a large number of leaves on these branches creates conditions for obtaining high and high-quality yields from compact pear trees of this category. Light falls well on the middle part of the tree trunk, and improving the percentage of illumination of the middle parts of all trees creates conditions for the formation of high and high-quality pear yields in all parts of compact pear trees.

In recent years, a number of measures have been implemented in Uzbekistan to care for intensive orchards, including a radical improvement in the quality of fruit crops, in particular pear products, bringing the volume of their export to the required level, increasing the area of small intensive pear orchards, and improving and perfecting the agricultural technology of caring for orchards. Scientists and researchers involved in fruit growing in Uzbekistan are introducing varieties of fruit crops that correspond to soil and climatic conditions, that is, giving high yields and quality, studying them in depth on the basis of scientifically based experiments, creating productive intensive orchards on large areas in production conditions.

In recent years, the vertical system has proven to be more cost-effective and acceptable in production conditions than the traditional method of growing pear trees (planting scheme 4.0 x 2.0 on slow-growing rootstocks). Intensive pear varieties are easy to use in production conditions compared to trees formed by grafting.

Our scientific research has shown that when planting 2,500 varieties of fruit trees on one hectare of land, the number of fruit branches and fruit-bearing elements on the trunk and branches of dwarf pear trees is almost the same. In these trees, the trunk and the central part of the branches have almost the same amount of light, so the physiological processes occurring in the leaves suffer less. This is explained by the fact that even in small trees, the formation of fruit and fruit branches in the inner part is almost the same. In this type of antlers, the Williams variety makes up 52-55% of the body, and the Abbot variety - 50-52% (Table 1).

Table 1

Dependence of the magnitude of formation of crop elements on the tree trunk, variety and density of seedlings, carried out in 2020 in the horticultural enterprise of Siyovush Agro LLC (in 2023).

Seedling Thickness, m	Williams variety			Abbot variety		
	Lower body	Middle part of the body	Upper body	Lower body	Middle part of the body	Upper body
4.0x1.0	28.0	30.0	42.0	28.0	31.0	49.6
4.0x1.2	29.2	33.5	36.0	29.0	31.0	40.0
4.0x1.4	30.4	34.0	36.0	30.5	31.2	38.3
4.0x1.6	31.0	34.6	31.2	30.8	32.0	37.2
4.0x1.8	33.2	35.0	31.4	31.0	32.4	36.6
4.0x2.0	34.4	35.6	29.0	30.4	33.0	36.6
4.0x2.2	32.0	35.0	30.4	29.6	33.2	37.2

The studies have shown that the number of fruiting branches and the productivity of these parts of the tree decrease as the tree trunk thickens from the bottom up . The studies have shown that as the number of pear trees per hectare of orchard increases , the distribution of the tree trunk and branches decreases in the lower parts and increases towards the top. This situation is observed mainly in the 4.0x1.0 m and 4.0x1.2 m variants. It has been established that this type of fruiting body and branches reduces the yield by 40-36%. In the studied pear varieties, it has been established that the formation of fruiting elements is more localized in the upper part , which is consistent with the biological characteristics of fruit trees, their growth and development, as well as with the improvement of the quantity and quality of the harvest. Many researchers and our studies have established that the formation of fruiting elements in the cone and skin and their location in the body depend to a greater extent on the biological characteristics of the studied varieties. It is also considered advisable that the main fruits of the studied pear varieties be formed on 2-3-year-old branches, which will lead to increased yield and quality.

In Williams and Abbott pear varieties, due to low branching, the fruiting elements are located on the skeletal branches in the upper part of each year.

Therefore, during pruning, it is advisable to prune the fruiting branches on small pear trees, placing the fruiting branches in the middle of the trunk and branches, which allows for a high yield.

were achieved mainly by pruning 20–25 cm long scaffold branches during annual pruning.

Based on the biological characteristics of the studied Williams and Abbott pear varieties, it is desirable that the light on the pear trees, i.e. sunlight, mainly affects the formation of fruit elements, and the formation of lanceolate branches on the tree trunk and fruit-bearing branches is more desirable. In order to obtain a consistently abundant and high-quality harvest of Williams and Abbott pear varieties, it is advisable to pay special attention to pruning the trunk and branches of the tree, as a result of which a higher and higher-quality harvest is obtained from the model pear trees every year, which ultimately improves their economic indicators.

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