

## RELATIONSHIP OF PRODUCTIVITY AND QUALITY INDICATORS OF INTENSIVE APPLE PLANTS WITH MODERN RESOURCE-EFFECTIVE INNOVATIVE TECHNOLOGIES .

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**Abstract.** *The article studies the dependence of the growth, development of fruit trees, the formation of yield elements and fruit quality indicators on modern resource-saving innovative technologies in an intensive apple orchard in the conditions of the LLC "Siyovush Agro" horticultural farm located in the "Bogi Kalon" MFY of the Bukhara district of the Bukhara region for 2020-2023.*

**Keywords:** *Intensive apple orchard, variety-graft combination, seedling density, yield, quality indicators, modern resource-saving innovative technologies, efficiency.*

In recent years, the area of intensive small apple orchards has been rapidly increasing in the soil-climatic conditions of Uzbekistan. In these orchards, the combination of varieties and grafts, the thickness of seedlings, and their biological characteristics, as well as the growth, development, yield, and quality indicators of small trees, have not been fully studied on the basis of fully scientifically based modern resource-saving innovative technologies.

Modern resource-saving innovative technologies, along with the constant production of high-quality and abundant crops from intensive apple orchards, are currently the need of the hour to ensure that the created small orchards begin to bear fruit early, that is, in 2-3 growing years after being transferred to a permanent place of residence. It should be noted that in small intensive apple orchards, it has been found that by selecting varieties with slow and medium growth on the graft, small tree trunk size, constant production of high-quality and abundant crops, and high efficiency indicators, it is possible to produce 25-30 tons of quality fruit crops by using modern resource-saving agrotechnological measures [1,2,3,4].

The main goal of the scientific research is to thoroughly study the effect of optimal variety-graft combinations, seedling thickness on the yield and fruit quality indicators of zoned intensive apple varieties in the soil-climatic conditions of the Bukhara district, LLC "SiyovushAgro" horticultural farm, and to provide direct scientific and practical recommendations to farms on the technology of obtaining a stable, abundant and high-quality harvest every year, using innovative technologies based on modern resource-saving care.

This research is being conducted in the intensive apple orchard of the SiyovushAgro LLC horticultural farm during 2020-2023 on small trees grafted on the slow-growing M-9 rootstock of the Goldspur and Gala varieties.

The soils of this farm are alluvial, weakly saline soils that have been irrigated for a long time, and differ sharply from soils in other regions with a shallow water table (0.80-1.5m).

According to the data obtained from the Bukhara city meteorological station during the years 2020-2023, the research years were favorable for the growth, development and formation of yield elements of intensive small apple orchards, as well as the timely and high-quality implementation of modern resource-saving innovative technologies.

In 2020, at the “SiyovushAgro” horticultural farm in the “BogiKalon” MFY of the Bukhara district, the Goldspur and Gala varieties of dwarf apple trees were grafted onto the slow-growing M-9 rootstock, and these varieties were planted in an intensive apple orchard in the following order : 4.0x1.0m; 4.0x1.2m; 4.0x1.4m; 4.0x1.6m; 4.0x1.8m and 4.0x2.0m . 1250-2500 healthy one-year-old dwarf seedlings with a well-developed root system were transplanted into one hectare of apple orchard.

In the process of caring for apple trees, drip irrigation is used as a modern resource-saving innovative technology in order to obtain a consistently abundant and high-quality harvest during 2020-2023. The use of this method has a number of advantages, water consumption per hectare of orchard is reduced by 2-3 times. Drip irrigation is carried out in rows in an intensive apple orchard through rubber hoses. The hoses are located on both sides of the apple trees along the length of the row at a height of 50 cm. This method is a modern progressive method that reduces weeds in intensive apple orchards and provides priority, that is, long-term moisture.

During 2020-2023, all modern protection methods carried out in the orchard for intensive care of apple trees and obtaining consistently abundant, high-quality fruit yields, that is, in order to obtain abundant and high-quality yields from intensive apple orchards, will be carried out on a scientific basis in collaboration with agronomists working on the farm, which ultimately led to high results.

One of the main factors in creating intensive orchards with consistently abundant and high-quality yields based on modern resource-saving innovative technologies is the use of virus-free, clean, well-rooted seedlings in intensive orchards. For orchards with high and high-quality yields, it is advisable to use productive vegetative grafts. It should be noted that taking into account the biological characteristics of grafts and their maintenance in different soil and climatic conditions and the widespread introduction of varieties suitable for production conditions is the basis of intensive fruit growing.

In 2023, intensive apple trees were cultivated on the basis of highly modern resource-saving innovative agrotechnologies at the SiyovushAgro LLC horticultural farm, taking into account their biological characteristics, selecting suitable and convenient variety-

graft combinations, selecting the appropriate seedling thickness, and ultimately, due to the correct location of the branch bud of four-year-old intensive small apple trees of the Goldspur variety on the trunk, the light indicators were high in all parts of the trunk. In late August and early September 2023, an average of 1.5-8.0 kg of quality fruit was obtained from one intensive apple tree, and the average yield per hectare was 37.5-200.0 t/ha of quality fruit. The efficiency of fruit production in orchards was high.

**Conclusion.** Based on the results of scientific research and testing conducted during 2020-2023, it was found that the formation of optimal size of the Goldspur apple variety in an intensive orchard resulted in high light indicators and favorable conditions for the growth and development of apple trees, scientific pruning of apple branches and their correct shaping led to an improvement in the phytometric indicators and biological properties of the trees, ultimately leading to an increase in the productivity of the apple tree and a consistently abundant and high-quality harvest.

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