

## **GROWTH OF YABDUNI TREES DEPENDING ON THE SHAPE OF THE CROWN AND THE TIME OF PRUNING**

**Andrii Chaploutskyi**

PhD in Agriculture, Associate Professor of the Department of Fruit Growing and Viticulture Uman National University of Horticulture, Uman

Horticulture is an important component of the agricultural economy [1]. To ensure the annual fruiting of apple trees with high yields, it is necessary to apply the latest technologies and follow them perfectly [2]. High-quality sunlight supply to all parts of the crown guarantees photosynthesis and the formation of generative buds. This can be achieved with the help of a suitable crown shape [3, 4].

For good fruiting, the apple tree needs to be properly shaped to ensure the redistribution of nutrients and the formation of fruit buds. Typically, pruning is carried out during the winter dormancy period in early March. However, in summer, pruning has a strong effect on the lighting conditions, increasing the amount of plastic substances.

Without pruning, it is impossible to grow a fruit tree with a strong crown, convenient for crop care (summer pruning, spraying) and harvesting [5]. When forming, one should take into account the natural conditions of the orchard location, biological characteristics of the fruit species, growth characteristics of the rootstock and the cultivar.

A prerequisite for accelerating the early maturity and productivity of fruit trees is the condition of their leaf apparatus. Formation and pruning should contribute to the rapid growth of the tree's leaf surface and increase its photosynthetic activity in general. This is achieved by creating a well-lit crown [6].

One of the main ways to form crowns in modern orchards is to create one powerful central conductor and bend all other branches to a horizontal position, which contributes to the rapid and massive setting of fruit buds. Another important rule for the formation and subsequent pruning of the crown is the annual removal of coarse branches on a knot (3-5 cm) whose diameter exceeds 50% of the diameter of the central conductor at the point of regrowth [7].

The research was carried out in an apple orchard of two varieties: Honey Crisp and Fuji on rootstock M.9 with a planting scheme of 4x1m. Three crown shapes were studied: slender spindle (control), French viz and ballerina (with the removal of all shoots in the zone 25 cm high on the central conductor above the semi-crossbred branches). Tree crowns were pruned in winter and summer after the June ovary shedding. Field, statistical and calculation-analytical methods of processing experimental data were used in this study.

The intensity of lateral growth of Fuji and Honey Crisp apple trees during the experiment differed significantly with a predominance in favor of the latter. Also, the implementation of the studied agricultural measures had an impact on the intensity of growth of the stem diameter. As a result of winter pruning of the crown of the French axis, the largest increase in the stem diameter of 7.2 mm per year was found. This was

almost twice the double pruning of the ballerina crown in the Fuji variety. The activity of the lateral growth of the trunk during the 4 years of research did not differ significantly, but it depended on the pomological variety by 44%, with a predominance of the Honey Crisp variety. The active lateral growth of the stem was facilitated by the formation of the crown of the French axis (6 mm), while the formation of the ballerina crown significantly slowed down this process with an average annual value of 5.1 mm (NIP05=0.3). Forming the crown The slender spindle occupied an intermediate position among the three forms of the crown. Pruning the crown of trees twice during the growing season contributed to reducing the intensity of trunk thickening by 10%.

The crown height of Honei Crisp trees was 5% higher than that of Fuji trees. A significant impact on the crown size was caused by the introduction of different crown shapes. In particular, as a result of the formation and subsequent pruning of the French axis crown, the highest value of the crown height index was found at 2.2 m. The smallest crown height was observed in the ballerina crown. Pruning of the studied trees in winter and repeated in summer contributed to a decrease in crown height.

Thus, the trees of the Honeoye Crisp variety are distinguished by stronger growth compared to the Fuji variety on the rootstock M.9. The formation of the French axis crown resulted in an increase in crown height and thickening of the stem, while these processes slowed down when pruning the ballerina crown. Slowing down of growth activity was also facilitated by two crown pruning during the growing season.

#### **References**

1. Kostiuk LA. Current state and prospects of development of horticulture in Cherkasy region: Collection of scientific papers of TDATU. 2008. № 1(17). VOL. 1. P. 248-256.
2. Apple production. URL: <https://vidomosti-ua.com/economics/73942> (accessed 16.05.2016).
3. Poperechna O.V. Apples. Harvest forecast in Europe. Gardening in Ukrainian. 2015. № 5. C. 12-15.
4. Traditional and modern gardening in the USA. Gardening news. 2010. № 1. C. 30-32.
5. Trends in the development of the agricultural sector in the context of market transformations. Economic Journal XXI. 2012. №11-12(2). C. 27-29.
6. Kondratenko P.V., Shestopal O.M., Barabash L.O. The main directions of development of industrial gardening in Ukraine. Horticulture. 2009. Issue 62. C. 5-13.
7. Kudryavets R.P. Productivity of apple trees. Moscow: Agropromizdat, 1987. C. 215-216.