

PRODUCTIVITY OF THE APPLE TREE DEPENDING ON THE FORM OF THE CROWN AND THE TERM OF PRUNING

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In modern horticulture, it is important to research and introduce small, compact crown forms into production and study the specifics of caring for them. Dense plantations can produce more fruit per unit area. After all, increased production intensification implies an increase in the level of yield per unit area. This can be achieved through the development of new small-sized crown forms that are able to produce more quality fruit due to the peculiarities of their design.

Correct pruning and shaping of apple trees affects the increase in yields, improvement of fruit quality, air, light and water conditions and helps to avoid the phenomenon of fruiting periodicity [1]. The main purpose of tree crown pruning is to improve the illumination of all parts of the crown [2].

Performing crown pruning in summer increases the level of crown illumination by at least 6-14%, according to Palmer J.W. 1992 and Tustin D.S. 2022 [3, 4]. Summer pruning reduces vegetative growth in the next year after pruning and improves fruit color. It also increases the intensity of leaf photosynthesis and improves the establishment of generative buds [5].

The aim of the study was to determine the effect of pruning time of different types of crowns on the productivity of apple trees in the conditions of the Right-Bank Forest-Steppe of Ukraine.

The research was started in the spring of 2019 at the Uman National University of Horticulture in the garden of 2015, planted with Fuji and Honey Crisp varieties, on the rootstock M.9 T337. Tree planting scheme in a 4x1 m garden. Trees were pruned in two terms: in winter and twice per season - in winter and summer after the June ovary shedding (II decade of June). Three crown shapes were studied: slender spindle, ballerina (with removal of fouling wood on the central conductor 25 cm above the lower tier of semi-crossbred branches) and French axis.

The decrease in the number of fruits in the trees of both studied varieties was caused by the formation of the French axis crown. According to the results of the analysis of variance, the number of fruits increased due to changes in the number of fruit formations. The planting of Fuji variety was characterized by a larger number of fruits by 14% compared to Honeoye Chris variety, and as a result of the formation of ballerina crown by 4% relative to the slender spindle. The change in the value of the indicator by 62% was caused by the factor "crown shape". An increase in the number of fruits by 7 pcs./d was achieved as a result of the introduction of double pruning of trees in winter and summer in the plantations of both studied varieties.

An increase in fruit weight was found as a result of the formation of the French axis crown and its pruning in winter with repeated performance in summer - 172 g in Fuji trees and 179 g in Honey Crisp. The peculiarities of crown formation had a significant impact on the value of fruit weight (21% factor influence). A positive effect on the increase in fruit weight (by 14 g) was facilitated by the implementation of two-time pruning of trees in winter and summer.

The yield of plantations varied over the years with a gradual increase in the value of the indicator. The yield of plantations depended on the shape of the crown by 58% and on the term of its pruning by 11%. In particular, an increase in the yield level by 4.4 t/ha, which amounted to 15%, was ensured by the formation of a ballerina crown compared to the formation of a slender spindle. Performing crown pruning twice during the growing season contributed to an increase in yield by 5.4 t/ha.

Thus, the number of fruits prevailed in the trees of Fuji variety, but their weight was inferior to Honeoye Crisp variety. Forming the ballerina crown resulted in higher values of tree productivity. The number of fruits increased by 4%, fruit weight by 11%, and plant yield by 15% compared to the crown of the slender spindle. The positive effect of the introduction of additional summer pruning on the increase of both fruit weight and productivity of apple trees was also noted.

References

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