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On The Results Of Research Work On The Formation And Pruning Of Apricot Trees In The Conditions Of Northern Tajikistan

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Abstract: This study investigates the significance of crown formation in young apricot trees and the role of specific crown forms in maintaining optimal conditions within the canopy of fruit-bearing trees. Particular attention is given to light penetration, stimulation of active vegetative growth, extension of the productive lifespan, and the balance between vegetative growth and fruiting. Shortening skeletal and semi-skeletal branches by ¼–½ of their length, combined with thinning of the inner crown, resulted in an increased number of new shoots both within the canopy and along its periphery. In the second year of observation, pruned trees exhibited higher yields compared to the unpruned control.

Keywords: Apricot, crown formation, pruning, young trees, fruit-bearing trees, cultivation.

Introduction: Horticulture has long been an integral component of agricultural production in Tajikistan. Historical evidence indicates that fruit cultivation was practiced by ancient populations of the region, including the Sogdians and Bactrians. The soil and climatic conditions of Northern Tajikistan are particularly favorable for fruit growing, especially apricot, enabling high productivity for fresh consumption, drying, and industrial processing. Under these conditions, the scientific development and application of region-specific horticultural practices are essential to ensure the rational distribution of fruit crops, improve productivity, and enhance sustainability.

LITERATURE REVIEW

Achieving high apricot yields requires the application of comprehensive agronomic practices, including crown formation in young trees and systematic pruning of fruit-bearing trees. Observations indicate that approximately 50–60% of annual orchard maintenance costs are associated with pruning and harvesting operations. Proper pruning promotes the formation of new shoots, extends the productive lifespan of trees, maintains a balance between vegetative growth and fruiting, and improves light penetration within the crown. The majority of apricot fruits are formed on one- to three-year-old shoots, as well as on spurs and lateral shoots. In older trees, the density of fruiting buds declines, highlighting the critical importance of regular and scientifically grounded pruning practices. Previous studies by Kostina K.F., Pulotov A.P., Metlitsky Z.A., Yesayan G.S., and others have demonstrated that timely crown formation in young trees plays a more decisive role in productivity than corrective pruning of mature trees.

METHODS

The research was conducted on local apricot cultivars, including Mirsandzhali, characterized by a pyramidal

crown, as well as Ahmadi and Babai. The experimental site was located in Northern Tajikistan at an altitude of 410 m above sea level. The region is characterized by a continental climate with dry air, abundant sunshine, low snow cover, and annual precipitation of 120–150 mm. During the study period, minimum and maximum air temperatures reached −21 °C and +43 °C, respectively. The soil of the experimental orchard was gray sandy and characterized by low nutrient availability, with total nitrogen content of 0.085%, phosphorus 0.114%, and potassium 0.87%.

Young tree formation was evaluated under four variants: natural crown formation (control), cup-shaped crown, tiered branch arrangement, and pyramidal crown. Pruning of fruit-bearing trees included regular sanitary pruning as a control, shortening of 1- and 2-year-old branches by ½–⅓ of their length, and shortening of 3- and 4-year-old branches by ¼–⅕ of their length. Measurements included shoot growth, number of newly formed shoots, crown recovery, trunk diameter, tree height and width, fruit yield, and fruit quality.

Table 1. Yield of apricot trees depending on pruning methods during the study years

Pruning treatment	Ahmadi 1	Ahmadi 2	Ahmadi 3	Ahmadi 4	Ahmadi 5	Ahmadi 6	Ahmadi 7	Ahmadi 8	Babai 1	Babai 2	Babai 3	Babai 4	Babai 5	Babai 6	Babai 7	Babai 8
Control	15.8	24.6	22.5	35.1	46.1	71.9	26.1	40.7	32.2	50.2	37.2	58.0	35.2	54.9	38.2	59.5
Moderate pruning ½–⅓	16.2	25.2	27.0	42.1	46.0	71.7	36.0	56.2	30.6	47.7	39.7	61.9	42.3	65.9	48.7	75.9
Moderate pruning ¼–⅕	14.4	22.5	24.7	38.5	55.5	86.6	38.0	59.3	31.9	49.7	41.2	64.3	45.3	70.6	50.8	79.2
Light pruning	15.1	23.5	26.1	40.7	40.6	63.3	28.2	43.9	30.6	47.7	33.8	52.7	35.3	55.1	45.1	70.3

Table 2. Effect of pruning on average apricot yield

Pruning treatment	Ahmadi (c ha^{-1})	Increase vs. control	Babai (c ha^{-1})	Increase vs. control
Control	43.1	–	55.6	–

Moderate pruning ½–⅓	48.8	+5.7	62.8	+7.2
Moderate pruning ¼–⅕	51.7	+7.9	65.9	+10.3
Light pruning	42.8	+0.3	56.4	+0.8

$LSD_{0.05}$: Ahmadi = 1.45; Babai = 4.31

CONCLUSIONS

1. Pruning significantly increased the proportion of shoots 11–30 cm in length by 46–49% compared with the unpruned control.

2. Appropriate pruning and crown formation practices improved both tree productivity and fruit quality.

3. Crown formation of young trees during the third year of growth had a positive effect on their subsequent growth and long-term development.

4. For the Ahmadi cultivar, the average yield over three years increased from 43.1 c ha^{-1} in the control treatment to 51.7 c ha^{-1} under the most effective pruning regime, while for the Babai cultivar, yields increased from 55.6 to 65.9 c ha^{-1}.

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