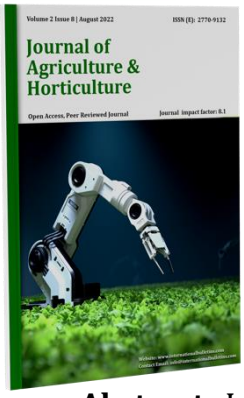

EFFECT OF SUMMER PRUNING ON THE GROWTH AND DEVELOPMENT OF CHERRY TREES IN PROTECTED AREAS

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Abstract. In this study, cherry varieties grown in protected areas were subjected to summer pruning at three different times (the 1st, 2nd, and 3rd ten-day periods of May) and at three different lengths (15 cm, 30 cm, and 45 cm), compared with an unpruned (control) variant. The article presents data on the effect of summer pruning on the number of leaves per tree, individual leaf area, total leaf area, and the thickness and length of shoots.

Keywords: Protected area, cherry, variety, spring, Royal Tioga, tree, shoot, summer pruning, leaf, flower, fruit.

Introduction. Summer pruning of cherry trees in protected areas is considered one of the most important factors. Through summer pruning, the size of cherry trees can be regulated, and flowering and fruiting can be improved. Research has shown that the timing of summer pruning affects the flowering of cherry trees and the production of high-quality fruits. When new shoots are pruned to a length of 25–30 cm during summer pruning, more flower buds are formed compared to leaving shoots 40 cm or longer [2].

Pruning may also negatively affect the physiology of the tree, particularly when performed after harvest. Although this timing has traditionally been recommended to control vegetative growth, it may lead to reduced energy reserves for the following season. Such adverse effects are generally not observed after spring pruning [1,4].

In the northern hemisphere, summer pruning is usually conducted in late June or early July. Performing trunk girdling (ringing) of the tree during this period can also help regulate tree size and stimulate flowering [2].

To both limit tree size and maximize fruit yield and quality, it is advisable to apply various practical techniques. One such practice is the removal of unnecessary shoots after harvest, which qualifies as a summer pruning method. All unproductive shoots are removed immediately after harvesting, and newly formed shoots are pruned multiple times thereafter to stimulate flower bud formation [3].

Research Methods. Field experiments evaluating the growth and development of cherry varieties were conducted following the guidelines of *"Program and Methods for Variety Testing of Fruit, Berry, and Nut Crops"* (1999). Leaf area measurements were carried out based on the methodology outlined in *"Methodological Guidelines for Accounting and Monitoring of Key Indicators of Photosynthetic Activity in Crop Stands"* (1969).

Research Results. Cherry varieties grown under protected conditions were subjected to summer pruning at three different timings (1st, 2nd, and 3rd ten-day periods of May) and at three different shoot lengths (15 cm, 30 cm, and 45 cm), and compared with a non-pruned (control) variant.

Variety: "Bahor"

• In the control (non-pruned) variant during the first ten days of May, the number of leaves was 2,871, the single leaf area was 26.2 cm^2, the total leaf area was 7.5 cm^2, shoot thickness was 5.1 mm, and shoot length was 36.3 cm.

• When pruned at 15 cm, the number of leaves increased to 3,147, leaf area to 29.4 cm^2, total leaf area to 9.2 cm^2, shoot thickness was 7.5 mm, and length 76.8 cm.

• At 30 cm pruning, leaf number was 3,683, single leaf area 30.6 cm^2, total 11.3 cm^2, shoot thickness 6.8 mm, and length 70.1 cm.

• With 45 cm pruning, there were 3,178 leaves, leaf area 28.7 cm^2, total 9.1 cm^2, shoot thickness 5.8 mm, and length 57.7 cm.

Variety: "Royal Tioga"

• In the non-pruned variant, the leaf number was 3,193, single leaf area 27.1 cm^2, total leaf area 8.6 cm^2, shoot thickness 4.8 mm, and length 31 cm.

• When pruned at 15 cm, the leaf count increased to 3,423, leaf area to 28.2 cm^2, total 9.6 cm^2, thickness 7.1 mm, and length 69.2 cm.

• At 30 cm pruning, there were 3,912 leaves, leaf area 29.8 cm^2, total 11.7 cm^2, shoot thickness 6.7 mm, and length 64.3 cm.

• With 45 cm pruning, the number of leaves was 3,431, leaf area 27.9 cm^2, total 9.6 cm^2, shoot thickness 5.6 mm, and shoot length 54.7 cm.

Figure 1. Summer pruning of cherry varieties at different shoot lengths during the growing season in protected areas

In the second ten-day period of May, for the *"Bahor"* variety: At 15 cm pruning, the number of leaves was 3,053, leaf area per leaf – 29.1 cm^2, total leaf area – 8.9 cm^2, shoot thickness – 7.1 mm, and shoot length – 72.3 cm. At 45 cm pruning, the number of leaves was 3,072, leaf area per leaf – 28.4 cm^2, total leaf area – 8.7 cm^2, shoot thickness – 5.4 mm, and shoot length – 55.1 cm.

For the *"Royal Tioga"* variety: At 15 cm pruning, the number of leaves was 3,318, leaf area per leaf – 27.8 cm^2, total leaf area – 9.2 cm^2, shoot thickness – 6.8 mm, and shoot length – 67.2 cm. At 30 cm pruning, the number of leaves was 3,827, leaf area per leaf – 29.5 cm^2, total leaf area – *(continues in Table 1)*.

Table 1. *Effect of Summer Pruning on the Growth and Development of Cherry Trees in Protected Areas*

Variety name	Cutting length	Number of leaves, pcs.	Area of one leaf, cm^2	Leaf area per bush, cm^2	Nthickness of the hull, mm	Length of the rod, cm
First decade of May						
Bahor	uncut control	2871	26,2	7,5	5,1	36,3
	15	3147	29,4	9,2	7,5	76,8
	30	3683	30,6	11,3	6,8	70,1
	45	3178	28,7	9,1	5,8	57,7
Royal tioga	uncut	3193	27,1	8,6	4,8	31
	15	3423	28,2	9,6	7,1	69,2
	30	3912	29,8	11,7	6,7	64,3
	45	3431	27,9	9,6	5,6	54,7
2nd decade of May						
Bahor	15	3053	29,1	8,9	7,1	72,3
	30	3543	30,2	10,7	6,3	68,2
	45	3072	28,4	8,7	5,4	55,1
Royal tioga	15	3318	27,8	9,2	6,8	67,2
	30	3827	29,5	11,3	6,3	60,7
	45	3341	27,6	9,2	5,4	52,9
In the third decade of May, control						
Bahor	15	2979	28,7	8,5	6,8	69,1
	30	3543	29,8	10,6	6,1	63,7
	45	2986	28,1	8,4	5,2	53,2
Royal tioga	15	3215	27,4	8,8	6,3	64,1
	30	3716	29,2	10,9	6,1	57,8
	45	3231	27,3	8,8	5,1	49,9

Leaf area was 11.3 cm^2, shoot thickness was 6.3 mm, and length was 60.7 cm. At 45 cm pruning, the number of leaves was 3,341, the leaf area per leaf – 27.6 cm^2, total leaf area – 9.2 cm^2, shoot thickness – 5.4 mm, and shoot length – 52.9 cm.

In the third ten-day period of May, for the *"Bahor"* variety: At 15 cm pruning, the number of leaves was 2,979, leaf area per leaf – 28.7 cm^2, total leaf area – 8.5 cm^2, shoot thickness – 6.8 mm, and shoot length – 69.1 cm. At 30 cm pruning, there were 3,543 leaves, leaf area per leaf – 29.8 cm^2, total leaf area – 10.6 cm^2, shoot thickness – 6.1 mm, and shoot length – 63.7 cm. At 45 cm pruning, the number of leaves was 2,986, leaf area per leaf – 28.1 cm^2, total leaf area – 8.4 cm^2, shoot thickness – 5.2 mm, and shoot length – 53.2 cm.

For the *"Royal Tioga"* variety: At 15 cm pruning, the number of leaves was 3,215, leaf area per leaf – 27.4 cm^2, total leaf area – 8.8 cm^2, shoot thickness – 6.3 mm, and shoot length – 64.1 cm. At 30 cm pruning, the number of leaves was 3,716, leaf area per leaf – 29.2 cm^2, total leaf area – 10.9 cm^2, shoot thickness – 6.1 mm, and shoot length – 57.8 cm. At 45 cm pruning, the number of leaves was 3,231, leaf area per leaf – 27.3 cm^2, total leaf area – 8.8 cm^2, shoot thickness – 5.1 mm, and shoot length – 49.9 cm.

Conclusion.

In protected areas, pruning at 30 cm during the first ten-day period of May resulted in the most effective indicators of cherry tree growth and development.

Specifically, in the *"Bahor"* variety, the number of leaves reached 3,683, leaf area per leaf – 30.6 cm^2, total leaf area – 11.3 cm^2, shoot thickness – 6.8 mm, and length – 70.1 cm, showing active development of vegetative organs.

In the *"Royal Tioga"* variety, 30 cm pruning also produced the highest values: 3,912 leaves, leaf area per leaf – 29.8 cm^2, total leaf area – 11.7 cm^2, shoot thickness – 6.7 mm, and length – 64.3 cm

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