

# THE INFLUENCE OF SUMMER PRUNING SYSTEM ABOVE THE GROWTH AND PRODUCTIVITY OF APPLE TREE

## INFLUENȚA TĂIERII ÎN VERDE ASUPRA CREȘTERII ȘI FRUCTIFICĂRII POMILOR DE MĂR

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**Abstract.** *The investigation were effectuated in the apple intensive orchard of the „Alfa - Nistru” society of Soroca district, the Republic of Moldova. The orchard was planted in spring of 2000 year with grafted trees on the table on the rootstock M9 on Pinova and King Jonagold variety. The planting distance was of 3,5 x 1,2 m. The goal of this experiment was to study the processes of growing fructifying of the apple trees depending on 4 summer pruning systems. The researches results demonstrate us that the apple trees parameters reach optimum sizes the fifth year after plantation without significant modifications depending on the studied summer pruning systems the inclination of the vigorous branches without fruits with help of the loads and clips as well as the pinching of the vertical vigorous offshoot tops contributes to the acceleration of the fructifying processes.*

**Key words:** apple tree, variety, summer pruning.

**Abstract:** *Investigațiile au fost efectuate în livada intensivă de măr a societății „Alfa-Nistru”, raionul Soroca, Republica Moldova. Livada a fost planată în primăvara anului 2000 cu pomi altoiți la masă pe portaltoiul M9 de soiul Pinova și King Jonagold. Distanța de plantare 3,5×1,2 m. Scopul înființării acestei experiențe a fost de a studia procesele de creștere și fructificare a pomilor de măr în dependență de patru sisteme de tăiere în verde. Rezultatele cercetărilor ne demonstrează că parametrii pomilor de măr ating dimensiuni optime în anul 5 după plantare fără modificării semnificative în funcție de sistemele de tăiere în verde studiate. Înclinarea ramurilor viguroase fără rod cu ajutorul greutateților și a agrafelor precum și ciupitul vârfulor lăstarilor viguroși verticali contribuie la accelerarea proceselor de fructificare.*

**Cuvinte cheie:** pom de măr, soi, tăiere în verde.

### INTRODUCTION

Summer pruning is practiced in arboriculture already ancient times, but once with implementation of intensive orchards, the importance of these measures agrotechnical increase.

Thanks to the summer pruning, it eliminates the surplus crown shoots, done that promotes normal development of those remains, accelerates the formation of the crown and therefore more rapid entry on fruit of young trees etc.

It is known that the response of trees to summer pruning varies depending on the time when they are applied: as far as we advance in the growing season (July) the growth of shoots is reduced (2,4). Summer pruning performed early (May) are welcome to eliminate the shoots with vertical position.

The formation of the crown using summer pruning operations contributed to increase the size of young tree (1,3).

## MATERIAL AND METHOD

The investigations were carried out in intensive apple orchards of the farm "Alfa – Nistru, distict Soroca, Republic Moldova. The plantation was founded in 2000 with varieties of trees Pinova and King Jonagold grafted on M9 and planted at a spacing of 3,5 x 1,2 m (2380 trees/ha). The trees are conducted as follows spindle slender type. The trees studied were grouped into 4 variants with 4 repetitions each. For the study of the effects of summer pruning system was performed measuring of phytometriques characters and fruit production.

The summer pruning systems studied are:

V t. v. 1 - (control), the elimination of competitors shoots in the upper souscharpantes as well and on the central axis.

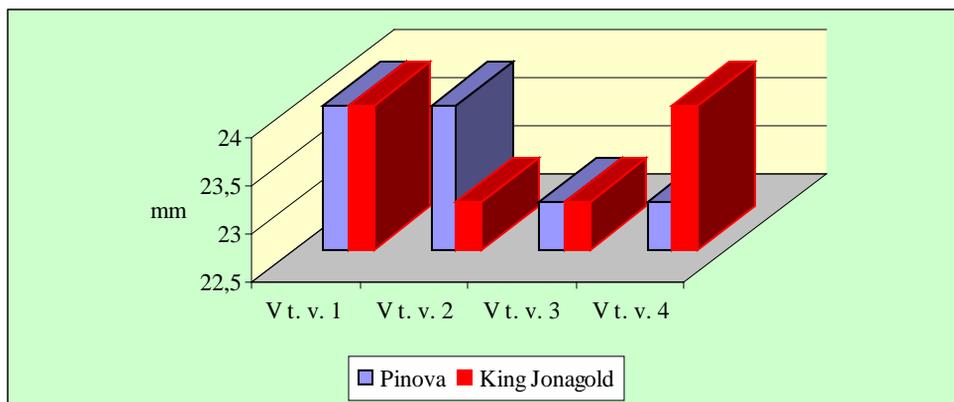
V t. v. 2 – the inclination of branches without fruit using a weights.

V t. v. 3 – the pinch of the tops of vigorous vertical shoots.

V t. v. 4 - disunity in the middle or at the base of the vertical branches from the destruction of 2 / 3 tissue.

## RESULTS AND DISCUSSIONS

In the context of variants with different summer pruning systems, the trunk diameter of Pinova and King Jonagold variety (fig. 1) has evolved constantly, recording during the 3 years of study a increase of 23-24 mm.



**Fig. 1.** Increase of trunk diameter in dependence of variety and summer pruning system

*The rootstock M9, the distance of the planting 3,5 x 1, 2m, spindle slender type S. A. "Alfa-Nistru", in medium of the years 2005-2007*

The tree height was maintained using a summer pruning systems studies in the limits 296-310 cm (table 1). The comparison of tree height with the control variant shows that the value of this indicator is smaller in the variant with the inclination of branches without fruit aids weights. In this variant the difference in tree height between the two varieties ranged from 292 cm up to 302 cm. The

diameter of crown on length of row is extended on average up to 141-162 cm for the variety Pinova and up to 139-171 cm for the variety Jonagold King.

Table 1

**The height of apple tree and the diameter of crown in dependence of variety and summer pruning system**

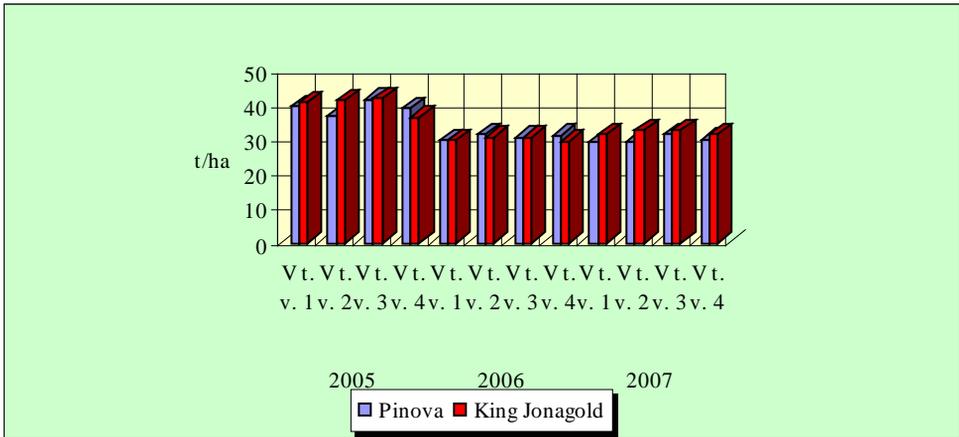
*The rootstock M9, the distance of the planting 3,5 x 1,2m, spindle slender type S. A. "Alfa-Nistru"*

Summer pruning system	Height of tree (2005-2007), cm	The diameter of crown, cm					
		On length of row			On breadth of row		
		2005	2006	2007	2005	2006	2007
Pinova							
V t. v. 1	303	141	162	158	156	160	155
V t. v. 2	297	153	158	161	171	174	151
V t. v. 3	310	147	160	159	157	171	149
V t. v. 4	306	150	162	150	164	165	152
DL <sub>0,05</sub>	-	3,88	2,90	3,59	2,98	2,56	2,21
King Jonagold							
V t. v. 1	299	148	161	168	178	178	165
V t. v. 2	296	150	171	165	191	175	164
V t. v. 3	305	151	168	165	178	182	165
V t. v. 4	298	139	164	164	177	174	160
DL <sub>0,05</sub>	-	2,97	2,56	2,11	2,87	3,15	2,74

The minimum diameter of crown on breadth of row was characteristic for the variety of trees Pinova (149-174 cm), followed by King Jonagold (160-191 cm). These dimensions of the crown ensure a free space between the neighboring row of about 160-170 cm, which is favorable to the regime of light and for the mechanized works in the orchard. In analyzing the data on extension of the crowns size, we can see that the trees have shown a moderate growth, which is characteristic for the hereditary potential of varieties King Jonagold and Pinova conducted in the form of slender spindle crown.

The production of fruit depending on summer pruning system (figure 2) was on average higher in the plantation where we tilted the vigorous shoots without fruit using a weights (V t. v. 2) and pinched the tops of vertical vigorous shoots (V t. v. 3)

Thus the production of fruits in the two variants was also varies depending on years of 29,7 to 41,8 t / ha in the case of the variety Pinova and respectively of 30,9 to 42,2 t / ha for the variety King Jonagold. By analyzing global average production in the plantation with summer pruning systems (V t. v. 2) and (V t. v. 3), during the three growing seasons, the value of this indicator of the variety King Jonagold (34,6 t / ha) dominated the variety Pinova (33,7 t / ha).



**Fig. 2.** The fruit production in dependence of variety and summer pruning system

*The rootstock M9, the distance of the planting 3,5 x 1, 2m, spindle slender type S. A. "Alfa-Nistru", in medium of the years 2005-2007*

## CONCLUSIONS

The phytometriques parameters of apple trees grafted on dwarfing M9 rootstock and planted on a distance 3,5 x 1,2 m reached optimal dimensions in the fifth year of planting and does not affect essential in dependence on summer pruning system.

The inclination of branches without fruit and the pinch of the tops of vigorous vertical shoots accelerates the process of fructification, which is giving a good promise for better management of production in intensive apple orchard.

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