

STUDY ON ESTABLISHMENT OF A CROWN-SHAPED FRUIT FENCE, PALMET CHANDELIER WITH SIX ARMS AND BELGIAN FENCE SYSTEM AND HOW TO USE THEIR IN LANDSCAPING

STUDIU PRIVIND REALIZAREA FORMELOR DE COROANĂ PENTRU GARDURI FRUCTIFERE ÎN SISTEMELE PALMETA CANDELABRU CU ȘASE BRAȚE ȘI SISTEMUL GARD BELGIAN ȘI MODUL DE UTILIZARE A ACESTORA ÎN AMENAJĂRI PEISAGISTICE

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Abstract: *The research was conducted over six years of USAMVB Didactic Timișoara. In the paper were studied two varieties of apple and two of pear, which resulted in systems palmettes crown chandelier whit 6 arms and systems fence Belgian, for making fruit fences. The method of embodiment was based on the realization of different types of forming operations such as:*

- operations of changing the position of growth branches and the shoots of which we mention, operations for forming a branch and operations of pinching the branches;

- proper cutting operations of which we mention operations training of the trunk, operations of branches shortness and operations of branches notching.

Key words: *apple trees, landscape, pear trees, espaliered fruit trees*

Rezumat: *Cercetările s-au efectuat pe parcursul a șase ani la Stațiunea Didactică a U.S.A.M.V.B. Timișoara. În cadrul lucrării s-au luat în studiu două soiuri de măr respective două soiuri de păr, care s-au condus în sistemele de coroană Palmeta candelabru cu 6 brațe și sistemul gard belgian, pentru realizarea unor garduri fructifere. Metoda de realizare a avut la bază realizarea diferitelor tipuri de operații de formare cum sunt:*

- operații de modificare a poziției de creștere a ramurilor și lăstarilor din care amintim operații de dresare a unei ramuri respectiv operații de ciupit a lăstarilor;

- operații de tăieri propriu-zise, cum sunt operațiile de formare a trunchiului, operații de scurtarea ramurilor respective, operații de creșterea ramurilor.

Cuvinte cheie: *măr, amenajare peisageră, păr, forme artistice de pomi fructifer*

INTRODUCTION

In the experimental plot established in 2004 in Didactic of U.S.A.M.V.B. Timișoara was studied two varieties of pear, Clapp's favorite, and Cüré. The purpose of the research concern the improvement sequences from technology

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training, artistic crown fruit trees and the possibility of using them in green spaces (Baciu, 2005).

In the present paper were studied several apple varieties respectively pear and follow the behavior of these species and varieties during training the proposed crowns.

MATERIAL AND METHOD

To obtain the desired crown shapes, and a balance vertical (between floors or between branches of the stem axis) and a horizontal balance (between branches belonging to the same floor) are required 3-4 years and during which they are carried out 2 groups of technical operations:

- Operations, to amend the position of the branches and shoots growing (Manageable, bending, arching, twisting, etc.);
- Cutting operations themselves.

1. Working method for directing apple varieties in crown system, *Candelabra Palmette with 6 branches*

To form the crown system, *Candelabra Palmette with 6 branches*, rods were planted at 3.5 meters on rows, and 3.5 meters between rows. Height that is short the rod to form the trunk is 40-50 cm above 2 buds oriented time. Management operations that were conducted during this period pursued to obtain branches lengths of 150 cm, to keep a distance of about 40 cm between the branches that will form on them.

2. Working method for directing apple varieties in *Belgian fence* crown system

The trees were planted at a distance of 80 cm in the row and 3.5 m between rows. Shortening was done immediately after planting trees at a high trunk 60-65 cm above 2 buds and place opposite the row. These works mentioned were repeated throughout the research period until the form has reached the desired height (Iordănescu, 2008).

RESULTS AND DISCUSSION

A. The dynamic growth of fruit trees driven into the " *Candelabra Palmette with 6 branches* " at different varieties of apple and pear

To form the crown system, *palmetto candelabra with six arms*, the trees were planted at 3.5 meters along the row and 3.5 m between rows. The height to which the trees were shortened to form trunk is 40-50 cm above 2 buds oriented along the row.

To present form was chosen the best specimen formed. From the buds left, during training trunk of the tree, young shoots emerged, needed, training the branches (Drăgănescu, 2002).

These shoots were conducted in a horizontal position on the line, always keeping the tip of them tilted obliquely for rapid elongation.

The leadership of the two horizontal arms, was done from the first year, when their length exceeded 50 cm in length and a diameter of 0.5 mm.

The management operations that were performed during this period aimed to obtain the branches lengths of 150 cm, to keep a distance of about 40 cm between the arms, which will form on them.

To achieve a more aesthetic shape with a roughly equal distance between arms were carried notching operations, crescent-shaped (consisting of a cut in the bark and some wood), above a bud sleeping, to wake 's.

The notching was made along the length of both arms, the first at 30 cm from the trunk, and the 2 nd at 30-40 cm from the first shortened. The outer arms will be formed by bending the tip of the horizontal arm to the vertical at a distance of 30-40 cm from the 2nd boom (Mitre, 2008).

The operations of notching were made throughout the year 2 and 3, during the growing period, depending on the increases in achieved.

Other operations in forming the crown, were the suppression of the greedy shoots on the trunk,, and pinching the 4-6 leaves of the branches from the horizontal portion at the base of the arms (Fig. 1). Following technical operations carried out during this period, the tree reached a height of 250 cm, with the trunk diameter of 6.8 cm and length of crown shape eventually reached 200-220 cm.



Fig. 1 - Candelabra Palmette with 6 branches (original)

It also was aimed to shorten the arms which appeared at the level of notches on each arm, to 3-4 buds, favoring their thickening.

In the following years were followed the growth and thickening of the 6 arms and the shoots appeared, on the horizontal portion of the branches are pinching until the outer arms have reached the desired height. In order to achieve a balance of growth, and better increase, with branches of fruits, of the 6 arms, their extensions were shortened to 30-40 cm per year (Tab. 1 Tab. 2).

Table 1

Moments of training the crown for the "palmettes candelabra with six branches" of apple varieties

Specie	The height (m)	Trunk diameter (mm)	Trees age
Apple	0,5	6,0	sapling from planting (spring 2004)
	0,5	11,0	1 year (spring 2005)
	0,85	20,0	1,5 year (fall 2005)
	1,25	31,0	2,5 years (fall 2006)
	1,65	43,0	3,5 years (fall 2007)
	2,1	57,0	4,5 years (fall 2008)
	2,5	68,0	5,5 years (fall 2009)

Table 2

Moments of training the crown for the "palmettes candelabra with six branches" of pear varieties

Specie	The height (m)	Trunk diameter (mm)	Trees age
Pear	0,70	7,0	sapling from planting (spring 2004)
	0.75	14,0	1 year (spring 2005)
	0.90	21,0	1,5 year (fall 2005)
	1,30	28,0	2,5 years (fall 2006)
	1,70	36,0	3,5 years (fall 2007)
	2,10	44,0	4,5 years (fall 2008)
	2,50	52,0	5,5 years (fall 2009)

B. The Dynamics of trees growth led to the "Belgian fence" at different varieties of apple and pear

This type of crown is a cordon with two oblique arms, each arm forms with the vertical an angle of 45°. On the main branches are preserved only fruit branches.

In this system, the structures of each tree will be crossover in structures, of trees neighbors, taking the shape of rhombus.

The young trees were planted at the distance of 80 cm in the row and 3.5 m between rows. Shortening acestoras made immediately after the planting at a high trunk of 60-65 cm above 2 buds sit opposite, and on the same row.

In the the first year of vegetation the shoots on the trunk are deleted, keeping only the two shoots, which directs in the form of "V".

In the 2nd year, the arms were shortened for better Tamping. During the growing season were also executed and operations shortness of shoots and pinch a few leave (Fig. 2).

After technical operations and agro- technical work performed the trees, led in this form reached a height of 2.5 m, with a trunk diameter of about 6 cm, and length of arms, being about 180-190 cm each (Tab. 3, Tab. 4).



Fig. 2 - Shape of Belgian fence crown (original)



Fig. 3 - Shape of Belgian fence crown (original)

These works mentioned were repeated throughout the research period until the form has reached the desired height.

The strings supporting arms tree of, trellis, it will weaken, with their increasing in thicknesses later on will be removed, no longer needed because the tree is self supporting.

Cutting works, consisted in shortening annual of the arms to 30-40 cm in order thickening and filling them with branches of fruit (Fig. 3).

Throughout the formation of the crown, it was necessary to fix the arms in order to direct as possible into the desired shape.

Table 3

Moments in forming crown system, Belgian fence for the apple tree varieties

Specie	The height (m)	Trunk diameter (mm)	Trees age
Apple	0,65	6,0	sapling from planting (spring 2004)
	1,1	10,0	1 year (spring 2005)
	1,5	15,0	1,5 year (fall 2005)
	1,9	26,0	2,5 years (fall 2006)
	2,2	35,0	3,5 years (fall 2007)
	2,5	49,0	4,5 years (fall 2008)
	2,5	56,0	5,5 years (fall 2009)

**Moments in forming crown system, Belgian fence
for the pear tree varieties**

Specie	The height (m)	Trunk diameter (mm)	Trees age
Pear	0,7	5,0	sapling from planting (spring 2004)
	1,1	9,2	1 year (spring 2005)
	1,5	15,0	1,5 year (fall 2005)
	1,9	30,0	2,5 years (fall 2006)
	2,5	46,0	3,5 years (fall 2007)
	2,5	54,0	4,5 years (fall 2008)

CONCLUSIONS

In conclusion we observe the proper development, and behavior of specimens, of the varieties of apple trees in their training operations in the system palmettes candelabra with six branches.

Also the trees, of crown system, Belgian fence reached the desired height and shape.

Trees behaved very well to pruning and cutting training routing. In 2009 the extension the arms were shortened to limit the growth.

In the study, in terms of landscaping, crown-shaped Belgian fence I recommend it for green spaces for both vigor and good looks.

Palmettes candelabra with six arms is one of the most spectacular artistic shapes of the crown, but requires more knowledge on operations, primary and secondary, of forming the crown;

However I recommend to green spaces with a particular aspect and also a rich vegetative mass with artistic involvement and significant ecological.

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