PARTICULARITIES REGARDING THE INTENSITY OF FRUCTIFICATION'S CUTTING OF THE MIXED BRANCHES AT THE PEACH TREE

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Abstract

The main branch of the peach tree's fruit is the mixed branch. Regarding the cutting shorter or leave it entire when the cuttings of fructification from the recommendation of leaving the mixed branches entire (uncut) until the oppose extreme, to cut them at 4-6 groups of buds.

For the varieties took into study there were undertook some researches regarding the intensity of shortening the mixed branches in the view to improve the conception of cutting and the capacity of branching out in function of the cutting's intensity as well as the initial vigor of the mixed branches.

MATERIALS AND METHODS

In the study undertook we worked with the Cardinal soil grafted on a wax cherry tree. The trees were planted at a distance of 5/4 m and conducted under the form of a fan-shaped espalier with oblique arms. The experience was made in the years 2007 and 2009 and included five alternatives:

V1 – The cutting shorter the mixed branches at 4 groups of buds

V2 – The cutting shorter the mixed branches at 8 groups of buds

V3 – The cutting shorter the mixed branches at 12 groups of buds

V4 – The cutting shorter the mixed branches at 16 groups of buds

V5 – The mixed branch not shorted (entire), witness

Each alternative included 4 repetitions each of them with one tree. At each tree there were studied 50 mixed branches of big vigor (70 – 110 cm), 50 mixed branches of middle vigor (40 – 70 cm), and 50 mixed branches of weak vigor (20 – 40 cm).

It was pursued the influence of the shortening's intensity concerning the capacity of ramification of mixed branches as well as the possibility of assuring "the wood for fruit" for the next year.

The capacity of ramification as it is seen in table no. 1 is in function of the intensity of the cutting shorter of the mixed branches as well as their vigor. So, the total length of the new growths was bigger (188cm) in the case of mixed branches which were shorted at 4 groups of buds and in their frame, at the branches with a bigger vigor (250cm). The mixed branches with a weaker vigor, no matter of the cutting intensity, formed the smallest annual growths and in the same time the smaller. Ivascu A. (2001)

The mixed branches cut at 4 and 8 groups of buds formed through their top, in average, about three new groups of mixed branches of middle length, able to assure the "wood for fruit" for the next year Sarca Gheorghe (1995).

The new annual growths were mixed branches, necklaces, bunches and spurs. At the longer cuts (12-16 groups of buds) there were formed less mixed branches but enough vigorous. The mixed branches that were let entire and especially those with a weak vigor didn't assure the forming of new mixed branches necessary for their replacement. Botu I. (1996)

The majority of the growths were short and they became necklaces, bunch and spurs. Some scientists, Coman Stefan (1996), show that the mixed branches that were not shorted react different in function of their length and their thickness. The entire mixed

branches, assure better "the wood for fruit" than those with a reduced vigor, but totally insufficient for the obtaining of a corresponding production, that's what the researches of. Cociu V. (1981) show.

The intensity of the cutting determines the change of the productive characteristics of mixed branches Sarca Gheorghe (1990).

Table 1

The medium production of fruits (g at mixed branches)

Variation	The intensity of cutting at mixed branches	Production g	Different	% toward the witness	Meaning
V1	At 4 groups of buds	395	137	74.20	0
V2	At 8 groups of buds	410	122	77.00	0
V3	At 12 groups of buds	400	132	75.18	0
V4	At 16 groups of buds	508	24	95.48	-
V5	Entire mixed branch (Mt)	532	-	100.00	-

LSD 5 % =123,7; LSD 1 % =172,89; LSD 0,1 % =246,089.

The total production on a system *(table 1)* grew once with the decrease of the intensity of cutting. Toward the entire mixed branch considered witness, the alternatives of shortening the branch at 4, 8 and 12 groups of buds represent negative meanings.

The number of fruits as well as the total production was bigger as the mixed branch shortened less.

Behind the results obtained regarding the shortening or not of the mixed branches with the occasion of the cuttings of fructification of the peach tree in the crop zone – the west side of the country – S.C. SARMED there can be detach some conclusions:

1. As well as the number and the total length of the annual growths formed on mixed branches cut at different lengths, depends of their vigor and of the intensity of shortening. So, once with the decrease of the shortening intensity, decreased the total length of annual growths, but it increase their number, much more that the branches had a reduced vigor.
2. The new mixed branches of replacement are assured in the case of the shortening of mixed branches at 4-12 groups of buds. The uncut mixed branches continue their grow through the terminal bud, is cleaning through the base, and laterally it forms necklaces, bunch and spurs, and mixed branches of reduced vigor.
3. The intensity of the shortening determines the change of the efficient characteristics of the mixed branches. The number of the fruits grows once with the decreasing of the intensity of cutting. The total production on a system grows once with the decreasing of the intensity of cutting.
4. The shortening of the mixed branches at 8-12 groups of buds in the case that the fruits are not spaced out in a crop that is not irrigated, assure as well as a big production, as well as " the replacement wood" for the next year.

CONTRIBUTIONS REGARDING SOME METHODS OF FRUCTIFICATION'S CUTTING AT THE STUDIED PEACH TREE

Through the cuttings of fructification at peach tree we follow first of all the realizing of a normal equilibrium between the growing and the fruit bearing, or other saying, the obtaining of the fruit and the new growths which to assure the fruit bearing for the next year.

Secondly, through the fructification cuttings correctly made, we realize the standardization of the production in accordance with the biological potential of every type of peach tree.

The branches of the trees about that are not applied ordering and fructification cuttings become more frequent, and the penetration of the light and air in the wreath's tree become more difficult, fact what favors the phenomenon of cleaning the skeleton and of the semi-skeleton, as well as the obtaining of some fruits insufficient colored and of an inadequate quality Ivascu A. (2002).

At the peach tree, we have to take account the fact that the branch of fruit normally fructifies only once, after what it debilitates and is going to produce less or at all. That's why the branches that beard fruit are crossing out and they are going to be replaced with other young branches enough vigorous of one year old. That's why it is necessary to obtain every year mixed branches of middle vigor (50-60 cm length), the only ones which can assure a qualitative and quantitative fruit Some types are bearing fruit on the superior third of the mixed branches that usually have a bigger vigor rpose at these types the mixed branches are not going to be shortened even if they are going to surpass the length of 60 cm, but they will be bend even if it is not the happiest method – the slope (bending) being made at the angle of 45-60º.

Through the study made and analyzed in the present paper we followed to determine the methods of the fructification cuttings, their efficiency from the economical point of view in the ecological conditions from the western side of the country – Oradea area. There were studied the classic and modern methods, used in our country and in foreign countries.

The experience was made between the years 2007 – 2009. The trees from the Cardinal type were planted in an intensive orchard at a distance of 5 m between the rows and 4 in a row – directed under a form of palm cu oblique arms with 3 floors, each floor with two branches, with the branches at a distance of 8-10 cm of each other.

The experience was made on a wreath with a palm form, because the oblate wreaths have a larger utility in big plantations due to the multiple advantages that they represent.

The form of oblate wreaths allows increasing the grade of mechanization of the works in the plantations of peach trees and concomitantly a better exposure of the fruits at light. The work's volume of formation the oblate wreaths at peach trees is smaller in the first two years then it grows reaching at maximum in the years II and IV since the trees were planted in the orchard.

Starting with the years III – IV begin the performance of fructification cuttings, letting in rapport with the tree's age and their conformation, a number of fruit branches which to assure as well as a big as possible fructification and a good growth of the trees.

The experience we made has five variants:

V1 – The long cutting with entire mixed branches, spaced out at 15-20 cm (witness, American)

V2 – Modern cutting, through which the third part from the total mixed branches, shorted themselves at 5-8 groups of buds, and the other two thirds, at 12-14 groups of buds.

V3 – The classic cutting – the croquet variant (spigot at two buds and the mixed branch at 3-4 groups of buds).

V4 – The mixed cutting – the differential shortening of the mixed branches on the length of the frameworks

V5 – The alternative suppressing of the fruit. On the frameworks 1,3 all the branches which had beard fruit as well as the mixed branches or the vegetative branches are cutting at 1-3 buds (or 3-5 after the vigor of the branch on the framework) and the

frameworks 2,4 are not subdued at any fructification cutting. The experience is materialized in tables 2,3,4.

Following these cuttings the wreath's biotop and the tree's vigor were directly influenced by the method used when the fructification cuttings were made, being recorded the smaller dimensions in the case of the alternative suppressing of the fruit on the framework. Face of a witness, all the variants present negative differences, assured at different levels. The medium diameter of the wreath's trees was obviously influenced in the sense that face of a witness, at all the methods studied, the differences are very important.

The small wreaths allow the intensification of the peach tree's crop and the applying of the works is easier.

The cleaning of the trees in the base zone is a phenomenon which appears and tend to stress on the measure that the trees grow older, having direct implications on the fructification and the production zone. This phenomenon may be influenced through cuttings being weak expressed in the case of shortening the mixed branches in a differential way on the length of the frameworks.

The biggest quantity of wood eliminated through cuttings was in the case of alternative suppressing of the fruit on frameworks (7.7) and the smallest, when the long (5.94) and mixed (6.6) cuttings were applied *(table 2).*

The smallest quantity of wood eliminated is the proof of some adequate cuttings in the previous year and expresses the existence of equilibrium between the growth and fructification processes.

Table 2

Biometry dates on trees and the weight of the wood eliminated through cuttings (average 2007 – 2009)

The cutting method	Tree's high	Ø Of the wreath	Ø of the trunk	The zone's cleaning	Wood eliminated at cuttings
	m	m	cm	m	Kg
V1-Long cutting (witness)	4.70	6.37	16.04	2.94	5.94
V2-Modern cutting	4.00^{00}	5.36^{000}	11.8^{000}	1.9^{00}	6.90^{+++}
V3-Classic-croquet cutting	4.30^{000}	6.02^{000}	13.88^{00}	2.4^{0}	7.33^{++}
V4-Mixed cutting	4.15^{0}	5.33^{000}	16.22^{+}	0.9^{00}	6.6^{*}
V5-Alternative suppressing of the fruit on frameworks	3.75^{000}	5.20^{00}	13.10^{000}	0.98^{0}	7.7^{***}
DL 5%	0.41	0.18	0.64	1.64	0.53
DL 1%	0.60	0.27	0.98	2.38	0.72
DL 0,1%	0.90	0.40	1.41	1.57	1.15

The shortening of the branches of fruit release a lot the spacing out of the fruits, which is a very meticulous operation and request a lot of time to work. Drobota Gheorghe (1980).The reasonable shortening or the spacing out of the mixed branches favors the growth offshoots of middle vigor, which are going to form the branches for fruit for the next year.

The cutting method has influences on the number and the vigor of the mixed branches.

Table 3

The number and the average length of the mixed branches (the average 2007-2009)

The cutting method	The mixed branches – pieces		The length
	Before cutting	After cutting	Cm
V1-The long cutting (witness)	321	244	34,2
V2-Modern cutting	336^{0}	288^{+}	46^{+++}
V3-Classic cutting-croquet	366^{+}	250	25.6^{+++}
V4-Mixed cutting	504^{+++}	336^{+++}	50^{+++}
V5-The alternative suppressing of the fruit on frameworks	372	331^{+++}	53^{+++}
DL 5%	57.24	35.44	4.02
DL 1%	83.76	50.72	5.80
DL 0,1%	124.90	74.44	8.48

The mixed cutting had assured the formation of a big number of mixed branches, when in the case of long cuttings this-ones were only a few.

The mixed branches *(table 3)* that formed after the applying of different methods of cutting have a length between 34,2 cm at a long cut and 53,0 cm at the alternative suppressing of the fruit on frameworks. Sarca Gheorghe (2001) shows that under a qualitative and quantitative rapport the fructification process gives the best results on the mixed branches of 35-70 cm length.

In all the fructification years there were registered different values – these ones being in function of the cutting method applied.

The pluriannual average *(table 4)* was included between 50,3 kg/tree at long cutting and 87,5 kg/tree at mixed cutting. The mixed cutting favors the obtaining of the biggest yields, because it corresponds to the growth's specific and the fructification's peach tree. The yield differences were statistic assured in all the experimentation years.

The average weight of a fruit in all the experimentation years and at all variants has a positive meaning or a distinct meaning face of the witness.

The dates presented in table no. 4, it is revealed the fact that on the entire mixed branches (long cutting), the fruits are smaller. To improve the crop's quality, it is necessary the fruit's growth – or the standardization.

Table 4

The yield of fruits/tree and its quality (fruit's gram)

The cutting method	2007	2008	2009	The average 2007-2009	
				Yield kg/tree	The average weight of one fruit
V1-The long cutting (witness)	50.80	54.2	4.50	50.3	66.0
V2-Modern cutting	60.0^{+++}	68.9^{+++}	72.3^{+++}	68.2^{+}	88.3^{+++}
V3-Classic cutting-croquet	70.0^{+++}	62.4^{++}	50.1	60.0^{0}	74.7^{+}
V4-Mixed cutting	82.3^{+++}	84.2^{+++}	96.4^{+++}	87.5^{+++}	98.6^{+++}
V5-The alternative suppressing of the fruit on frameworks	51.00	62.2^{++}	67.3^{++}	57.7^{+}	90^{+++}
DL 5%	5.12	5.10	3.96	15.15	7.74
DL 1%	7.19	7.16	5.54	22.0	1.25
DL 0,1%	10.50	9.90	7.90	33.06	16.88

CONCLUSION

From the dates presented we can detach the next observations:

- The cutting method of fructification applied has an influence on the vigor and the tree's growth, which is distinguished through the wreath's size, the trunk and the branch's length.
- The fruit's and its quality is meaning influenced by the method of cutting applied.

The results are the best, under the rapport of the vegetative growth and of the fructification at the peach tree were obtained in the conditions from Oradea in the case of differential shortening of the mixed branches on the length of the frameworks (V4) and in the case of modern cutting (V2), these methods proving to be adequate to the biological characteristics of the peach tree.

1. Branch of semi-skeleton with mixed branches
2. Branch of semi-skeleton cut with mixed branches spaced out and cut
3. Mixed branches with fruits that were not spaced out
4. Mixed branches with spaced out fruits

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