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THE STUDY OF A FEW OLD APPLE VARIETIES AND LOCAL POPULATIONS AT POHALMA NURSERY IN LUGOJ, TIMIȘ COUNTY

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Abstract

The purpose of the current study was to analize aspects reffering to the growth vigour of the apple trees in the third year after the planting (the trunk's diameter, the height of the tree and the length of the annual growths) as well as properties of the fruit itself, including number of fruits per tree, small and large diameter, height and mass of the fruits, dry matter and sugar content. All 26 varieties are grafted on the M106 rootstock. The large diameter of the fruits varied between 42.00 mm for 'Creţesc' variety and 85.33 mm for 'Curcubătoase', the average being 63.06 mm. The mass of the fruits ranged between 63.69 g for 'Creţesc' variety and 334.96 g for 'Curcubătoase' variety, the average of the experience being 189.09 g. The biggest fruits belonged to 'Curcubătoase' and 'Jonathan', whereas 'Creţesc', 'Măr Ţigănesc' and 'Florăneşti' had smaller fruits. In addition, a questionnaire had been created, which revealed that most people are aware of the fact that it is challenging to find truly healthy apples, but they consume these fruits regularly.

Key words: *apple trees, old varieties, Lugoj, measurements, questionnaire.*

INTRODUCTION

With the appearance of cosmopolitan apple varieties, the old local ones had started to be neglected by growers. At the moment, these varieties are only identified isolated or in certain orchards.

The value of the old varieties is given by their remarkable taste, productivity, longevity and resistance to extreme environmental circumstances. Although they possess the enumerated qualities, these varieties have some disadvantages too: due to their high growth vigour, it is impossible to establish intensive or superintensive orchards containing these specific varieties.

In the same time, it is a rustic species with high ecological plasticity, which in superior agrotechnical conditions gives significantly higher crop than the other fruit species (Chira & Paşca, 2008).

Another aspect is that the crop's value is rather high. For example, the crop from 1 ha of intensive apple orchard can be sold at the same price as 5 ha of cereals (Chira & Paşca, 2008).

Apple intake has various benefits on our bodies: eaten in the morning, the fruit helps prevent large intestine cancer, absorbing the toxins; apple is also used in infantile diarrhea treatments; it contributes to the egestion of uric acid from the organism, therefore apple is recommended in obesity cases; it is considered as a natural alternative against arterial hypertension (Chira & Paşca, 2008).

Apples are fruits eaten all over the world, they constitute a rich source of phytochemicals. Epidemiological studies found the relation between apple consumption and low risk of developing cancer, especially lung cancer, as well as cardiovascular diseases, asthma, diabetes. Laboratory analysis put in evidence the strong antioxidant property of apples, which also reduces the cholesterol level. Correlation was also made between apple consumption and weight loss. Storage does not have effect or has minimal consequence over phytochemical content, but on the other hand, processing influences the chemical composition of the fruit (Boyer & Liu, 2004).

Stored at low temperatures, the fruits can be edible up to one year (Mditshwa et al., 2018).

Recently, a decrease in apple consumption can be observed worldwide, researchers are in continous search of the explanations regarding this tendency. Konopacka et al. (2010) have come to the conclusion that apple consumption

is lower among young people, which in the Different studies have proved that one of the main factor in fruit consumption is represented by people's income: in countries like Italy, Denmark or Albania, citizens are willing to pay more in order to consume organic and local apples (Ceschi et al., 2017; Denver & Jensen, 2014; Skreli & Imami, 2012).

According to statista.com (Shahbandeh, 2021), last year the global apple production was 63.9 mil tons. In this regard, China was on the first place with 41.00 mil tons, followed by USA with 4.82 mil tons and Turkey with 3.00 mil tons.

In Romania, in 2020, apple production was 551.5 thousands tons, with 50 thousands extra than in the previous year (Brodeală et al., 2021).

With the purpose of studying and preserving the local germoplasm, a small apple plantation was established at the Pohalma Nursery in Lugoj in 2017.

MATERIALS AND METHODS

The varieties that were analyzed are the following: 'Măr Țigănesc', 'Măr Domnesc', 'Pietros', 'Curcubătoase', 'Poinic', 'Carigate', 'Mustoase', 'Florănești', 'Botu Oii Alb', 'Măr mare', 'Pătul', 'Vițate', 'Jonathan de munte', 'Măr de Jupani', 'Mari de Berini', 'Măr dulce amar', 'Măr dulce', 'Măr plăcintă Berini', 'Șovare', 'Caslere', 'Jonathan', 'Pogace', 'Aore', 'Crețesc', 'Botu Oii de Caraș', 'Pătul de Vârciorova', 'Parmen auriu'.

future may lead to a continous decline.

The trees were planted in 2017 and are all grafted on the M106 rootstock.

The measurements have been started to be carried out in early 2020, when the trees were still in resting phase and ended in October 2020.

The aims of the research were: measuring the length of the annual growths, the growth vigour of the trees and the trunk's diameter, as well as counting the fruits on each tree, then analyzing the large and small diameter, height and mass of the fruits, their dry matter and sugar content.

The data have been statistically processed and interpreted, then compared between the varieties.

Given a species that is so consumed and appreciated, it was opportune to create a questionnaire to see people's habits and preferences in eating this fruit.

RESULTS AND DISCUSSIONS

The trunk's diameter in the case of these old varieties and local populations, studied in the third year after the planting, varied between 27.16 mm for 'Mari de Berini' and 50.77 mm for 'Florănești' and 'Măr mare' varieties.

It can be observed that 16 varieties out of the 26 had values above the control's value and the other 10 below it. Only the 'Mari de Berini' variety was statistically assured, being distinctly significantly negative compared to the control (Table 1).

Table 1. The trunk's diameter

Crt. nr.	Variety	Trunk's diameter mm	Relative value (%)	Difference from the control	Semnification
1	Măr Țigănesc	40.17	94.94	-2.14	-
2	Măr Domnesc	46.30	109.44	3.99	-
3	Pietros	46.10	108.97	3.79	-
4	Curcubătoase	47.87	113.14	5.56	-
5	Poinic	47.27	111.72	4.96	-
6	Carigate	44.87	106.05	2.56	-
7	Mustoase	46.90	110.86	4.59	-
8	Florănești	50.77	120.00	8.46	-
9	Măr mare	50.77	120.00	8.46	-
10	Pătul	45.20	106.84	2.89	-
11	Vițate	43.46	102.74	1.16	-
12	Jonathan de munte	43.8	103.52	1.49	-
13	Măr de Jupani	38.06	89.97	-4.24	-
14	Mari de Berini	27.16	64.21	-15.14	00
15	Măr dulce amar	43.8	103.52	1.49	-
16	Măr dulce	47.26	111.72	4.96	-

Crt.nr.	Variety	Trunk's diameter mm	Relative value (%)	Difference from the control	Semnification
17	Măr plăcintă Berini	42.06	99.43	-0.24	-
18	Șovare	46.66	110.30	4.36	-
19	Caslere	35.63	84.22	-6.67	-
20	Jonathan	40.33	95.33	-1.97	-
21	Pogace	41.03	96.99	-1.27	-
22	Aore	46.86	110.77	4.56	-
23	Creţesc	45.00	106.36	2.69	-
24	Botu Oii de Caraș	35.4	83.67	-6.90	-
25	Pătul de Vârciorova	35.83	84.69	-6.47	-
26	Parmen auriu	34.93	82.571	-7.37	-
27	Average of the varieties	42.31	100.00	0.00	control
		DL 5% = 8.96 mm	DL 1% = 12.11 mm	DL 0.1% = 16.14 mm	

The height of the trees in the third year after the planting had its values between 165.0 cm for 'Mari de Berini' and 251.66 cm for 'Măr dulce' variety, the average of the experience being 204.22 cm.

Among the analyzed varieties, 13 have exceeded the control, but only 2 of them were statistically assured, 'Măr dulce' (distinctly significantly positive) and 'Măr dulce amar' (significantly positive). 'Pietros', 'Poinic', 'Domnesc' and 'Curcubătoase' varieties also had high vigour.

On the opposite pole, the lowest height was observed in case of 'Mari de Berini' and 'Caslere' varieties, both significantly negative compared to the control. A lower vigour was measured for 'Pătul de Vârciorova', 'Parmen auriu', 'Șovare', 'Jonathan' and 'Pogale', their hight being below 190.00 cm (Table 2).

Table 2. The tree's height

Crt. nr.	Variety	Height of the tree (cm)	Relative value (%)	Difference from the control	Semnification
1	Măr Ţigănesc	210.33	103.00	6.12	-
2	Măr Domnesc	228.33	111.81	24.12	-
3	Pietros	230.33	112.79	26.12	-
4	Curcubătoase	224.67	110.01	20.45	-
5	Poinic	230.00	112.63	25.78	-
6	Carigate	207.00	101.36	2.78	-
7	Mustoase	216.67	106.10	12.45	-
8	Florăneşti	216.67	106.10	12.45	-
9	Măr mare	210.00	102.83	5.78	-
10	Pătul	197.00	96.47	-7.22	-
11	Viţate	215.66	105.60	11.45	-
12	Jonathan de munte	193.66	94.83	-10.55	-
13	Măr de Jupani	189.33	92.71	-14.88	-
14	Mari de Berini	165.00	80.79	-39.21	0
15	Măr dulce amar	238.33	116.70	34.11	X
16	Măr dulce	251.66	123.23	47.45	XX
17	Măr plăcintă Berini	197.33	96.62	-6.88	-
18	Șovare	186.33	91.24	-17.88	-
19	Caslere	171.00	83.73	-33.21	0
20	Jonathan	187.00	91.56	-17.21	-
21	Pogace	186.66	91.40	-17.55	-
22	Aore	208.66	102.17	4.45	-
23	Creţesc	201.33	98.58	-2.88	-
24	Botu Oii de Caraș	190.00	93.03	-14.21	-
25	Pătul de Vârciorova	176.66	86.50	-27.55	-
26	Parmen auriu	180.00	88.14	-24.21	-
27	Average of the varieties	204.22	100.00	0.00	control
		DL 5% = 32.59 cm	DL 1% = 44.04 cm	DL 0.1% = 58.66 cm	

The average length of the annual growths in the experiment changed between 63.44 cm for 'Caslere' variety and 107.55 cm for 'Măr dulce amar', the average being 83.56 cm.
Values above the average of the experience were obtained for 'Măr dulce amar' (distinctly significantly positive in comparison with the control), followed by 'Măr dulce' (significantly positive) and 'Curcubătoase', 'Pietros' and 'Mustoase' varieties, but these latter ones weren't statistically assured.
Twigs with values under the average were found in case of 'Caslere' (significantly negative compared with the control) and varieties such as 'Jonathan de munte' and 'Mari de Berini' (Table 3).

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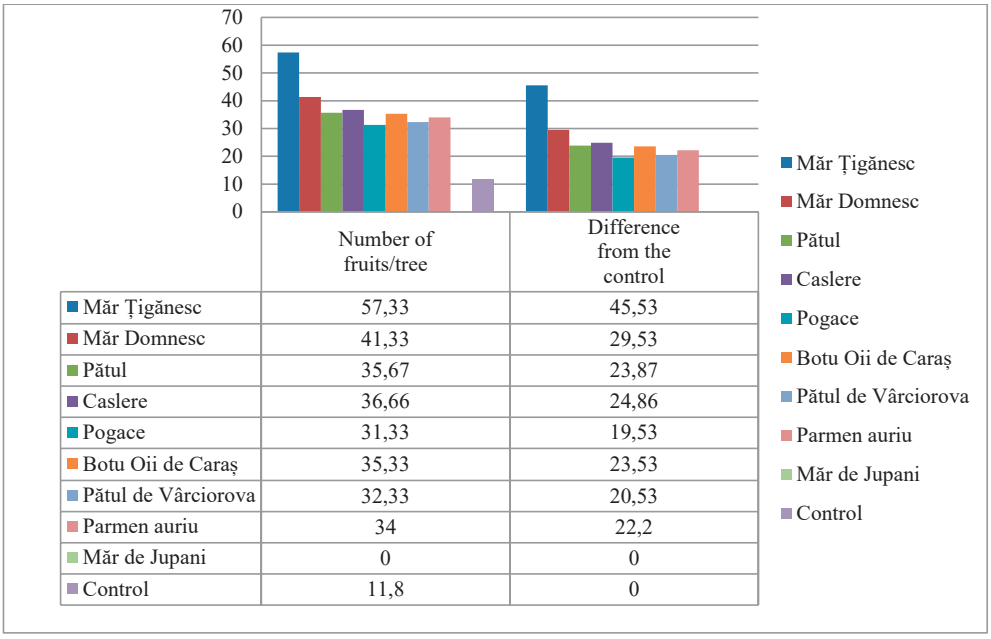
Table 3. The annual growth's average length

Crt. nr.	Variety	The annual growth's average length (cm)	Relative value %	Difference from the control	Semnification
1	Măr Țigănesc	81.88	98.00	-1.67	-
2	Măr Domnesc	87.89	105.18	4.33	-
3	Pietros	94.97	113.66	11.42	-
4	Curcubătoase	98.77	118.21	15.22	-
5	Poinic	92.42	110.61	8.86	-
6	Carigate	83.55	100.00	0.00	-
7	Mustoase	94.66	113.29	11.11	-
8	Florănești	87.78	105.05	4.22	-
9	Măr mare	86.66	103.72	3.11	-
10	Pătul	76.22	91.22	-7.34	-
11	Vițate	90.55	108.37	6.99	-
12	Jonathan de munte	71.33	85.36	-12.22	-
13	Măr de Jupani	73.55	88.02	-10.00	-
14	Mari de Berini	70.42	84.27	-13.13	-
15	Măr dulce amar	112.77	134.96	29.21	XX
16	Măr dulce	107.55	128.71	23.99	X
17	Măr plăcintă Berini	80.44	96.26	-3.11	-
18	Șovare	79.44	95.07	-4.11	-
19	Caslere	63.44	75.92	-20.11	0
20	Jonathan	68.55	82.04	-1.00	-
21	Pogace	71.44	85.49	-12.11	-
22	Aore	84.10	100.65	0.55	-
23	Crețesc	77.55	92.81	-6.00	-
24	Botu Oii de Caraș	71.88	86.02	-11.67	-
25	Pătul de Vârciorova	72.11	86.30	-11.44	-
26	Parmen auriu	92.55	110.76	8.99	-
27	Average of the varieties	83.56	100.00	0.00	control
		DL 5% = 18.93 cm	DL 1% = 25.58 cm	DL 0.1% = 34.07 cm	

The number of fruits per tree in the third year after the planting oscillated between 0 for 'Măr de Jupani' and 57.33 for 'Măr Țigănesc' (Figure 2 and Figure 3), with an average of the experience of 11.80.
13 varieties out of the total of 26 have exceeded the control's value. The highest value was achieved by 'Măr Țigănesc' (very significantly positive compared to the control), followed by 'Măr Domnesc', also categorized as very significantly positive.
The next varieties that were statistically assured are: 'Caslere', 'Pătul', 'Botu Oii de Caraș', 'Pătul de Vârciorova' and 'Parmen auriu', all of them being distinctly significantly positive compared to the control. 'Pogace' variety, with the average of 31.33 fruits per tree, was significantly positive (Figure 1).
Values below the average obtained 13 varieties, the lowest ones belonging to 'Măr de Jupani', 'Crețesc', 'Măr mare', 'Mari de Berini' and 'Pietros' varieties. None of them was statistically assured.



	Number of fruits/tree	Difference from the control
Măr Țigănesc	57,33	45,53
Măr Domnesc	41,33	29,53
Pătul	35,67	23,87
Caslere	36,66	24,86
Pogace	31,33	19,53
Botu Oii de Caraș	35,33	23,53
Pătul de Vârciorova	32,33	20,53
Parmen auriu	34	22,2
Măr de Jupani	0	0
Control	11,8	0

Figure 1. Number of fruits/tree- statistically assured varieties

Figure 2. 'Măr de Jupani' variety in august 2020

Figure 3. Closer look to the fruits of 'Măr Țigănesc' variety in august 2020

Regarding the big diameter of the fruits, it varied from 42.00 mm for 'Creţesc' variety to 85.33 mm for 'Curcubătoase', the average of the experience being 63.06 mm.

Values above the control's value have been found at 9 varieties. 'Curcubătoase', 'Jonathan', 'Aore' are very significantly positive in comparison with the control and 'Florănești', 'Jonathan de munte', 'Caslere' are significantly positive.

8 varieties had values under the control's. 4 of them ('Măr Țigănesc', 'Botu Oii Alb', 'Creţesc' and 'Parmen auriu') were registered as very significantly negative compared to the control. 'Vițate' variety was catalogued as significantly negative (Table 4).

Table 4. Big diameter of the fruits

Crt. nr.	Variety	Big diameter mm	Relative value %	Difference from the control	Semnification
1	Măr Țigănesc	43.83	69.51	-19.23	000
2	Măr Domnesc	58.00	91.97	-5.06	-
3	Curcubătoase	85.33	135.31	22.27	XXX
4	Florănești	72.00	114.17	8.94	X
5	Botu Oii Alb	50.00	79.29	-13.06	000
6	Pătul	68.33	108.36	5.27	-
7	Vițate	55.00	87.21	-8.06	0
8	Jonathan de munte	72.33	114.70	9.27	X
9	Șovare	68.00	107.83	4.94	-
10	Caslere	72.33	114.70	9.27	X
11	Jonathan	76.33	121.04	13.27	XXX
12	Pogace	66.00	104.65	2.93	-
13	Aore	77.00	122.09	13.93	XXX
14	Creţesc	42.00	66.59	-21.06	000
15	Botu Oii de Caraș	61.00	96.72	-2.06	-
16	Pătul de Vârciorova	59.33	94.08	-3.73	-
17	Parmen auriu	45.33	71.88	-17.73	000
18	Average of the varieties	63.06	100.00	0.00	control
		DL 5% = 6.97 mm	DL 1% = 9.42 mm	DL 0.1% = 12.55 mm	

The small diameter of the analized fruits had values between 40.00 mm for 'Creţesc' and 81.00 mm for 'Curcubătoase' variety. The average of the experience was 58.68 mm.

9 varieties exceeded the control and 8 did not reach the control's value. 'Curcubătoase' and 'Aore' varieties were very significantly positive in comparison with the control, 'Jonathan' distinctly significantly positive and 'Florănești' variety significantly positive. 'Pătul', 'Caslere', 'Pogace', 'Botu Oii de Caraș' and 'Pătul de Vârciorova' were not statistically assured.

The furthest values from the control out of the varieties that could not reach the control's values were 'Crețesc' and 'Parmen auriu' (very significantly negative compared to the control). 'Măr Țigănesc', 'Botu Oii Alb' and 'Jonathan de munte' varieties were distinctly significantly negative. 'Măr Domnesc', 'Vițate' and 'Șovare' were not statistically assured.

The height of the measured apples was changing from 29.00 mm for 'Crețesc' variety to 68.00 mm for 'Curcubătoase', the average of the experiment being 49.82 mm.

10 varieties exceeded the control, but only 2 of them were statistically assured: 'Curcubătoase' (very significantly positive) and 'Caslere' (distinctly significantly positive beside the control).

Out of the 7 varieties below the experiment's average, 2 were classified as very significantly negative beside the control: 'Crețesc' and 'Parmen auriu'.

Regarding the mass of the apples, it oscillated between 63.69 g for 'Crețesc' variety and 334.96 g for 'Curcubătoase', with an average of 189.09 g.

The biggest positive difference from the control was found in case of 'Curcubătoase', followed by 'Jonathan' and 'Florănești', all of them being very significantly positive compared to the control. 'Caslere' and 'Aore' had close values, both of them being classified as significantly positive. The rest of the varieties with higher values were not statistically assured.

On the opposite pole, 'Măr Țigănesc', 'Crețesc' and 'Parmen auriu' were very significantly negative in comparison with the control. 'Botu Oii Alb' and 'Vițate' varieties had almost identical values, and were significantly negative beside the control.

Values of the dry matter content in the fruits varied between 9.97 °Brix for 'Curcubătoase' and 18.90 °Brix for 'Măr Domnesc', with an average of 14.18 °Brix.

Above the control's value were situated 8 varieties: 'Măr Domnesc' and 'Parmen auriu' (very significantly positive in comparison with the control), 'Florănești' (significantly positive) and other varieties ('Măr Țigănesc', 'Vițate', 'Jonathan de munte', 'Șovare' and 'Botu Oii de Caraș') that were not statistically assured.

Values below the average got 9 varieties, including 3 statistically assured ones: 'Curcubătoase' (very singificantly negative beside the control, with 9.97ºBrix), 'Aore' (distinctly significantly negative, with 11.86 °Brix) and 'Pătul de Vârciorova' (significantly negative compared to the control, with 12.1 °Brix) (Table 5).

Table 5. Dry matter content of the fruits

Crt. nr.	Variety	Dry matter content °Brix	Relative value %	Difference from the control	Semnification
1	Măr Țigănesc	14.77	104.11	0.58	-
2	Măr Domnesc	18.90	133.25	4.72	XXX
3	Curcubătoase	9.97	70.27	-4.22	000
4	Florănești	16.30	114.92	2.12	X
5	Botu Oii Alb	12.90	90.95	-1.28	-
6	Pătul	12.63	89.07	-1.55	-
7	Vițate	15.40	108.58	1.22	-
8	Jonathan de munte	14.90	105.05	0.72	-
9	Șovare	15.20	107.17	1.02	-
10	Caslere	13.63	96.12	-0.55	-
11	Jonathan	13.05	92.00	-1.13	-
12	Pogace	13.65	96.23	-0.53	-
13	Aore	11.86	83.66	-2.31	00
14	Crețesc	13.10	92.36	-1.08	-
15	Botu Oii de Caraș	14.5	102.23	0.31	-
16	Pătul de Vârciorova	12.10	85.31	-2.08	0
17	Parmen auriu	18.35	129.37	4.16	XXX
18	Average of the varieties	14.18	100.00	0.00	control
		DL 5% = 1.58 °Brix	DL 1% = 2.13 °Brix	DL 0.1% = 2.84 °Brix	

The last table shows the sugar content of the fruits: the values varied between 8.06 g/l for 'Curcubătoase' and 17.58 g/l for 'Măr Domnesc' variety. The average of the experience was 12.55 g/l.

Values above the control's value have been measured in case of 8 varieties: 'Măr Domnesc' and 'Parmen auriu' were very significantly positive compared to the control; 'Florănești' distinctly significantly positive, with 14.81 g/l. The other 5 varieties ('Măr Țigănesc', 'Vițate', 'Jonathan de munte', 'Șovare' and 'Botu Oii de Caraș') had close values to the control and were not statistically assured.

Lower values were obtained at 9 varieties. 'Curcubătoase' variety was very significantly negative compared to the control. 'Aore' was distinctly significantly negative with 10.13 g/l sugar content, 'Pătul' and 'Pătul de Vârciorova' were significantly negative in comparison with the control. 'Botu Oii Alb', 'Caslere', 'Jonathan', 'Pogace' and 'Crețesc' were not statistically assured (Table 6).

Table 6. Sugar content of the fruits

Crt. nr.	Variety	Sugar content g/l	Relative value %	Diferrence from the control	Semnification
1	Măr Țigănesc	13.18	105.05	0.63	-
2	Măr Domnesc	17.58	140.12	5.03	XXX
3	Curcubătoase	8.06	64.27	-4.48	000
4	Florănești	14.81	118.04	2.26	XX
5	Botu Oii Alb	11.12	88.66	-1.42	-
6	Pătul	10.36	82.55	-2.19	0
7	Vițate	13.94	111.11	1.39	-
8	Jonathan de munte	13.32	106.19	0.78	-
9	Șovare	13.64	108.74	1.10	-
10	Caslere	12.04	95.94	-0.51	-
11	Jonathan	11.36	90.56	-1.18	-
12	Pogace	12.00	95.64	-0.54	-
13	Aore	10.13	80.79	-2.41	00
14	Crețesc	11.10	88.49	-1.44	-
15	Botu Oii de Caraș	12.9	102.81	0.35	-
16	Pătul de Vârciorova	10.79	86.02	-1.75	0
17	Parmen auriu	16.99	135.44	4.44	XXX
18	Average of the varieties	12.55	100.00	0.00	control
		DL 5% = 1.72 g/l	DL 1% = 2.32 g/l	DL 0.1% =3.09 g/l	

In the following, the results of the questionnaire will be presented. 93 people answered the questions.

People from all generations have been asked, based on four categories: below 18 years, 18-30 years, 31-50 years, above 50 years. Another criteria was their provenience: urban/ rural.

Apples being fruits that can be found on the market all year long, it was a curiosity to find out how people take advantage of it. Only a small percentage of those asked said that they rarely consume this fruit. Referring to age categories, individuals under 18 years and between 31 and 50 years consume apples on a weekly basis, those between 18 and 30 years a few times per month, whereas most of the persons over 50 eat apple on a daily basis.

As far as preferences regarding apple type, red apples are on the first place, followed very closely by green apples.

The sweet-and-sour flavour is appreciated the most.

About the pulp's consistency, the crunchy and hard fruits are preferred the most, but succulence is also cherished.

Fruits that look perfectly are the ones people search for the most, but from the answers it can be understood that consumers are aware of the fact that a big and flawless fruit does not necessarily guarantee good flavour or healthy food.

Another question was: "How much do you take into account the fruit's origin when buying apples?" A considerable number of consumers

choose to support local growers, but underage people do not really care about this factor.

"Do you have a favourite variety that you buy at any price or you buy whatever is on discount?" was the next question. It can be clearly seen that more than half of the respondents put more emphasis on preference than on price, which denotes a stable financial situation.

As favourite varieties, the following ones were mentioned the most: 'Jonathan', 'Golden Delicious', 'Idared', 'Granny Smith', 'Florina'. Other mentioned varieties were: 'Pătul', 'Poinic', 'Slav', 'Grushovka Moscova', 'Gala', 'Fuji', 'Starkrimson', 'Mutsu', 'Golden Reinders', 'Siculane', 'Papirovka', 'Bot de iepure'.

To the question "Are you willing to buy Bio/Eco apples, which usually cost more?" many have said that they invest in organic fruits. Lately, the population is more and more knowledgeable and healthy alimentation is becoming more popular day by day.

It is more than obvious that most people prefer the fresh fruits over the processed options.

The last question brought up for discussion the famous assertion that „An apple a day keeps the doctor away". 61 persons agree with it, 10 persons not really or not at all, 4 agree partially. Some of the other answers are the following: „An apple does not make a difference if the rest of the food we eat is not healthy", „This proposition is true, I have known it since I was a child", Yes, because it provides vitamins that are good for our immune system", „It depends. I don't think that the simple fact of eating apples keeps you healthy. But I think it is an important fruit that contains vitamins", „It would be nice, but I don't believe in it. Unfortunately I don't think there are that many vitamins in fruits anymore", „Not necessarily, it is something that is said to encourage people to eat fruits and healthy snacks", „It depends on their provenience. If they come from growers, and their source is safe, for sure ".

CONCLUSIONS

By productivity stood out the most the following varieties: 'Botu Oii de Caraș', 'Pătul de Vârciorova' and 'Parmen auriu'. However, there were a few varieties that did not produce at all in the third year after the planting: 'Pietros', 'Măr de Jupani', 'Mari de Berini'.

The highest sugar content and dry matter content was registered in case of 'Măr Domnesc' and 'Parmen auriu'.

The biggest fruits were produced by 'Curcubătoase', 'Caslere' and 'Jonathan' varieties, whereas the same indicators (big and small diameter, height and mass of the fruits) had the lowest values in case of 'Crețesc', 'Parmen auriu' and 'Măr Țigănesc'.

Regarding the trunk's diameter, the highest values were obtained in case of 'Florănești' and 'Măr mare' varieties, whereas the lowest ones for 'Parmen auriu', 'Mari de Berini' and 'Botu Oii de Caraș'.

Regarding the height of the trees, the highest values were measured for 'Măr dulce', 'Măr dulce amar', 'Poinic' and 'Pietros' varieties. 'Mari de Berini', 'Caslere' and 'Pătul de Vârciorova' had the smallest vigour.

Related to the results of the questionnaire, overall it can be deducted that a very high percentage of those asked are convinced that a balanced and healthy alimentation must include these fruits too. People seem to be aware of the fact that fruits in general, especially apples, need many chemical treatments, therefore they do not believe that these are as healthy as they once used to be. This fact is the answer to why Bio apples are that expensive: it is very challenging for growers to produce fertilizer-free fruits when the number of pests and diseases is constantly growing.

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