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THE INFLUENCE OF THE CLIMATIC CONDITIONS IN TIMISOARA AREA UPON FRUITS' QUALITY OF SOME APRICOT VARIETIES

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Abstract: The Romanian apricot varieties assure a consume period of three months from June to August, the varieties being characterized by quality fruits, very productive, some with a good resistance to low temperatures during the pause period and to late frosts, that became more and more frequent during the past years in our country.
By this work there were studied 12 apricot varieties with different periods of maturation and there was observed their behavior in the climatic conditions of Timisoara and the influence that the climatic conditions have upon the production and quality of fruits.

INTRODUCTION

The apricots are very much asked by the consumers as fresh fruits and also processed in different ways. For many people that live in the cold climate areas the apricots are considered as delicatessen or exotic fruits. The big request for these fruits is due to their quality and technological features: delicate pulp, specific flavor, rich content in sugars, acidity and other substances useful to the human organism. The main components of the apricots are: dry substance 10.6-21.71%, sugar 6-15.68%, total acidity 0.34-2.61%, crude proteins, pectin, minerals, K, P, Ca, vitamins A, C, P, E.

MATERIALS AND METHODS

The biological material consists of 12 apricot varieties cultivated in the didactic orchard of the Fruit Culture Department in Timisoara: Earlyryl, Dana, Neptun, Saturn, Cea mai bună de Ungaria, Venus, Callatis, Sulina, Favorit, Selena, Silvana and Olimp.

The trees belonging to the studied varieties were planted in 1997 spring, being grafted on mirobolam and having the crown form of vase.

The experiment developed in conditions of two years: 2006 and 2007, being observed the following:

- the evolvement of fruiting phenophases;
- tree's resistance to late spring frosts;
- estimative fruit production;
- fruits' quality: size index, weight, sugar, acidity and vitamin C.

The working method was a stationary one being based on two stages:

- first stage: in the field, based on following the fruit binding degree, counting the fruits and weighting them for the specific goals:
- second stage: in the laboratory, based on calculating and interpreting the obatined data.

The obtained data were calculated and interpreted according to the statistical rules specific for each studied parameter.

In the current paper work there will be presented the results obtained concerning:

- the evolvement of fruiting phenophases;
- fruits' quality (chemical features).

RESULTS AND DISCUSSIONS

Before presenting the results there will be presented the climatic conditions registered in Timis, during the studied years 2006-2007.

Tabel 1

Medium monthly temperatures (^oC) registered at the Weather Station Timişoara

Year/Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2006	- 2,0	0,0	5,0	12,0	16,0	20,0	24,0	20,0	18,0	12,0	6,0	2,0
2007	4,0	6,0	9,0	13,0	18,0	22,5	24,1	23,0	14,9	10,6	4,2	0,1
Average on 20 years	-1,1	1,2	5,8	11,2	16,5	19,5	21,2	20,8	16,2	11,1	5,8	1,2

We have to mention the fact that during the spring of 2006 there was a late frost on 20th March, when the temperature was -1.2^oC and the spring of 2007 was even more fitful because there were registered low temperatures during March and April in three periods:

- 22-23 March: almost -2^oC;
- 20 April: -1.6^oC;
- 23 April: -1.2^oC.

These determined negative effects upon the fruit production being affected most of the varieties no matter the phenophase or the development of the fruits in that period, even if there were early or late varieties.

Tabel 2

Monthly rainfall (l) registered at the Weather Station Timişoara

Year/Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2006	30	42	49	79	50	88	50	98	25	17	31	21
2007	26	92	57	4	69	65	46	65	62	53	85,9	22,6
Average on 20 years	39	38,5	33,9	46,8	63,1	79,6	62,4	51,4	42,1	42,2	49,4	52,6

We can observe that there were low quantities of rainfall in June 2007 and July in both years (2006,2007) and high quantities of rainfall that determined favorable development of *Monilinia sp.* in April, June and August, 2006.

The evolvement of fruiting phenophases is presented in tables 3 and 4.

Table 3

The evolvement of fruiting phenophases in 2006

Variety	Bud inflation	Bud opening	Flowering			Duration of flowering
			Beginning	In full	Ending	
Earlyryl	25.02	28.02	10.03	13.03	19.03	9
Dana	25.02	28.02	11.03	14.03	19.03	8
Neptun	26.02	01.03	13.03	16.03	21.03	8
Saturn	26.02	01.03	13.03	15.03	20.03	7
Cea mai bună de Ungaria	28.02	04.03	14.03	17.03	22.03	8
Venus	01.03	05.03	16.03	19.03	23.03	7
Callatis	01.03	05.03	17.03	21.03	24.03	7
Sulina	03.03	06.03	17.03	20.03	23.03	6
Favorit	28.02	05.03	17.03	20.03	22.03	5
Selena	03.03	06.03	16.03	19.03	22.03	6
Silvana	03.03	07.03	19.03	21.03	25.03	6
Olimp	01.03	05.03	18.03	20.03	23.03	5

Out of table 3 we can observe that in 2006 the bud inflation started in 25.02 for the early varieties and in 03.03 for the late varieties, excepting Olimp variety.

The beginning of flowering started at 10.03 and continued until 19.03 for Silvana variety, observing that the varieties had a grouped blooming. The flowering duration was almost unitary, between 5 days (Olimp variety) and 9 days (Earlyryl variety).

Table 4

The evolvement of fruiting phenophases in 2007

Variety	Bud inflation	Bud opening	Flowering			Duration of flowering
			Beginning	In full	Ending	
Earlyryl	21.02	25.02	05.03	08.03	14.03	9
Dana	23.03	27.02	07.03	10.03	14.03	7
Neptun	25.02	01.03	13.03	17.03	19.03	6
Saturn	25.02	28.02	10.03	13.03	16.03	6
Cea mai bună de Ungaria	23.02	27.02	08.03	12.03	16.03	8
Venus	27.02	03.03	12.03	14.03	20.03	8
Callatis	27.02	03.03	12.03	15.03	20.03	8
Sulina	25.02	01.03	12.03	16.03	18.03	6
Favorit	25.02	01.03	10.03	12.03	16.03	6
Selena	28.02	03.03	12.03	14.03	20.03	8
Silvana	28.02	04.03	14.03	17.03	22.03	8
Olimp	25.02	01.03	10.03	13.03	18.03	8

Out of table 4 we can observe that in 2007 the bud inflation started at 21.02 for Earlyryl variety and ended at 28.02 for the late varieties Selena and Silvana.

The beginning of flowering took place at 05.03, for Earlyryl and continued until 14.03 for Silvana variety, the other varieties having a grouped flowering, arround 12.03. The flowering duration was also unitary, between 6 days (Neptun and Saturn) and 9 days Earlyryl.

Comparing the two studied years, we can observe that in 2007 the fruiting phenophases took place earlier because of the favorable climatic conditions for starting the vegetation period.

Fruits' quality: weight and mainly the chemical features of fruits, such as: dry substance, sugars and acidity will be presented in the following tables.

Table 5

Apricots weight in 2006

Variety	Medium weight of fruits (g)	Relative value %	Difference to the witness	Significance
Earlyryl	82	109,33	7,0	XXX
Dana	52	69,33	-23	000
Neptun	44	58,67	-31	000
Saturn	58	77,33	-17	000
Cea mai bună de Ungaria	75	100	0	Mt.
Venus	68	90,67	-7	000
Callatis	60	80,00	-15	000
Sulina	54	72,00	-21	000
Favorit	64	85,33	-11	000
Selena	62	82,67	-13	000
Silvana	46	61,33	-29	000
Olimp	64	85,33	-11	000

DL 5%= 1,71 DL 1%= 2,37 DL 0,1%= 3,19

Concerning the fruits' weight, in 2006, to the witness Cea mai bună de Ungaria (75g) the other varieties had very significant negative differences, having a weight between 44g, Neptun variety and 68g for Venus variety. Earlyryl variety had very significant positive differences to the witness, its fruits having a medium weight of 82 g.

Table 6

Apricots weight in 2007

Variety	Medium weight of fruits (g)	Relative value %	Difference to the witness	Significance
Earlyryl	82,2	105,38	4,2	XX
Dana	45,0	57,69	-33	000
Neptun	42,5	54,49	-35,5	000
Saturn	57,5	73,72	-20,5	000
Cea mai bună de Ungaria	78,0	100	0	Mt.
Venus	43,0	55,13	-35,0	000
Callatis	53,5	68,59	-24,5	000
Sulina	51,0	68,57	-24,5	000
Favorit	66,0	84,02	-12,0	000
Selena	63,0	80,62	-15,0	000
Silvana	47,0	60,27	-31,0	000
Olimp	74,0	94,87	-4,0	00

DL 5%= 2,56 DL 1%= 3,48 DL 0,1%= 4,68

In 2007, most of the varieties had very significant negative differences to the witness Cea mai bună de Ungaria, variety that had fruits weighting 78,0 g average. These varieties had medium weights of 42,5 g (Neptun) an 66,0g (Favorit). Olimp variety, although had big fruits of 74,0g average, value close to the witness, had distinct significant negative difference to it. Again we can remark Earlyryl, which had a medium weight of apricots of 82,2g over-passing the witness value and having distinct significant positive differences to the witness.

Table 7

Chemical features of fruits obtained in 2006

Variety	Dry substance (%)	Sugars (%)	Acidity (%mallic acid)	Gluco-acidical index
Earlyryl	15,0	13,43	0,68	19,75
Dana	16,4	14,92	0,70	21,30
Neptun	19,8	18,53	0,88	21,05
Saturn	16,2	14,71	0,73	20,15
Cea mai bună de Ungaria	16,2	14,71	0,73	20,15
Venus	15,2	13,65	0,70	19,50
Callatis	15,0	13,43	0,68	19,75
Sulina	17,2	15,77	0,76	20,75
Favorit	16,8	15,35	0,75	20,46
Selena	16,2	14,71	0,73	20,15
Silvana	17,0	15,56	0,76	20,47
Olimp	16,8	15,35	0,75	20,46

Out of table 7, we can see that in 2006 the highest percentage of dry substance was determined in the fruits of Neptun variety (19,8%), and the lowest in the fruits of Earlyryl and Callatis (15,0%). Concerning the sugars, the percentage was between 13,43% for the fruits belonging to Earlyryl and Callatis varieties and 18,53% for Neptun apricots. The lowest acidity was determined for the Earlyryl and Callatis varieties (0,68%), and the highest percentage of acidity was obtained in the apricots belonging to Neptun variety (0,88%).

Table 8

Chemical features of fruits obtained in 2007

Variety	Dry substance (%)	Sugars (%)	Acidity (%mallic acid)	Gluco-acidical index
Earlyryl	15,20	13,65	0,71	19,22
Dana	17,10	15,66	0,78	20,07
Neptun	20,70	19,49	0,97	20,09
Saturn	17,00	15,56	0,80	19,45
Cea mai bună de Ungaria	16,64	15,18	0,78	19,46
Venus	15,34	13,79	0,71	19,42
Callatis	15,00	13,43	0,71	18,91
Sulina	17,60	16,26	0,84	19,35
Favorit	17,10	15,66	0,80	19,57
Selena	16,90	15,49	0,70	22,12
Silvana	17,16	15,73	0,81	19,41
Olimp	17,10	15,66	0,81	19,33

In 2007, the highest percentage of dry substance (20,70%), sugars (19,49%) and mallic acid (0,97%) were determined also in the fruits of Neptun variety, and the lowest values, as the past year – 2006, for Callatis apricots (15,0% dry substance; 13,43% sugars and 0,71% acidity).

The chemical features of fruits had higher values in 2007 than in 2006, fact that can be explained by the long vegetation period and because of the high temperatures registered in 2007, which helped the accumulation of sugars.

CONCLUSIONS

The apricot is one of the most early vegetation species that, as we could see, started its vegetation very early, at the end of February. This thing is many times not favorable because the apricot always gets affected by the late spring frosts.

By comparing the two studied years we can see that in 2007 the fruiting phenophases started earlier than in 2006 because of the favorable climatic conditions (temperature) but this had a negative impact upon the production as the apricots were affected by late spring frosts.

Concerning fruit's quality (weight and chemical features), the values were almost the same in both years the fruits maintaining their specific features. Anyway we can remark the varieties Cea mai bună de Ungaria (witness), Olimp, Earlyryl and Favorit, having good quality fruits, great aspect, flavor and taste.

Considering the chemical composition of fruits we can remark the varieties Neptun, Silvana, Favorit and Olimp as having good quality fruits and they are recommended to be cultivated in conditions of Banat area, because they give good quantity and quality productions.

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