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THE BEHAVIOUR OF SOME PEACH CULTIVARS PERTAINING TO THE PEACH WORLD COLLECTION IN PEDOCLIMATIC CONDITIONS OF TIMISOARA AREA

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Abstract

Peach represents one of the most appreciated fruit tree variety of the temperate climate, which in the last 30 years has benefited of a special attention, fact that has led to the expansion of cultivated areas with this variety and to diversification of the assortment. Researches carried out in USA, Canada, France, Italy, Spain, even in our country had led to obtaining a large number of varieties with remarkable agro-productive characteristics. In the present work were studied 9 cultivars of peach pertaining to the Peach and Nectarine World Collection introduced and multiplied in Romania by Acad. Dr. Vasile Cociu. The cultivars originating from all continents have been planted in Timisoara in 2007 with the purpose of being tested in culture and naturalizing in Romania of some new foreign varieties. Regarding the fruit weight were evidenced 'Yinquing', 'Giala di Roma', 'Tardiva', 'Eureka' and 'Piros Magdalena'. In terms of % kernel were highlighted 'Giala di Roma Tardiva', 'Marqueen' and 'Gold Dust' cultivars with less than 7% kernel %. Concerning dry substances, the highest sugar content was registered in the fruits of following cultivars: 'Marqueen', 'Eureka', 'Yinquing' and 'Giala di Roma Tardiva'.

Key words: *Peach, Peach and Nectarine World Collection, fruit weight, percent kernel, sugar content*

INTRODUCTION

Peach represents one of the most appreciated fruit tree variety of the temperate climate, which in the last 30 years has benefited of a special attention, fact that has led to the expansion of cultivated areas with this variety and to diversification of the assortment. Researches carried out in USA, Canada, France, Italy, Spain, even in our country had led to obtaining a large number of varieties with remarkable agro-productive characteristics. In the present work were studied 9 cultivars of peach pertaining to the Peach and Nectarine World Collection introduced and multiplied in Romania by Acad. Dr. Vasile Cociu.

MATERIAL AND METHOD

The experience was conducted in the didactical plantation of Fruit Growing Department of USAMVBT.

The biological material was constituted of 10 peach cultivars pertaining to the Peach and Nectarine World Collection founded in Timisoara in the year 2007.

The cultivars originating from all continents were multiplied at SCDP Băneasa from where they were purchased afterwards being planted in the pedoclimatic conditions of Timisoara.

The planting distances were 4x2 m and the crowns were conducted in free palmette system.

Nine less known cultivars were considered for this study respectively 'Marianna', 'Sun Hun Hui', 'Yingquing', 'Piros Magdalena', 'Gold Dust', 'Eureka', 'July Elberta', 'Giala di Roma Tardiva', 'Marqeen' and 'Spring Gold' as experimental control.

It were followed aspects linked to fructification of plants as fruits dimensions, large diameter, small diameter and fruit height, average fruits weight, kernel weight and pulp dry substance content. For each element 20 fruits were analyzed. Fruits were measured with calipers

and weighed with high accuracy balance Kern Pes. Dry substance was determined with the refractometer Hanna Instruments.
All the data were statistically processed using variance analysis.

RESULTS AND DISCUSSIONS

The obtained results regarding the fruits weight in the experimental years 2012-2013 are presented in Table 1, Table 2.

Table 1. Weight of the fruits studied in 2012

Cultivar	Average weight (g)	Relative value %	Difference to the control	Significance
Marianna	49.67	133.04	12.33	X
Sun Hui Hun	45.33	121.43	8.0	-
Yinquing	93.0	249.11	55.67	XXX
Piros Magdalena	51.67	138.39	14.33	X
Gold Dust	39.33	105.36	2.0	-
Eureka	51.33	137.5	14.0	X
July Elberta	41.0	109.82	3.67	-
Giala di Roma Tardiva	62.67	167.86	85.33	XXX
Marqueen	34.0	91.07	-3.33	-
Spring Gold	37.33	100	0	control

DL5% = 11.24 DL1% = 15.19 DL0,1% = 20.23

The highest value of the fruits weight in the year 2012 was registered on 'Yinguing' cultivar (93.0 g) and 'Giala di Roma Tardiva' (62.67 g), the difference to the experiment control being very significant, positive. Values superior to the control were obtained also on the fruits of the 'Piros Magdalena' (51.33 g) and 'Marianna' (49.67 g), both being significant positive to the control.
The lowest value of the fruits weight in the experimental year 2012 was registered on the 'Marqueen' cultivar (34.0 g) however without significance, the value being close enough to the experiment control.

Table 2. Weight of the fruits studied in 2013

Cultivar	Average weight (g)	Relative value %	Difference to the control	Significance
Marianna	53.29	129.11	12.01	X
Sun Hui Hun	49.46	119.84	8.19	-
Yinquing	99.21	240.37	57.94	XXX
Piros Magdalena	54.93	133.08	13.65	X
Gold Dust	43.18	104.61	1.90	-
Eureka	55.35	134.10	14.07	X
July Elberta	44.70	108.30	3.43	-
Giala di Roma Tardiva	67.21	162.84	25.94	XXX
Marqueen	37.71	91.37	-3.56	-
Spring Gold	41.27	100	0	control

DL5% = 10.92 DL1% = 14.76 DL0,1% = 19.66

In the experimental year 2013, the highest values of the fruits weight were registered as well on 'Yinquing' and 'Giala di Roma Tardiva' cultivars, the differences to the experiment control being very significant positive. Values superior to the control were registered on 'Eureka', 'Piros Magdalena' and 'Marianna' cultivars, all being significant positive to the experiment control. The lowest value of the fruit weight was registered likewise in 2012 on 'Marqueen' cultivar, value which vas not statistically insured.
The experiment results regarding the large diameter of the fruits on the peach cultivars studied in 2012-2013 are presented in the Table 3, Table 4.

Table 3. Large diameter of the fruits studied in the year 2012

Cultivar	Large diameter (average)	Relative value %	Difference to the control	Significance
Marianna	46.0	108.66	3.67	-
Sun Hui Hun	42.33	100	0	-
Yinquing	51.33	121,26	9.0	XX
Piros Magdalena	45.0	106.30	2.67	-
Gold Dust	40.0	94.49	-2.33	-
Eureka	46.67	110.24	4.33	-
July Elberta	43.67	103.15	1.33	-
Giala di Roma Tardiva	49.17	116.14	6.83	X
Marqueen	39.33	92.91	-3.0	-
Spring Gold	42.33	100	0	control

DL5% = 5.25 DL1% = 7.09 DL0,1% = 9.44

Table 4. Large diameter of the fruits studied in the year 2013

Cultivar	Large diameter (average)	Relative value %	Difference to the control	Significance
Marianna	39.77	92.74	-3.11	-
Sun Hui Hun	42.67	99.49	-0.22	-
Yinquing	52.39	122.15	9.5	X
Piros Magdalena	46.0	107.26	3.11	-
Gold Dust	40.33	94.05	-2.55	-
Eureka	47.07	109.75	4.18	-
July Elberta	44.44	103.62	1.55	-
Giala di Roma Tardiva	50.0	116.59	7.11	-
Marqueen	40.0	93.27	-2.89	-
Spring Gold	42.89	100	0	control

DL5% = 8.16 DL1% = 11.03 DL0,1% = 14.69

Table 5. Small diameter of the fruits studied in the year 2012

Cultivar	Small diameter (average)	Relative value %	Difference to the control	Significance
Mariana	43.33	107.44	3.0	-
Sun Hui Hun	40.67	100.83	0.33	-
Yinquing	50.33	124.79	10.0	XXX
Piros Magdalena	42.67	105.79	2.33	-
Gold Dust	38.33	95.04	-2.0	-
Eureka	45.67	113.22	5.33	X
July Elberta	42.0	104.13	1.67	-
Giala di Roma Tardiva	45.0	111.57	4.67	-
Marqueen	37.0	91.79	-3.33	-
Spring Gold	40.33	100	0	control

DL5% = 5.09 DL1% = 6.87 DL0,1% = 9.16

In the year 2012, the biggest value of the large diameter of the fruit was registered on the 'Yinquing' cultivar (51.33 mm) this being distinctly significant positive to the experiment control. A value superior to the control was registered by the fruits of 'Giala di Roma Tardiva', this one being significantly positive to the experiment control. With the exception of the 'Gold Dust' cultivar, all the others cultivars had fruits large diameters superior to the control but close in value. In the experimental year 2013, the only cultivar statistically insured regarding the large diameter of the fruit was 'Yinquing', difference to the control being significant positive. Three cultivars, respectively 'Marqueen', 'Gold Dust' and 'Sun Hun Hui' had registered values inferior to the control, but they were not statistically insured.

The experiment results regarding the small diameter of the fruits on the peach cultivars studied in 2012-2013 are presented in the Table 5 and Table 6. In the year 2012 the highest value of the small diameter of the fruit was registered on 'Yinquing', difference to the

control being very significant positive. A superior value, statistically insured, was registered as well on the 'Eureka' fruits, this one being significantly positive versus the studied parameter. Values inferior to the control were registered on the fruits of the 'Marqueen' and 'Gold Dust' cultivars, but they were not statistically insured.

Table 6. Small diameter of the fruits studied in the year 2013

Cultivar	Small diameter (average)	Relative value %	Difference to the control	Significance
Marianna	44.0	104.22	1,78	-
Sun Hui Hun	41.67	98.70	-0.55	-
Yinquing	50.72	120.14	8.50	XX
Piros Magdalena	43.0	101.86	0.78	-
Gold Dust	39.0	92.38	-3.22	-
Eureka	46.0	108.96	3.78	-
July Elberta	42.5	100.66	0.28	-
Giala di Roma Tardiva	45.67	108.17	3.45	-
Marqueen	37.67	89.22	-4.55	-
Spring Gold	42.22	100	0	control

DL5% = 5.42 DL1% = 7.32 DL0,1% = 9.75

Table 7. Height of the fruits studied in the year 2012

Cultivar	Height of the fruits (average)	Relative value %	Difference to the control	Significance
Marianna	45.0	100.75	0.33	-
Sun Hui Hun	47.0	105.22	2.33	-
Yinquing	57.33	128.36	12.67	XXX
Piros Magdalena	45.33	101.49	0.67	-
Gold Dust	40.67	91.04	-4.0	-
Eureka	45.67	102.24	1.0	-
July Elberta	42.67	95.52	-2.0	-
Giala di Roma Tardiva	47.0	105.22	2.33	-
Marqueen	39.33	88.06	-5.33	0
Spring Gold	44.67	100	0	control

DL5% = 4.07 DL1% = 5.47 DL0,1% = 7.32

Table 8. Height of the fruits studied in the year 2013

Cultivar	Height of the fruits (average)	Relative value %	Difference to the control	Significance
Marianna	45.78	100.74	0.34	-
Sun Hui Hun	48.0	105.63	2.56	-
Yinquing	58,0	127.67	12.56	XXX
Piros Magdalena	46.33	101.97	0.89	-
Gold Dust	41.67	91.70	-3.77	-
Eureka	46.0	101.23	0.56	-
July Elberta	43.39	95.48	-2.05	-
Giala di Roma Tardiva	47.5	104.53	2.06	-
Marqueen	41.33	90.96	-4.11	0
Spring Gold	45.44	100	0	control

DL5% = 4.03 DL1% = 5.44 DL0,1% = 7.25

In the year 2013 the only statistically insured cultivar was 'Yinquing', the difference to the experiment control being distinctly significant positive. Values inferior to the control were registered as well by 'Marqueen' and 'Gold Dust' cultivars. The experiment results regarding the fruits height on the peach cultivars studied in 2012-2013 are presented in the Table 7 and Table 8.

In the experiment year 2012, the highest value of the fruits height was registered on the 'Yinquing' cultivar, difference to the control being very significant positive.

The lowest value of the fruits height was registered on 'Marqueen' cultivar, difference to the experiment control being significantly negative. All other cultivars had close values, not being statistically insured.
Also in the year 2013 the highest value of the fruit height was registered also on the 'Yinquing' cultivar, being very significant positive to the control experiment. The fruits of the 'Marqueen' cultivar had registered the lowest value of the fruit height, difference to the experiment control being significant negative. Values superior to the control were registered to 'Giala di Roma Tardiva', 'Piros Magdalena', 'Sun Hun Hui' and 'Marianna' cultivars but no one was statistically insured.
The experiment results regarding the kernel percentage on the peach cultivars studied in 2012-2013 are presented in the Table 9 and Table 10.

Table 9. Kernel percentage of the fruits studied in the year 2012

Cultivar	Kernel % (average)	Relative value %	Difference to the control	Significance
Marianna	13.76	125.44	2.79	XX
Sun Hui Hun	16.47	150.18	5.50	XXX
Yinquing	8.46	77.17	-2.50	00
Piros Magdalena	8.01	73.04	-2.96	00
Gold Dust	7.79	71.06	-3.17	000
Eureka	7.49	68.30	-3.48	000
July Elberta	8.37	76.35	-2.59	00
Giala di Roma Tardiva	6.29	57.33	-4.68	000
Marqueen	7.57	69.03	-3.40	000
Spring Gold	10.97	100	0	control

DL5% = 1.68 DL1% = 2.26 DL0,1% = 3.02

In the experiment year 2012 the highest kernel % was registered on 'Sun Hun Hui' cultivar (16.47%), difference to the control being very significant positive and on 'Mariana' cultivar (13.76%) difference to the control being very significant positive. On the opposite, the smallest kernel % was registered on 'Giala di Roma Tardiva' (6.29%), 'Eureka' (7.49%), 'Marqueen' (7.57%) and 'Gold Dust' (7.79%) cultivars, all being very significant negative to the experiment control.

Table 10. Kernel percentage of the fruits studied in the year 2013

Cultivar	Kernel % (average)	Relative value %	Difference to the control	Significance
Marianna	13.31	126.14	2.88	X
Sun Hui Hun	16.11	146.04	5.08	XXX
Yinquing	8.23	74.58	-2.80	0
Piros Magdalena	9.80	88.88	-1.23	-
Gold Dust	7.79	70.60	-3.24	00
Eureka	7.39	67.0	-3.64	00
July Elberta	8.32	75.46	-2.71	0
Giala di Roma Tardiva	6.45	58.45	-4.58	000
Marqueen	7.43	67.36	-3.60	00
Spring Gold	11.03	100	0	control

DL5% = 2.17 DL1% = 2.93 DL0,1% = 3.90

In the year 2013 the highest kernel % was registered on the same cultivars, respectively 'Sun Hun Hui' and 'Marianna'. The lowest % was registered on 'Giala di Roma Tardiva' cultivar which as well in the year 2013 obtained differences very significant negative to the experiment control. 'Eureka', 'Marqueen' and 'Gold Dust' cultivars also had low kernel %, difference to the experiment control being distinctly significant negative.

CONCLUSION

Regarding fruits weight in the year 2013, the values were superior to the year 2012, the climatic conditions from Timisoara being

favorable to a good growth and development of peach and acumulated with a weaker attack of Taprina sp.
In both experiment years was evidenced the asian cultivar 'Yinquing' whose fruits were close to 100 g.
Good results were obtained on the 'Giala di Roma Tardiva' and 'Piros Magdalena' cultivars, which got big and constant values in both experimental years.
Also regarding the fruits size represented by the large diameter, small diameters and height were evidenced 'Yinquing', 'Giala di Roma Tardiva' and 'Eureka' cultivars which registered big and constant values in both years.

The lowest values of the studied parameters in both experimental years and in pedoclimatic conditions of Timisoara were registerd on 'Marqueen' and 'Eureka' cultivars.
The fruits with lowest kernel percentage in both experimental years were 'Giala di Roma Tardiva', 'Eureka', 'Marqueen' and 'Gold Dust'.

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