RESEARCH ON THE VT 95.03.49 HYBRID IN ORDER TO IMPROVE THE ASSORTMENT OF APRICOT TREES IN DOBROGEA

CERCETĂRI ASUPRA HIBRIDULUI VT 95.03.49 ÎN VEDEREA ÎMBUNĂTĂȚIRII SORTIMENTULUI DE CAIS ÎN DOBROGEA

OPRIȚĂ V.A.[1]
e-mail: olaviani@yahoo.co.uk

Abstract. *Fruit quality is an ensemble of specific features and characteristics which, together with other traits, stands for the selection and promotion of varieties according to the market demand and destination. In the breeding work, this characteristic is a major objective in the selection of new genotypes. The studies were carried out between 2008 – 2011 at the Research Station for Fruit Growing Constanta, within the Breeding Apricot Tree Laboratory, on a number of 11 hybrids. The following observations were performed: the ripening period, the size of fruit, the shape, the colour of the skin, the taste and flavour and the content of nutrients, according to the present demands on the European market. The study of these hybrids has as aim the obtaining of new varieties with superior qualities, being considered for the improvement of the assortment of apricot trees in this area.*
Key words: *Prunus armeniaca*, assortment, variety, promotion.

Rezumat. *Calitatea fructelor este un ansamblu de însuşiri şi caracteristici specifice care, alături de alte criterii, stă la baza alegerii şi promovării sortimentului în funcţie de cerinţele pieţei de consum. La fel în amelioararea genetică această însuşire constituie obiectiv major în selecţia noilor genotipuri în dependenţă de destinaţia fructelor. Studiile s-au efectuat în perioada 2008 – 2011 la SCDP Constanţa, în cadrul Laboratorului de amelioarare cais pe un număr de 11 hibrizi. La aceştia s-au făcut urmatoarele observaţii şi determinări: perioada de coacere, mărimea fructului, forma, culoare pieliţei, aroma şi gustul, conţinutul în substanţe utile. Studiul asupra acestor hibrizi doreşte crearea de noi soiuri cu însuşiri organoleptice superioare, fiind considerate de perspectiva pentru îmbunătăţirea sortimentului de cais în condiţiile zonei de studiu.*
Cuvinte cheie: *Prunus armeniaca,* sortiment, soi, promovare.

INTRODUCTION

In the national strategy within the domain of research and development for the period between 2007 and 2013, sustainable agriculture must be in accordance with the demand for healthy and qualitatively superior food, thus meeting the general and specific needs of the market. (Braniţte et al., 2008)

The fruit quality as concerns the apricot trees depends on a wide range of elements, such as: shape, size, colour of the skin, taste, flavour, content of sugar and

[1] Research and Development Station for Fruit Tree Growing of Constanța, Romania

acidity within the pulp, adherence of the core to the pulp. According to the manner in which these elements are combined, a general appreciation of the quality of the fruit can be performed. By combining data following organoleptical appreciations with those obtained from chemical analyses regarding the fruit's composition of useful substances, their nutrient value and the possibility of their being processed, there can be made recommendations concerning the destination of a variety or a hybrid, as well as the using of fruit for fresh consumption or for industrial processing through dehydration, distillation and so on. (Butac and Bulgaru, 2001).

MATERIAL AND METHOD

The studies were carried out between 2008 and 2011 at the Research Station for Fruit Growing Constanta, within the Breeding Apricot Tree Laboratory. The biological material consisted of 11 apricot tree hybrids, with a blossoming period ranging from very early to very late, part of a contest crop planted in 2003. For the VT 95.03.49 hybrid the Umberto variety was used as witness. Each hybrid is represented by 28 trees, planted at a distance of 4/4, with the shape of the head being a free flat palm in the direction of the row. The applied culture technology is that specific to apricot trees, containing fructification cuts, phytosanitary treatments, soil works, irrigation, harvesting, conditioning and capitalisation of the fruit. In order to construe the data, observation were made concerning the triggering and the evolution of the vegetative and fructification stages, as well as the quantity and quality of the fruit production. The determination of physical and organoleptical characteristics was performed according to the regular methodology for the study of varieties, as follows: the weight of the fruit was determined by weighing all fruit within a sample (25 fruit) and the average weight was calculated in g/fruit; the colour of the fruit and of the pulp was established through direct visualizing, with the aid of colour codes (plastic tags with specific colours); the fruit's content of dry substance was determined by means of a digital refractometer, in Brix degrees.

The main chemical components were determined within the Chemistry Laboratory of ICDP Piteşti, as follows: the total quantity of sugar through the Fehling volumetric method; the total acidity through the titrimetric method, using phenolphthalein as indicator. The results were statistically processed by means of variance. (Botu and Botu, 1997)

RESULTS AND DISCUSSIONS

The VT 95.03.49 hybrid displays an intense fructification characteristic on short formations type May bouquets with an average growth over a period of 4 years of 98 linear meters (table 1), which means that they are smaller than those of the Umberto variety which acted as witness (103.2 linear meters), having a smaller growth vigour as well.

The VT 95.03.49 hybrid manifested its vigour through the growth of the trunk section, statistically displaying quite significant differences compared to the witness cariety Umberto, a hybrid which is considered to be having a rather average vigour, leaning towards small (table 2).

The swelling of the vegetative buds (table 3) began on the 16th of March and lasted until the 9th of April, while the blossoming began on the 23rd of March and lasted until the 13th of April.

Table 1

Volume of the head and the sum of vegetative growths (2008 - 2011)

Variety	Volume of the head – m³				Average 2008-2011	+- compared to the witness	Significance	Total growth of annual sprouts linear meters				Average 2008-2011	+- compared to the witness	Signi-fican-ce
	2008	2009	2010	2011				2008	2009	2010	2011			
VT.95.03.4	15.3	17.2	21.5	24.4	19.6	-6	000	83	107	135	67	98	- 5.2	-
Umberto (witness)	20.4	24.5	27.3	30.3	25.6	-	-	98	117	160	38	103,2	-	-
				LSD 5%	2.45							34.8		
				LSD 1%	3.33							47.3		
				LSD 0.1%	4.46							63.3		

Table 2

Growth of the trunk in thickness (years V - VIII after planting)

Variety	Surface of the trunk section -cm²						Growth rate in thickness – cm²								
							2009		2010		2011		Media 2009-2011		
	2008	2009	2010	2011	+- comp. to the witn.	Signif.	cm	Signif.	cm	Signif.	cm	Signif.	cm	+- comp. to the witn.	Signif.
VT95.03.49	130	154	177	185	-26	000	24	000	23	-	8	-	18,3	-6	-
Umberto (witness)	138	178	203	211	-	-	40	-	25	-	8	-	24,3	-	-
LSD 5%					6.6			7.16		5.42		3.5			10.6
LSD 1%					9.08			10.41		7.9		4.76			14.6
LSD 0.1%					12.5			15.62		11.84		6.38			20.1

Table 3

Main vegetative phenophases and active thermal sum (average 2008 - 2011)

Variety	Swelling of the buds		Blossoming		Beginning of sprout growth		Ending of sprout growth	Ending of the vegetative period		Duration of the veg. period (days)
	Data	tºC	Data	tºC	Data	tºC	Data	Data	tºC	
VT.95.03.49	16.03-5.04	121-129	23.03-13.04	174-236	04.04-26.04	321-387	04.07-27.07	23.10-13.11	3632-4081	200-242
Umberto (witness)	18.03-06.04	121-148	24.03-13.04	174-227	04.04-25.04	340-371	04.07-18.07	24.10-13.11	3645-4075	203-240

The beginning of sprout growth for the VT 95.03.49 hybrid was identical to the beginning of sprout growth for the witness variety.

The beginning of blossoming for the VT 95.03.49 hybrid (table 4) occurred between the 22nd of March and the 9th of April, while the ending of the blossoming occurred between the 31st of March and the 19th of April.

Table 4

Observations and determinations concerning the fructification phenophases (average 2008-2011)

Variety	Beginning of blossoming		Ending of blossoming		Duration (days)	Ripening of the fruit		Duration of the fruct. stage (days)	Average tºC
	Data	tºC	Data	tºC		Data	tºC		
VT.95.03.49	22.03-9.04	153-188	31.03-19.04	257-303	8-10	28.07-10.08	1473-1550	134-148	1525
Umberto (witness)	21.03-8.04	167-233	29.03-18.04	268-311	8-9	25.07-05.08	1586-1715	131-143	

The blossoming takes up to 8-10 days, which is enough for the realisation of the pollination and the fertilisation.

As concerns the ripening of the fruit, the VT 95.03.49 proved to be tardier than the Umberto variety, which ripens in the same climatic and soil conditions with 6-10 days earlier. In the 4 studied years, the VT 95.03.49 reached the ripening stage between the 28th of July and the 10th of August, the earliest being in 2008 (28th of July) and the latest in 2011 (10th of August).

The VT 95.03.49 hybrid has a high coefficient of natural fertility (table 5 – 30.7%), being superior to the witness variety Umberto (29.8%). The fruit production of this hybrid is positively influenced by the fertility percentage.

Table 5

Behaviour during the pollination and fertilisation process (average 2009-2011)

Variety	Autofertility %				Natural fertility %			
	2009	2010	2011	Average	2009	2010	2011	Average
VT 95.03.49	5.6	9.4	12.0	9.0	28.8	25.2	38.2	30.7
Umberto (witness)	0.5	0.5	1.1	0.7	21.0	31.8	36.2	29.8

As concerns the fruit production (table 6), it has been observed tat in favourable years, its values are higher than those of the witness variety.

Table 6

Fruit production between 2007 and 2011 (year IX of vegetation)

Period		V.T. 95.03.49	Umberto	
2007	kg/tree	14	21	
	t/ha	8.7^{O}	13.1	LSD 5%=3.70; LSD 1%=5.04 LSD 0,1%=6.75
2008	kg/tree	30	20.7	
	t/ha	18.7^{OO}	12.9	LSD 5%=6.37; LSD 1%=8.76 LSD 0,1%=12.6
2009	kg/tree	5.1	1.4	
	t/ha	3.1	0.9	LSD 5%=0.78; LSD 1%=1.06 LSD 0,1%=1.42
2010	kg/tree	20.8	13.5	
	t/ha	12.8^{OO}	8.4	LSD 5%=0.84; LSD 1%=1.14 LSD 0,1%=1.53
2011	kg/tree	21	16	
	t/ha	13.1	10.0	LSD 5%=4.20; LSD 1%=4.470 LSD 0,1%=7.60
Average 2007-2011	kg/tree	18.1	14.5	
	t/ha	11.3	9.0	
	+- comp. to the witn.	2.3	-	
	signif.	-	-	

The year 2008 is considered to have been favourable for the fruit production from a climatic point of view, the lower temperatures during the blossoming (5.7 – 12.6º C) leading to a delay in this phenophase and implicitly, to a good tying, thus realizing a greater production (18.7 t/ha), the difference being significantly positive when compared to the witness variety. The year 2009 was unfavourable to the cultivation of apricot trees because of the climatic accidents that occurred during the blossoming stage (-2.9ºC in the air and -5°C on the ground), which led to the destruction of the tied fruit; however, this hybrid proved to be more resistant, the production being of 3.1 t/ha. The year 2010 was not quite favourable for the apricot tree because of the extended draught from the previous year, thus determining a production of 12.8 t/ha of the VT 95.03.49. The value was fairly positively significant compared to the witness (8.4 t/ha), which demonstrates its ability to adapt to the climatic conditions characterised by an extended draught in the previous year.

In 2011, the VT 95.03.49 realised an average production of 13.1 t/ha and it is safe to say that it has remade its productive potential faster than the witness variety.

Analysing the average of the fruit production over a period of 5 years and taking into account the year 2009, when the production was quite low, we can state that this hybrid realized an average production of over 11 t/ha.

A criterion based on which a variety in promoted into the assortment is the appreciation of the resistance to cold and variations in temperature (fig. 1).

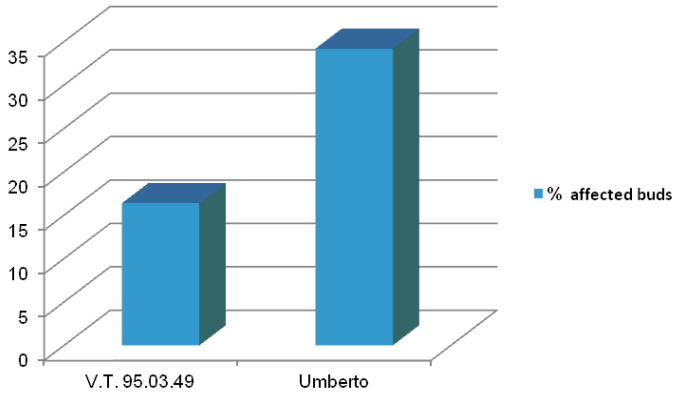

Fig. 1 – Resistance to cold of flowering buds

Between 2007 and 2011, before the beginning of the vegetative stage, observations for this hybrid were performed on over 820 flowering buds. We can state that the VT 95.03.49 is highly resistant to low temperatures and fairly resistant to comeback cold periods, the average percentage of destroyed buds over a period of 4 years being of 16.4%, as compared to 34.2% for the witness variety.

CONCLUSIONS

1. The VT 95.03.49 hybrid can be considered a variety with a late ripening stage and it can improve the structure of the current assortment, which is still lacking in tardy varieties (in the area).

2. This hybrid outlines for the first time the consumption of tardy fresh fruit, given the fact that the ripening stage occurs 10 days later than at the witness variety Umberto (beginning with the first 10 days of August), thus making the hybrid superior to the witness variety.

3. The guarantee of this variety's value is also given by its adaptability to local climatic and soil conditions, expressed through its high resistance to the extreme temperatures specific to this area, to diseases and pests, which recommends its homologation as variety and its extension within crops.

REFERENCES

1. Botu I., Botu M., **1997** - *Metode şi tehnici de cercetare în pomicultură*. Ed. Conphys, Rm. Vâlcea.

2. Branişte N. şi colab., 2008 - *Quality of cultivars range for the major fruit species freshly marketed in Romania*. ICDP Piteşti-Mărăcineni.

3. Butac Mădălina, Bulgaru Liliana, 2001 - *Rezultate parțiale privind comportarea unor hibrizi pe perspectivă la prun sub aspectul calității fructelor*. Buletin ştiințific nr. 65, ICPP Piteşti-Mărăcineni.