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THE ADAPTATION CAPACITY OF THE HYBRID VT 66.30.52 IN DOBROGEA CLIMATE CONDITIONS

Vlăduț-Alexandru OPRIȚĂ[1], Leinar ȘEPTAR[1], Ion CAPLAN[1], Corina GAVĂȚ[1], Cristina MOALE[1], Gheorghe LĂMUREANU[1]

[1]Research Station for Fruit Growing Constanta, No. 25 Pepinierei Street, Valu lui Traian, 907300, Constanța

Corresponding author email: olaviani@yahoo.co.uk

Abstract

The expansion of apricot consumption depends on the marketing, the quality of the fruit upon harvesting and on their cost. Market trends that have an impact upon apricot consumption are: globalization, the need for year round supplies of produce, the high cost labour, the diversification of the safety issues of pesticide use and bacterial contamination of fresh fruit. These pressures have renewed the interest in production systems in order to extend the harvest season, to reduce chemical inputs and to ensure a consistent fruit quality. Therefore, our efforts were focused on developing new varieties with high quality of fruit, higher levels of production, a greater diversity of fruit types to market and the adaptation to climate changes which have recently begun to occur. In this paper we studied the characteristics of the VT 66.30.52 hybrid, having as witness the variety Marculesti 22/4. The experimental determination was conducted the at Research Station for Fruit Growing Constanța between 2012 and 2015. The hybrid VT 66.30.52 proved to be superior to the witness in terms of weight of the fruit, their firmness, the dry matter and the colour of the skin.

Key words: *Prunus armeniaca, assortment, variety, promotion.*

INTRODUCTION

Throughout the entire world the research carried out concerning the apricot trees have among its main objectives the relationship between the climatic conditions and the cultivation of apricot trees. In our country, this relationship has been studied by many authors, among which we should mention the results obtained by Constantin N. ș.a (1955), Burloi Niculina (1957), Bordeianu T. et all. (1961), Cojean Natalia (1961), Mănescu Creola et al. (1975), Topor Elena (1987, 2002), Stancu T. et al. (1989), Roman Ana Maria (1998), Topor Elena (2009).

The results obtained by all these studies corresponded to a certain period of time and to a certain assortment of varieties, thus creating the link between the biology of the apricot tree and the climatic conditions in the area where it is cultivated (Topor E. 2009).

The purpose of this paper is to study the apricot tree hybrid VT 66.30.52 as concerns its phenological phases, its growth and productivity as well as the quality of the fruit, in order to improve the assortment of apricot trees in the climatic conditions of Dobrogea.

MATERIALS AND METHODS

The studies were carried out between 2012 and 2015 at the Research Station for Fruit Growing Constanta, within the Breeding Apricot Tree Laboratory. The biological material consisted of 2 apricot tree hybrids, part of a national collection planted in spring of 2009. Each hybrid is represented by 3 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 organoleptic 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.

RESULTS AND DISCUSSIONS

In order for the blossoming phenophase to begin in the pedoclimatic conditions of SCDP Constanta, the VT 66.30.52 hybrid required 205.6 – 271.1ºC and a period of 5 to 10 days, enough for the pollination and the fertilization.
For the 'VT 66.30.52', the blossoming took place in 2013 on the 21th of March, six days earlier that the witness variety Marculesti 22/4, and in 2015 on the 19th of March (table 1).

Table 1. Main fructification phenophases (2013-2015)

Variety	Year	Beginning of blossoming		Ending of blossoming		Duration of the bloss. (days)	Ripening of the fruit		Duration of ripen. (days)
		Date	tºC	Date	tºC		Date	tºC	
VT 66.30.52	2013	21.03	142.2	2.04	218.8	13	23.06	1479.7	93
	2014	25.03	191.3	4.04	271.1	11	20.06	1526.8	88
	2015	19.03	139.8	30.03	205.6	12	15.06	1413.1	87
Marculesti 22/4 mt.	2013	27.03	159.5	5.04	242.9	10	1.07	1700.3	107
	2014	28.03	191.3	4.04	271.1	9	23.06	1693.4	87
	2015	25.03	191.3	4.04	271.1	11	1.07	1501.7	97

The date when the fruit become ripen is a biological characteristic for the 'VT 66.30.52'; this stage took place in 2014 and 2015 on the 15th of June, eight and nine days respectively earlier than the witness variety, proving that it belongs in the category containing varieties with extra-early ripening of the fruit (until the 30th of June).

The vigour of the trees' growth, represented by the growth in thickness of the trunk and the total growth of the annual sprouts between 2013 and 2015 (vegetative years V - VII) reveal a lower vigour for the 'VT 66.30.52', as compared to the witness variety Marculesti 22/4, this hybrid being considered as having a medium vigour (table 2).

Table 2. Surface of the trunk section and the total growth of annual sprouts
Years V-VII since cultivation (2013-2015)

Variety	Surface of the trunk section cm²				Growth rate 2013 - 2015			Average growth rate	Average number of sprouts/tree			Total growth of annual sprouts linear meters		
	2012	2013	2014	2015	2013	2014	2015		2013	2014	2015	2013	2014	2015
VT 66.30.52	37.3	49.1	54.9	59.9	11.8	5.8	5.0	7.5	70	40	79	18.3	17.3	21.9
Marculesti 22/4	34.2	62.5	71.8	98.1	28.2	9.3	26.3	21.2	58	60	93	21.2	31.7	34.8

Considering the tree as a whole and judging by the surface of the trunk section, the rate of the growth in thickness and the sum of the annual vegetative growth, it is revealed that the VT 66.30.52 has the tendency of having a moderate habitat, the fructification occurring mostly on branches that are 1 year old – mixed branches and May bouquets.

Analysing the average fruit production over the three years, we can state that the VT 66.30.52 fits in the category of productive varieties, its production ranging from 11 to 15 t/ha. Thus, it proves that it is worth being taken into account due to this quality (table 3).

Table 3. Fruit production over the period 2013-2015.

Variety	Year`	Average prod. 2013-2015		Diff. comp. to the witness +-	Signif.	Production dex kg/cm trunk sect.
		Kg/tree	t/ha			
VT 66.30.52	2013	23.7	14.8	+8.9	xxx	0.48
	2014	16.0	10.4	+4.1	xxx	0.29
	2015	22.4	11.2			0.37
	Average	20.7	12.13			
Marculesti 22/4	2013	9.4	5.9	-	-	0.15
	2014	10.0	6.3	-	-	0.13
	2015	15.0	7.5	-	-	0.15
	Average	11.4	6.5			

DL. 5% - 0.45; DL.1% - 0.61; DL. 0.1% - 0.81

From the determinations that were carried out, the conclusion was the fruit's loss of weight was a consequence of the draught in 2013. This hybrid managed to accumulate an average quantity of 13.7g/100g S.P. total sugar and 15.9% S.U.T., (table 4) which is a predominant characteristic of chosen genitors.

Table 4. Main physical and chemical characteristics

Variety	Year	Average weight of the fruit g.	% core	S.U.T. %	Total sugar g/100gS.P.
VT 66.30.52	2013	56	6.0	14.5	10.8
	2014	22.6	8.3	16.0	14.5
	2015	54.5	5.6	17.3	15.8
	Average	44.3	6.6	15.9	13.7
Marculasti 22/4	2013	60	6.0	14.5	10.3
	2014	34.6	5.4	14.2	12.5
	2015	50.2	9.3	14.5	12.9
	Average	48.2	6.9	14.4	11.9

The fruit which ripens early has a small to medium size, it is symmetrical and round (table 5). The main colour of the skin is orange with carmine on the sunny side. The pulp is light orange, with a smooth texture and a soft consistency and it does not adhere to the core.

Table 5. Shape and size of the fruit

Variety	D	d	H	Shape index (mm)
VT 66.30.52	48	40	55	1.1
Marculesti 22/4	41	37	53	1.2

According to the value of the attack degree of the frequency, the 'VT 66.30.52' hybrid fits into the resistance group 1=easily attacked in the conditions of the performance of phytosanitary treatments. In order to establish the resistance to disease of the 'VT 66.30.52', the relative resistance index was calculated, R=0.8, which proves that its value is higher than 0.7, this being a resistant variety (table 6).

Table 6. Resistance to *Stigmina carpophila* (2013-2015)

Variety	Frequency of attack %				Intensity of attack %			Resistance group			Degree of attack		
	2013	2014	2015	Average	2013	2014	2015	2013	2014	2015	2013	2014	2015
VT 66.30.52	4.8	4.8	1.5	3.7	+	+	+	1	1	1	0.1	0.4	0.01
Mt.	6.5	3.2	1.3	3.6	+	+	+	1	1	1	0.3	0.1	0.01

CONCLUSIONS

The 'VT 66.30.52' hybrid can be considered a variety with early ripening and it can improve the structure of the current assortment which still lacks in early varieties (in the area). In the district of Constanta, with the aid of the 'VT 66.30.52', the apricot season between the 15th and the 23rd of June become more diverse as concerns the consumption of fresh fruit, this variety being considered a perspective one.

This hybrid offers for the first time in this area the possibility of extending the consumption of early fresh fruit, given the fact that the fruit become ripen until the 20th of June (beginning with the second decade of June) compared to the witness variety. Thus, the hybrid is superior in terms of elements such as: the ripening precocity, the productivity, the commercial aspect, the resistance to diseases, organoleptic traits.

The guarantee for this variety's value is its adaptability to local conditions of climate and soil, expressed through its increased resistance to extreme temperatures in the area, to diseases and pests, which recommends its extension in cultivation.

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