

## **THE BEHAVIOUR OF SOME VARIETIES OF APRICOT TREE NEWLY INTRODUCED IN THE CROP WITHIN ORADEA FRUIT GROWING ECOSYSTEM**

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### ***Abstract***

*The annual decreases and fluctuations in the fruit production determined by the variable climatic conditions from one year to another, being found in interaction with the cultivated varieties, have inspired multiple concerns in the scientific research and practical activities till now. The concept of modern ecology that includes the variety among the means of production as single beneficiary of the whole ecosystem within production, the assortment of varieties has a determining importance. By its dynamic character, the assortment, either father plant can and must be continuously improved by halting from multiplication of the varieties with a low qualitative and productive potential, and the varieties recommended for multiplication by repetitive conservative selection must be improved and the newly created varieties within our country or newly introduced from the international assortment must be put into practice.*

*For the improvement of the apricot tree assortment within Oradea fruit-growing basin, there have been studied six varieties, newly introduced in this area, some of them being introduced from abroad in comparative competition crop during the period 2003-2005. For comparison, Cea mai bună de Ungaria was used as a control variety, still widely spread in production.*

**Key words:** varieties of apricot, diameter of the trunk (cm), generative phenological phases, morphological and organoleptics characteristics of fruits,

### **INTRODUCTION**

The competition crop belongs to the Research and Development Fruit-Growing Station, Oradea, being placed on a land with a gentle slope 12-15 %, that is not antierosional planned and with a southern exposition. The soil is brown clay migrated with a weak textural differentiation and with a granite structure, relatively well expressed in the superior horizons. The underground water is found at a corresponding depth. From a chemical point of view, the soil has a weakly acid pH 6-6,5, and the humus content corresponds to a middle natural fertility state.

From an ecoclimatic point of view, the period of vegetation for the respective species is extended on average along 196 days from the third decade of March till the middle of October.

The annual average temperature oscillates around 10° C and 16, 5° C during the vegetation period. The minimum absolute temperature is - 28° C,

decreasing in the last years, being very close to the resistance limit of the fruitful buds.

The temperature variations that appear during the optional dormancy can negatively affect the productive potential of the fruit trees.

The shining period during the vegetation period was of 1630 hours, a satisfactory value for the apricot tree and the annual precipitation had an average value of 635 mm, with a corresponding distribution. Besides the temperature variation during the dormant period, the productive potential of most of the varieties cultivated, that are blooming later, can be diminished when hoar frost and late hard frost appear, phenomena that are present in Oradea for 2-3 years in a period of 10 years.

#### MATERIAL AND METHOD

As in can be seen from table 1, there have been studied 7 varieties of apricot trees including the control variety, out of which 2 come from USA (NJA 19 and Goldrich), one from Canada( Harcot), and from România ( Venus, Comandor, Olimp, and the control varietz, Cea mai bună de Ungaria).

*Table 1.*

Origin, maturation period and the place for the assortment from Oradea

Crt. no.	Name of variety	Origin country	Maturation period	Place in the assortment from Oradea
1.	Harcot	Canada	Early (VI/1)	To analyse
2.	NJA 19	SUA	Early (VI/1)	To analyse
3	Cea mai bună de Ungaria	RO/Ungaria	Middle (VII/2)	Cultivated
4.	Goldrich	SUA	Middle (VII/2)	To analyse
5.	Venus	România	Middle (VII/2)	To analyse
6.	Olimp	România	Late (VIII/2)	Cultivated
7.	Comandor	România	Late (VIII/2)	Cultivated

Amongstudied varieties, two have an early period of fruit maturation ( NJA 19 and Harcot), three have a middle maturation ( Goldrich, Venus and control variety) and two have a late maturation( Comandor and Olimp).

Work method comparative method with the control variety Cea mai bună de Ungaria. For the estimation of the varieties under study there have been made some observations and determinations as regards the growing strength of the fruit trees, the development of phenological phases, the productive potential, the fruit crop and their morphological and organoleptics characteristics.

## RESULTS AND DISCUSSION

The growing strength was estimated according to the size of fruit trees, the length of annual growths and to a general evaluation.

*Table 2.*

The growing strength of the ten year old fruit trees

Crt. no.	Name of variety	Size of the fruit trees			The length of the annual branches	General strength
		Height of fruit trees (m)	Diameter of the crown (m)	Diameter of the trunk (cm)		
1.	Harcot	2,87	2,70	10,94	59,5	Middle to high
2.	NJA 19	3,38	2,74	13,30	83,8	High
3.	Cea mai bună de Ungaria	3,10	2,77	9,70	75,0	High
4.	Goldrich	2,77	2,71	9,54	45,1	Middle to high
5.	Venus	2,69	2,65	10,66	65,2	Middle to low
6.	Olimp	2,85	2,69	10,42	56,6	Middle to high
7.	Comandor	2,84	2,59	10,58	58,5	Middle to high

The height of fruit trees recorded increasing values from 2,69 m for Venus variety to 3,38 m for NJA 19. The crown diameter varies within relatively closed limits from 2,59 m for Comandor variety to 2,77 m for the control variety ( Cea mai bună de Ungaria). The diameter of the trunk, important element in the estimation of the productive potential of the fruit trees, through the productivity index, expresses increasing values from 9,54 cm for Goldrich to 13,30 cm for NJA 19. The length of annual branches with increasing values from 45,1 cm for Goldrich to 83,8 cm for NJA 19 expresses favourable connections between the growing and fructification processes of the fruit trees. A general estimation shows a weak to middle strength for Venus, a middle strong streng for Harcot, Olimp, Comandor and Goldrich and a strong strength for NJA 19 and Cea mai bună de Ungaria.

The development of the generative phenological phases. As a consequence of a shot relative winter dormancy, the swelling of the fruitful buds on the 8 of March for NJA 19 or the 11 of March for the control varietz Cea mai bună de Ungaria. The beginning of blooming was observed the earliest on the 16 of March for NJA 19 and the latest for the control variety.

Table 3.

The development of the generative phenological phase general favourable estimations

Crt. no.	Name of variety	Generative Phenological Phases			Features of favorability
		Swelling of buds	Beginning of blooming	Average duration of growth at fruits	
1.	Harcot	10.03	23.03	92	Relatively resistant to cold
2.	NJA 19	8.03	16.03	89	Relatively resistant to cold and diseases
3.	Cea mai bună de Ungaria	11.03	27.03	104	Self-fertility and resistant to cold
4.	Goldrich	9.03	24.03	114	Self fertile and relatively resistant to cold
5.	Venus	10.03	24.03	103	Relatively resistant to cold
6.	Olimp	9.03	17.03	127	Self fertile and relatively resistant to cold
7.	Comandor	10.03	26.03	128	Self fertility and resistant to cold

Expressed by the period of time from the end of blooming till the beginning of maturation, the stage of fruit growing values from 89 days for NJA 19 days for Comandor with a late maturation.

By a general evaluation of some valuable features, most of the studied varieties present a relatively increased resistance against the frost during winter and similarly to the late spring hoar-frost. NJA 19 variety presents an increased resistance to cryptogamic diseases and Venus and Comandor must be appreciated for their relative self-fertility.

The resistance of the late spring hoar-frosts. When the temperature decreased to 1,50° C at the level of the fruit crown, the percent of viable pollen grains recorded increasing values from 48,86 % for Olimp variety to 91,57 % for Venus.

Table 4.

The resistance of flowers to late spring hoar frost

Crt. no.	Name of variety	Viability of pollen		Degree of producing flowers	
		Viable grains (%)	Germinated grains (%)	Free polination (%)	Self polination
1.	Harcot	90,97	90,0	41,0	6,5
2.	N.J.A. 19	83,33	79,0	29,0	7,1
3.	Cea mai bună de Ungaria	88,90	80,0	32,0	6,6
4.	Goldrich	67,27	62,0	31,0	7,9
5.	Venus	91,57	88,0	33,0	11,0
6.	Olimp	48,86	31,0	37,0	6,0
7.	Comandor	85,38	80,0	30,0	11,0

The superior viability of the pollen was recorded for Cea mai bună de Ungaria (88,50%), Comandor 85,38%) and NJA 19 (83,33%). The percent of germinated grains recorded values from the 31% for Olimp, followed by Goldrich with 62 %, NJA 19 With 79 % and by the Cea mai bună de Ungaria with 80 %, Venus with 88% and Harcot with 90 %.

The degree of flower producing in the case of free pollination recorded increasing values from 29 % for NJA 19 to 41% for Harcot and in the case of self pollination there were recorded values from 6,0 % for Olimp variety to 11% for Venus and Comandor.

For apricot varieties under study, the fruit production recorded increasing values from 11,47% kg/fruit tree for the control variety Cea mai bună de Ungaria, to 38,83 kg/fruit tree for Olimp variety. Being estimated according to the surface assigned to the same varieties, the fruit production can be of 9,53 t/ha, respectively 27,34 t/ha.

*Table 5.*  
The annual production for ten to twelve year old fruit trees( average values 2003-2005)

Crt. no.	Name of variety	Fruit production			Diference +/- towards the control variety	Significance of difference
		Absolute		Relative towards the control variety (%)		
		kg/tree	t/ha			
1.	Harcot	15,5	12,53	131	+3	xxx
2.	NJA 19	22,36	18,62	195	+9	xxx
3.	Cea mai bună de Ungaria	11,47	9,53	100	-	-
4.	Goldrich	32,31	26,91	282	+17	xxx
5.	Venus	20,59	17,15	180	+7	xxx
6.	Olimp	32,83	27,34	287	+17	xxx
7.	Comandor	19,07	15,88	167	+6	xxx

From a relative point of view, in comparison with the control variety, there are noticed exceedings for all the varieties as follows: for Harcot 31%, for Comandor 67 %, for Venus 80 %, for NJA 19 195 %, for Goldrich variety 182 % and Olimp 187 %. The actual differences towards the control variety start from 3 t/ha for Harcot to 17 t/ha for Olimp and Goldrich.

From a statistical point of view, all the varieties have recorded very positively distinctively significant differences, in comparison with the control variety.

As it is known, the exterior aspect and organoleptics characteristics of the pulp are important especially when the fruits are for fresh consumption. For

the studied varieties, the weight of fruits recorded increasing values from 42,52 g for Goldrich to 68,38 for Comandor.

Table 6.

Morphological and organoleptics characteristics of fruits

Crt. no.	Name of variety	Fruits hardship and proportion		Organoleptics characters	
		Fruit (g)	Stoneproportion (%)	Consistency	Taste
1.	Harcot	49,20	7,29	Firm	Balance- sweet
2.	NJA 19	50,25	6,47	Middle	Pleasant- wean
3.	Cea mai bună de Ungaria	47,81	7,26	Middle	Bitter- sweettasty
4.	Goldrich	42,52	7,01	Middle	Easy-acidulated tasty
5.	Venus	48,58	4,28	Middle	Sweetish fine
6.	Olimp	48,29	8,71	Middle	Bitter- sweet fine
7.	Comandor	68,38	7,03	Firm	Balanced- fine

The stone represents from 6,47 % for NJA 19 to 8,71 % for Olimp of the total weight of the fruit.

From an organoleptics point of view, the fruit pulp varies from a firm consistency for Comandor and Harcot to a middle consistency for NJA 19, Venus, Olimp, Goldrich and Cea mai buna de Ungaria.

The taste varies from balanced pleasant for Comandor, NJA 19, Olimp and Cea mai bună de Ungaria to mellow for Venus and Harcot and weakly acidulated for Goldrich.

The flavour of the fruit pulp is fine, pleasant for Comandor, Venus, Olimp and less pronounced but pleasant in the same for Harcot, Goldrich and NJA 19.

## CONCLUSIONS

From the achieved data, we can draw the following conclusion:

The biotop parameters within Oradea fruit growing basin provide favourable conditions for the growth and fructification of the apricot tree.

The diversity of the apricot varieties under study present a wide biological aspect as regards the strength of growth of fruit trees, productive potential, period of fruit maturation, quantity and quality of crop.

The varieties of apricot tree under study present a vigorous growth differentiated from weak for Venus to middle for Harcot, Olimp, Comandor and Goldrich, and strong for NJA 19 and Cea mai bună de Ungaria. In Oradea fruit growing basin, the blooming phenological phase for apricot tree starts early when the danger of hoar frost and late hard frosts is still present.

The presence of the low temperatures during the blooming phenological phase can determine the decrease of the productive potential of fruit trees which is differentiated according to the variety.

The most productive varieties proved to be Olimp and Goldrich, followed by NJA 19, Venus and Harcot

The apricot varieties under study present a phasing in the fruit maturation: from early maturation for NJA 19 and Harcot, middle maturation for Goldrich, Venus and Cea mai bună de Ungaria, to a late maturation for Comandor and Olimp.

The quality of the fruits belonging to the varieties under study is within the parameters specific to requirements of a modern market.

It is recommended the promotion to multiplication and the introduction in the new plantation of Olimp, Goldrich, NJA19, Venus, and Comandor varieties and the halting multiplication of Cea mai buna de Ungaria variety.

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