RESEARCHES REGARDING THE BEHAVIOUR OF THREE NECTARIN CULTIVARS IN DIFFERENT ORCHARD MANAGEMENT

CERCETĂRI PRIVIND COMPORTAREA A TREI SOIURI DE NECTARIN ÎN DIFERITE CONDIȚII DE AGROTEHNICĂ POMICOLĂ

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Abstract. *Research Station for Fruit Growing Constanta created many new cultivars for apricot, peach and nectarine species and for their promote in the culture there were necessary many others studies. In this way, were organized a new experiment which included three factors, these ones being: Factor A: the cultivar: Delta, Cora, Romamer 2, Factor B: planting distances: 6/2 m; 4/3.5 m; 4/3.0 m; 4/1.5 m; Factor C: the crown shape: Tatura trellis vertical axis, veronese vase, improved vase. The unroll activities were composed of: the pruning for crown shape formation; the determinations and observations regarding vegetative grows, fructification stages, fruit qualities productivity on cultivars, shape crown and planting distances. The results for seven years shows that the improved vase and vertical axis support the economic yields in correlation with very good qualities of fruit for all three cultivars.*

Rezumat. *Staţiunea de Cercetare-Dezvoltare pentru Pomicultură Constanţa a creat multe soiuri de cais, piersic, nectarin şi pentru promovarea acestora în cultură au fost necesare şi alte studii de agrotehnică pomicolă. În acest sens, a fost organizată o experienţă în care s-au studiat trei factori: factorul A – soiul: Delta, Cora, Romamer 2; factorul B – distanţe de plantare 6/2 m; 4/3,5 m; 4/3,0 m; 4/1,5 m; factorul C – forme de coroană: Tatura trellis, cordon vertical, vas veronez, vas ameliorat. Activităţile desfăşurate au constat în: tăieri pentru formarea coroanelor; observaţii şi determinări privind creşterea vegetativă, fenofazele de fructificare, calitatea fructelor, productivitatea/ soi/ formă de coroană/ distanţă de plantare. Rezultatele obţinute pe parcursul a 7 ani au arătat că se susţine economic formele de coroană: vas ameliorat şi cordon vertical pentru toate cele 3 soiuri luate în studiu.*

INTRODUCTION

In Romania, though there are very favorable soil and climatic conditions in many fruit trees growing areas, nectarines cultivation hasn't extended owing to the absence of the competition with peach cultivars and not knowing some specific details in nectarines culture technology.

At present, cultivators are very much interested in this crop, prices being an important stimulus in fruits market. In order to encourage the respective cultivators, the Research Station for Fruit Growing Constanta has offered the first technical guidance still 2003 and organized a new experimental crop especially with reference to the crop technology of early nectarine cultivars (considering the conditions in Romania).

In this paper we present the results of observations and determinations on the influence of some shapes, of the crown over the vegetative growth and three new nectarine cultivars starting fruit bearing, cultivars obtained at the Research Station Constanta.

MATERIALS AND METHODS

Cora, Delta and Romamer 2 which were studied were grafted on one year old peach trees T16. Each cultivars was produced in 4 crown shapes: Tatura trellis, Vertical belt, Verona vase and Ameliorated vase, planted distances varying from 6/2m (833 trees/ha), 4/1.5 m (1666 trees /ha), 4/3 m (833 trees/ha) and 4/3.5 m (714 trees/ha).

All data commented further on; represent an average of 5 trees in 2002-2007 periods, since the planting moment. It was considered the influence of the crown shape and soil over trees growth (indicators: trees height (H), trunk diameter, crown diameters following the directions of the trees line (D) and the perpendicular of the trees line (d) and the fructification of trees (indicators: precocious ripening, fruit production per tree and ha, fruit qualities).

RESULTS AND DISCUSSIONS

Considerations regarding the influence of crown shape over certain factors of fructifications

The observations regarding the beginning of blossoming and those on fruits maturity at harvest time are not influenced by the systems of cultivars management, these phenophases being genetically determined and under climatic conditions influence. So, in the earliest year which were 2007, the nectarine cultivars began to blossom on the end of March (between 27-30 March) and in the latest year which were 2003 the nectarine cultivars began to blossom on the first of May (between 1-3 May)(table 1).

Table 1

-The phenology evolutions for nectarine cultivars 2003-2007 period limits*

Cultivars	Beginning of the blossom	The end of the blossom	The become hard of stone	The harvest maturity
Cora	27.03…1.05	9.04…7.05	4.06-12.06	22.06-1.07
Delta	29.03…1.05	11.04…7.05	4.06-12.06	24.06-4.07
Romamer 2	30.03…3.05	13.04…7.05	4.06-13.06	28.06-4.07

*the earliest year was 2007
The latest year was 2003

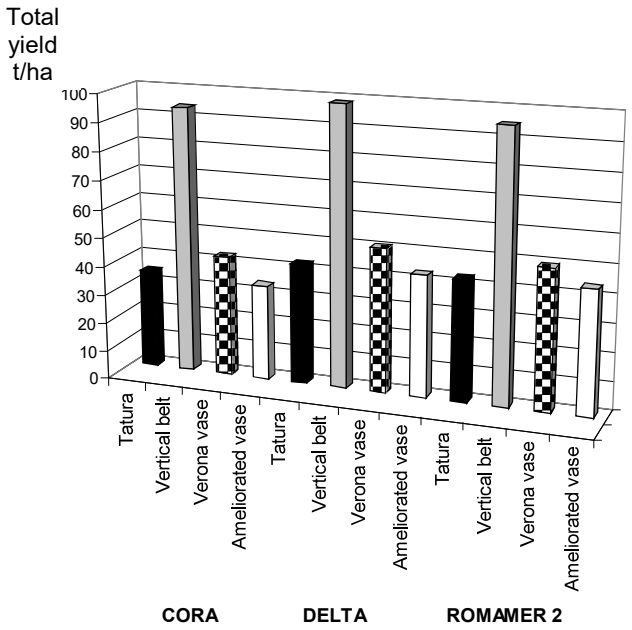
Fruit harvesting period is earlier in comparison with another nectarine cultivars from assortment that represents an important advantage in the trade with nectarines. Variation limits of harvesting period were between 22 June and 1 July for Cora 24 June-4 July for Delta and 28 June-4 July for Romamer 2. Nectarine is the species with a great productivity since second year after planting and therefore the number of trees/ha and the crown shape are more important in first years of bearing.

In the table 2 on see that the yields obtaining per tree ranged between 41.40 kg for Cora and 51.13 kg for Romamer 2 at Tatura shape; between 56.1 kg for Cora and

59.2 kg for Delta at Vertical belt; between 50.83 kg for Cora and 60.73 for Delta at Veronese vase; between 46.1 kg for Cora and 61.23 kg for Romamer 2 at ameliorated vase.

The yield quantity obtaining per tree in the first five years from planting, no showed us differences to large between cultivars or crown shape, but values regarding the yield per surface unit (hectare) where plants density interfere, being determined by the crown shape and planting distance and very much different.

So, on first place there is situated vertical belt with the yields ranged between 93.45 t/ha for Cora and 98.33 t/ha for Delta, while the smallest yield/ha.
had ameliorated vase ranged between 33.27 t/ha for Cora and 43.72 t/ha for Romamer 2 (graph 1).



Graph 1 – Total yield for different crown shape (2002-2007 period)

Nectarine cultivars run for study are with very early ripening period, small to medium fruit weight, stone with adherence of flesh, all these characters being genetic established and a little influenced by the environmental and technological conditions.

Table 2.

Yields per tree and hectare

Cultivar	Crown shape*	The yields/years								The sum of period	
		2004		2005		2006		2007			
		kg/tree	t/ha	kg/tree	t/ha	kg/tree	t/ha	kg/tree	t/ha	kg/tree	t/ha
CORA	Tatura	1.16	0.97	1.74	1.45	16.5	13.74	22.0	18.32	41.40	34.48
	Vertical belt	1.42	2.37	2.37	3.95	23.3	38.82	29.0	48.31	56.09	93.45
	Verona vase	1.41	1.17	1.92	1.60	22.5	18.74	25.0	20.85	50.83	42.36
	Ameliorated vase	1.02	0.73	2.19	1.56	19.9	14.20	23.5	16.78	46.61	33.27
DELTA	Tatura	1.34	1.12	2.52	2.10	19.8	16.49	27.0	22.49	50.66	42.20
	Vertical belt	1.45	2.41	2.97	4.96	24.6	40.98	30.0	49.98	59.02	98.33
	Verona vase	1.39	1.16	2.44	2.03	27.1	22.57	29.8	24.82	60.73	50.58
	Ameliorated vase	1.10	0.78	2.11	1.51	27.1	19.34	29.5	21.06	59.81	42.69
ROMAMER 2	Tatura	0.67	0.56	1.76	1.47	21.7	18.08	27.0	22.49	51.13	42.60
	Vertical belt	0.76	1.27	1.44	2.39	25.8	42.98	29.0	48.31	57.00	94.95
	Verona vase	0.10	0.92	3.11	2.59	25.79	21.48	29.2	24.32	59.20	49.31
	Ameliorated vase	1.15	0.82	3.36	2.40	25.32	18.08	31.4	22.42	61.23	43.72

*The number of trees/ha and crown shape is:
833 trees/ha - Tatura
1666 trees/ha - Vertical belt
833 trees/ha - Verona vase
714 trees/ha - Ameliorated vase

Fruit weight average varied for the same cultivar depending on crown shape a little, being for Cora between 72.5 g (Tatura) and 79.0 g (Vertical belt), for Delta between 84,0 g (Tatura) and 87,0 g (Verona vase), for Romamer 2 between 80.0 g (Ameliorated vase) and 84.5 (Vertical belt) (Table 3).

Table 3.

The values of main traits of fruit

Cultivar	Crown shape	Weight fruit average (g)	Weight of stone average (g)	Stone percent	Dry matter content %	Total acidity g% malic acid
CORA	Tatura	72.5	9.5	13.1	10.0	1.18
	Vertical belt	79.0	9.3	11.7	10.0	1.18
	Verona vase	74.0	9.5	12.8	10.0	1.18
	Ameliorated vase	73.0	9.8	13.4	10.0	1.18
DELTA	Tatura	84.0	12.0	14.2	11.5	0.94
	Vertical belt	85.0	12.5	14.7	11.5	0.94
	Verona vase	87.0	13.4	15.7	11.5	0.94
	Ameliorated vase	84.5	12.0	14.2	11.5	0.94
ROMAMER 2	Tatura	84.0	12.8	15.2	12.0	0.67
	Vertical belt	84.5	10.5	12.4	12.0	0.67
	Verona vase	84.0	12.0	14.2	12.0	0.67
	Ameliorated vase	80.0	11.4	14.2	12.0	0.67

Regarding on dry matter content and total acidity there are not differences than only between cultivars, crown shape have no influence.

Leaving aside the shape of the crown, the minim height of trees vas at the end of the sixth year of plantation between 2.98 (Cora) to 3.18 m (Romamer 2) for Tatura shape and maximum height between 3.30m (Cora), to 3.52 m (Romamer 2) at Vertical belt (Table 4).

Table 4.

Vegetative growth in the sixth year since planting (2007)

Cultivar	Crown shape	Trunk diameter (mm)	Tree height (m)	Crown diameter	
				On long the rows D (m)	Perpendicular on rows d(m)
CORA	Tatura	97.46	2.98	1.14	1.14
	Vertical belt	102.60	3.30	1.60	1.20
	Verona vase	89.00	3.18	1.04	1.36
	Ameliorated vase	92.80	3.02	1.18	1.18
	Tatura	91.20	3.04	0.88	1.40
	Vertical belt	82.20	3.34	1.40	1.22

DELTA	Verona vase	86.20	3.18	1.48	1.64
	Ameliorated vase	90.58	3.12	1.36	1.40
ROMAMER 2	Tatura	90.80	3.12	1.00	1.46
	Vertical belt	83.20	3.52	1.10	1.22
	Verona vase	79.80	3.16	1.30	1.32
	Ameliorated vase	82.80	3.14	1.20	1.30

The diameter of trunk – a very important indicator for plants vigor estimation – also varied considering the cultivar and crown shape. Romamer 2 cultivar has the lowest growth of the trunk thickness 79.8 mm for Verona vase shape, Delta 82.2 mm and Cora 92.80 mm – both for Vertical belt shape. The higher growth of the trunk thickness vas produced at Cora cultivar 102.60 mm for ameliorated vase shape crown following the direction of the trees line can provide information on the production volume and the correct utilization of the space among plants with effects on fruit quality now and in future.

CONCLUSIONS

The begining of flourishing and the fruit maturity at harvest time are not influenced by the system of cultivars management, these phenophases being genetically determined.

Plants growth in first four years since planting is very much controlated and directed for crown shape realizing, thus that in the sixth year since planting are interpenetrated on direction of the trees line for 1.5 m and 2.0 m distances of planting, while for 3.0 m and 3.5 m distances between trees the spaces are not entirety conquered.

Total yield realized in all years of studied period was net superior for vertical belt shape at 4/1.5 m distances of planting (between 93.45 t/ha-Cora and 98.33 t/ha Delta) thus us the investment for a superintensive orchard is very quickly recoverable.

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