Fruit Growing Research, Vol. XXXIV, 2018 DOI 10.33045/fgr.v34.2018.15
http://publications.icdp.ro/index.php

FORME DE COROANĂ LA GUTUI PENTRU REALIZAREA GARDURILOR FRUCTIFERE FĂRĂ MIJLOACE DE SUSȚINERE LA STAȚIUNEA DE CERCETARE - DEZVOLTARE HORTICOLĂ TÂRGU JIU

FORMS OF THE CROWN AT THE QUINCE FOR MAKING FRUIT FENCES WITHOUT MEANS OF SUPPORT AT HORTICULTURAL RESEARCH AND DEVELOPMENT STATION FROM TARGU JIU

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Abstract

The quince is one of the tree fruit species with ancient traditions among growers, with great ecological plasticity and a diversified use of fruit. On this desideratum, in Horticultural Development Research Station Târgu - Jiu there have been and there are works on the improvement, but also on the establishment of a modern technological links specific to this culture, in the climatic and soil conditions of the sub-Carpathian area of Oltenia. The experience was organized according to the method of subdivided parcels into intensive system, with 625 trees/ha, with two factors, each factor with 4 graduations, respectively: crown shape (simple palmette, shapeless fence, delayed bowl and bush); quince varieties (Moldoveneşti, De Portugalia, Aromate, De Constantinopol) in a total of 16 variants. Data collected over a 6-year period (2005-2010) concluded that: delayed bowl crown shape best suited to the realization of fruitless fences without support system, producing average yields of 51 kg/tree; the 'Moldoveneşti' quince variety, characterized by a weaker growth and good fertility capacities is the best suited for making fruit fences without a support system, the trees also have a good soil stability due to lower vigor; the delayed bowl combination of 'Moldoveneşti' and 'Aromate' varieties obtained the highest production compared to the other variants, respectively 20-25%.

Cuvinte cheie: gutui, forme de coroană, soiuri.
Key words: quinces, crown shapes, varieties.

1. Introduction

Quince is one of the tree fruit species with ancient traditions among Romanian growers. The use of its fruits in the human nourishment comes from remote past, being recorded in over four thousand years in archeological documents (Caliopi, 1972). These species has rejoiced, both in the past and currently, by a wide spread in the fruit growing of the countries with milder climate in the Mediterranean shores and in Asia. The major position occupied by the quinces in the ancient people fruit growing gradually decreased as the development of the culture of other fruit species, especially of the apple and of pear, due to the better gustative qualities of the fruits and to their features to be stored long-standing after the harvest for fresh use (Caliopi, 1972). The quinces are rustic species with a great adaptability to the pedoclimatic conditions, so, with a wide extent area in our country, as well as with an apart quality of the fruits, which is the raw material of the industrialization. On this desideratum, in Horticultural Development Research Resort Tg. Jiu there have been and there are works on the improvement and checking in production of some valuable quince varieties and biotypes, but also on the establishment of a modern technological links specific to this culture, under the climatic and soil conditions in the Sub-Carpathian area of Oltenia. One of these experiences regards the research for introducing in production of some economical crown forms with a good stability into ground, which leads in the obtaining of fruit fences without support system.

2. Material and methods

The researches were in Târg-Jiu dingle area where, the climatic conditions are characteristics to continental temperate climate with medium annual temperatures of 10,2°C, rainfalls of 753 mm, relative humidity 72%. During the experimental period of 2005-2010, the climatic conditions were characterized by medium annual temperatures of 9.7-11.8°C and an amount of annual rainfalls of 251,6-601,4 mm during the vegetation period. The experience was placed on a river bed luvisoil, glaze pressured, terrain, generally flat which is part of the third terrace of Jiu River, the mother rock being loam and clay. The phreatic water depth is 1.0 – 1.5 m. The soil is reaction light-acid, weak-provided in fertilizing elements.

The experience was established in the year of 2000 in Horticultural Development Research Station Târgu-Jiu, Drăgoieni point, according to subdivided lots method, in intensive system with 625 trees/ha, with two factors, each factor having 4 graduals, respectively: *A Factor* - crown shape with the variants:

delayed bowl, simple palm, bush and shapeless fence; *B Factor* - Quince sorts with the variants: 'Moldoveneşti', 'De Portugalia', 'Aromate', 'De Constantinopol'.

The obtained and analyzed data are of 2005-2010 period and is the average of 6 years. The agrofitotechnical works were homogenuous according to the technological datasheet. The forming and the crown care cuts were differentiated applied according to the experimented way.

3. Results and discussions

The crown shape and the quince sort were determining factors for differentiating of the fruit production as the effect of these on the biometric characteristics of tree growing and of the plantation structure.

The plantation architecture is based on the crown shape and on the sort, as well.

Of the collected data resulted that delayed bowl is the crown shape which promotes an optimal ventilation in the plantation structure, a better reception of the sunrays leading to the favorable consequences on the quality and quantity of fruits. These features are underpinned by the main biometry indicators determined which are shown in table no. 1.

From the collected data during the 6 studying years results that the crown shape influenced the biometric characteristics of the trees. Thus, it was determined a superiority of the values for the delayed bowl crown shape, as the crown projection, the crown volume, the nutrition surface occupation degree. These are the indicators that were reflected both into the fruit production and their quality, data presented in table no. 2.

The fruit production during the 2005 - 2010 period was obviously influenced by the sort factor whichever crown shape they are.

The 'Moldovenesti' variety proved to be invariable for the fruit production, having a good bearing for the delayed bowl crown shape offering a medium production of 31875 kg/ha, respectively of 51 kg/tree.

The increase of the 'Moldovenesti' variety was significantly positive for all four studied crown shapes.

Significantly positive productions were obtained from the 'Aromate' variety, productions obtained were between 29650 kg/ha for *delayed bowl* crown shape and 26500 kg/ha for *bush trunk* crown shape.

'De Portugalia' and 'De Constantinopol' varieties proved to be less productive under the hillock conditions of Oltenia, with various productions from one year to another.

The influences of the crown shape and of the sort are shown in the tables no. 3 and 4.

The collected data presented in the table no. 3 showcase the superiority of the *delayed bowl* crown shape whatever of sort, followed by the *simple palmette* crown. The production increases were of 108% respectively of 101% compared to the experience average.

The bush trunk and shapeless fence crown shapes bring deficit productions year by year and are not recommended for the quince plantations. The studied varieties were differentiated by the obtained productions as the effect of the adaptability to the environment conditions from the hillock area of Oltenia.

From this point of view, the 'Moldoveneşti' variety proved to be invariable for production year by year thus, this kind of sort recorded a medium production of 29901 kg/ha followed by the 'Aromate' variety with a production of 27913 kg/ha.

4. Conclusions

The 'Moldovenești' quince variety, characterized by a weaker growth and good fertility capacity is best suited for making fruit fences without a support system, the trees also have a good soil stability due to lower vigor.

The highest production benefits during the 6 years of research, compared to the average of the experience from the same period, recorded the varieties: 'Moldoveneşti' and 'Aromate' of 47,8 kg/tree, respectively 44,7 kg/tree, benefits statistically assured as very significant.

The *delayed bowl* crown shape is best suited for making fruit fences, without a support system at quinces, recorded the highest fruit production on average 43,8 kg/tree in 2005 - 2010.

The most efficient combinations among sorts and crown shapes proved that those of 'Moldoveneşti' and 'Aromate' varieties leaded to delayed bowl where the recorded productions were in average 47,5 - 51,0 kg/tree in 2005-2010.

5. References

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Tables and Figures

Table 1. The influence of crown shape and sort studied factors on the fitometer characteristics of tree growing and of plantation structure, in Horticultural Research and Development Station Târgu Jiu 2005 - 2010

Crown shape	Variety	Crown prijection -mp-	Crown volume -m^3-	Nutrition surface	Nutrition surface : crown projection ratio	Nutrition surface occupation degree % (shadowing)
Delayed bowl	Moldoveneşti	9,25	28,52	16	1:1,73	58
	De Portugalia	11,48	23,4	16	1:1,39	72
	Aromate	10,37	23,66	16	1:1,54	65
	De Constantinopol	11,17	31,71	16	1:1,43	70
Average		***10,57***	***26,82***	***16***	***1:1,51***	***66***
Simple palmette	Moldoveneşti	8,32	26,1	16	1:1,92	52
	De Portugalia	10,8	30,87	16	1:1,48	68
	Aromate	9,32	20,05	16	1:1,72	58
	De Constantinopol	10,1	28,39	16	1:1,58	63
Average		***9,63***	***26,35***	***16***	***1:1,55***	***60***
Bush trunk	Moldoveneşti	8,50	25,3	16	1:1,88	53
	De Portugalia	10,8	22,6	16	1:1,48	68
	Aromate	10,2	23,0	16	1:1,57	64
	De Constantinopol	11,0	30,0	16	1:1,45	69
Average		***10,1***	***25,22***	***16***	***1:1,58***	***63***
Shapeless fence	Moldoveneşti	8,2	24,8	16	1:1,95	51
	De Portugalia	9,8	22,0	16	1:1,63	61
	Aromate	10,0	24,5	16	1:1,6	63
	De Constantinopol	10,5	30,7	16	1:1,52	66
Average		***9,63***	***25,5***	***16***	***1:1,59***	***60***

Table 2. Fruit production obtained at quince culture according to the studied factors in Horticultural Research and Development Station Târgu Jiu 2005 - 2010

Crown shape	Variety	Fruit production t/ha 2005 - 2010	Difference kg/ha	Relative production %	Meaning
Delayed bowl	Moldoveneşti	31875	4529	116,6	xxx
	De Portugalia	23560	-3788	85,2	000
	Aromate	29650	2304	109,4	x
	De Constantinopol	24300	-3048	89,3	000
Average		**27346**	**Mt.**	**100**	**-**
Simple palmette	Moldoveneşti	29580	4039	115,8	xxx
	De Portugalia	22600	-2945	88,5	00
	Aromate	28700	3159	112,4	xxx
	De Constantinopol	21300	-4249	83,4	000
Average		**25545**	**Mt.**	**100**	**-**
Bush trunk	Moldoveneşti	28000	4350	118,4	xxx
	De Portugalia	20600	-3050	87,1	000
	Aromate	26500	2850	112,1	xx
	De Constantinopol	19800	-3850	83,7	000
Average		**23650**	**Mt.**	**100**	**-**
Shapeless fence	Moldoveneşti	30150	5380	121,6	xxx
	De Portugalia	21700	-3080	87,5	000
	Aromate	26800	2020	109,2	x
	De Constantinopol	20470	-4310	82,5	000
Average		**24780**	**Mt.**	**100**	**-**

DL 5% = 1950 kg/ha; DL 1% = 2580 kg/ha; DL 0.1% = 2960 kg/ha

Table 3. The influence of crown shape on quince production in Horticultural Research and Development Station Târgu Jiu 2005 - 2010

Crown shape	Production		Difference To/ha	Meaning
	Kg./ha	%		
Delayed fbowl	27346	108	2018	xx
Simple palmette	25545	101	215	-
Bush trunk	23650	93	-1680	0
Shapeless fence	24780	98	-550	-
Average	**25330**	**100**	**-**	**-**

DL 5% = 1200 kg/ha; DL 1 % = 1970 kg/ha DL 0.1%= 2300 kg/ha

Table 4. The influence of quince sort on production, 2005 – 2010 in Horticultural Research and Development Station Târgu Jiu 2005 - 2010

Sort	Production		Difference Kg./ha	Meaning
	Kg./ha	%		
Aromate	29901	118	4551	xxx
Aurii	22119	87	-3231	000
Moldoveneşti	27913	110	2563	xxx
De Constantinopol	21468	85	-3882	000
De Portugalia	25350	100	-	-

DL 5% = 1460 kg/ha; DL 1 % = 2030 kg/ha; DL 0.1% = 2520 kg/ha.

Fig. 1. Quince plantation

Fig. 2. Delayed bowl crown shape

Fig. 3. 'Moldovenești' quince variety