THE BEHAVIOR IN NURSERY OF SOME FRUIT TREE SPECIES WITH HIGH ORNAMENTAL VALUE

COMPORTAREA ÎN PEPINIERĂ A UNOR SPECII POMICOLE CU VALOARE ORNAMENTALĂ RIDICATĂ

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Abstract. *Different ornamental characters, habitus, color, texture, given the adaptability of the various species to the site-specific environmental conditions, are the starting point for the choice of species for landscaping. Thus, it appears the opportunity to use a planting material well suited to the conditions of our country that create a sustainable ornamental effect. In the present paper we've studied the compatibility in grafting of ornamental fruit species grafted on different rootstocks and the behavior of the material in the nursery. Two grafting methods were tested: chip budding and grafting in 'T' with sleeping buds. For each of the five species studied, two types of rootstocks were used. For Prunus serrulata Kanzan Lindl. mahaleb rootstocks and wild cherry were used. Prunus cerasifera Pisardii Ehrh. was grafted on mirobolan and 'Roşior văratic'. And the species Malus baccata Borkh., Malus golden hornet Rehder. and Malus purpureea Rehd. were grafted on Malus sylvestris Mill and vegetative type MM 106.*
Keywords: *Prunus* sp., *Malus* sp., grafting, ornamental

Rezumat. *Diferitele caractere ornamentale, habitus, culoare, textură, în condiţiile adaptabilităţii diverselor specii la condiţiile de mediu specifice sitului, sunt punctul de plecare în alegera speciilor pentru amenajările peisagere. Astfel, apare oportunitatea folosirii unui material săditor bine adaptat condiţiilor ţării noastre care să creeze un efect ornamental sustenabil. În cadrul lucrării s-a studiat compatibilitatea la altoire a unor specii pomicole ornamentale altoite pe diferiti portaltoi şi comportarea materialului în pepinieră. Au fost testate două metode de altoire: chip budding şi altoirea în 'T' cu mugure dormind. Pentru fiecare din cele cinci specii luate în studiu s-au folosit două tipuri de portaltoi. Pentru specia Prunus serrulata Kanzan Lindl. s-au folosit portaltoii mahaleb şi cireş sălbatic. Prunus cerasifera Pisardii Ehrh. s-a altoit pe mirobolan şi Roşior văratic. Iar speciile Malus baccata Borkh., Malus golden hornet Rehder. şi Malus purpureea Rehd. s-au altoit pe Malus sylvestris Mill. (măr pădureţ) şi măr vegetativ tipul MM 106.*
Keywords: *Prunus* sp., *Malus* sp., altoire, decorativ

INTRODUCTION

Different ornamental characters, habitus, color, texture, given the adaptability of the various species to the site-specific environmental conditions, are the starting point for the choice of species for landscaping (Borza, 1947).

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Thus, it appears the opportunity to use a planting material well suited to the conditions of our country that create a sustainable ornamental effect (Grădinaru, 2002).

In the present paper we have studied the compatibility in grafting of ornamental fruit species grafted on different rootstocks and the behavior of the material in the nursery. Two grafting methods were tested: chip budding and grafting in 'T' with sleeping buds.

For each of the five species studied, two types of rootstocks were used. For *Prunus serrulata* Kanzan Lindl. *Prunus mahaleb* rootstocks and *Prunus avium* were used. *Prunus cerasifera* Pisardii Ehrh. was grafted on *Prunus myrobolan* and 'Roşior văratic'. And the species *Malus baccata* Borkh., *Malus golden hornet* Rehder. and *Malus purpureea* Rehd. were grafted on *Malus sylvestris* Mill and vegetative type MM 106.

MATERIAL AND METHOD

In order to achieve the objectives proposed, this study had as research material the ornamental fruit trees species found in Hemeiuş Park from Bacău County and the species studied at the Istrița Fruit Growing Research and Development Resort, Buzău County.

The researches carried out in Buzău County took place at the Istrița Fruit Growing Research and Development Resort, which has as main activity the production and marketing of trees of all species that are adapted to the pedoclimatic conditions in Romania.

Within the Istrița Fruit Growing Research and Development Resort, we analyzed the existing tree vegetative material in order to establish the compatibility in grafting of ornamental tree species, using as rootstock both species from the spontaneous flora and species obtained from the researches in the field, by the grafting in dormant eyes method (Zlati, 2007).

In order to achieve the objectives proposed and to obtain objective scientific results regarding the compatibility in grafting of some species of the genus *Malus* Mill. and *Prunus* L. grafted on different rootstocks, two working techniques were used (Kester, 1965; Iglesias *et al*, 2004). Observations and determinations were made during 2015-2017.

Observations and determinations made in the nursery referred to:

- Successful grafting percentage;
- Winter resistance of the grafted buds;
- Entering the vegetative stage of the grafted buds;
- Growth vigor of the propagating material.

As grafts the following species were used: *Prunus serrulata kanzan* Lindl., *Prunus cerasifera pisardii* Ehrh., *Malus purpurea* Rehd., *Malus baccata* Borkh. and *Malus golden hornet* Mill (Grivu, 2001).

The period when the grafting was made was from August 15 to 30, 2015, with the essential condition that the bark was easily detachable.

The planting distances used to set up Field I of the nursery were 90 cm between rows and 20 cm between seedlings per row.

Fig. 1 The experimental field, *Prunus cerasifera* Eheh. rootstock, (original, Istrița nursery, Buzău County)

Fig. 2 The height of the plants resulted from chip budding grafting (original, Istrita nursery, Buzău County)

RESULTS AND DISCUSSIONS

The organization of the experiment began in the spring of year 2015, with the set up of the Field I of the nursery. The planting distances used were 90 cm between rows and 20 cm between seedlings per row.

In the experiment, two types of rootstocks were used for each specie studied (fig. 1), respectively *Prunus mahaleb* and *Prunus avium*, were used for the species *Prunus serrulata Kanzan* Lindl., Prunus mirobolan and P.F. 'Roşior văratic' for *Prunus cerasifera Pisardii* Ehrh. and *Malus sylvestris* Mill (crab

apple) and vegetative apple type MM 106 for the species *Malus baccata* Borkh., *Malus golden hornet* Rehder. and *Malus purpureea* Rehd.

The determination of successful grafting of rootstock seedlings after one month from planting lead to reveal that the successful percentage was over 95% in all types of rootstocks.

Successful grafting was recorded in the fall of year 2015 for the two types of genus following grafting with dormant eyes, as it can also be seen in table 1. Grafting in the dormant eyes was achieved by the two methods, chip budding and T-budding, in August where 50 buds were grafted for each variety-rootstock combination.

Table 1

Biometrical data regarding the percentage of successful grafting of studied fruit tree species

No.	Specie/variety	Rootstock	Grafting success percentage	
			Grafting method	
			"T" grafting	***Chip budding grafting***
1	*Prunus serulata-Kanzan* Lindl.	Prunus avium	92.0	95.0
		Prunus mahaleb	95.0	97.0
2	*Prunus cerasifera- Pisardii* Ehrh.	Prunus mirobolan	92.0	92.0
		P.F. 'Rosior văratic'	92.0	94.0
3	*Malus purpurea* Rehd.	Malus sylvestris Mill	94.0	95.0
		MM 106	93.0	94.0
	Malus golden hornet Rehder. Rehder.	Malus sylvestris Mill	92.0	93.0
		MM 106	92.0	93.0
	Malus baccata Borkh.	Malus sylvestris Mill	93.0	93.2
		MM 106	92.0	92.0

Analyzing the successful grafting percentage (tab. 1), in relation to the rootstocks used does not reveal any significant differences between them, but it reveals there is a higher percentage of successful grafting with the chip budding grafting method, compared to the T-budding grafting method.

Winter resistance of the grafted buds in the climatic conditions of our country may be affected more or less by the low temperatures depending on each specie. Thus, were detached with a large number of viable scion buds the individuals resulted from the grafting of *Malus sylvestris* Mill. and vegetative apple MM 106 of the species *Malus purpurea* Rehd. Positive results were also recorded for *Malus golden hornet* Rehder., grafted on *Malus sylvestris* Mill., for *Prunus serulata Kanzan* Lindl., grafted on Prunus avium, as well as the species *Prunus cerasifera Pisardii* Ehrh., grafted on Myrobolan.

Entering the vegetative stage of the grafted buds occurred at different dates, being influenced by the genetic specificity of each specie taken into study, as well as by the variety-rootstock combination (Hartmann and Kester, 2002). Thus it was found that at the end of March, *Prunus serulata Kanzan* Lindl. enters the vegetative stage, followed by *Prunus cerasifera Pisardii* Ehrh., *Malus purpurea*

Rehd., *Malus golden hornet* Rehder., and the last species being *Malus baccata* Borkh. at the end of April (fig. 2).

Rgarding the biometrical data of the grafting growth of studied material we can conclude that the use of grafted plants in landscaping, it has been found that grafting in ornamental varieties may have the advantage of reducing the vigor (tab. 2) and hence the easier use in compositions intended for small spaces.

Table 2

Biometrical data regarding the grafting growth of studied fruit tree species

No.	Specie/ variety	Rootstock	Height of graft sprouts (cm)		Diameter in the graft area (mm)		Early shoots number	
			"T" grafting	*Chip budding grafting*	"T" grafting	*Chip budding grafting*	"T" grafting	*Chip budding grafting*
1	*Prunus serulata-Kanzan* Lindl.	Prunus avium	176.0	190,0	12.3	14.0	6	7
		Prunus mahaleb	178.0	178.0	11.8	13.4	4	5
2	*Prunus cerasifera-Pisardii* Ehrh.	Prunus mirobolan	170.0	181.0	12.3	12.8	6	8
		P.F. Rosior văratic	164.0	176.0	12.0	12.3	6	6
3	*Malus purpurea* Rehd.	Malus sylvestris Mill	168.0	172.0	11.8	12.10	7	8
		MM 106	172.0	170.0	11.0	12.0	7	8
	Malus golden hornet Rehder.	Malus sylvestris Mill	164.0	174.0	11.0	12.0	5	7
		MM 106	160.5	169.0	10.8	11.8	5	6
	Malus baccata Borkh.	Malus sylvestris Mill	158.5	168.0	10.8	11.8	6	6
		MM 106	156.0	164.0	11.0	11.5	6	6

CONCLUSIONS

1. From the diameter analysis to the callus, the species with very good results are *Prunus serulata* Kanzan Lindl., *Prunus cerasifera* Pisardii Ehrh. grafted on *Prunus avium* and *Prunus myrobolan*, and *Malus purpurea* Rehd. grafted on the *Malus sylvestris* Mill. As for the number of early shoots, the species *Malus purpurea* Rehd. and *Prunus cerasifera* Pisards Ehrh. saw a number of eight shoots, and *Prunus serulata* Kanzan Lindl., grafted on *Prunus mahaleb* in "T", marked a number of five shoots. The other species, irrespective of the rootstocks and the grafting type, fell within this range with the number of early shoots.

2. Also, the varieties studied have good compatibility with the chosen rootstocks.

3. Regarding the use of grafted plants in landscaping, it has been found that grafting in ornamental varieties may have the advantage of reducing the vigor and hence the easier use in compositions intended for small spaces.

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