

Influence of Mahaleb and Gisela 5 Rootstocks on the Growth of 'Biggareau Burlat' Sweet Cherry Cultivar

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Abstract

The influence of *Prunus Mahaleb* L. and 'Gisela 5' rootstocks on the growth of 'Biggareau Burlat' sweet cherry cultivar was evaluated in the environmental conditions of Cluj-Napoca city, in 2015, in a high-density plot (trees were planted at the distance of 4 x 1.5 m) with 1666 trees/ha, trained as spindle bush, with trellis system with drip fertirrigation provided. The measurements were done in April, on 10 trees of the cultivar grafted on different rootstocks, in the 4th year after planting. The trunk diameter growth was measured 5 cm above the grafting joint point, and the number and length of annual growth were also recorded (long, medium and spur fruiting branches) and tree height was calculated. After the first years of planting, 'Biggareau Burlat' grafted on 'Gisela 5' rootstock proved to be more vigorous than grafted on *Prunus Mahaleb* L., considering the total number of the medium and long branches per tree. 'Biggareau Burlat'/'Gisela 5, compared to 'Biggareau Burlat'/'*P. Mahaleb* significantly exceeded in the number of medium branches (4.7 in comparison with 3), number of long branches on the tree (17.2 comparing to 7.9), and the number of flower buds (74.7 compared to 41.3) and also the total length of annual tree branches.

Keywords: branches, growth, *Prunus mahaleb* L., rootstock, sweet cherry

Introduction

Sweet cherry is a fruit tree with a high economic value, because of the nutritive, commercial and technological characteristics of the fruits (Budan S. and Gradinariu G., 2000). In the last years, there has been manifested an important interest of cultivating new cultivars of sweet cherries, grafted on dwarf vegetative cherry rootstocks (Lang, 2001). This allowed developing high-density orchards with smaller vigour trees that are more productive and precocious (Andersen *et al.*, 1999).

Aims and objectives

The main objective of this study was to investigate the influence of *Prunus mahaleb* L. and 'Gisela 5' rootstocks on the growth parameters of

'Biggareau Burlat' sweet cherry cultivar, in the 4th year after planting, in the eco-climatic conditions of Cluj-Napoca city, in 2015.

Materials and methods

This research has been carried out in the spring of 2015. The study took place in the fruit-growing ecosystems of Steluța from Cluj-Napoca, in a high-density plot (4 x 1.5 m) with 1666 trees/ha, trained as spindle bush, provided with trellis system and drip fertirrigation. Determinations regarding the influence of two different rootstocks, *Prunus Mahaleb* L. and 'Gisela 5', have been made for 'Biggareau Burlat' sweet cherry cultivar on: the tree height, the trunk diameter growth, number of long branches on the tree, number of medium

Tab. 1. The influence of *Prunus Mahaleb* L. and 'Gisela 5' rootstocks on the growth of 'Biggareau Burlat' sweet cherry cultivar

Cultivar/ Rootstock	Tree height (cm)	Trunk height (cm)	Trunk diameter (cm)	Number of medium branches	Length of medium branches (cm)	Number of inflorescence buds	Number of long branches	Length of long branches (cm)
Burlat/ Gisela 5	298,5 ± 21,08	57,3 ± 7,40	5,36 ± 0,48	4,7 ± 1,94	22,04 ± 3,82	75,7 ± 30,98	17,2 ± 4,28	58,26 ± 7,20
Burlat/ Mahaleb	300,8 ± 20,02	73,1 ± 17,80	4,38 ± 0,88	3 ± 1,63	21,79 ± 3,19	41,3 ± 11,34	7,9 ± 2,68	57,26 ± 6,58
	p=0,805	p=0,018	p= 0,006	p= 0,048	p= 0,871	p= 0,004	p= 0,000	p= 0,750
	F= 0,062	F= 6,712	F= 9,395	F= 4,476	F= 0,026	F= 10,871	F= 33,770	F= 0,104

**Fig. 1** Tree vigour and trunk diameter of 'Bigarreau Burlat' sweet cherry cultivar grafted on 'Gisela 5' (A) and 'Bigarreau Burlat' grafted on *Prunus mahaleb* (B.) in the 4th year after planting

braches, number of flower buds, the lengths of medium and long branches. Ten experimental trees were selected per cultivar and the trunk diameter was measured with a caliper 5 cm above the grafting point, and the length of the branches was measured using a tape measure.

The statistical analyses were conducted using SPSS software version 18.0 (SPSS Inc. Chicago, IL, USA).

Results and Discussion

Regarding the vigour of the examined cultivars (Tab. 1), it could be remarked that 'Burlat'/'Gi 5' has registered the biggest increase in diameter growth of the trunk (5.36 cm), significantly distinct from 'Burlat'/'Mahaleb (4.38 cm) (Fig.1), and the lowest value with a significant difference

of trunk height (57.3 cm compared to 73.1 cm). The biggest number of inflorescences per tree were counted for 'Burlat'/'Gi 5' (75.7), followed by 'Burlat'/'Mahaleb with 41.3 inflorescences/tree. It can be observed in Tab. 1 that 'Burlat'/'Gi 5' formed the highest number of long branches per tree (17.2) compared to 'Burlat'/'Mahaleb (7.9) and the data collected showed a very significant interaction between the cultivars. The studies on the tree height, length of medium branches and long branches did not show any significant differences between the cultivars.

The means were compared using Duncan's Multiple Range Test, at $P \leq 0,05$. The interaction between cultivars and rootstocks was evaluated by selecting $P \leq 0,0001$, $P \leq 0,01$ and $P \leq 0,05$ to determine significance.

Conclusion

Analysing the growth parameters of 'Bigarreau Burlat' sweet cherry cultivar grafted on two different rootstocks, in the 4th year after planting it can be concluded that compared to Mahaleb, Gisela 5 rootstock improved precocity being the most efficient rootstock for sweet cherry trees in high-density systems.

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