NURSERY VALUE OF SOME DWARFING CHERRY ROOTSTOCKS IN HUNGARY
ZEMA AUGUMA ĶIRŠU POTCELMU VĒRTĒJUMS KOKAUDZĒTAVĀ UNGĀRIJĀ

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Kopsavilkums

Izmēģinājumā tika salīdzināti potcelmi GiSelA 5 un GiSelA 6 ar Cerasus mahaleb formu ‘Cema’, kura tiek tradicionāli izmantota kā saldo ķiršu potcelms Ungārijā. Sešas jaunizveidotas saldo ķiršu šķirnes (‘Rita’, ‘Carmen’, ‘Péter’, ‘Vera’, ‘Aida’, ‘Alex’) tika acotas uz šiem potcelmiem un izvērtētas kokaudzētavā no 2001. līdz 2003. gadam. Būtiskas atšķirības acojumu pieaugumā starp variantiem netika konstatētas. GiSelA potcelmu ietekme uz koka augumu bija novērojama jau kokaudzētavā – augu augstums bija par 29-55% zemāks un stumbra diametrs par 4-45 % mazāks kā kontroles variantam. Sānu dzinumi neveidojās uz kokiem, kuri acoti uz GiSelA potcelmiem, bet uz ‘Cema’ - veidojās sasteigtie dzinumi.

Abstract

There is a keen interest in intensive sweet cherry (*Cerasus avium* L. Mönch.) growing in Hungary. Smaller tree size is essential for this technology; in an intensive orchard the pathogens and pests can be better controlled, thus more effective and environment safe plant protection can be done. It is very easy to prune the orchard, the trees begin yielding earlier, and the cost of picking is lower than in a traditional orchard. GiSelA 5 and GiSelA 6 rootstocks were chosen to compare their values to Cerasus mahaleb ‘Cema’ which is the standard cherry rootstock in Hungary. Six newly bred sweet cherry cultivars (‘Rita’, III-42/114 (‘Carmen’), IV-6/5 (‘Péter’), ‘Vera’, IV-13/20 (‘Aida’ and ‘Alex’) from the Research Institute’s breeding programme were budded on them. Observations were made in a nursery from 2001 till 2003. There were no significant differences in bud take compared to the ‘Cema’ rootstock. The dwarfing effect of GiSelA rootstocks occurred already in the nursery stage, since the height of the budded cultivars on GiSelA rootstocks was 29-55 % and trunk diameter 4-45% smaller than those by the control variant. No secondary branches were produced on the budded cultivars on GiSelA rootstocks while the trees on ‘Cema’ seedling produced feathers.

Key words: dwarfing cherry rootstocks, nursery value.

Introduction

In Hungary there is a keen interest, in planting intensive orchards of sweet cherry (*Cerasus avium* (L.) Mönch.) similarly to other fruit species. There are a lot of advantages of the intensive fruit growing due to smaller size of trees compared to „traditional” ones. In an intensive orchard the growers can exploit biological and ecological potential of the site to produce the highest possible yield and the best fruit quality (Papp, 1997). This technology can be realized by using dwarfing rootstocks.

The Research Institute for Fruitgrowing and Ornamentals of Budapest-Érd searches for perspective foreign-bred dwarfing rootstocks to its novel sweet cherry cultivars and hybrids. It is very important to test the new dwarfing rootstocks under Hungarian climate conditions as they differ from those in Western Europe. In Hungary soils are more calcareous and the climate is drier compared to Western Europe, therefore why it is important to know lime- and drought-tolerance of the roots.

Worldwide most planted dwarfing rootstock is of the GiSelA series (Franken-Bembenek 2004, Bujdosó and Kállay 2004). Compared to F 12/1 the dwarfing effect of GiSelA 5 on the growth of budded cultivars is 48-77 % higher and the budded cultivars’ yield is 2-3 times higher. The growth of cultivars grafted on GiSelA 6 is stronger than growth of cultivars grafted on GiSelA 5. The sweet cherry cultivars on GiSelA 6 have 10 % bigger trunk cross sectional area than that of cultivars on GiSelA 5. Both dwarfing rootstocks have very good compatibility (Franken-Bembenek, 1998, 2004).

Materials and Methods

A rootstock trial was set up at the experimental farm of the Research Institute for Fruitgrowing and Ornamentals of Budapest-Érd in 2001 and 2002 to evaluate the GiSelA 5 and GiSelA 6 dwarfing rootstocks. The control of the trial was *Cerasus mahaleb* L. 'Cema' (syn.: C 500) which is used in 70% of the Hungarian sweet cherry orchards.

After planting the rootstocks budded in August of 2001 and 2002 of 3 sweet cherry cultivars ('Rita', 'Vera', 'Axel' (syn.: 'Alex')) and 3 sweet cherry hybrids (III-42/114 ('Carmen'), IV-6/5 ('Petrus') (syn.: Péter), IV-13/20 ('Aida')), bred at the Research institute, were.

In the year after budding (2002 and 2003 resp.) bud take (Table 1), height of trees (20 trees/rootstock/scion combination), trunk diameter at 30 cm over the graft (Table 2), and number of lifted whips and feathered trees (Table 3) were assessed. Trees with at least 100 cm high trunk and at least 3 laterals. Statistical differences between the stock/scion combinations were calculated by Duncan's Multiple Range Test.

Results and Discussion

According to data assessed in 2002 and 2003 every scion variety took well on 'Cema' mahaleb seedling rootstock, on GiSelA 5, and on GiSela 6 (Table 1). The best bud take of 'Rita' and IV-13/20 ('Aida') was on 'Cema' mahaleb stock, that of 'Vera' 'Axel' and III-42/114 ('Carmen') - on GiSelA 6, while IV-6/5 ('Petrus') showed the best results on GiSelA 5. Calculating the average of the take of the 6 scion varieties the best take (79 %) was on GiSelA 6, then follow 'Cema' (77 %) and GiSelA 5 (71 %). These facts agree with the findings of Franken-Bembenek (1995).

The height of the trees on GiSelA 5 was by 29 to 53 % less, and on GiSelA 6 by 32 to 55 % less than on 'Cema' mahaleb stock (Table 2). Trunk diameter data gave very similar results: the measured data of the scion varieties were by 25 to 45 % and 4 to 35 % less than in the control (Table 3).

Table 1. Bud take of new cherry cultivars budded on 'Cema' mahaleb seedling and GiSelA 5 and GiSelA 6 dwarfing rootstocks, % (Érd-Elvira major, average of 2002-2003)

	Bud take					
Rootstocks	of 'Rita'	of III-42/114 'Carmen'	of IV-6/5 'Petrus'	of 'Vera', %	of IV-13/20 'Aida'	of 'Axel'
'Cema'	81[1]a	71[1] a	82[1] a	83[1] a	74[1] a	76[1] a
GiSelA 5	70 b	68 b	86 b	80 a	56 b	67 b
GiSelA 6	75 b	75 a	80 a	90 b	65 c	90 c

[1]: Multiple range test, α=0.05

Table 2. Height of one-year-old sweet cherry trees in the nursery, cm (Érd-Elvira major, average of 2002-2003)

	Height					
Rootstocks	'Rita'	III-42/114 'Carmen'	IV-6/5 'Petrus'	'Vera'	IV-13/20 'Aida'	'Axel'
'Cema'	191[1] a	212[1] a	227[1] a	240[1] a	200[1] a	218[1] a
GiSelA 5	136 b	104 b	133 b	149 b	114 b	103 b
GiSelA 6	129 b	103 b	123 b	138 b	109 b	122 b

[1]: Multiple range test, α=0.05

Statistical examination of trunk diameter data showed significant difference. Every combination on dwarfing rootstocks met the specifications of the Hungarian nursery standards (Anonym. 2004). These results also agree with those described by Franken-Bembenek (1995), who the found a dwarfing effect of 30 to 40 % compared to the control trees. Investigating the young trees on dwarfing stocks GiSelA 5 and GiSelA 6 as a group they showed statistical homogeneity, except IV-13/20 ('Aida') and 'Axel'.

Trunk diameter of these two season varieties differed significantly from that of the groups.

Table 3. Trunk diameter of one-year-old sweet cherry trees in the nursery, cm (Érd-Elvira major, average of 2002-2003)

	Trunk diameter					
Rootstocks	of 'Rita'	of III-42/114 'Carmen'	of IV-6/5 'Petrus'	of 'Vera', %	of IV-13/20 'Aida'	of 'Axel'
'Cema'	17[1] a	19,4[1] a	19,4[1] a	19,3[1] a	19,7[1] a	19,3[1] a
GiSelA 5	12,8 b	10,8 b	10,8 b	13,9 b	12 b	12,1 b
GiSelA 6	16,4 a	15,4 b	15,4 b	15,9 b	14,8 c	14,9 c

[1]: Multiple range test, α=0.05

As to feathering of young trees, research results were less favourable. Most trees on 'Cema' mahaleb rootstock were well feathered, while those on GiSelA stocks had no laterals (Table 4). These facts contrast with the experience of German researchers (Vogel, 2001). GiSelA dwarfing rootstocks proved rather profitable in the nursery: they can be easily propagated and show good compatibility with a wide range of scion varieties. However, in the (bearing) orchard most estimation is not as appreciative in Hungary. Under less favourable climate (less precipitation) than that of Western Europe, unfavourable traits and symptoms come to dominance: early ageing, getting barren early, fruit quality worsen year by year, weak regenerative capacity (Bujdosó *et al*., 2004). Thus planting nursery trees on GiSelA 5 or GiSelA 6 is useful only at the best growing sites or possibly in irrigated plantations.

Table 4. Ratio of the feathered trees in the nursery, % (Érd-Elvira major, average of 2002-2003)

	Ratio of feathered trees					
Rootstocks	of 'Rita'	of III-42/114 'Carmen'	of IV-6/5 'Petrus'	of 'Vera', %	of IV-13/20 'Aida'	of 'Axel'
'Cema'	60[1]a	64[1] a	15[1] a	56[1] a	76[1] a	83[1] a
GiSelA 5	0 b	0 b	0 b	0 b	0 b	0 b
GiSelA 6	0 b	0 b	0 b	0 b	0 b	0 b

[1]: Multiple range test, α=0.05

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