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## PROPAGATION EFFICIENCY OF FOUR CULTIVARS OF *PRUNUS SERRULATA* (LINDL.) ON TWO ROOTSTOCKS

**Summary.** Research was carried out in two series from 2003 to 2005 years. The studies aimed at estimating the efficiency of propagation and growth of four grafted cultivars of *Prunus serrulata* (Lindl.) on two rootstocks in nursery production. The following cultivars were examined: 'Ama-no-gawa', 'Shirofugen', 'Kanzan' and 'Kiku-shidare' and rootstocks: *Prunus avium* and 'Colt'. The results showed that for nursery production the rootstock 'Colt' has the same usefulness for grafting cultivars of *P. serrulata* as *P. avium*.

**Key words:** cultivars of *Prunus serrulata*, rootstocks, grafting, efficiency, growth

### Introduction

There are very few other ornamental trees that bloom more beautiful than cultivars of *Prunus serrulata*. Their blossom is abundant and the flowers are especially varied. Ornamental cherry trees are becoming more and more popular and their offer is expanding. Most of them are propagated by grafting on *P. avium* rootstock.

The aim of these studies was an evaluation of propagation of four grafted cultivars of *P. serrulata* on two rootstocks in nursery production.

### Material and methods

The experiment was carried out in years 2003-2005 using a randomized block design with four replications, with 25 plants per plot. In spring 2003 and 2004 the rootstocks: *P. avium* and 'Colt' (*P. avium* L. × *P. pseudocerasus* Lindl.) were planted into a nursery ground. Grafting of the rootstocks with scionwood of 'Ama-no-gawa' cultivar by used side graft method was performed at the height of 30 cm, the cultivars 'Shiro-

fugen' and 'Kanzan' at 100 cm and 'Kiku-shidare' by split and tongue graft method at 150 cm in the third decade of April 2004 and 2005.

In the last decade of October the following observations and measures were executed on 10 randomly taken plants in each replicate: the number of taken scionwood compared with the number of grafted rootstocks (given in percents), the thickness of the trees (mm) (measured above the place of the rootstock-scion fuse), number and the sum of lengths of lateral shoots (cm) and the number of roots. The observations and measures were made after two vegetative seasons and the results presented in tables are mean values of two series.

Statistical analysis of the results was carried out using STAT programme at the confidence level  $\alpha = 0.05$ . A separate variance analysis was performed for each cultivar because of different character of the growth.

## Results

Applied rootstocks did not have any significant influence on the percentage of scionwood taken of *P. serrulata* (Table 1), however, higher percentage of trees was obtained on 'Colt' compared with *P. avium*. The highest percentage was obtained for 'Ama-no-gawa' cultivar, the lowest for 'Kiku-shidare'.

Table 1. Percentage of scionwood taken and thickness of plants of four cultivars of *Prunus serrulata* depending on a rootstock (two years mean)

Tabela 1. Procent przyjętych zrazów oraz grubość roślin czterech odmian wiśni piłkowanej w zależności od podkładki (średnia z dwóch lat)

Cultivar	Rootstock	Scionwood taken (%)	Thickness of plants (mm)
'Ama-no-gawa'	<i>Prunus avium</i>	82.9 a	9.2 a
	'Colt'	87.1 a	14.6 b
'Shirofugen'	<i>Prunus avium</i>	79.7 a	12.8 a
	'Colt'	84.2 a	18.0 b
'Kanzan'	<i>Prunus avium</i>	81.5 a	9.1 a
	'Colt'	86.3 a	13.7 b
'Kiku-shidare'	<i>Prunus avium</i>	75.5 a	8.6 a
	'Colt'	82.7 a	11.4 b

Means followed by the same letters within the analysed cultivars are not significantly different at  $\alpha = 0.05$ .

The mean thickness of trees of all the examined cultivars on 'Colt' rootstock was significantly bigger compared with *P. avium*. The trees of 'Shirofugen' were much thicker than the remaining ones (Table 1).

‘Colt’ rootstock stimulated the creation of significantly bigger number of lateral shoots for all examined cultivars of *P. serrulata* (Table 2). The highest number of shoots was observed for ‘Kiku-shidare’ cultivar. The trees of other cultivars were branched much weaker.

Table 2. Branching and growth of root system of trees of four cultivars of *Prunus serrulata* depending on a rootstock (two years mean)

Tabela 2. Rozgałęzianie się i wzrost systemu korzeniowego drzewek czterech odmian wiśni piłkowanej w zależności od podkładki (średnia z dwóch lat)

Cultivar	Rootstock	Number of shoots	Sum of length of shoots (cm)	Number of roots
‘Ama-no-gawa’	<i>Prunus avium</i>	3.2 a	164.2 a	17.2 a
	‘Colt’	6.1 b	306.3 b	23.4 b
‘Shirofugen’	<i>Prunus avium</i>	2.5 a	221.5 a	17.3 a
	‘Colt’	4.9 b	322.5 a	23.3 b
‘Kanzan’	<i>Prunus avium</i>	2.7 a	139.7 a	16.5 a
	‘Colt’	4.7 b	283.4 b	23.8 b
‘Kiku-shidare’	<i>Prunus avium</i>	8.6 a	241.2 a	17.0 a
	‘Colt’	13.8 b	405.6 b	23.2 b

Explanation: see Table 1.

The trees with bigger sum of the lengths of the shoots were obtained on ‘Colt’ rootstock than on *P. avium* (Table 2). The longest shoots were measured on ‘Kiku-shidare’, the shortest on ‘Kanzan’.

The trees on ‘Colt’ rootstock had significantly bigger number of roots compared with *P. avium* (Table 2).

## Discussion

The percentage of scionwood taken enables to state that both ‘Colt’ and *P. avium* rootstocks are useful for the production of *P. serrulata* trees in a nursery production. Percentage of the obtained trees of ‘Ama-no-gawa’ cultivar was similar to that obtained by ŚWIERCZYŃSKI (2005). However, for ‘Kiku-shidare’ it was definitely worse. This fact may have been influenced by temperature changes immediately after grafting rootstocks in the ground.

The experiment showed big differences in the results of tree thickness, the length of lateral shoots as well as the number of roots depending on the applied rootstock. PANNELL et AL. (1983) and YSTAAS (1990) say that ‘Colt’ rootstock decreases the size of trees of 30% compared with F12/1 rootstock. This thesis was not confirmed by the

present studies as a stronger growth on 'Colt' rootstock compared with *P. avium* was observed.

'Colt' was the rootstock that increased the number and the length of lateral shoots independently from the grafted cultivar of *P. serrulata*. A similar conclusion was drawn by STACHOWIAK and ŚWIERCZYŃSKI (2001) on the basis of their earlier studies. A bigger number of lateral shoots of 'Kiku-shidare' cultivar was caused by a different character of the growth of this tree. Because of a small number of lateral shoots, their branching must be stimulated by cutting them during the nursery production.

A better root system of the trees on 'Colt' rootstock may influence their easier taking after planting into a final place.

The obtained results testify that the production of *P. serrulata* trees by grafting rootstocks that grow in a nursery is possible. However, its effectiveness depends on the grafted cultivar and the applied rootstock. Also unfavourable temperatures immediately after grafting may influence a smaller effectiveness of the trees in a nursery production.

## Conclusions

1. The applied rootstocks did not influence the percentage of scionwood taken of *Prunus serrulata*.

2. 'Colt' rootstock increased the power of growth of the examined cultivars compared with *P. avium*.

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## EFEKTYWNOŚĆ ROZMNAŻANIA CZTERECH ODMIAN WIŚNI PIŁKOWANEJ (*PRUNUS SERRULATA* (LINDL.)) NA DWÓCH PODKŁADKACH

**Streszczenie.** W doświadczeniu przeprowadzonym w latach 2003-2005 porównano efektywność rozmnażania przez szczepienie czterech odmian wiśni piłkowanej (*Prunus serrulata* (Lindl.)): 'Ama-no-gawa', 'Shirofugen', 'Kanzan' i 'Kiku-shidare' na dwóch podkładkach w szkółce.

Świerczyński S., Stachowiak A., 2007. Propagation efficiency of four cultivars of *Prunus serrulata* (Lindl.) on two rootstocks. *Nauka Przyr. Technol.* 1, 3, #45.

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Zastosowane podkładki nie miały istotnego wpływu na procent przyjętych zrazów. Silniejszy wzrost roślin stwierdzono na podkładce 'Colt' niż na czereśni ptasiej.

**Słowa kluczowe:** odmiany wiśni piłkowanej, podkładki, szczepienie, wydajność, wzrost

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