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INFLUENCE OF ROOTSTOCKS AND METHOD OF BUDDING ON THE GROWTH OF MAIDEN TREES OF 'PISSARDII' CULTIVAR IN NURSERY PRODUCTION

Summary. In the experiment, carried out in 2004-2006, usefulness of two rootstocks and budding methods for the production of maiden trees of 'Pissardii' cultivar was compared. A bigger number of maiden trees, as well as better bud taking, was obtained on *Prunus tomentosa* while applying both budding methods, and on *P. cerasifera* while applying chip budding. Chip budding method caused a significantly stronger growth of maiden trees on *P. cerasifera* rootstock. The used rootstocks and budding methods did not influence the number of long shoots and roots. The obtained maiden trees met the requirements of Polish Norm PN-R-67010 in more than 95%.

Key words: rootstocks, methods of budding, maiden trees, efficiency, growth, quality

Introduction

Currently, ornamental trees with colourful leaves, used in different colour arrangements are being looked for. One of the species that meets such requirements is *Prunus cerasifera* in its 'Pissardii' cultivar. It has big, irregular, purple-red leaves. In nursery production it is propagated by budding on *P. cerasifera* seedling.

The aim of this experiment was an evaluation of the usefulness of two rootstocks for the production of maiden trees of 'Pissardii' cultivar. Simultaneously, efficiency of two budding methods: T budding and chip budding was compared.

Material and methods

Maiden trees of 'Pissardii' cultivar were produced in a nursery on two rootstocks: *P. cerasifera* and *P. tomentosa*, using two budding methods: T budding and chip bud-

ding. The experiment was set up in four replications, with 25 rootstocks per plot and planted in spring 2004 and 2005. In spring of the second year, the number of taken buds, compared with the number of budded rootstocks, was calculated. The following measurements and observations were conducted in autumn, after the end of the vegetation period: height of maiden trees (cm), their thickness (mm) – 30 cm above the ground, number of long shoots and their average length, number of roots. Consistency with the Polish Norm PN-R-67010 was evaluated on the basis of the obtained results.

Statistical analysis of the results was carried out using two-factor variance analysis, using Duncan's test at the confidence level $\alpha = 0.05$. The data presented in tables are the mean of two series.

Results

A bigger percent of taken buds of 'Pissardii' cultivar was obtained on *P. tomentosa* rootstock using two budding methods, and on *P. cerasifera* applying a chip budding method. A significantly lower results were observed for *P. cerasifera* using T budding method (Table 1).

Table 1. Influence of rootstock and method of budding on the percentage of taken buds and obtained maiden trees of 'Pissardii' cultivar
Tabela 1. Wpływ podkładki i metody okulizacji na procent przyjętych oczek i otrzymanych okulantów odmiany 'Pissardii'

Rootstock	Percentage of taken buds		Percentage of obtained maiden trees	
	T budding	chip budding	T budding	chip budding
Prunus cerasifera	66.7 a	90.4 b	54.6 a	73.3 b
Prunus tomentosa	90.4 b	85.2 b	84.1 c	81.5 c

Means followed by the same letters within the characteristic do not differ significantly at $\alpha = 0.05$.

The percentage of the obtained maiden trees depended mainly on the rootstock. It was noticeably higher on *P. tomentosa*, independently from the budding method. In case of the second rootstock much more maiden trees grew from chip budding (Table 1).

The height and thickness of the maiden trees, significantly bigger from other combinations, was obtained on *P. cerasifera* using chip budding method. The thickness of maiden trees, using the same budding method on the two studied rootstocks did not differ (Table 2).

Significantly higher average length of long shoots was obtained on *P. cerasifera* using chip budding method compared with other combinations evaluated in the experiment (Table 3).

The applied rootstocks and budding methods did not differentiate the number of long shoots and roots significantly (Table 3, 4).

Table 2. Influence of rootstock and method of budding on the height and thickness of maiden trees of 'Pissardii' cultivar
Tabela 2. Wpływ podkładki i metody okulizacji na wysokość i grubość okulantów odmiany 'Pissardii'

Rootstock	Height (cm)		Thickness (mm)	
	T budding	chip budding	T budding	chip budding
Prunus cerasifera	147.4 a	194.1 b	14.6 a	19.2 b
Prunus tomentosa	143.6 a	145.5 a	13.8 a	15.0 ab

Explanation: see Table 1.

Table 3. Influence of rootstock and method of budding on the number of long shoots and the average length of long shoots of 'Pissardii' cultivar
Tabela 3. Wpływ podkładki i metody okulizacji na liczbę i średnią długość długopędów odmiany 'Pissardii'

Rootstock	Number of long shoots		Average length of long shoots (cm)	
	T budding	chip budding	T budding	chip budding
Prunus cerasifera	8.9 a	11.6 a	48.7 a	57.6 b
Prunus tomentosa	8.4 a	8.9 a	46.7 a	48.2 a

Explanation: see Table 1.

Table 4. Influence of rootstock and method of budding on the number of roots and the percentage of compatibility of maiden trees with Polish Norm PN-R-67010
Tabela 4. Wpływ podkładki i metody okulizacji na liczbę korzeni i procentową zgodność okulantów z Polska Normą PN-R-67010

Rootstock	Number of roots		Percentage of compatibility with norm	
	T budding	chip budding	T budding	chip budding
Prunus cerasifera	19.3 a	20.6 a	99.8 b	99.9 b
Prunus tomentosa	20.8 a	19.4 a	95.5 a	99.4 b

Explanation: see Table 1.

Lower consistency, expressed in percent, with the Polish Norm PN-R-67010 was observed for maiden trees on *P. tomentosa*, obtained from T budding (Table 4). The results of the other combinations did not differ much.

Discussion

In literature one can find opinions that *P. tomentosa*, as a rootstock, blends well with plum trees cultivars (TRET'YAK 1983, MICHEV 1990, KARYCHEV and YANKOVA 1999, ŚWIERCZYŃSKI 2001). Both, the percentage of taken buds and the obtained maiden trees of 'Pissardii' cultivar in the conducted experiment, confirms these claims.

In the experiment, carried out on *P. cerasifera* it was observed that significantly better results of taken buds and obtained maiden trees were noticed when chip budding was applied. Also CZARNECKI (1991) believes that a budding method, especially chip budding, influences a better bud taking.

Percentage of obtained maiden trees of 'Pissardii' cultivar was also dependant on the applied rootstock. A similar dependence was observed by GĄSTOŁ and PONIEDZIAŁEK (1998). However, such influence of a rootstock on a final number of plum maiden trees was not observed by GRZYB and SITAREK (1996).

In the discussed experiment maiden trees obtained on *P. tomentosa* had the height similar to those on *P. cerasifera*, obtained in T budding, however weaker than those on *P. cerasifera* obtained in chip budding. It is not consistent with the results of KARYCHEV and YANKOVA (1999), who obtained much weaker growth of plum maiden trees on *P. tomentosa.* Also GĄSTOŁ and PONIEDZIAŁEK (1998) observed differences in the growth of plum maiden trees depending on the applied rootstock. But GRZYB and SITAREK (1996), on the basis of their observations, did not notice any influence of a dwarf rootstock on weakening the growth of plum maiden trees in nursery production.

Maiden trees of 'Pissardii' cultivar had a big number of small roots, thanks to which they could take root very well after being planted to the designated place.

A very high consistency of the obtained maiden trees with the norm testifies the usefulness of both rootstocks for nursery production of 'Pissardii' cultivar maiden trees.

Conclusions

1. Percentage of the obtained maiden trees was the highest on *Prunus tomentosa.*
2. Chip budding method increased the efficiency of maiden trees only in case of *P. cerasifera* rootstock
3. A stronger growth of maiden trees coming from chip budding was observed on *P. cerasifera* rootstock.
4. Obtained maiden trees were characterised with a very high consistency with Polish Norm PN-R-67010.

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WPŁYW PODKŁADKI I METODY OKULIZACJI NA WZROST OKULANTÓW ODMIANY 'PISSARDII' W PRODUKCJI SZKÓŁKARSKIEJ

Streszczenie. W doświadczeniu przeprowadzonym w latach 2004-2006 porównano przydatność dwóch podkładek i dwóch metod okulizacji do produkcji w szkółce okulantów odmiany 'Pissardii'. Lepszą wydajność okulantów otrzymano na podkładce *Prunus tomentosa* z zastosowaniem obu metod okulizacji, a na podkładce *P. cerasifera* – z zastosowaniem okulizacji na przystawkę. Ta metoda okulizacji spowodowała istotnie silniejszy wzrost okulantów na podkładce *P. cerasifera*. Okulanty w ponad 95% spełniały wymagania Polskiej Normy PN-R-67010.

Słowa kluczowe: podkładki, metody okulizacji, okulanty, wydajność, wzrost, jakość

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