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EFFECT OF INTENSIVE REGENERATION PRUNING OF FROSTBITTEN PEACH TREES 'HARBINGER' CV. ON THEIR GROWTH AND YIELDING

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Abstract. Studies were carried out in the years 2006–2008 in Przybroda near Poznań. Objects of studies consisted of 8-year old peach trees 'Harbinger' cultivar grown on three rootstocks: Manchurian Peach, Sand Cherry and Rakoniewicka Seedling. Tree crowns had a vase form and they were strongly damaged by frost during the winter 2005/2006. In spring 2006, intensive tree pruning was carried out. The objective of the studies was the estimation of the effect of a radical pruning of frostbitten trees on their regeneration and yielding, as well as to estimate the role of rootstocks in this process. Studies have shown that the tree pruning evoked a very strong compensation growth, the reaction of trees was the stronger, the more intensive was the tree pruning. As a result of the pruning, after 3 years, the lowered tree height (on the average by 40–50 cm) was maintained in relation to the control trees. After pruning, in the tree crown, longer productive long-shoots with diameters > 0.5 cm, developed as compared with the control. However, the radical pruning of trees caused in the third year after pruning a decrease in tree yielding from 30 to 40%, in comparison with the not pruned trees.

Key words: peach, regeneration pruning, rootstock, growth, yielding

INTRODUCTION

Cultivation of peach-trees in Poland is connected with a high natural risk. Frequently, hard winters damage the trees and ground frosts in spring damage the tree blooms and fruit buds destroying completely the yield, so as it happened after the winter in 2005/2006 [Radajewska and Szklarz 2006].

In spring 2006, the break in tree fruiting was utilized for a radical pruning of the tree crowns. According to many authors [Bielozierov 1972, Dudziński and Hołubowicz 1985, Marini 1984, Marini 2002, Radajewska 1989] an intensive pruning of trees significantly improves the processes of tree regeneration and at the same time it modern-

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izes the crown sizes and particularly it decreases the excessive height of trees. The objective of the presented studies was the estimation of the effect of intensive pruning of the frostbitten 8-year old peach trees of 'Harbinger' cultivar on the regeneration processes and on the reconstruction of the tree crowns, as well as the estimation of the role of rootstock played in the whole process. It is known that both the Manchurian Peach and the Sand Cherry rootstocks exert a weakening effect on the tree by about 30-40% [Radajewska and Andrzejewski 2004] in relation to the commonly applied Rakoniewicka Seedling rootstock.

MATERIAL AND METHODS

Studies were carried out in the years 2006–2008 in orchard of the Agricultural and Pomicultural Experimental Farm in Przybroda near Poznań. The objects of studies consisted of 8-year old peach trees 'Harbinger' cultivar with a vase form of the crown. The trees were grown on three rootstocks: Manchurian Peach (*Prunus mandschurica*/ Koehme), Sand Cherry (*Prunus besseyi*) and Rakoniewicka Seedling (*Prunus persica)*. The trees were grown in a spacing of 4.0×2.0 m (1250 trees·ha^{-1}), in random block design and in 6 replications. In tree rows, there was maintained a herbicide fallow according to the valid recommendations, while in the interrows, there was turf mown successively, depending on the needs. Every year, an adequate homogeneous standard fertilization was applied and prophylactic treatments against diseases were carried out. The trees suffered a strong damage caused by the winter of 2005/2006 showing numerous symptoms of bark and wood diseases.

Phot. 1. Control tree – not pruned
Fot. 1. Drzewo kontrolne – niecięte

Phot. 2. Tree pruned at height 1.5 m
Fot. 2. Drzewo przycięte na wysokości 1,5 m

Phot. 3. Tree pruned at height 1.0 m
Fot. 3. Drzewo przycięte na wysokości 1,0 m

In May 2006, a radical pruning of the trees was carried out in 3 levels:
1. control combination, trees were not pruned at all (phot. 1),
2. trees were pruned at the height of 1.5 m (phot. 2),
3. trees were cut at the height of 1.0 m (phot. 3).

In spring 2006, a high nitrogen and potassium fertilization was applied (100 kg N and 150 kg $K_2O \cdot ha^{-1}$). Every year in autumn, the following measurements were estimated: tree growth, tree height, projection of tree crowns (quotient of 2 widths), number of one-year old long-shoots ≥ 0.5 cm, the mean and summaric long-shoot length on selected branches in the central part of tree crowns and trunk cross sectional area of trees. Every year, also the yield of the trees was estimated. Results were statistically elaborated using the program STAT of the analysis of variance for 2-factorial experiments. The significance of differences was estimated by Duncan's test at the significance level of $\alpha = 0.05$.

RESULTS AND DISCUSSION

The presented studies have shown that strong tree pruning and high fertilization applied directly after pruning evoked a strong compensation growth of trees. The trees were in some way trying to rebuild the lost crown parts. Trees pruned at the height of 1.5 m, in the first year after pruning, restored their height by about 0.6 m to 1.0 m (tab. 1). Trees pruned at the height of 1.0 m, grew still more intensively and increased their height to 1.0–1.2 m. Control trees were the highest and reached 2.7 m of height. In the following year, the trees increased their height by about 0.5 m, independent of their height after pruning, while control trees reached about 3 m height (tab. 2). Trees pruned at 1.5 m, reached the height of 2.8 m. Trees pruned the strongest reached about 2.6 m height. Such reaction to a strong pruning in the spring period is known, many authors [Marini 1984, Marini 2002, Mika 1979, Radajewska 1989] reported that pruning in spring as well as high fertilization of trees with nitrogen enhances their growth. Marini [2002] reported that although the pruning reduces leaf buds and the production of assimilates, the not-pruned trees with similar resources must divide them among the particular growth sites and therefore, their shoot growth is poorer. Marini [2002] also indicated that in numerous studies on the frostbitten trees carried out in Virginia, it was found that the best term for tree pruning is the period occurring not later than 2-3 weeks after blooming and that the most rational is the very strong pruning, such as was presented in this experiment.

A stronger growth after pruning was shown by trees on the rootstocks of Manchurian Peach and Rakoniewicka Seedling. A weaker growth was shown by trees grown on Sand Cherry rootstock (tab. 1, 2, 3). Trees on Sand Cherry most probably showed symptoms of physiological disagreement, because their growth was differentiated and many trees were lost.

Thus, the stimulating effect of tree pruning on the growth of trees on the Rakoniewicka Seedling [Radajewska and Andrzejewski 2004] has been confirmed, on the other hand, no weakening effect on the growth has been shown by the Manchurian Peach rootstock. The reaction of trees on both rootstocks after strong pruning was similar, the trees increased their growth very strongly.

Table 1. Growth of peach trees on different rootstocks after intensive regeneration pruning, 1 year after pruning
Tabela 1. Wzrost drzew brzoskwini na różnych podkładkach po intensywnym cięciu regeneracyjnym, 1 rok po cięciu

	Rootstock Podkładka	Method of trees pruning Sposób cięcia drzew			Mean for rootstock Średnia dla podkładki
		control kontrola	pruned at 1.5 m cięcie na 1,5 m	pruned at 1.0 m cięcie na 1,0 m	
Tree crown height Wysokość koron drzew m	Manchurian Peach – Brzoskwinia Mandżurska	2.5 de*	2.5 cde	2.2 abc	2.4 b
	Sand Cherry – Wisienka stepowa	2.3 bcd	2.1 ab	2.0 a	2.1 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	2.7 e	2.1 ab	2.1 ab	2.3 b
	Mean for pruning method Średnia dla sposobu cięcia	2.5 b	2.2 a	2.1 a	
Tree crown projection Projekcja koron drzew m^2	Manchurian Peach – Brzoskwinia Mandżurska	9.2 c	6.5 b	4.0 a	6.6 a
	Sand Cherry – Wisienka stepowa	5.9 b	5.9 b	5.4 ab	5.7 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	6.9 b	7.0 b	5.1 ab	6.3 a
	Mean for pruning method Średnia dla sposobu cięcia	7.3 b	6.5 b	4.8 a	
TCSA PPPP cm^2**	Manchurian Peach – Brzoskwinia Mandżurska	79.4 c	71.9 bc	63.0 abc	71.4 b
	Sand Cherry – Wisienka stepowa	52.1 a	69.2 abc	52.3 a	57.9 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	54.7 ab	64.3 abc	71.6 bc	63.5 ab
	Mean for pruning method Średnia dla sposobu cięcia	62.1 a	68.5 a	62.3 a	

*Means indicate by the same letter do not differ significantly at $P \leq 0.05$. Statistical analysis was made separately for each characteristic.
*Średnie oznaczone tą samą literą nie różnią się istotnie przy $P \leq 0,05$. Analiza statystyczna została wykonana oddzielnie dla każdej cechy.
**TCSA – trunk cross sectional area (cm^2)
** PPPP – powierzchnia przekroju poprzecznego pnia (cm^2)

Table 2. Growth of peach trees on different rootstocks after intensive regeneration pruning, 2 year after pruning
Tabela 2. Wzrost drzew brzoskwini na różnych podkładkach po intensywnym cięciu regeneracyjnym, 2 rok po cięciu

	Rootstock Podkładka	Method of trees pruning Sposób cięcia drzew			Mean for rootstock Średnia dla podkładki
		control kontrola	pruned at 1.5 m cięcie na 1.5 m	pruned at 1.0 m cięcie na 1.0 m	
Tree crown height Wysokość koron drzew m	Manchurian Peach – Brzoskwinia Mandżurska	3.0 cd*	2.9 bcd	2,7 bc	2.9 b
	Sand Cherry – Wisienka stepowa	3.0 cd	2.7 b	2,3 a	2.7 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	2.9 bcd	2.7 bc	2,9 bcd	2.9 b
	Mean for pruning method Średnia dla sposobu cięcia	3.0 b	2.8 a	2,6 a	
Tree crown projection Projekcja koron drzew m^2	Manchurian Peach – Brzoskwinia Mandżurska	12.7 b	7.8 a	6,4 a	8.9 ab
	Sand Cherry – Wisienka stepowa	8.7 a	8.0 a	6,7 a	7.8 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	11.8 b	8.6 a	7,7 a	9.4 b
	Mean for pruning method Średnia dla sposobu cięcia	11.1 b	8.1 a	6,9 a	
TCSA PPPP cm^2**	Manchurian Peach – Brzoskwinia Mandżurska	98.5 b	84.8 ab	71.3 ab	84.9 a
	Sand Cherry – Wisienka stepowa	54.8 ab	78.1 ab	60.9 a	64.6 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	80.2 ab	66.8 a	77.9 ab	75.0 a
	Mean for pruning method Średnia dla sposobu cięcia	77.8 a	76.6 a	70.0 a	

* and ** Explanations, see Table 1.

Table 3. Growth of peach trees on different rootstocks after intensive regeneration pruning, 3 year after pruning
Tabela 3. Wzrost drzew brzoskwini na różnych podkładkach po intensywnym cięciu regeneracyjnym, 3 rok po cięciu

	Rootstock Podkładka	Method of trees pruning Sposób cięcia drzew			Mean for rootstock Średnia dla podkładki
		control kontrola	pruned at 1.5 m cięcie na 1.5 m	pruned at 1.0 m cięcie na 1.0 m	
Tree crown height Wysokość koron drzew m	Manchurian Peach – Brzoskwinia Mandżurska	3.1 d*	2.7 bcd	2.4 abc	2.8 b
	Sand Cherry – Wisienka stepowa	2.5 abc	2.4 ab	2.3 a	2.4 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	3.6 c	2.7 abcd	2.8 cd	3.0 c
	Mean for pruning method Średnia dla sposobu cięcia	3.1 b	2.6 a	2.5 a	
Tree crown projection Projekcja koron drzew m^2	Manchurian Peach – Brzoskwinia Mandżurska	10.9 abc	12.8 bc	8.1 a	10.6 ab
	Sand Cherry – Wisienka stepowa	11.4 abc	9.3 ab	8.3 a	9.7 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	13.7 c	13.1 c	9.5 ab	12.1 b
	Mean for pruning method Średnia dla sposobu cięcia	12.0 b	11.7 b	8.6 a	
TCSA PPPP cm^2**	Manchurian Peach – Brzoskwinia Mandżurska	88.4 b	94.1 b	84.1 ab	88.9 b
	Sand Cherry – Wisienka stepowa	58.1 a	81.3 ab	77.7 ab	72.4 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	105.0 b	87.7 b	84.0 ab	92.2 b
	Mean for pruning method Średnia dla sposobu cięcia	83.8 a	87.7 a	81.9 a	

* and ** Explanations, see Table 1.

Table 4. Longshoots characteristic after intensive regeneration pruning, 1 year after pruning
Tabela 4. Charakterystyka długopędów po intensywnym cięciu regeneracyjnym, 1 rok po cięciu

	Rootstock Podkładka	Method of trees pruning Sposób cięcia drzew			Mean for rootstock Średnia dla podkładki
		control kontrola	pruned at 1.5 m cięcie na 1.5 m	pruned at 1.0 m cięcie na 1.0 m	
Number of shoots with diameter ≥ 0.5 cm Liczba długopędów o średnicy ≥ 0.5 cm	Manchurian Peach – Brzoskwinia Mandżurska	7.7 c*	7.3 c	6.2 bc	7.0 b
	Sand Cherry – Wisienka stepowa	3.5 a	5.2 ab	5.8 bc	4.8 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	5.3 ab	5.8 bc	6.2 bc	5.8 a
	Mean for pruning method Średnia dla sposobu cięcia	5.5 a	6.1 a	6.0 a	
Mean length of shoots with diameter ≥ 0.5 cm Średnia długość długopędów o średnicy ≥ 0.5 cm cm	Manchurian Peach – Brzoskwinia Mandżurska	43.7 bc	51.2 c	68.0 d	54.3 c
	Sand Cherry – Wisienka stepowa	22.0 a	46.7 bc	60.3 d	43.0 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	38.3 b	45.7 bc	61.7 d	48.5 b
	Mean for pruning method Średnia dla sposobu cięcia	34.7 a	47.8 b	63.3 c	
Summaric length of shoots with diameter ≥ 0.5 cm Sumaryczna długość długopędów o średnicy ≥ 0.5 cm m	Manchurian Peach – Brzoskwinia Mandżurska	3.3 cde	3.7 de	4.2 e	3.7 c
	Sand Cherry – Wisienka stepowa	0.8 a	2.3 bc	3.6 de	2.2 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	2.0 b	2.7 bcd	3.8 e	2.8 b
	Mean for pruning method Średnia dla sposobu cięcia	2.0 a	2.9 b	3.9 c	

* Explanations, see Table 1.

Table 5. Longshoots characteristic after intensive regeneration pruning, 2 year after pruning
Tabela 5. Charakterystyka długopędów po intensywnym cięciu regeneracyjnym, 2 rok po cięciu

	Rootstock Podkładka	Method of trees pruning Sposób cięcia drzew			Mean for rootstock Średnia dla podkładki
		control kontrola	pruned at 1.5 m cięcie na 1.5 m	pruned at 1.0 m cięcie na 1.0 m	
Number of shoots with diameter ≥ 0.5 cm Liczba długopędów o średnicy ≥ 0.5 cm	Manchurian Peach – Brzoskwinia Mandżurska	4.0 bcd*	4.0 bcd	4.2 bcd	4.0 a
	Sand Cherry – Wisienka stepowa	2.3 a	3.3 abc	5.0 d	3.6 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	3.2 ab	3.5 bc	4.3 cd	3.7 a
	Mean for pruning method Średnia dla sposobu cięcia	3.2 a	3.6 a	4.5 b	
Mean length of shoots with diameter ≥ 0.5 cm Średnia długość długopędów o średnicy ≥0.5 cm cm	Manchurian Peach – Brzoskwinia Mandżurska	35.0 abc	35.5 abc	42.8 c	37.8 a
	Sand Cherry – Wisienka stepowa	28.3 a	32.2 a	43.0 c	34.5 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	31.8 a	33.0 ab	41.7 bc	35.5 a
	Mean for pruning method Średnia dla sposobu cięcia	31,7 a	33.6 a	42.5 b	
Summaric length of shoots with diameter ≥ 0.5 cm Sumaryczna długość długopędów o średnicy ≥ 0.5 cm m	Manchurian Peach – Brzoskwinia Mandżurska	138.3 bc	145.8 bc	182.2 cd	155.4 a
	Sand Cherry – Wisienka stepowa	65.7 a	113.0 ab	205.8 d	128.2 a
	Rakoniewicka Seedling – Siewka Rakoniewicka	103.0 ab	115.0 ab	179.0 cd	132.3 a
	Mean for pruning method Średnia dla sposobu cięcia	102.3 a	124.6 a	189.0 b	

* Explanations, see Table 1.

The crown projection of trees pruned at the height of 1.5 m was in the year of pruning smaller by about 0.9 m^2, but it did not differ significantly from the not pruned control trees (tab. 1), however, the projection of the crowns pruned at the height of 1.0 m was significantly smaller than that of the control trees showing 4.8 m^2 and 7.3 m^2, respectively (tab. 1). The rootstocks weakly differentiated the span of tree crowns. The crowns with a higher range were shown by trees on the rootstocks Rakoniewicka Seedling and Manchurian Peach, in comparison with trees on Sand Cherry rootstock. In the following year, the projection of the not pruned crowns was significantly wider than in the previous year shown by the pruned trees and it amounted from about 9 m^2 to almost 13 m^2 (on the average 11.0 m^2) (tab. 2). The crowns of the pruned trees had a significantly smaller span. Trees pruned at the height of 1.5 m showed 8 m^2 crowns and those pruned at the height of 1.0 m had a crown of about 7 m^2 (tab. 1). The rootstocks differentiated the size of tree crowns, similarly as in the previous year when the greatest crown was shown by trees grown on Rakoniewicka Seedling rootstock (9.4 m^2 – tab. 2). Then, there followed the trees grown on Manchurian Peach (8.9 m^2); the smallest crown was shown by trees on Sand Cherry rootstock (7.8 m^2). In the third year after tree pruning, a distinct influence on the tree height remained. The trees pruned at the height of 1.5 m were lower by about 50 cm than the control trees and the trees pruned at the height of 1.0 m were lower by about 60 cm than the control (tab. 3).

Measurement of tree trunk circumference and trunk cross sectional area values were similar for all pruning levels. However, a stimulating effect of the Rakoniewicka Seedling rootstock on the tree growth was visible, as well as the weakening effect of Sand Cherry rootstock. The radical pruning of trees evoked also significantly longer increments of the thick one year old long-shoots with a diameter ≥ 0.5 cm, being valuable for the future fruiting. With a similar number of long-shoots in all pruning combinations (5.5; 6.1; 6.0 respectively), their mean length was significantly greater on the pruned trees than on the control trees (tab. 4). Furthermore, the shoot increments were the longer the stronger was the tree pruning, which was expressed by the following results: on control trees – 35 cm, on trees pruned at the height of 1.5 m – 48 cm and on trees cut at the height of 1.0 m – 63 cm (tab. 4). Marini [2002] reported that there exists a direct relation between the fruit size and the length of long-shoots on which the fruits develop because on such shoots, there is a significantly more favourable number of leaves in proportion to the nourished fruits. The summary length of long-shoots was higher on the pruned trees amounting to 2.9 and 3.9 m respectively, while on the control trees, the shoot length was only 2.0 m (tab. 4). In the second year after tree pruning, there was a significantly smaller number of the valuable long-shoots showing on a branch 3.2, 3.6 and 4.5 m length, respectively, depending on the level of pruning. The number of long-shoots was the greater, the stronger was the tree pruning. The short-shoots were also slightly shorter and as a result, their summaric length was also significantly shorter amounting from 1.0 to 1.9 m, respectively (tab. 5). Also there, the same rule was observed, the longest short-shoots were on the most strongly pruned trees (at 1.0 meter height). Not branched long-shoots with a thickness ≥ 0.5 cm and 30–60 cm length are the most productive ones because on such shoots, every year, the flower buds are differentiated for the future fruiting. They constitute the main yield-producing potential of trees [Dudziński and Hołubowicz 1985, Marini 2002, Mika 1979].

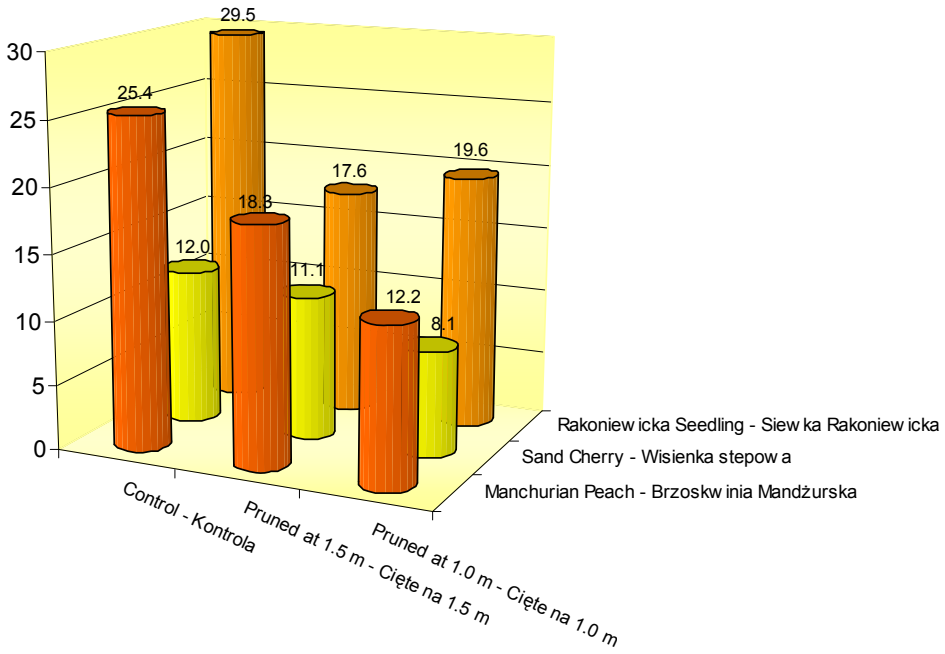

Fig. 1. Effect of pruning method and rootstock on yielding of peach 'Harbinger', kg·tree^{-1}
Ryc. 1. Wpływ sposobu cięcia i podkładki na plonowanie brzoskwini 'Harbinger', kg·drzewo^{-1}

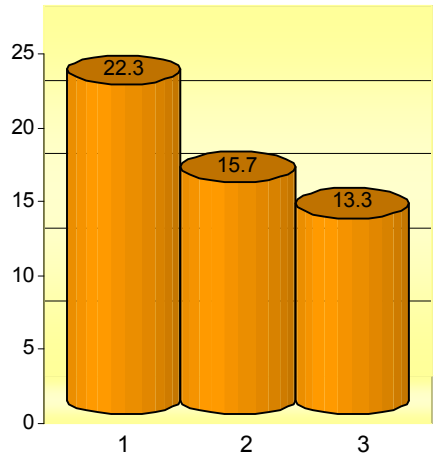

Fig. 2. Effect of pruning method on yielding of peach 'Harbinger', kg·tree^{-1}
Ryc. 2. Wpływ sposobu cięcia na plonowanie brzoskwini 'Harbinger', kg·drzewo^{-1}

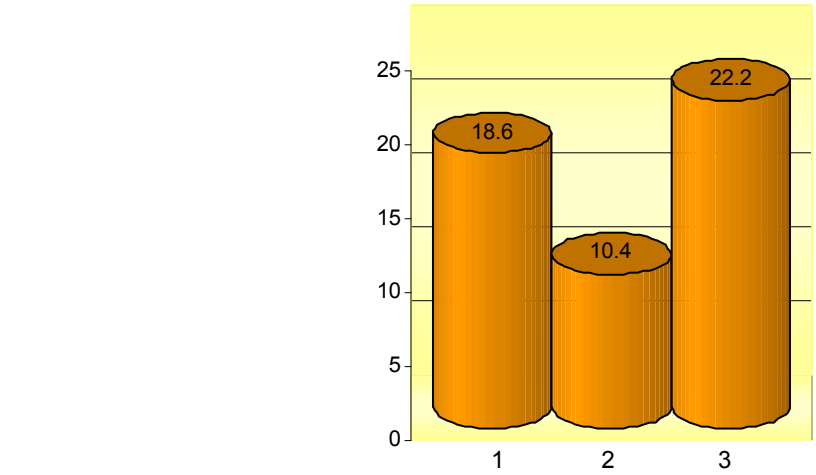

Fig. 3. Effect of rootstock on yielding of peach 'Harbinger', kg·tree^{-1}
Ryc. 3. Wpływ podkładki na plonowanie brzoskwini 'Harbinger', kg·drzewo^{-1}

In spring 2007, ground frosts destroyed the blooms and fruit buds, only a few single fruits were harvested from the trees. In 2008, the trees were blooming abundantly and they set fruit buds. All of them required fruit bud thinning and a full yield was harvested. The best yielding was shown by the not pruned trees giving a mean yield of 22.3 kg/tree. The yield from the pruned trees, both at the height of 1.5 m and 1.0 m was significantly smaller (15.7 and 13.3 kg·tree^{-1}, respectively). Better yield was obtained from trees on the Rakoniewicka Seedling and on Manchurian Peach rootstocks (22.2 and 18.6 kg·tree^{-1}, respectively). Significantly poorer was the yield on the Sand Cherry rootstock giving on the average 10.4 kg fruits·tree^{-1} (fig. 1, 2 and 3). In spite of the fact that many authors [Dudziński and Hołubowicz 1985, Marini 2002, Mika 1979, Radajewska 1989] recommend strong tree pruning in older peach orchards as a treatment stimulating trees to an intensive growth, one should be prepared that in the span of several years after pruning, there may follow a significant decrease of tree yielding. Such strong tree pruning decreases and thereby reduces significantly the fruit-creating zone where fruiting takes place. In spite of the potentially greater productivity of the regenerated part of tree crown after pruning, in relation to the not pruned trees, the obtained yield does not compensate the yield lost in the pruned off fruit-bearing tree zone. Therefore, the decision referring to such intensive pruning of trees damaged by frost should be taken individually in relation to the particular orchard, in order to calculate exactly the losses and advantages resulting from such treatment. However, it seems that peach trees strongly damaged by frost, attacked by numerous diseases of bark and wood require such stimulate to awake in them the regeneration processes and to correct the crown sizes of too excessively high trees.

CONCLUSIONS

1. Intensive pruning of 8-year old peach trees 'Harbinger' cultivar evoked a very strong compensating growth of trees, particularly in the first year after treatment.

2. Regenerative pruning of peach trees permitted to limit the crown dimension however, with the lapse of time, the differences were leveled up and the pruned trees seemed to make up for the lost growth and caught up with the control trees.

3. The estimated rootstocks exerted a significant effect on the regeneration processes and the growing of new shoots on the branches of peach trees 'Harbinger' cultivar. The higher growth was shown by trees grown on rootstock Rakoniewicka Seedling and on Manchurian Peach. Significantly poorer growth was shown by trees grown on Sand Cherry rootstock, frequently showing symptoms of physiological disagreement.

4. Strong pruning of frostbitten trees decreased in the third year after pruning their yielding by 30–40%, in comparison with the control trees.

5. The purposefulness of a radical pruning of frostbitten peach trees should be individually considered before taking the final decision. Subject of consideration should be: the tree age and condition, the size of crowns, their density in the orchard, since by decreasing the crown size, also the yield will be decreased in the first years after treatment.

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WPŁYW INTENSYWNEGO CIĘCIA REGENERACYJNEGO DRZEW BRZOSKWINI 'HARBINGER' NA ICH WZROST I PLONOWANIE

Streszczenie. Badania prowadzono w latach 2006–2008 w Przybrodzie koło Poznania. Przedmiotem badań były 8-letnie drzewa brzoskwini 'Harbinger' na 3 podkładkach: Brzoskwini Mandżurskiej, Wisience stepowej i Siewce Rakoniewickiej silnie uszkodzone przez mróz w okresie zimy 2005/2006. Wiosną 2006 przeprowadzono intensywne cięcie drzew. Celem badań była ocena wpływu radykalnego cięcia przemarzniętych drzew na ich regenerację i plonowanie oraz ocena roli podkładki w tym procesie. Badania wykazały że przycięcie drzew wywołało bardzo silne przyrosty długopędów. Tym silniejsza była reakcja drzew, im mocniej drzewa przycięto. Wynikiem cięcia obniżono wysokość drzew średnio o 30–40 cm w stosunku do drzew kontrolnych. Różnice te utrzymywały się w kolejnych latach. Po cięciu wyrosło w koronach drzew więcej dłuższych długopędów o średnicy > 0,5 cm, aniżeli na drzewach kontrolnych. Jednakże radykalne cięcie drzew spowodowało w 3 roku po cięciu obniżenie ich plonowania o 30–40% w stosunku do drzew nieciętych.

Słowa kluczowe: brzoskwinia, cięcie regeneracyjne, podkładka, wzrost, plonowanie

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