## THE EFFECT OF M.26 AND P 14 ROOTSTOCKS ON THE QUALITY OF MAIDEN TREES OF THREE APPLE CULTIVARS PRODUCED IN THE ORGANIC NURSERY

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A prerequisite for obtaining good economic results in apple production is a high quality of the nursery material and this applies not only integrated, but also organic fruit production. Establishing an organic orchard with young trees that have been suitably prepared in the nursery will considerably reduce or even eliminate the need for pruning them after planting. This will have the beneficial effect of making the trees produce fruit earlier and more abundantly. The ecological agriculture regulations impose the requirement of establishing ecological orchards using trees produced in ecological nurseries. Rootstocks are very important components in the production of fruit trees, affecting not only on the quality parameters of maidens trees in the nursery, but also on their growth



and fruiting in the first years after planting in the orchard.

The aim of the presented study was to determine to compare two semi dwarf rootstocks on the quality of apple maiden trees produced in the organic nursery.

![](_page_0_Picture_7.jpeg)

The experiment was conducted in the years 2012-2013 in a ecological nursery, belonging to the Ecological Experimental Orchard at Nowy Dwór Parcela near Skierniewice. The M.26 and P 14 rootstocks were planted in the organic nursery in the spring of 2011, at a spacing of 0.9 m between the rows and 0.3 m in the rows. During the summer the rootstocks were budded by "chip-budding" method with buds of three apple cultivars: 'Free Redstar', 'Gold Milenium', and 'Melfree".

All agro-technical and plant protection treatments were carried out in accordance with the regulations applicable to ecological agriculture. Single manure application was done in the autumn before rootstocks planting. The dose of manure was 40 tones per hectare.

The results were evaluated statistically using the analysis of variance and the differences between means were assessed with Duncan's t-test at p = 0.05.

In the autumn of the first and the second year of the experiment the height and stem diameter of the rootstocks and trees were measured. The number of lateral shoots and their length were also recorded for the maiden trees.

Table 1. Growth of two rootstocks in the first season in an organic nursery.

Rootstock	Number of budded root- stocks [%]	Roc	Rootstock		
		Spring (after planting)	Autumn (after budding)	Annual growth	height [cm]
P 14	100,0a	5,9a	10,7	4,8a	91,4a

![](_page_0_Picture_14.jpeg)

![](_page_0_Figure_15.jpeg)

Means marked with the same letter do not differ significantly at P = 0,05, according to Duncan's multiple range test.

![](_page_0_Picture_17.jpeg)

![](_page_0_Picture_18.jpeg)

Table 2. Effect of two rootstocks on plant growth parameters of apple maiden treesgrown in an organic nursery.

Cultivar/rootstock	Trunk diameter [mm]	Tree height [cm]	Number of obta- ined trees [%]	Number of I class trees [%]
P 14				
'Free Redstar'	13,8cd	155,7c	87,3ab	88,0bc
'Gold Milenium'	14,2d	147,0b	96,9b	90,5c
'Melfree'	13,6bc	162,3d	92,9ab	85,9bc
M.26				
'Free Redstar'	13,0a	144,7b	84,7a	75,3a
'Gold Milenium'	13,4abc	127,8a	91,9ab	84,9bc
'Melfree'	13,1ab	149,0b	89,9ab	78,7ab
For explanation see table 1.				

Table 3. Effect of two rootstocks on quality parameters of apple maiden trees grownin an organic nursery.

Cultivar/ rootstock	Number of bran- ched trees [%]	Mean number of lateral shoots <sup>#</sup> [shoot/tree]	Mean length of lateral shoot [cm]
P 1	4		
'Free Redstar'	34,0ab	1,9b	14,1b
Gold Milenium'	94,0c	5,3d	18,4c
'Melfree'	29,6a	2,0b	30,8d
M.2	26		
'Free Redstar'	39,7ab	1,3a	9,4a
Gold Milenium'	83,8c	4,7c	11,6ab
'Melfree'	45,3b	1,8ab	20,6 c
For explanation see t	able 1.		

Note: # shoots longer than 5 cm.

## **Conclusions**

The diameter of the rootstocks of the examined cultivars depended on the type of the rootstock used.

**It turned out that the rootstock P 14 was thinner than the M.26 ones.** 

The high number of trees, in the relation to the number of budded rootstocks, was obtained for trees on both rootstocks.

The best quality maidens were obtained for apple cultivars budded on P 14.
The trees on P 14 had a larger diameter and were higher than those on M.26.
Trees budded on P 14 were better branched.

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