Compatibility of apricot cultivars with rootstocks Krymsk-1 and Krymsk-2

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Abstract

The objective of this study was evaluation of apricot genotypes compatibility to different rootstocks. Rootstocks Krymsk-1 (Prunus tomentosa x Prunus cerasifera) and Krymsk-2 (Prunus incana x Prunus tomentosa) were included in this study and compared with rootstocks MRS 2/5, St. Julien and apricot seedling MHL2. Apricot cultivars ´Betinka´, ´Darina´, ´Harcot´, ´Helena du Roussillon´, ´Lescora´, ´Kompakta´, ´Radka´ and hybrid ´LE-2927´ were evaluated in the trial. Total length of annual growth and trunk cross section area of tested cultivars were recorded in the nursery field at the end of growing season in the year 2010. Also the number of survival grafted plants was recorded on rootstocks Krymsk-1 and Krymsk-2 in this year of evaluation. In the year 2011 the behaviour of cultivars Betinka´, ´Darina´, ´Harcot´, ´Helena du Roussillon´, ´Lescora´, ´Kompakta´, ´Radka´ and hybrid ´LE-2927´ was evaluated on rootstocks Krymsk-1, Krymsk-2, MRS 2/5, St. Julien and apricot seedling MHL2. Survival rate of grafted genotypes ´Betinka´ and ´LE-2927´ was higher on the rootstock Krymsk-1 (84 %) in comparison with the rootstock Krymsk-2 (77 % respective 63 %).

Key words: rootstocks, compatibility, Krymsk-1, Krymsk-2, *Prunus armeniaca*

Introduction

The most significant characters which must be involved in selection of apricot rootstocks are ability to propagation, anchorage, growth rate, uniformity and compatibility, the environment adaptability, disposition for a formation of root suckers, the influence on precocity of bearing after planting and on yield. The extensive approach to rootstock breeding which mainly consisted in a selection from spontaneous natural resources (especially generatively propagated rootstocks) has been changed in purposeful rootstock breeding for different conditions. A remarkable amount of rootstocks with vegetative propagation has also been bred and introduced to practice in latest years (Loreti, 1994; Loreti, 1997; Reighard, 2000; Moreno, 2004; Layne, 1987; Okie, 1987). A lot of varieties of *Prunus* genus were utilized in the rootstock breeding. But the number of species which the most used rootstocks for apricots come from is not large. They are especially species *Prunus armeniaca* L., *Prunus cerasifera* Ehrh., *Prunus persica* L., *Prunus insititia* L. and *Prunus domestica* L. Rootstocks formed by interspecific hybridization whose application depends only on vegetative propagation are increasing (Vachun, 1995). The rootstock has a significant influence on plant decline percentage. The character of influence on a grafted variety is considerable with rootstock health, especially from the point of view of compatibility, growth-rate and apricot yield. Rootstocks Krymsk-1 (*Prunus tomentosa x Prunus cerasifera*) and Krymsk-2 (*Prunus incana x Prunus tomentosa*) are included in this study and compared with rootstocks MRS 2/5, St. Julien and apricot seedling MHL2.

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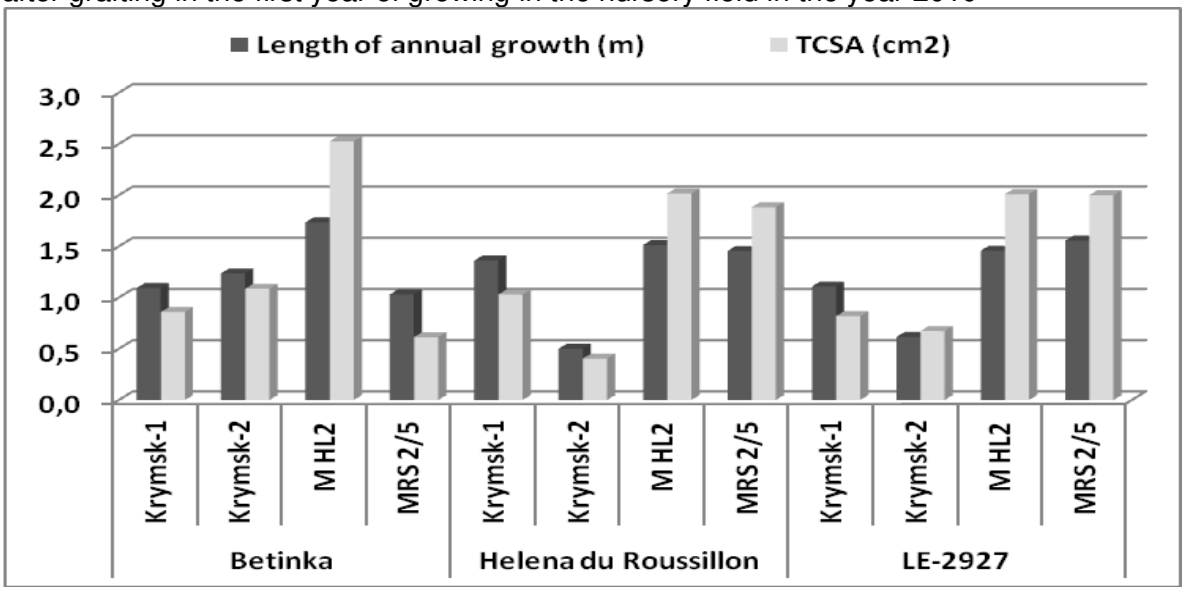
Material and methods

Apricot cultivars ´Betinka´, ´Darina´, ´Harcot´, ´Helena du Roussillon´, ´Lescora´, ´Kompakta´, ´Radka´ and hybrid ´LE-2927´ were involved in the trial. Rootstocks Krymsk-1 (*Prunus tomentosa x Prunus cerasifera*), Krymsk-2 (*Prunus incana x Prunus tomentosa*), MRS 2/5, St. Julien and apricot seedling MHL2 were tested. Twenty buds of cultivar ´Betinka´ and hybrid ´LE-2927´ were grafted on tested rootstocks. Cultivar ´Helena du Roussillon´ was put into the trial as a cultivar that is characterized by bad compatibility with common cultivated apricot rootstocks. Total length of annual growth and trunk cross-section area (TCSA) of tested cultivars were evaluated in the nursery field at the end of growing season in the year 2010. Also the number of survival grafted plants was recorded on rootstocks Krymsk-1 and Krymsk-2 in this year of evaluation. In the year 2011 the behaviour of cultivars Betinka´, ´Darina´, ´Harcot´, ´Helena du Roussillon´, ´Lescora´, ´Kompakta´, ´Radka´ and hybrid ´LE-2927´ was evaluated on rootstocks Krymsk-1, Krymsk-2, MRS 2/5, St. Julien and apricot seedling MHL2 after planting on the permanent site. The increase of TCSA of apricot cultivars planted into randomized blocs (totally 12 pieces from each cultivar) on different rootstocks was recorded at the end of growing season. Total height of trees was not recorded due to tree trimming after planting.

Results

Length of annual growth and trunk cross section area were recorded on evaluated cultivars on different rootstocks in the nursery field. Results are shown in the Figure 1. The most reduced growth and the higher increase of TCSA of the cultivar ´Betinka´ was recorded on the rootstock MRS 2/5 with 59.5 % and 49.3 % of TCSA in comparison with apricot seedling MHL2. In contrary the most reduced growth and TCSA of the hybrid ´LE-2927´ was recorded on rootstock Krymsk-2 with 42.3 % reduction of growth and 59.9 % of reduction of TCSA. Growth of the cultivar ´Helena du Roussillon´ was the most reduced on the rootstock Krymsk-2 (33.2 %) and TCSA was reduced to 81.2 % in comparison to growth on apricot seedling MHL2.

Figure 1: Length of annual growth and trunk cross-section area of one year old apricot cultivars after grafting in the first year of growing in the nursery field in the year 2010



Survival of grafted plants is shown in the Figure 2. From the records is evident higher survival rate on the rootstock Krymsk-1 of all three tested genotypes. The survival rate of the cultivar ´Helena du Roussillon´ that is characterized by bad compatibility with common cultivated apricot rootstocks was only 33.3 % on the rootstock Krymsk-2 and 43.5 % on the rootstock Krymsk-1.

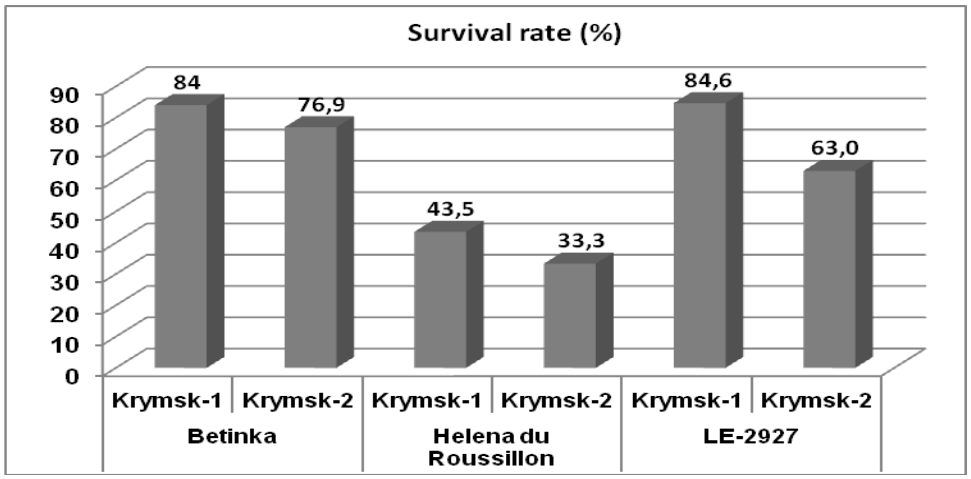


Figure 2: Survival of apricot cultivars after grafting on rootstocks Krymsk-1 and Krymsk-2 in the nursery field in the year 2010

Growth of apricot cultivars on different rootstocks after planting on the permanent site is shown in the Figure 3. On the contrary of the growth in the nursery field where was growth of cultivar Betinka the most reduced on the rootstock MRS 2/5 increasing of TCA on the permanent site in the first year of growing was on this rootstock the highest. Growth of tested cultivars was more vigour on the rootstock MRS 2/5 than on rootstocks St. Julien (none on cultivars ´Helena du Roussillon´and ´Darina´), Krymsk-1 and Krymsk-2. Growth of cultivars ´Darina´, ´Harcot´, ´Kompakta´, ´Lescora´ and ´Radka´ was evaluated only on rootstocks S. Julien and MRS 2/5.

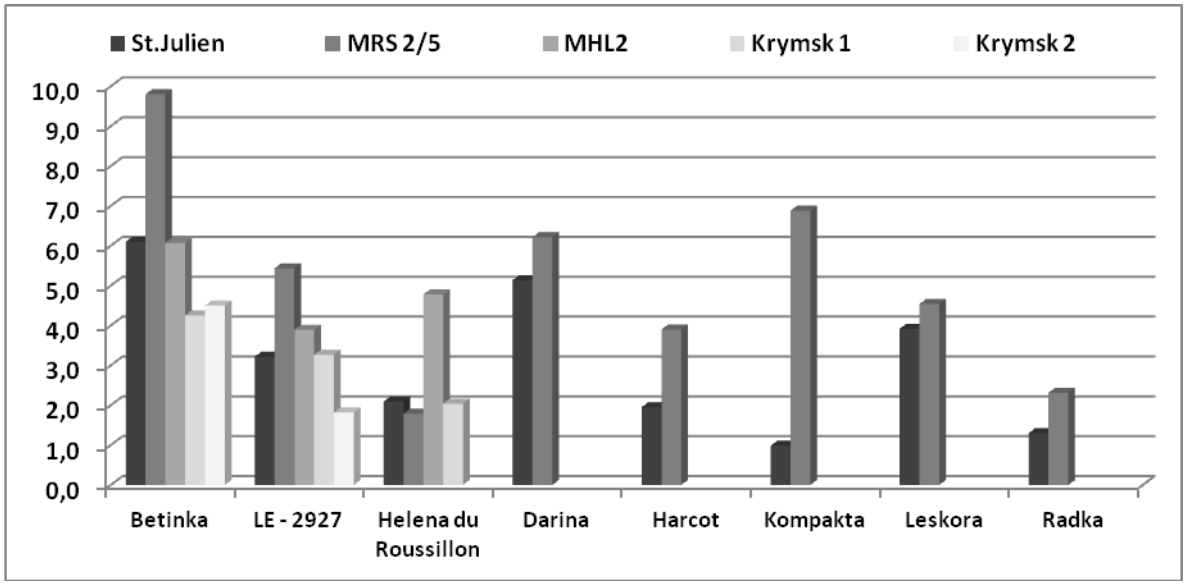


Figure 3: The increase of trunk cross-sectional area of apricot cultivars grafted on different rootstocks in the first year of growing on the permanent site (in cm^2)

Discussion

The consumers request apricot fruits with high quality and nutritional value but also fruits from organic production without residues of chemicals. As the result of this situation the organic apricot production has been established and is flourishing. The healthy apricot trees on perspective rootstocks help to get successful results in this field. Tested rootstocks Krymsk-1 (*Prunus tomentosa x Prunus cerasifera*) and Krymsk-2 (*Prunus incana x Prunus tomentosa*) are challenge to increase health of apricot trees and to depress economic losses due to high tree decline also in organic orchard. The compatibility of tested cultivars shows different survival rate of grafted cultivars on those rootstocks. The growth of trees on rootstocks Krymsk-1 and Krymsk-2 is decreased and therefore these rootstocks are highly recommended into new-fashioned high tree density orchards that are suitable also for organic farming.

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