

P-21 (135)**ASIAN AND EUROPEAN PEAR SCION-ROOTSTOCK INTERACTIONS AND PYRODWARF ROOTSTOCK ROOT GROWTH AND DISTRIBUTION**

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In recent years some of pear nurseries have been suggested using vegetative propagated European pear (*Pyrus communis* L.) 'Pyrodwarf' rootstock for pear orchards in Iran. This research was carried out in order to explore the scion/rootstock interactions, root growth and root length density (RLD) and distribution of two Asian (*Pyrus serotina* Rehd) and one European pear cultivars on vegetatively propagated Pyrodwarf rootstock. Two Asian pear 'KS₆' and 'KS₁₀' cultivars with one European pear 'Shahmiveh' cultivar budded on 'Pyrodwarf' rootstock on late August 2012. The scions vegetative and rootstock root growth and distribution were recorded under Tarbiat Modares University (TMU), Asian pear orchard's conditions during 2013 and 2014 growing seasons. In addition, in order to study the scion/rootstock compatibility, the amount of starch in the above and below of the graft union was determined using isozyme study by polyacrylamide gel electrophoresis. The obtained results showed that the vegetative growth of the studied cultivars on Pyrodwarf rootstock were significantly different, although the amount of two years growth on 'KS₁₀' cultivar was lower than 'KS₆' and 'Shahmiveh' cultivars. In addition, the amount of starch content was significantly different among the studied cultivars, so 'Shahmiveh' had the lower starch than the other two studied cultivars. Isozymes study showed A and B bands in the 'Pyrodwarf' rootstock and 'Shahmiveh' cultivar, although the only B band was observed in the 'KS₆' and 'KS₁₀' Asian pear cultivars. According to the results, it seems that 'Shahmiveh' as a European pear cultivar showed good compatibility on 'Pyrodwarf' rootstock. Although, 'KS₆' and 'KS₁₀' as Asian pear cultivars showed semi-incompatibility on 'Pyrodwarf'. Note that the evaluation of the 'Pyrodwarf' root system showed that the main roots of this rootstock grew most horizontally near to the top layer of the soil, so roots were not penetrated and grew well within the deeper layer of the soil. We conclude that because of the root system and structure, 'Pyrodwarf' rootstock may not suitable in the arid and semi-arid areas and will not be suggested to pear fruit orchards that facing with shortage of irrigation water or drying conditions. The future research using suitable and compatible rootstocks with optimum root growth under drought conditions will warrant suitable fruit production for Asian and European pear orchards in Iran.

Keywords: Pyrodwarf rootstock, European pear, Asian pear, Graft compatibility