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TOP TO ROOT RATIO AND DRY MATTER PARTITIONING IN SOME MATURE OLIVE (*OLEA EUROPAEA L.*) TREES IN RELATION TO THE ROOT VOLUME AND POSSIBLE EXISTENCE OF HARMFUL NEMATODES IN THE SOIL

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The diversity in the climatic conditions in Iran created the features to produce high quality yield of various fruit crops. This diversity in the climate, leads to the positive potentials as well as negative limitations for culture and establishment of some specific fruit trees such as olive (*Olea europaea L.*). According to the statistics olive culture have been increased during the last three decades in the various regions of Iran, but severe unfavorable conditions as well as cold winter usually damage the current established orchards and also has negative impact on the new program for orchards establishment in some part of the country. The severe cold winter in 2008 damaged to the 95% of olive orchards in Qom, Saveh and Tehran and also damage, have been reported for many regions in 2013 and 2015. The top growth of mature olive trees completely damaged and death in the mentioned olive culture areas, so the new top canopy re-established from the un-damaged root system with the loss of cropping during re-growth of the top after cold winter damage. The idea for using specific rootstock for olive orchards in Iran is under consideration, but in the regions that may face with winter cold damage needs more careful attention and relevant research in order to reduce the risk of fast re-establishment of the damaged tree canopy from the cold and faster orchards cropping and economic returns. The aim of present research was to explore the amount of top soil growth and analysis of mature olive trees damaged after harsh winter cold in 2007. The own rooted olive trees cultivars 'Mission, and 'Blaidy' was planted in March, 2004 in 1 m distance within row in the research orchard of Department of Horticultural Science, Tarbiat Modares University (TMU), in Tehran. Mature olive trees had been experienced for severe winter cold in 2008, so the top growth completely damaged with remaining alive the root system. Trees allowed re-establishing their canopy after cold, so the top growth has been re-covered. In order to evaluate and analyze top growth, some mature trees randomly selected and destructively harvested for the top growth in 2017 early growing season. The canopy divided into the leaves, shoots, and trunk and scaffold branches. Results indicated the difference between total top dry mass among the studied cultivars, so 'Mission' showed higher total dry mass than 'Blaidy' cultivar. In addition, the highest dry matter increments was belongs to the trunk and main scaffold branches and then to the leaves and shoots. Research is continuing in order to explore the effect of soil volume and the possible existence of harmful nematodes in the soil. In addition, in this paper we will discuss the effect of top to root ratio and the impact of root volume, root length density (RLD) and root weight density (RWD) as well as the possible existence of harmful nematodes in the soil on dry matter partitioning of the mature own rooted potted olive trees cultivar 'Dezful' that grown under glasshouse conditions.

Keywords: Olive orchards; Winter cold damage; Canopy growth analysis; Dry matter partitioning; Root weight density (RWD); Root length density (RLD); Root to top dry weight ratio