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ORIGINAL ARTICLE

THE EFFECT OF FOLIAR SPRAY WITH PRO.SOL FERTILIZER AND LICORICE EXTRACT ON SOME VEGETATIVE GROWTH INDICATORS FOR YOUNG POMEGRANATE (*PUNICA GRANATUM* L.) SEEDLINGS CV. 'SALEMI'

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Abstract: The study was conducted to investigate the effect of foliar spray with PRO.SOL fertilizer and licorice extract on improving some vegetative growth indicators for young pomegranate seedlings of 'Salemi' cultivar. The results showed that the treatment of foliar spray with PRO.SOL fertilizer was significantly superior in the concentration of 4 ml L^{-1} in the height of seedlings, number of leaves per seedling, number of branches per seedling, leaf area, N, P and K, total chlorophyll, soluble carbohydrates and protein content in the leaf compared to the other treatments. The results also indicate that the treatment of foliar spray with licorice extract at a concentration of 10 g L^{-1} was significantly superior in all the vegetative indicators mentioned in the above compared to the control treatment. But the seedlings that were sprayed with the control treatment recorded the lowest values in all indicators studied. The study recommends spraying young pomegranate seedlings of 'Salemi' cultivar with PRO.SOL fertilizer to improve vegetative growth.

Key words: Chlorophyll, *Glycerrhiza glabra*, Fertilization, Protein, Vegetative growth.

Cite this article

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1. Introduction

Pomegranate (*Punica granatum* L.) is a deciduous fruit tree/shrub that belongs to the Lythraceae family. Pomegranate is a shrub naturally branching at the soil surface into several main branches and has a dense appearance [Singh *et al.* (2006), Holland *et al.* (2009)]. When planted, it can grow as a small tree up to 5 meters high. Under normal conditions, it can sometimes reach a height of more than 7 m [Levin (2006)]. Pomegranate requires a long, hot and dry season to produce a good quality fruit crop. Pomegranate is native to Central Asia. However, the pomegranate tree has adapted to a wide range of climates and soil conditions as it is cultivated in many different geographical regions including the Mediterranean basin, Asia and California. Modern scientific research has confirmed that it is used as a traditional medical treatment as these researches indicate that the tissues of pomegranate fruits, flowers, bark and leaves contain vital phytochemicals that are anti-microbial, reduce blood pressure and work against serious diseases such as diabetes and cancer [Holland *et al.* (2009). The nutritional value in pomegranate fruits includes its high content of antioxidant compounds, such as polyphenols, flavonoids especially anthocyanin, vitamin C, tannins, fatty acids, proline, and these fruits also contain proteins, carbohydrates and some important minerals such as potassium, calcium, phosphorus and magnesium [Pareek *et al.* (2017), Wu and Tian (2017), Pinilla *et al.* (2019)]. The nutrient solutions that plants are sprayed with foliar fertilization can be easily

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