

## Morpho-physiological reactions, photosynthetic capacity and quality of cut tuberose (*Polianthes tuberosa* L.) under different soil and soilless cultivation systems

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### Abstract

Fragrant tuberose is the most important scented cut flower of Iran, which rank 4<sup>th</sup> among other cut flowers, based on the cultivation area and production. Due to the scarcity of water resources, soil constraints, and the aim of comparison and possible substitution of soil cultivation with soilless cultivation of tuberose, a pot experiment was conducted as factorial, based on completely randomized design with four replications, on two cultivars of tuberose ('Mahallati' and 'Dezfuli'), in two greenhouse production systems, with soil and soilless medium. Based on the ANOVA results, photosynthetic capacity [number of leaves and leaf area, stomatal conductance and photosynthetic pigments content (chlorophyll a, b and total)], flower-stem height, number of florets, diameter of florets, nutrients uptake and flower vase life were significantly ( $P \leq 0.01$ ) affected by culture system. Soilless system increased the flower-stem height and vase life (as the main quality indices of cut flowers) by 50% and 35%, respectively, as compared with soil cultivation. In addition, peroxidase activity, calcium, and potassium uptake were significantly ( $P \leq 0.05$ ) affected by cultivar. Analysis of variance indicated that interaction of cultivar and cultivation system had significant effects on calcium uptake and number of leaves per plant. According to the results, soilless culture improved photosynthetic capacity and mineral uptake and subsequently increased quality and vase life of cut tuberose. This culture system showed high ability and potential to replace soil cultivation of tuberose.

**Keywords:** Soil management, Root development, Environmental stresses, Electrical conductivity, Bulk density.

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