Research **P**aper

Effect of mycorrhiza and vermicompost on properties of vertisol soil and leaf NPK content of Nagpur Mandarin (*Citrus reticulata* Blanco)

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ABSTRACT : A research experiment was conducted at Fruit Research Farm, Department of Fruit Science, College of Horticulture and Forestry, Jhalrapatan city, Jhalawar (Rajasthan) to study the effect of mycorrhiza and vermicompost on soil properties of vertisol and leaf NPK content of Nagpur mandarin (*Citrus reticulata* Blanco). The results indicated that application of treatment M_3V_3 (mycorrhiza 30g/ plant + vermicompost 6kg/plant) has given significantly superior results over control and other treatments with respect to increase in soil water holding capacity (87.04%), organic carbon (0.82%), nitrogen (382.93 kg ha^{-1}), phosphorus (25.13 kg ha^{-1}), potassium (392.44 kg ha^{-1}) content and reduced electrical conductivity (0.81dSm^{-1}) of Nagpur mandarin orchard soil after 150 days of treatment application. Further application of mycorrhiza 30g/plant + vermicompost 6kg/plant treatment has also resulted significantly maximum leaf nitrogen (2.74%), phosphorus (0.219%) and potassium (2.75%) content of mandarin leaves as compared to control and their lower doses, after 150 days of treatment. However, soil pH and relative water content of leaves were not affected significantly by applications of any treatment, used in the study during the period of experimentation.

KEY WORDS : Mycorrhiza, Vermicompost, Nagpur mandarin, Vertisol soil

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In India, production of citrus fruits is ranked at third after mango and banana. Among citrus, Nagpur mandarin (*Citrus reticulata* Blanco) is considered to be one of the most important cultivated species and is being commercially grown on vertisols in certain specific region of the country like Nagpur in Maharashtra and Jhalawar in Rajasthan. The *citrus* crops occupy an area of 759 thousand hectare with an annual production of 63.26 lac tonnes (Anonymous, 2006) with a productivity of 10.1 tonnes/ha out of which 41 per cent is contributed by mandarin alone (Uppal and Dabas, 2003). While in Jhalawar district of Rajasthan this "Nagpur" mandarin occupies 15490 hectare area with a production of 206820 tonnes of fruits (Hort. Dept.,Jhalawar, 2007). Nutrition is one of the most important aspects of fruit production and accounts for thirty per cent of the total cost of cultivation.

The mycorrhiza, basically a fungus, remains in association with the roots of higher plants and help in better synthesis of phosphorus from the soil by increasing the root surface area. On the other hand, vermicompost improves physical (soil structure, aeration and water-holding capacity), biological (soil micro flora and fauna) and chemical (nutrient level) condition of soil. In view of these facts the application of mycorrhiza and vermicompost was done.

RESEARCH METHODS

The present study was carried out in orchard of Nagpur mandarin (*Citrus reticulata* Blanco.) plants grown on vertisol at the Fruit research farm, Department of Fruit Science, College of Horticulture and Forestry, Jhalawar (Rajasthan) with treatments consisting of 4 levels of each of mycorrhiza (0, 10, 20, and 30 g/plant) and vermicompost (0, 2, 4, 6 kg/plant) thus total 16 treatment combinations were applied after recording