

Response to rangpurlime seedlings to VA-mycorrhizal inoculation

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SUMMARY

A pot culture experiment using sterile, P deficient soil was conducted to study the symbiotic relationship of rangpurlime seedlings with VAM-fungi (viz., *Glomus epigaeum*, *Glomus mosseae*, *Gigaspora calospora* and their mixture) in respect of growth parameters like height, number of leaves, root length, dry weight of shoot and root and mycorrhizal dependency percentage. It was observed from results that mycorrhizal treatments were superior over non-mycorrhizal treatments of rangpurlime seedlings. *Glomus mosseae* single and *Glomus epigaeum* + *Glomus mosseae* + *Gigaspora calospora* mixture were recorded the maximum height, number of leaves, root length, dry weight of shoot and root and mycorrhizal dependency percentage.

Key words : Rangpurlime seedlings, VAM fungi, Growth parameters.

Rangpurlime (*Citrus limonia* Osbeck) a vigorous hardy root stock with good adaptability to wide range of soil, particularly for heavy soil. It is tolerant to tristeza and also to salt. The quality of fruit on Rangpurlime root stock is fairly good and it is tolerant to Gumosis of citrus. It is promising root stock at present is used for both mandarins as well as sweet oranges in Maharashtra and some other states. In recent time, the root stock has assumed a greater importance in a view of dieback complex which is reduced to some extent by using root stock like Rangpurlime.

The role of Vesicular Arbuscular Mycorrhiza (VAM) in plant growth and nutrient uptake is well documented (Tinker, 1975). It has been reported in different plant, soil infecting roots of many species (McGran and Schenck, 1981). An experiment was conducted with an object to study the response of Rangpurlime seedlings to VAM fungi like *Glomus epigaeum*, *Glomus mosseae*, *Gigaspora calospora* and their mixture inoculation in P deficient sterile soil in respect of their height, root length, number of leaves, Dry weight of shoot and root and Mycorrhizal dependency percentage.

MATERIALS AND METHODS

A pot culture experiment was conducted during October 2002 to April 2003 in completely randomized design with three replications and eight treatments. The rangpurlime seedlings were inoculated with single and their mix VAM inoculum adjusting the dose finally to 150 g/pot. This inoculum of *Glomus epigaeum*, *Glomus mosseae* and *Gigaspora calospora* contained 680-800 spores/50 ml soil by volume. The rangpurlime seedlings were planted in pots with soil + FYM (1 : 1) mixture containing phosphorus 12.40 kg/ha and nitrogen 207.60 kg/ha. The rangpurlime seedlings were uprooted and VAM root colonization, nitrogen and phosphorus uptake were determined at 90 and 180 days after planting. The P and N uptake by plants were determined by microkjeldahl and vanadomolybdc phosphoric acid yellow colour methods (Jackson, 1971),

respectively. The per cent root colonization was done by the procedure given by Phillips and Hayman (1970).

RESULTS AND DISCUSSION

Height and root length

The height and root length (Table 1) of rangpurlime seedlings was significantly influenced due to different VAM inoculations both at 90 and 180 days, respectively. The plant height of mycorrhizal plant ranged from 9.87 to 18.07 cm and 22.80 to 38.62 cm at 90 and 180 days respectively indicating differential response of VAM species under sterilized soil. The mixture of three VAM fungi i.e. GE + GM + GC recorded the maximum plant height (18.07 and 38.62 cm at 90 and 180 days, respectively) over the rest of all inoculation treatments.

The non mycorrhizal rangpurlime seedlings recorded the least plant height i.e. 7.04 and 18.09 cm at both the stages of plant growth. Whereas the mixture of three VAM fungi i.e. GE + GM + GC recorded the significant increase in root length (20.67 and 42.38 cm) at 90 and 180 days respectively. However, these mixture of three fungi were on par with GE + GM (18.47 and 39.00 cm) at both the stages of plant growth. The nonmycorrhizal (control) rangpurlime recorded the least root length i.e. 9.30 and 21.19 cm at 90 and 180 days respectively. The results of present investigation are therefore in conformity with results reported by Sivprasad *et al.* (1990) and Onkarayya and Mohandas (1993) who reported significant increase in plant height and root length in orange and cassava respectively with mycorrhizal inoculation.

Dry weight of shoot and root

The results of dry weight of shoot and root (Table 2) as influenced by inoculation with different VA- mycorrhizae were significant both at 90 and 180 days. At both the stages, inoculation with mixture of GE + GM + GC recorded the significant increase in dry weight of shoot and root (1.65 and 3.78 g and 1.39 and 3.19 g) at 90 and 180 days respectively. However, the inoculation of GE + GM alone

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