Combined Effects of Auxin Application and Beneficial Microorganisms on Rooting and Growth of Ficus benjamina L. Air-layers

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Abstract:

This study was conducted to define the best auxin application method with or without the inoculation with beneficial microorganism (Bacillus subtilis and arbuscular mycorrhizal fungi [AMF]) to improve rooting characteristics of F. benjamina air-layers. The treatments were arranged in a split-plot design. Seven combined treatments of auxin concentrations and application methods (control, 50 and 100 ppm IBA in rooting substrate, 1500 and 3000 ppm IBA by painting girdled zone, 1500 and 3000 ppm IBA in talc paste) were assigned to the main plots. The sub-plots comprehended the application of B. subtilis and arbuscular mycorrhizal fungi in addition to the control. Data recorded on air-layers performance exhibited significant variation among different application methods and concentrations of IBA compared with the control with clear superiority of applying IBA at 3000 ppm by painting girdled zone in enhancing rooting%, number, length, fresh and dry weights of roots per rooted air-layer, as well as total contents of both carbohydrates and phenolics, and showed the shortest period required for root appearance. Similar trend was noticed regarding survival percentage, increment in plant height and number of leaves and shoots after detaching air-layers from mother plants. All root and growth characteristics showed significant increment when air-layers were treated with B. subtilis or AMF compared to the control with clear superiority of B. subtilis. The combined treatment of IBA at 3000 ppm by painting girdled zone and B. subtilis recorded the highest rooting (100%) and survival percentages (100%) and the best root and growth characteristics. This treatment could be recommended for propagation of Ficus benjamina by air layering.

Keywords:

Ficus benjamina, IBA, Bacillus subtilis, arbuscular mycorrhirzal fungi, air layering.

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