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Influence of plant growth regulators on rooting of litchi (*Litchi chinensis* Sonn.) air layers

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Abstract **:** A field experiment was conducted during 2010-2011 to study the influence of different concentration of plant growth regulators (PGR's) on rooting of litchi air layers at Horticultural Regional Research station, Dhaulakuan, Himachal Pradesh. The result indicated that application of IBA 5000 ppm treated layers took lesser days to root initiation (25.99 days) and also gave better results with respect to all the parameters studied including per cent rooting (86%), number of first (27.30) and second (41.20) order roots, total length of first order roots (2.14 m), mean root thickness (1.09 mm), fresh (2.89 g) and dry (1.11 g) weight of roots, fresh (46.29 g) and dry (28.00 g) weight of shoot and root: shoot ratio (0.04) of air layer in comparison to all other treatments. Application of IBA and NAA in combination (IBA 4500 ppm + NAA 200 ppm) also showed significant influence on rooting of air layers and was closely followed by IBA 5000 ppm. Among different concentration of growth regulators NAA 100 ppm showed minimum effect on the rooting of litchi air layers but when compared all the treatments control has minimum effect on rooting of litchi air layers.

Key words **:** IBA, NAA, Rooting, Air-layers, Litchi

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Litchi (*Litchi chinensis* Sonn.) is one of the most environmentally sensitive subtropical fruit tree. Its fruit has gained popularity as an exotic fruit and that is why demand of planting material of litchi is increasing tremendously. Limited availablity of quality planting material is the main cause of low expansion of area under litchi cultivation. Litchi can be multiplied sexually but owing to disadvantages of seedling plants, it is chiefly propagated through vegetative means. The absence of easy and reliable clonal propagation method limits large scale cultivation of promising varieties and use of modern techiniques like micropropagation has not proved very successful in litchi (Amin *et al.*,1996). Of the various methods, marcotting or air layering is the most common and convenient method (Bhambota *et al.*, 1968). Nevertheless, the major bottleneck associated with this method of propagation is varying degree of success of air layering, the high mortality of layers after severing them from the mother plant and establishment in nursery on their own root system. Thus, it restricts the availability of propagules of elite genotypes of litchi (Sharfuddin, 1983; Sharma *et al.*, 1990). The use of plant growth regulators especially indole-3- butyric acid (IBA), α-naphthalene acetic acid (NAA) etc. have been adovcated for accelerating rooting in litchi layers (Ram and Majumder, 1983). Nanda and Kochhar (1985) reported the application of root promoting substances during layering to get profuse rooting within a short time period and IBA has been found most effective. However, more information regarding use of growth regulators, ways to overcome higher mortality rate and improving the survival rate of litchi air layers needs to be generated. It was hypothesized that by applying proper concentration of plant growth regulators and use of suitable growing medium will help in the production of quality planting material with better root system of air-layers. Keeping the above difficulties and constraints in view the present investigation was carried out to study the influence of different concentration of plant growth regulators (IBA and NAA) on rooting of air layers. This will further help in lowering the cost of planting