

Effect of Gibberellic Acid, Thiourea, Dextrose and Foliar Nutrients on the Growth of Mangosteen Seedlings (*Garcinia mangostana* L.)

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Abstract

Mangosteen (*Garcinia mangostana* L.) is a tropical fruit with great economic potential. The major impediment to the development of the mangosteen industry is slow growth and the long pre-bearing stage that seedlings require to produce fruits. This study was conducted to determine the effect of gibberellic acid, thiourea, and foliar nutrients on enhancing the growth of young mangosteen seedlings at the Fruit Research and Development Institute, Horana, Sri Lanka in year 2015. Seven treatments; 500 ppm gibberellic acid- T1; 1000 ppm thiourea + 12000 ppm dextrose -T2; 2500 ppm foliar nutrients (250 mg N, 1300 mg P, 250 mg K, 0.5 mg B, 1.25 mg Cu, 2.5 mg I, 1.25 mg Zn, 1.25 mg Mn and 0.0125 mg Mo) -T3; 500 ppm gibberellic acid + 2500 ppm foliar nutrients -T4; 500 ppm gibberellic acid + 1000 ppm thiourea + 12000 ppm dextrose -T5; 500 ppm gibberellic acid + 1000 ppm thiourea + 12000 ppm dextrose + 2500 ppm foliar nutrients -T6; and control (water) -T7; were sprayed weekly and continued up to ten weeks. The experiment was conducted in a Randomized Complete Block Design with three replicates and a treatment unit consisted of ten (3 months old) seedlings. The observations on stem height (cm/week), internode length (cm/week), stem girth (cm/week), number of leaves (weekly interval), leaf area (cm²), and dry weight (g) were recorded as growth parameters. The data were analyzed using analysis of variance (ANOVA) in Statistical Analysis System (SAS) with windows 9.0 version. Application of 500 ppm gibberellic acid + 2500 ppm foliar nutrients significantly increased ($p \leq 0.05$) absolute stem elongation by 20.89cm through increasing internode length by 2.73 cm in 10 weeks. Minimum stem elongation was noted in control (1.43 cm) treatment and internode increment in control was recorded as 0.08 cm. Application of 500 ppm gibberellic acid + 2500 ppm foliar nutrients showed a significant increment ($p \leq 0.05$) of number of leaves (4.8) in 10 weeks, while control gave 1.6 mean numbers of leaves. At the end of the experiment, the seedlings treated with 500 ppm gibberellic acid + 2500 ppm foliar nutrients showed a significant increment of dry weight (0.76 g) at $p \leq 0.05$. It was three times over the control. However, stem girth and leaf area were not significantly affected ($p \leq 0.05$) by treatments. This study concluded that 500 ppm gibberellic acid + 2500 ppm foliar nutrients was effective out of the treatments tested to induce the growth of mangosteen seedlings.

Keywords: Dextrose, Foliar nutrients, *Garcinia mangostana*, Gibberellic acid, Thiourea

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