**Encourage Synchronize Flower Bud Initiation of Soursop (*Annona muricata L.*) by Using Synthetic Plant Growth Regulators**

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Soursop fruits contribute a very small portion of Sri Lanka's export revenue. This might be due to several limitations, including synchronized blooming, less fruit setting, and a prolonged time for fruit maturation. Therefore, encouraging synchronized flowering is essential to a higher yield of Soursop, as an objective encourage synchronized flower bud initiation of Soursop by using synthetic plant growth regulators. Hence, a field trial was conducted at the Fruit Research and Development institute, Horana, Sri Lanka, from September to December 2022. As synthetic plant growth regulators, namely; gibberellic acid, salicylic acid, paclobutrazol, and ethereal, were used as treatments under three concentrations [T1 (Salicylic acid 200ppm), T2 (Salicylic acid 300ppm), T3 (Salicylic acid 400ppm), T4 (Ethereal 100ppm), T5 (Ethereal 150ppm), T6 (Ethereal 200ppm), T7 (Gibberellic acid 100ppm), T8 (Gibberellic acid 150ppm), T9 (Gibberellic acid 200ppm), T10 (Paclobutrazol 1000ppm)T11 (Paclobutrazol 2000ppm), T12 (Paclobutrazol 3000ppm) T13(Ethanol 50% solvent, control 1) and T14 (No treatment, control 2). The experiment was laid out in Randomized Complete Block Design (RCBD) with three replicates. The number of flowers that bloomed after treatment applications were counted weekly interval. Pollen viability and stigma size were checked after 15 weeks after treatment application. Data were analyzed through Kruskal–Wallis test and ANOVA. Results revealed that foliar application of 400 ppm salicylic acid had given more flowers (51) than other treatments T1 (37), T11 (34), T1 (30), T4 (24), T10 (23), T7 (20), T12 (17) T13 (15), T6 (11), T9 (10) T5 (7), T14 (2). Moreover, pollen viability and stigma size were not significantly differed between treatments. Thus, the study concludes that salicylic acid concentrated at 400 ppm is a viable option for synchronize flowering of Soursop.

**Keywords**: *foliar applications, plant growth regulators, soursop synchronize flowering*