ABSTRACT

Title of Thesis	**:**	**Effect of bioregulators on fruit and flower drop of kagzi lime (*Citrus aurantifolia*Swingle) under Jammu Sub Tropics**
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ABSTRACT

A field study conducted during 2024-2025 at the Rainfed Research Sub-Station for Sub-Tropical Fruits, SKUAST-Jammu, evaluated the effect of plant bioregulators on flower and fruit drop, vegetative and physiological growth, and economic returns in Kagzi lime (*Citrus aurantifolia*Swingle). The experiment employed a Factorial Randomized Block Design with ten treatments and three replications on 30 trees spaced 4 m × 4 m. Treatments involved foliar sprays and soil drenching of paclobutrazol (PBZ), naphthalene acetic acid (NAA), and 2,4-dichlorophenoxyacetic acid (2,4-D) at three concentrations each, alongside a distilled water (control). The results showed that NAA @ 50 ppm was the most effective in enhancing growth, flowering, and fruiting. It promoted early flower bud emergence (69 days), increased flowering intensity (44.52 flowers/m shoot), and shortened the time to 50% fruit set (10.14 days). It also had the lowest flower drop (10.62%), earliest fruit maturity (138 days), and highest fruit yield per plant (7.32 kg). Physiological improvements with NAA @ 50 ppm included enhanced chlorophyll fluorescence, intercellular CO_2 concentration, and transpiration rate. Fruit quality was superior, with the highest juice content (53.60%), vitamin C (32.16 mg/100g pulp), total soluble solids (8.67 °Brix), balanced acidity (5.31%), and favorable TSS:acid ratio (1.63). Physical fruit parameters such as fruit weight (51.28 g), diameter (36.8 mm), seed size, and pulp segment count were also improved, favoring commercial quality. Economically, NAA 50 ppm provided the highest benefit-cost ratio (13.01), outperforming PBZ (7.39), 2,4-D (7.01), and control (6.08). PBZ increased flower emergence and photosynthesis but offered moderate yield and returns, while 2,4-D had moderate physiological benefits and reduced flower drop. Also,NAA @ 50 ppm showed the highest pollen viability (85.33%). Overall, NAA @ 50 ppm is recommended for sustainable Kagzi lime production and superior fruit quality in rainfed subtropical regions of Jammu**.**

Key words: Kagzi lime, *Citrus aurantifolia*Swingle, Naphthalene acetic acid (NAA), Paclobutrazol (PPZ), 2,4-D, physiological traits, rainfed horticulture.

Signature of the Major AdvisorSignature of the Student