Effects of paclobutrazol on reproductive and vegetative growth traits in *Phalaenopsis* Join Grace 'TH288-4'

Abstract

Phalaenopsis is the most popular potted plants worldwide. However, their typically long spikes often lead to increased shipping costs and risks. This study investigates the effectiveness of varying concentrations, timing, and frequency of paclobutrazol (PP333) applications on shortening the spike of *Phalaenopsis* Join Grace 'TH288-4'. Concurrently, also examines the potential for producing visually appealing, single-flower potted phalaenopsis product by truncating. Mature phalaenopsis plants were moved to a cool room at the seventh week to induce flowering. Three experimental groups were established based on different PP333 application schedules, the T2 group, a single application at the second week; the T2T3 group, applications at both the second and third weeks; and the T7T8 group, applications at the seventh and eighth weeks. PP333 concentrations used were 0, 250, 500, 750, and 1000 $mg \cdot L^{-1}$, applied as foliar sprays. The results showed that the shortest spikes, measured from base to first flower, were observed in the T2 group with 750 and 1000 $mg \cdot L^{-1}$; the T2T3 group treated with 500, 750, and 1000 $mg \cdot L^{-1}$ PP333; and the T7T8 group with 1000 $mg \cdot L^{-1}$. These treatments resulted in spike lengths of 16.7-22.2 cm, which are 54-69% shorter than the control ones. PP333 application had minimal effect on spike diameter, pedicel length, flower width, length, and length/width ratio. Nevertheless, root diameter was thicker in plants treated with PP333 compared with that of control. For producing single-flower phalaenopsis, a foliar spray of 750 $mg \cdot L^{-1}$ PP333 is recommended approximately four weeks before moving *Phalaenopsis* Join Grace 'TH288-4' to cooler conditions, followed by truncation while retaining only the first flower. This study establishes a

PP333 treatment protocol for phalaenopsis, offering a strategy to effectively shorten the spikes.