

Title Pre-harvest foliar application of Prohexadione-Ca and gibberellins modify canopy source-sink relations and improve quality and shelf-life of 'Bing' sweet cherry

Author Caixi Zhang and Matthew Whiting

Citation Plant Growth Regulation, 65, Number 1, 145-156, 2011

Keywords Plant growth regulators; Gibberellins; Prohexadione-Ca (PCa); Fruit size; Postharvest; Sensory quality; *Prunus avium*

Abstract

This research evaluated the potential of gibberellins (GA), and Prohexadione-Ca (PCa) to affect sweet cherry (*Prunus avium*) fruit size and quality. The results demonstrate the ability of ostensibly counter-acting plant growth regulators to significantly improve sweet cherry cv 'Bing' fruit size, fruit quality and postharvest characteristics compared to the current commercial application of GA₃ alone. In 2008, we found that the combination of GA₃ or GA_{4/7} (30 mg l⁻¹) with PCa (150 mg l⁻¹) applied to entire 3-year-old limbs 30 days after anthesis increased fruit size and improved fruit quality in 'Bing'. In 2009, we investigated the effect of application timing in larger-scale field trials, comparing treatments made at 30 or 37 days after anthesis, on fruit quality, storability and sensory attributes after storage. Treatment with PCa + GA₃ or PCa + GA_{4/7} delayed fruit maturity by about 7 days compared to the untreated control. Both the first and second applications of PCa + GA_{4/7} resulted in 35–40% fruit being ≥10 g, compared with only 20% in the control. PCa + GA₃ treatment also showed greater potential for improving fruit storability by maintaining fruit firmness, sweetness, and consumer appeal than PCa + GA_{4/7}. PCa alone or in combination with GAs inhibited current shoot growth and delayed fruit coloring development. After 30 days of 4°C storage, fewer than 5% fruit from untreated trees were rated as healthy and marketable, compared to 50 and 30% fruit from PCa + GA₃ treatment applied at 30 or 37 days after anthesis, respectively. In conclusion, preharvest foliar application of PCa + GA₃ at the onset of Stage II of fruit development shows potential to affect canopy source-sink relations and improved quality and shelf life of 'Bing' sweet cherries.

<http://www.springerlink.com/content/74141423877058m8/fulltext.pdf>