

Early preharvest calcium sprays improve postharvest fruit quality in ‘Liberty’ highbush blueberries

T. E. Lobos, J. B. Retamales and E. J. Hanson

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Abstract

Blueberry fruit are highly prone to deterioration, especially during storage. Calcium (Ca) can influence fruit quality of many fruit crops since it is an important mediating agent in the control of cell metabolism. Our aim was to determine if the application of foliar Ca sprays at different Ca rates (0, 400 or 800 g Ca ha⁻¹) and timings (early: fruit set, 8 and 16d after fruit set-dafs; or late: 16, 24 and 32 dafs) affect long-term postharvest quality and condition of highbush blueberry ‘Liberty’ (*V. corymbosum*) fruits. During the 2014/15 and 2015/16 seasons nine-year-old plants, located in Perquenco, Araucania Region, Chile (38°43’88” LS), were used in the trials. Fruits were harvested at > 90 percent full color and stored for 15, 30 and 45d at 0 °C + 1d at 18-20 °C. Fruit firmness and mass loss were the only quality attributes that registered significant interactions between Ca rates and spray timing, along with strong positive and negative correlations, respectively with fruit Ca concentrations. Firmer fruit (up to 10% higher than control) and lesser moisture loss (1% better than control) was obtained with early Ca foliar application treatments. Ca rates and spray timing had significant interactions and increased fruit Ca levels, total phenolic content, the proportion of sound fruits and reduced the percentage of dehydrated and decayed berries after storage. Fruit Ca concentration was lower in control and with late preharvest Ca sprays, which led to higher polygalacturonase activity during storage. Results evidence that early preharvest Ca sprays increase fruit quality and reduce deterioration in cold storage.