## Effect of cultivar, rootstock, and growing conditions on fruit maturity and postharvest quality as part of a six-year apple trial in Chile

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## Abstract

Fruit export is an important economic activity for Chile. Therefore, high productivity and quality fruit is a must in order to succeed in the business. A 6-year project was carried out to assess apple cultivars ('Galaxy', 'Brookfield®Gala', 'Super Chief', 'Fuji Raku Raku', 'Braeburn', 'Granny Smith', and 'Cripps Pink') and rootstock's (M.M.106 and M.9 EMLA) performance across different Chilean apple-growing areas (Graneros, San Clemente, Chillan, Angol, and Temuco). Fruit maturity (firmness, soluble solids, starch degradation, internal ethylene concentration, and skin color) preand-postharvest was assessed weekly starting one-month prior harvest and monthly postharvest during years 4, 5, and 6 of the trial. Physiological disorders were also evaluated monthly for 6 months in RA (0-1oC, >95% RH) storage. Based on bioclimatic variables, growing sites showed a clear distribution pattern on all principal component analyses, and it was more relevant than the growing season. In general, red skin color of most cultivars increased in sites towards the south of the country (cooler), regardless of the rootstock. Overall fruit firmness increased towards the southern sites in some cultivars, although not always statistically different. The highest softening rates pre-harvest were observed in 'Galaxy' and 'Brookfield®Gala'. In 'Galaxy', the lowest softening rate was observed in Temuco (coolest site). Brookfield®Gala' and 'Galaxy' apples grown in warmer sites (San Clemente and Angol) showed a sharper increase in internal ethylene concentration (IEC) than cooler sites (Temuco and Chillan) earlier in the season. Fruit quality and condition postharvest is also discussed.