

Title Occurrence of postharvest physiological disorders in 'Fuji' apples in response to orchard fertilization with nitrogen and potassium

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Citation Abstracts of 7th International Postharvest Symposium 2012 (IPS2012). 25-29 June, 2012. Putra World Trade Centre (PWTC), Kuala Lumpur, Malaysia. 238 pages.

Keywords apple; CA

Abstract

The development of some postharvest physiological disorders in apples has been related to orchard fertilization, which affects fruit mineral composition. This study aimed to evaluate the interactive effects of orchard fertilization with nitrogen (N) and potassium (K) on physiological disorders of 'Fuji' apples after storage in air (at 0 °C and 90-95% RH, for 6.5 months) and controlled atmosphere (CA; 1.5 kPa O₂ + 2.0 kPa CO₂, at 0 °C/90-95% RH, for 7.5 months). 'Fuji' apple trees grown on two soil types (Inceptisol and Entisol) were annually fertilized with doses of N and K₂O (0, 50, 100, and 200 kg ha⁻¹, for both nutrients) along nine growing seasons (from 1998 to 2006). The experiment followed randomized block design, according to the factorial scheme 2 x 4 x 4 (corresponding to two soil types, four doses of N, and four doses K), with three replicates. In 2005 and 2006, fruit were harvested at commercial maturity and assessed for incidence and severity of physiological disorders after storage (air and AC), plus seven days at 23°C, through subjective visual analysis. The combination of high N and K rates increased the risk of bitter pit, core flush, scald, and CO₂ damage, as well as of moldy core. The interactive effect of N and K doses on incidence of physiological disorders and moldy core depended on soil type, growing season and storage atmosphere. The results show that the recommendation of N and K fertilization doses for orchards planted in Southern Brazil should take into account differences in soil types.