

Title Superficial scald control after delayed treatment of apple fruit with diphenylamine (DPA) and 1-methylcyclopropene (1-MCP)

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Abstract

The effects of delayed treatments of diphenylamine (DPA) and 1-methylcyclopropene (1-MCP) on superficial scald development of 'Cortland' and 'Law Rome' apples were examined. Fruit were stored in air at 0.5 °C for 24 weeks after being treated with DPA or 1-MCP at harvest or after delays of 1, 7, 14 or 21 d ('Law Rome', experiment 1) or at harvest or after delays of 3, 7, 14 or 21 d ('Cortland' and 'Law Rome', experiment 2). Inhibition of scald development was affected by cultivar, DPA concentration, and delays between harvest and either DPA or 1-MCP application. Loss of scald control was associated with increasing internal ethylene concentrations (IEC) in the fruit with greater time delays before treatment, but to a greater extent for 1-MCP than DPA. DPA effects on scald development were independent of α -farnesene accumulation in the fruit skin but were associated with inhibition of its oxidation as indicated by lower concentrations of conjugated trienols (CTols). In contrast, 1-MCP effects were dependent on inhibition of α -farnesene accumulation and thereby the availability of less substrate for oxidation. The results show that minimal delays between harvest and treatment of fruit with either DPA or 1-MCP are necessary to maximize control of scald, but may be more critical for 1-MCP than for DPA.