

**Title** Using Ethylene Gas and Chlorpropham Potato Sprout Inhibitors Together  
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### Abstract

Marketplace preference for lower pesticide residues in foods has led to research to reduce the residue of chlorpropham (isopropyl *N*-3-chlorophenyl carbamate; CIPC), a postharvest-applied sprout inhibitor which is widely used around the globe to prevent sprouting of stored potatoes (*Solanum tuberosum* L.). Ethylene gas, an effective, safe and non-toxic sprout inhibitor used in several countries, sometimes has negative effects on the colour of processed potato products when used alone. Trials were conducted over 3 years using cv. Shepody (French fry) and cv. NorValley (potato chips/crisps) to determine whether a combination of these two sprout inhibitors, at reduced dosages, could inhibit sprouting while maintaining good processing colour. CIPC applied at 0, 0.1, 0.25 and 1.0 times the recommended dosage was combined with 4  $\mu\text{l l}^{-1}$  of ethylene gas applied or no ethylene at all (0 ethylene), for 1 day in 4 days, for 1 day in 2 days or continuously, in a factorial design. Sprout inhibition in both cultivars was excellent at all levels of CIPC application except the 0 rate. In both cultivars, sprouting was inhibited by the continuous ethylene treatment. However, all levels of ethylene exposure except the 0 rate negatively affected processing colour in both cultivars. The darkening was dose dependent, whereby the colour was darkest in continuous ethylene and was less affected by the intermittent exposures. In continuous ethylene, the colour was progressively lighter during storage after initial darkening. Shepody tubers appeared to be more sensitive to ethylene than the NorValley tubers. In Shepody only, colour in the ethylene of 1 day in 4 days treatments was progressively darker with increasing time in storage.

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