

Title Control of citrus postharvest green mold and sour rot by potassium sorbate combined with heat and fungicides

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Abstract

Potassium sorbate (KS), a common food preservative, was evaluated to control postharvest decay of citrus fruit. Significant advantages of KS over the commonly used sodium bicarbonate, which similarly improved fungicide performance, are the relatively low salt concentration of KS, the absence of sodium, and its lower pH, so disposal of used KS solutions would raise fewer regulatory issues. The influence of KS concentration and pH (pH 4–9) on the germination of spores of *Penicillium digitatum* was determined alone or in combination with four postharvest citrus fungicides, imazalil (IMZ), thiabendazole (TBZ), pyrimethanil, and fludioxonil. The EC₉₅ concentrations of KS to inhibit spore germination were lowest from pH 4–6. To control green mold on inoculated fruit, KS was compatible with these fungicides and consistently improved their performance. KS alone or fungicide–KS solutions were more effective when heated. The combination of KS and sodium bicarbonate was only moderately better than either alone. Green mold caused by an isolate of *P. digitatum* resistant to IMZ and TBZ was effectively controlled when KS was added to a heated IMZ or TBZ solutions. Heat, but not KS, increased residues of all of the fungicides in oranges. Sour rot, caused by *Geotrichum citri-aurantii*, was reduced from 94.5% among control lemons, to 49.1 and 47.2%, respectively, by 30 s immersion in KS or sodium bicarbonate at 1% (wt/vol) at 25 °C, and to 37.0 and 15.7%, respectively, when these solutions were at 50 °C.