

Title Comparative efficacy of the new postharvest fungicides azoxystrobin, fludioxonil, and pyrimethanil for managing citrus green mold

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Abstract

Three new fungicides (i.e., azoxystrobin, fludioxonil, and pyrimethanil) are currently being introduced for postharvest management of citrus green mold in the United States. The effectiveness of each fungicide was evaluated when applied alone (at 1,000 to 1,200 mg/liter) or in mixtures (at 500 mg/liter each component) to lemon fruit that were wound-inoculated with imazalil/thiabendazole (TBZ)-sensitive or -resistant isolates of *Penicillium digitatum*. In laboratory studies when aqueous fungicide solutions were applied 9 to 21 h after inoculation, pyrimethanil showed the highest level of green mold control. The efficacy of fludioxonil and azoxystrobin was very high at the early timings, but decreased as time after inoculation increased. Differences in fungicide performance were not due to multiple fungicide resistance, but more likely due to differences in fungicide mobility in fruit tissue. Azoxystrobin-fludioxonil mixtures were significantly more effective when compared to single-fungicide treatments. Mixtures of imazalil with pyrimethanil were the most effective in controlling decay. The efficacy of all fungicides was significantly lower when mixed into a packing fruit coating as compared to aqueous or storage fruit coating applications. In laboratory and packingline studies, the lowest incidence of green mold decay was obtained when azoxystrobin-fludioxonil and imazalil-pyrimethanil were applied as aqueous solutions that were followed by a fruit coating. Among the new fungicides, azoxystrobin and fludioxonil applied in water or storage fruit coating, respectively, provided the best anti-sporulation activity. Storage fruit coating improved the activity of both fungicides. Pyrimethanil was the least effective fungicide in suppressing sporulation of the pathogen on decaying fruit. Overall, among the mixtures, azoxystrobin-fludioxonil and TBZ-fludioxonil had high anti-sporulation activity in aqueous and storage fruit coating applications. New integrated management programs should be based on monitoring of fungicide sensitivities in pathogen populations, rotating mixtures of products with different modes of action, and using appropriate fungicide application strategies.