

Title Postharvest decay management for stone fruit crops in California using the “reduced-risk” fungicides fludioxonil and fenhexamid

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Abstract

In laboratory studies and experimental packingline trials that closely simulated fungicide treatments under commercial conditions, the “reduced-risk” fungicides fenhexamid and fludioxonil were highly effective in managing postharvest brown rot and gray mold decays of peach, nectarine, and plum caused by *Monilinia fructicola* and *Botrytis cinerea*, respectively. Tebuconazole was more effective against brown rot than against gray mold. Additionally, fludioxonil and tebuconazole significantly reduced the incidence of Rhizopus rot caused by *Rhizopus stolonifer*. In laboratory studies, the QoI fungicide azoxystrobin was not consistent in its decay control activity. The high efficacy of fenhexamid and fludioxonil against brown rot and gray mold was substantiated by low effective concentrations necessary (≤ 0.063 mg/liter) for 50% inhibition of mycelial growth in vitro. In general, fungicides applied 14 to 16 h after wound inoculation were significantly more effective than those applied before inoculation. These results indicate that the fungicides act mainly as protectants that do not penetrate deeply enough into the fruit to prevent decay from wounds that extend below the fruit epidermis. Laboratory treatments of plum fruit generally were less effective than those of peach or nectarine fruit. Comparative studies using either low-volume spray or high-volume, in-line drench applications over a roller bed demonstrated that drench applications were significantly more effective in reducing postharvest decays of inoculated plum fruit. Decay incidence using fenhexamid or fludioxonil was $\leq 1.1\%$, whereas incidence after the spray applications was between 25.2 and 40.4% for brown rot, between 12.0 and 24.3% for gray mold, or 62.6% for Rhizopus rot (fludioxonil only). This research identified effective replacements for iprodione, a fungicide voluntarily canceled by the manufacturer in 1996.