Abstract

A portable drencher capable of drenching a single bin of fruit was built to simulate the commercial application of chemicals to harvested apples in small orchard operations in the central and eastern United States. The drencher required as little as 125 liters of the treatment solution and permitted various bin travel speeds. Wounded apples were placed midway between the bottom and top of the bin, in the center, and near the four corners of the bin (20 fruit per location) and covered with enough unwounded apples to fill the bin. The bins were drenched with a suspension containing *Penicillium expansum* at 2 × 104 conidia per ml in 2000, 5 × 103 conidia per ml in 2001, and 3 × 103 conidia per ml in 2002 and 2003. In 2000 and 2003, the additional treatments included a combination of *P. expansum* with the yeast *Metschnikowia pulcherrima* at ~1.2 × 107 CFU/ml, and in 2003 a combination with 2% sodium bicarbonate (SB) or a mixture of the yeast and SB. After 3 months of storage at ~2°C, at all *P. expansum* conidial concentrations, more than 90% of wounded fruit developed decay on 'Golden Delicious', 'Delicious', and 'Rome' apples in the 2000–02 experiments. In 2003, 66 and 33.1% of the wounded fruit developed decay on 'Delicious' and 'Golden Delicious', respectively. The application of the antagonist reduced decay to 39 and 3.3% on 'Golden Delicious' in 2000 and 2003, respectively, and to 26% on 'Delicious' in 2003. The addition of SB reduced decay on both cultivars and, in combination with the yeast, was the most effective treatment on 'Golden Delicious'. This portable drencher can be very useful for evaluating different treatments applied to apples after harvest at the commercial level.