Title Evaluation under commercial conditions of the application of continuous, low concentrations of ozone during the cold storage of table grapes

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Abstract

Botrytis cinerea causes gray mold, a postharvest disease of table grapes. The ability of ozone (O_3) in air to inhibit gray mold in stored grapes was reported in chamber studies, but O_3 needed evaluation under commercial conditions. O_3 merits attention because it is pesticide-residue free and allowed as "organic" by the USDA National Organic Program. Tests were conducted at three commercial facilities using pallets of 'Flame Seedless', 'Thompson Seedless', and 'Princess Seedless' grapes in uncoated, corrugated fiberboard boxes containing grapes in ventilated cluster bags or hard plastic clamshell containers. Grape berries inoculated with *B. cinerea* were placed within grape clusters at the beginning of storage. After cold storage, the spread of infection, natural incidence of decay, and cluster appearance were evaluated. After initial pre-cooling in air, grapes were stored at -0.5 to 3°C with a day/night cycle of 100 ppb O_3 (day) and 300 ppb O_3 (night) for 5 to 8 weeks. At each exam, six 9-kg boxes with 9 cluster bags or 4 clamshell containers were examined. The mean number for all tested cultivars of berries adjacent to inoculated berries that became infected by the end of storage was 0.8 in the O_3 atmosphere compared to 3.1 among those in air. The mean percentage for all tested cultivars of naturally decayed berries at this time in O_3 was 2.4% compared to 5.8% among those in air. Cluster appearance was not harmed and storage life was extended by 2 to 3 weeks by O_3. The uncoated, paper fiber corrugated boxes used in these tests reduced O_3 diffusion into them more than coated corrugated fiberboard, expanded polystyrene, or corrugated plastic boxes. Selection of packaging that maximizes O_3 concentrations within packages should improve control of gray mold.