

Abstract

A relatively short extension of shelf life and dessert quality could allow shipment of fresh raspberries by surface means instead of air freight, as marketing of fresh raspberries is hindered by their brief shelf-life, manifested by high respiration and transpiration rates, morphological features that predispose them to crushing, and susceptibility to grey mold rot. As fresh raspberries provide comparatively larger financial returns to the producer, our overall objective is to not only extend the marketable shelf-life of fresh raspberries by using modified atmosphere packaging in conjunction with antifungal treatments, but to preserve as much just-picked quality as possible. In most highly-perishable fruit crops, color and texture preservation is less challenging than flavor retention, hence we are now concentrating on these latter aspects of postharvest preservation. Experiments revealed a mixture of biological control organisms to be effective in controlling postharvest fungal decay at high temperature. Raspberries were harvested and placed under the following atmospheres: Severe modification (8-12% O₂, 3-5% CO₂) and no modification at 0, 5, 15 and 25°C. Antifungal treatments were: No treatment; Lactic acid bacteria + *Cryptococcus* sp. (a patented low-temperature biocontrol organism); Lactic acid bacteria or *Cryptococcus* alone. At 0, 4 or 8 days, fresh raspberries were removed from storage and analyzed for percent salable berries, color, titratable acidity, moisture, pH, and flavor volatile content. The biocontrol organism mixture was effective at 15 and 25°C, however modified atmosphere treatments produced off flavors, attributable to high levels of ethanol. Biocontrol treatments had little to no effect on dessert quality. Modified atmosphere-stored berries retained more flavor and at-harvest quality compared to control treatments. Temperature studies demonstrated the risk associated with use of modified atmosphere packaging under temperature abuse situations. Lower constant temperature maintained higher quality berries whereas temperature abuse and high constant temperatures decreased raspberry shelf-life and dessert quality (flavor), rendering the berries unmarketable. Studies show that the proper combination of modified atmosphere and temperature make it possible to extend the shelf-life and dessert quality of fresh red raspberries .