Abstract:

During the past three years we conducted a series of studies on peach storageability. Longitudinal studies using incubators set at 0, 2.5, 5, 7.5 and 10°C showed that less juice was extractable after storage at temperatures below 7.5°C. Fruits held at 7.5C° or greater were capable of fully softening in storage, while fruit held at 5°C softened less. Studies demonstrated that storage at 2.5°C or less suppressed ethylene production dramatically. Shipping-mature 'Redhaven' fruits were successfully held for up to six weeks in storage at 0°C. After holding for seven days at room temperature, fruit still softened and became juicy. Ethylene evolution also increased dramatically at room temperature. Six weeks of storage at 0°C did not appear to damage the fruit's ability to evolve ethylene. Short-term studies of the effect of temperature on ethylene were conducted at temperatures from 0 to 20°C. After equilibration, ethylene evolution was measured. Preliminary plots of ethylene production appeared to be log-linear and did not show an inflection point at chilling temperatures. High Q10 values were measured for ethylene production in peach and nectarine. This temperature response may contribute to the development of storage disorders. Our working hypothesis was that flesh mealiness resulted from 'chilling injury.' While it was an attractive hypothesis, it was difficult to prove. Commercial observations of mealiness in late-harvested fruit would also argue against chilling injury. In hindsight, storage recommendations of 0°C rather than 5°C also seem illogical if mealiness is a symptom of chilling injury. We postulated that peach and nectarine disorders that occur in storage at 5°C are caused by the production of low levels of ethylene that induce some, but not all, ripening-related genes. Mealiness and the lack of juiciness may occur in response to senescent breakdown, rather than chilling injury.