

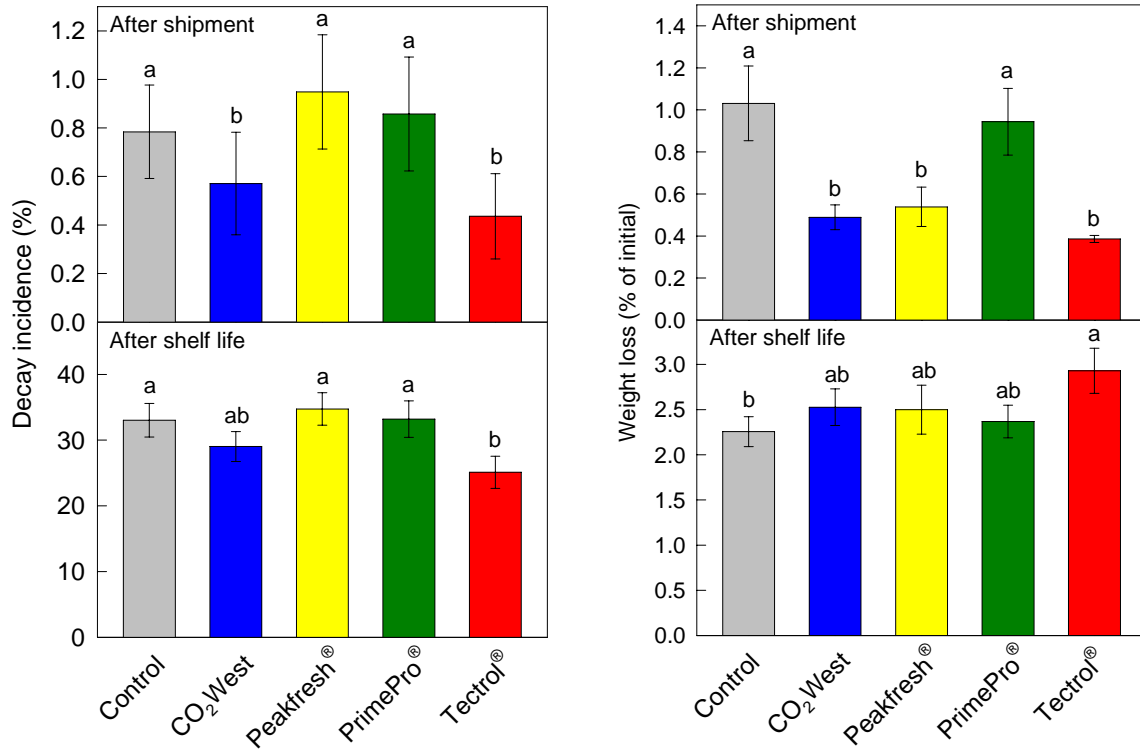
# INCREASING CONSUMPTION OF SPECIALTY CROPS BY ENHANCING THEIR QUALITY AND SAFETY

## **Objective 3: Develop and Test Improved Supply Chain Capabilities to Deliver Specialty Crops with Enhanced Eating Quality Characteristics Based on Consumer Sensory Preferences**

### **Project 1: Comparison of Pallet Cover Systems to Maintain Strawberry Fruit Quality**

*Andrew Macnish<sup>1</sup>, Francine Pupin<sup>1</sup>, Pavlos Tsouvaltzis<sup>2</sup>, Angelos Deltsidis<sup>2</sup>, Charles Sims<sup>3</sup>, Jeffrey Brecht<sup>2</sup>, Elizabeth Mitcham<sup>1</sup>; <sup>1</sup>Department of Plant Sciences, University of California, Davis, CA; <sup>2</sup>Horticultural Sciences Department, University of Florida, Gainesville, FL; <sup>3</sup>Food Science and Human Nutrition Department, University of Florida, Gainesville, FL*

The efficacy of several proprietary plastic pallet cover systems to maintain strawberry (*Fragaria ananassa*) fruit quality during commercial shipment was determined. 'Albion' fruit were harvested from two farms near Watsonville, California. Fruit in plastic clamshells were palletized and forced-air cooled to 33-35°F. Different cover systems (Tectrol<sup>®</sup>, CO<sub>2</sub> West, Peakfresh<sup>®</sup>, PrimePro<sup>®</sup>) were placed over pallets. Pads that released CO<sub>2</sub> were placed inside the CO<sub>2</sub> West cover. The Tectrol<sup>®</sup> cover was sealed to the pallet base and CO<sub>2</sub> gas was injected inside. The systems other than Tectrol<sup>®</sup> remained open at the base. Pallets from each farm were transported by refrigerated (32-39°F) trucks to retailers in either Florida or Georgia in 4-5 days. Three such shipments were completed during 2010. CO<sub>2</sub> concentrations were highest in the Tectrol<sup>®</sup> pallets at the beginning (13.2-34.4%) and end (2.8-24.8%) of shipment, and relatively low (0.03-0.44%) in the other covered systems. When averaged across the three shipments, the incidence of fruit decay was low (0.4-0.9%) immediately after transport, but increased after a 2-day shelf life at 68°F to 33% for non-covered control pallets, and 25, 29, 34 and 35% from Tectrol<sup>®</sup>, CO<sub>2</sub> West, PrimePro<sup>®</sup>, and Peakfresh<sup>®</sup> pallets, respectively. Relative to non-covered pallets, which lost 0.8-1.1% of fruit weight during each shipment, pallet covers reduced weight loss by 20-85%. There were no consistent effects of the pallet covers on fruit gloss, firmness, and color. There was also no difference in the eating quality of fruit from each pallet system as judged by a consumer taste panel. Our findings show that transporting strawberries within pallet covers reduces fruit weight loss. Maintaining elevated CO<sub>2</sub> levels around fruit also significantly reduced decay even at the relatively low shipping temperatures encountered in this study.



**Figure 1.** The level of decay and weight loss for ‘Albion’ strawberry fruit after a 4-5-day refrigerated shipment from California to Florida or Georgia, and then a 2-day shelf life at 68°F. Strawberries were shipped inside several pallet cover systems. Non-covered pallets acted as the control. Data are the average of three shipments. Different letters indicate significant differences.