

### Abstract:

The effect of exogenous squalene coating on the reduction of grapefruit chilling injury (CI) and maintenance of fresh fruit quality was studied in the 1998-2002 seasons. In the first study, all fruit were dipped with thiabendazole (TBZ) and imazalil (IMZ) and coated six hours later with different mixtures of a squalene emulsion and wax micro-emulsions (carnauba, or polyethylene). After 4 °C storage for 16 weeks the chilling injury (CI) was 21% for squalene-treated fruit, which was significantly higher than the 4-7% of CI found for all other treatments (control, wax alone or wax + squalene). Even at 10 °C storage there was 4% CI in fruit treated with squalene, compared with about zero for all other treatments. Decay was close to zero after 16 weeks of storage at 4 °C for all treatments. After two additional weeks at 23 °C decay was 5% in non-waxed and about 2% in waxed fruit. Fruit were also treated with other chemicals in the squalene emulsion to determine if these caused CI. After 10 weeks storage at 4 °C all treatments with squalene emulsion resulted in significant CI damage, and after 18 weeks storage the complete squalene emulsion gave highest incidence of CI. In the final study, white grapefruit treated with combinations of squalene emulsion or squalene in water, applied with or without carnauba wax were examined for CI, decay, peel gloss and weight loss. Non-waxed fruit had the highest rate of CI. Waxed fruit treated with squalene in water had the lowest after 3 months. Decay was generally lower than CI damage in all studies. Inconsistent results were found in fruit weight loss, internal gases, and fruit shine after exogenous squalene coating. The CI symptoms in fruit treated with squalene emulsion resembles phytotoxic peel damage.