Processed-Kaolin Particle film on almond

Brent A. Holtz[1] and Eric W. Hoffman[2]
Pomolgy Farm Advisor[1] and Staff Research Associate[2]
University of California, 328 Madera Avenue, Madera CA 93637,USA

A white clay like processed-Kaolin particle film, can easily be dissolved into suspension and sprayed onto trees. Several research reports have been published in the Journal American Society Horticultural Science and HortTechnology describing how this reflective film can reduce heat stress, reduce solar injury, increase leaf carbon assimilation, and reduce canopy temperatures on a number of crops in several countries (1, 2, 3). In 2001 processed-Kaolin particle film was applied to 15 year old Nonpareil, Sonora, can Carmel almond trees in a preliminary experiment. Three in-season applications of Kaolin appeared to result in more return bloom, nut set, and yield on Carmel trees in 2002 when compared to non-sprayed Carmel trees (4). The Carmel trees in this orchard were showing symptoms of severe bud failure. The Sonora and Nonpareil varieties appeared unaffected by the Kaolin. Record hot temperatures were experienced in the San Joaquin Valley in May 2001 and above normal temperatures at this time have been shown to worsen the severity of bud-failure on Carmel (Dale Kester).

In 2003 and 2004, four applications of Kaolin (25lbs/100 gallons water) were made each year to Carmel trees planted in January 2002 in order to examine if Kaolin could reduce heat stress and the onset of bud failure. We also examined the effect of Kaolin on tree water status, canopy temperatures, growth and yield. An almond orchard in Madera with 16 Carmel rows was divided into replicated design where 8 rows received four Kaolin applications in each year. Mid-day leaf stem water potential, tree circumference, current season shoot growth, and yield were examined.

In 2003 and 2004 mid day leaf stem water potential measurements were performed once a month from June-September. In 2003, June and July mid day leaf stem water potentials were significantly less on Particle Film Technology (PFT) treated trees when compared to non-treated trees. In August and September there was no difference between Particle Film Technology and non-treated trees (5). In 2004, mid day leaf stem water potential of Particle Film Technology treated trees were significantly less when compared to non-treated trees in June, July, and August (figure 1). By September there was no difference between Particle Film Technology and non-treated trees.

In 2003 and 2004 the PFT treated trees had significantly more current season shoot growth when compared to non-treated trees (figure 2). But there was no difference in trunk circumference between the two treatments in either 2003 or 2004. In 2004 we counted fruit on 60 trees that had received PFT and 60 control trees. We found no difference in the numbers of fruit per treatment. We will again repeat the application of Kaolin in 2005 in order to investigate the effects of PFT on heat stress and bud failure in both Carmel and Nonpareil almond varieties.

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Literature:

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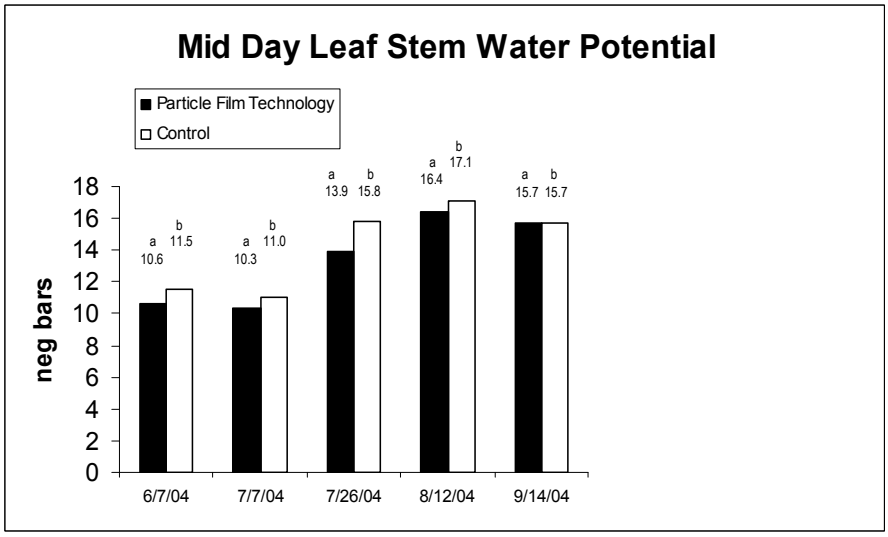

figure 1. Paired columns within the date with different letters were statistically different when compared in a Student's T-test (P# 0.05).

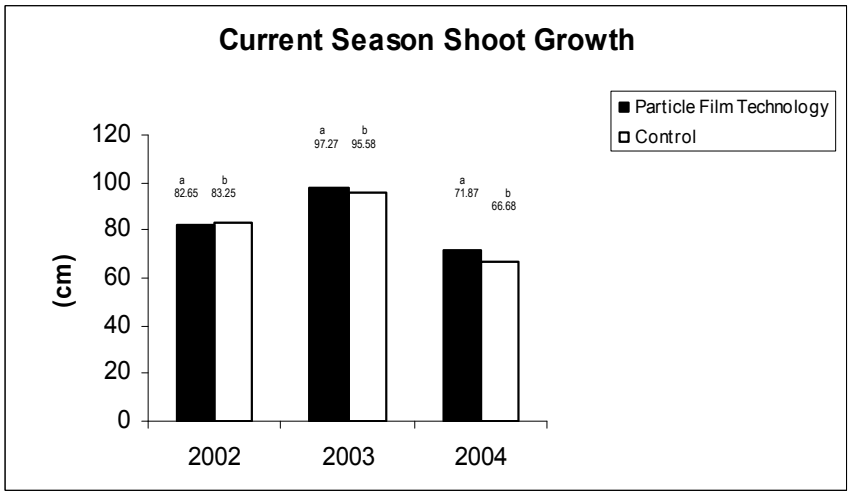

figure 2. Paired columns within the date with different letters were statistically different when compared in a Student's T-test (P#0.05)