Field Trial Report

Surround: Processed-Kaolin Particle Film on Pistachio

Dr. Brent Holtz, UC Farm Advisor, Madera

NovaSource Advisory Council

2008

Study Description:	**Surround: Processed-Kaolin Particle Film on Pistachio**
Reference Number:	Holtz Surround Pistachio CA 2008.doc
Researcher:	Dr. Brent Holtz, UC Farm Advisor, Madera
Location :	George Andrews Farms, Madera, CA
Year:	2008
Trial Quality (Excellent, Good, Fair, Poor):	Good

Product(s):	Surround WP
Rate(s):	Surround 25 lb/100 gal X 3 applications
Adjuvant(s):	
Rate(s):	

Crop(s):	Pistachio
Variety:	
Pest(s):	Leaf-footed bug and Stinkbug
Quality:	
Summary:	In 2008, the Surround-treated pistachio trees had numerically greater yield compared to the non-treated trees. The Surround-treated trees had significantly less insect damage when compared to the non-treated control trees. Water stress evaluations were made using mid-day leaf stem water potential (SWP) measurements performed several times in July and August. The Surround-treated trees usually had less stress when compared to the non-treated control trees, but on only one occasion did the Surround-treated trees have significantly less stress than the non-treated control trees. Results with pistachio were similar to the results obtained on almond the first year Surround applications were applied: no significant difference in yield was observed the first year, but significant results were obtained in subsequent years. Surround adheres more efficiently to the pistachio leaf when compared to almond and we believe that fewer than three sprays could achieve adequate coverage on pistachio.

Processed-Kaolin Particle Film on Pistachio

Brent Holtz, (Principal Investigator), Farm Advisor, University of California, Madera
Tome Martin-Duvall, Staff Research Associate, University of California, Madera
Dee Haanen, Laboratory Helper, University of California, Madera
Tom and John Coleman, Coleman Farming Company, Madera

Introduction

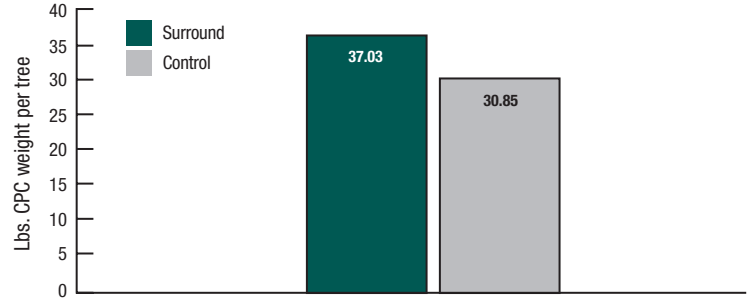
Surround, a white-clay substance, available as processed-Kaolin particle film, can easily be dissolved into suspension and sprayed onto trees. Several research reports have been published in the Journal of the American Society for Horticultural Science and HortTechnology describing how this reflective film can reduce heat stress, reduce solar injury, increase leaf carbon assimilation, and reduce canopy temperatures on a number of crops in several countries. This study was undertaken to examine if Kaolin could reduce heat stress in pistachio. We studied the effect of Kaolin on tree water potential (mid-day leaf stem water potential) and yield. As a function of yield we would also examine if Kaolin could reduce early splits, non-splits, insect damage and payable yield.

A bearing pistachio orchard in eastern Madera County was used. Five replications of five trees per plot were sprayed with three applications (June, July, August) of Kaolin at 25 lbs/100 gallons water and compared to control trees that did not receive Kaolin. Leaf stem water potentials were taken at several intervals throughout the season and yields were examined at harvest. Subsamples were obtained from each replication for grade out analysis.

Results

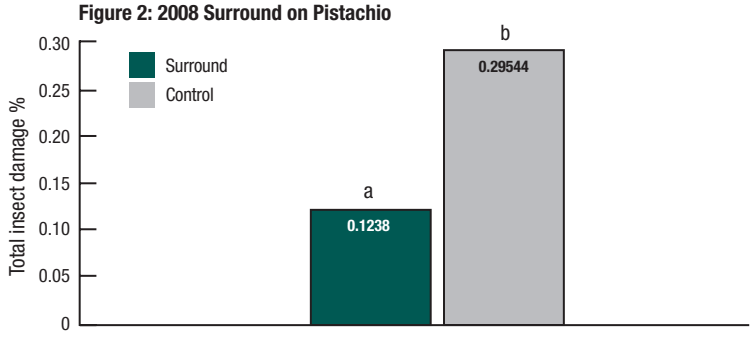
In 2008 the Surround-treated pistachio trees had greater ($P \leq 0.16$) yield when compared to the non-treated trees, but differences were not significant (figures 1 and 4). The Surround-treated trees had less ($P \leq 0.09$) insect damage when compared to the non-treated control trees (figure 2). Mid-day leaf stem water potential (SWP) measurements were performed several times in July and August. The Surround-treated trees usually had less stress when compared to the non-treated control trees, but on only one occasion did the Surround-treated trees have significantly less stress than the non-treated control trees (figure 3).

Figure 1: 2008 Surround Yield



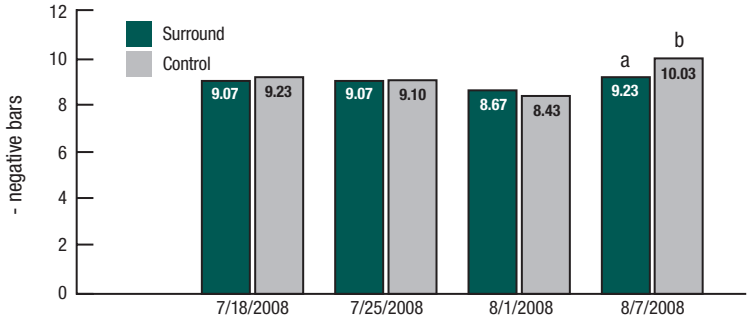
Paired columns with the same date with different letters were statistically different when compared in a Student's T-test ($P<0.05$). In 2008 the Surround-treated pistachio trees had greater ($P \leq 0.16$) yield when compared to the non-treated trees, but differences were not significant.

Figure 2: 2008 Surround on Pistachio



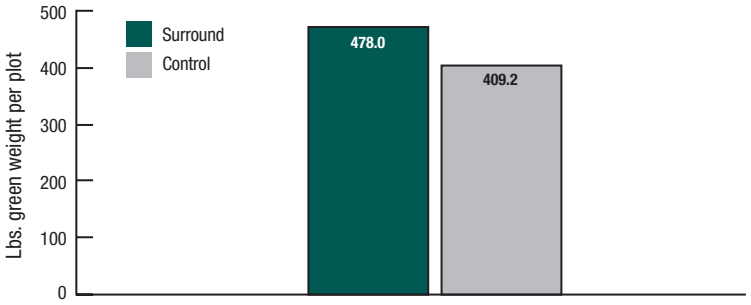
Paired columns with the same date with different letters were statistically different when compared in a Student's T-test ($P<0.09$). The Surround-treated trees had less ($P \leq 0.09$) insect damage when compared to the non-treated control trees.

Figure 3: 2008 Leaf Stem Water Potentials



Paired columns with the same date with different letters were statistically different when compared in a Student's T-test ($P<0.05$). The Surround-treated trees usually had less stress when compared to the non-treated control trees, but on only one occasion did the Surround-treated trees have significantly less stress than the non-treated control trees.

Figure 4: 2008 Surround Yield



In 2008 the Surround-treated pistachio trees had greater ($P\leq0.16$) yield when compared to the non-treated trees, but differences were not significant. Shown here is the lbs in green weight per 5 tree plots.

Conclusions and Practical Applications

Similar results were obtained on almond the first year Surround applications were applied: no significant difference in yield was observed the first year, but significant results were obtained in subsequent years. Surround adheres more efficiently to the pistachio leaf when compared to almond and we believe that fewer than three sprays could achieve adequate coverage on pistachio. We will repeat applications of Kaolin in 2009 in order to further investigate the effect of Surround on pistachio.

This study would not have been possible without the grower cooperation of Tom and John Coleman, Coleman Farming Company, Madera, and funding from the California Pistachio Research Board, Paramount Farming Company and Tessenderlo Kerley, Inc.