

Keeping Cool with Particle Films

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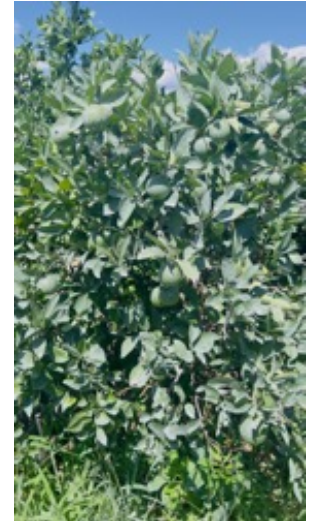
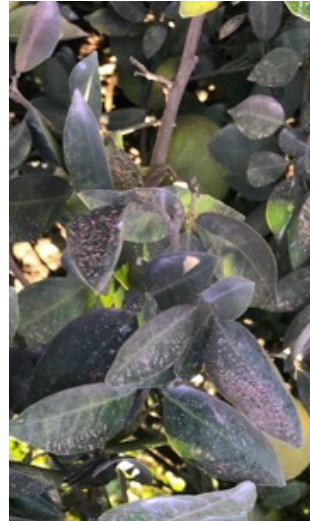
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Effort Statement: We initiated field studies of rates of red and white particle films.

Summary: Particle films have long been used to repel insect pests and enhance tree growth. Particle films are simply suspensions of solid particles that form a film over the surface of the leaf after they are sprayed and dried. They repel insects by reflecting different colors of light that keep the insect from identifying its host. They improve plant growth by dispersing light more evenly allowing leaves to stay cool and stomata to stay open for photosynthesis. Our research confirms that particle films can reduce psyllid pressure, delay huanglongbing (HLB) infection, and enhance growth in young trees. A new approach of dyeing the natural white color

Recent applications of moderately high rates of red-dyed and natural white kaolin particle films on sweet orange trees.



red, improved psyllid control and moderately improved citrus growth over the white. The result was that by year three of a planting, particle film-treated trees produced three times greater yields than trees treated with foliar insecticides at least once per month. In the same year, fruit from particle film treated trees had 1 °Brix more than control trees. With detailed studies we saw that particle films improve leaf water status even when trees have enough soil water and that they reduce heat stress by keeping leaves about 10 °F cooler in the summer. We have found, though that in cooler weather (<70 °F) particle films can reduce photosynthesis. While in moderate weather, low rates of particle films can improve water status, and in high summer temperatures higher rates are helpful.

We are currently researching what rates are best for growth and yield. For now, we can conclude that particle films reduce Asian citrus psyllid (ACP) pressure; delay HLB infection; increase growth and yield, by reducing stress and improving tree water status; red-dyed films are either better than or equal to the natural white kaolin products; and rates should depend on the season.

Take Home Message:

- Particle films increase growth by shading trees.
- Particle films can delay infection with HLB by reducing psyllid populations.
- Particle films are most beneficial in spring, summer, and fall, and probably not in winter.

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