

Seeing the Light: An Update on the Use of Particle Films and Shading to Manage Citrus and Citrus Pests



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Main points

- **Stay cool**: High light and leaf temperature combine to reduce citrus growth and yield
- Shade reduces stress of citrus trees
- Horticultural goal depends on balancing stress with flowering and fruit development
- In establishment period kaolin particle films can:

Increase growth and yield
 Reduce psyllids
 Delay HLB infection

- Red-dyed film is optimal
- Particle films and red colorant are commercially available



https://redcrossphillyblog.wordpress.com



Citrus and Light



- High light leads to high leaf temperatures
- Mild shade keeps leaf temperatures down

Feral citrus in central Florida

- No psyllids found in multiple observations
- Only 3 of 60 trees found to be HLB infected
- No HLB symptoms
- Greater shade improved photochemical responses

Full study:

https://link.springer.com/article/10.1007/s00468-021-02147-2

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ORIGINAL ARTICLE

Understory environment promotes photosynthetic efficiency and mitigates severity and function of an introduced, vectored pathosystem: a study of a feral citrus population in central Florida

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Taking it to the field (2018 Oct – till date)

Hamlin trees grafted on Swingle citrumelo



Full sun

Mesh size 0.7×1.5 cm² 30% shade Mesh size 0.5×1.0 cm² 50% shade Mesh size 0.5×0.7 cm² 70% shade **Yield**



This year (2021) – Flowering & fruit drop data

Can shade become part of citrus production?

- Where is the balance between stress, growth, and yield?
- What kinds of shading are useful?
- What about impacts on psyllids?



Particle films

- Properties:
 - Reflection
 - Shading
 - •Redistribution of light within the canopy
- Reduce sunburn
- Increase whole canopy photosynthesis
- Kaolin
- Red dye



Red and white kaolin









CLas infection





Trunk growth





Canopy Growth



Juanpablo Salvatierra-Miranda



UF UNIVERSITY *of* **FLORIDA**



Cloudpoint data from Agerpoint

Yield



Lessons in using kaolin

• Red-dyed formulation ideal:

- 35 lbs/acre Surround
- 2.5 fl oz Colorback /lb Surround (87.5 fl oz/acre)
- Or equivalent concentration with 100 gal:1 acre.
- Red-kaolin mix superior:
 - Growth
 - Yield
 - Psyllid reduction
 - CLas infection delay
- Fruit drop?
- Does it work the same with mature trees?

Our new paper on psyllid mgmt. with kaolin: Pierre et al. 2021, Crop Protection



Lemons – Ventura Co., CA



Crop Protection 150 (2021) 105792



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journal homepage: www.elsevier.com/locate/cro

ROTECTION

White and red-dyed kaolin particle films reduce Asian citrus psyllid populations, delay huanglongbing infection, and increase citrus growth

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ABSTRACT

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Florida citrus production has declined severely due to huanglongbing (HLB; "citrus greening disease") caused by Candidatus Liberibacter asiaticus (CLas), a phloem-limited bacterium transmitted by the several transmitted by the several bacteria and the several bacteria a

Thank you!

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