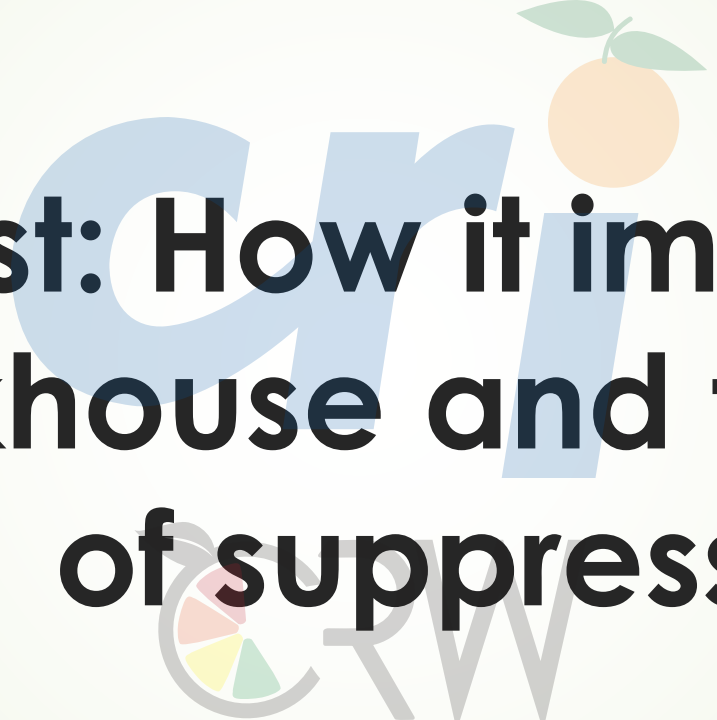




Dust: How it impacts the packhouse and the benefits of suppressing it

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Dust

What is dust?



- Small solid particles ranging in size from below $1\mu\text{m}$ to around $100\mu\text{m}$
- May be or become airborne, depending on their origin, physical characteristics and ambient conditions
- Settle out under their own weight, but could remain suspended for some time

Dust

- Inorganic dust
 - Derived from grinding or breaking up materials such as rock or metals
- Organic dust
 - Arise from handling plant or animal-based products such as wood or grain
 - May contain fungi and other microbes
 - Relevant concern: sour rot is soil-borne
- Fungal spores e.g. green mould is an integral part of dust

What do we know about dust?

- Familiar
 - Low priority
- Understanding of dust suppression mostly for insect pest management
 - Thrips and red scale on fruit in proximity to gravel roads
- Pollution and harmful to human health



Origin-Production



Typical packhouse impacts

- Wind spread:
 - Transported by dust covered fruit and equipment
 - Picking up dust on the way
 - Eventually deposited into the packhouse aqueous systems
 - N.B. drench (or whatever the first aqueous point is)
- Compromises water quality
 - Contaminates solutions
- Creates pressure on amount of chemicals used
 - Waste of money on chemicals
- Damages equipment

What do we mean there is pressure on chemicals?

- Our observations
 - Industry is challenged by persistent decay incidences
- What could be failing?
 - Self-doubt about practices, e.g.:
 - Volume of fruit (traffic) vs Chemical concentration
 - Stripping (both fungicides and sanitizers)
 - Infection age vs treatment times
- Dust is never upfront in mind (dirty fungicide solutions)
 - Drench

Dust puts pressure on chemicals

- Some dust particles have structures which **can** bind to pathogens which **can** allow them to survive disinfection process
 - Organic particles give more protection because it stabilizes the cell membrane and reduce pathogen sensitivity
 - Inorganic particles – cracks that bind pathogens
- Disinfection survival is therefore linked to cell membrane stabilization or incomplete penetration of the chemical into the particle which is embedded to the pathogen
 - Build up particles – build up of inoculum
- Particles puncture fruit – creates entry point for protected pathogens
 - Fungicides have to fight more infections

Further observations: Dust contaminating nets

- Observation on increasing concerns
 - *Alternaria* infections
 - Stem-end saprophytes
 - New pathogens?
- Dust effect on hail and shade nets



Preliminary work

- CRI project on dust suppression and management
 - Kicking of 2026
- Testing a food safe dust suppressing product
 - NOT what is used in industrial areas
- Placed dust traps along the main road
- Dilution series
 - High colony forming units (CFU) numbers
 - Confirmed to date: *Penicillium* spp., *Alternaria* sp., *Fusarium* spp.



Food for thought

- Identifying factors responsible for lifting, transporting and depositing dust particles
- Help in implementing appropriate measures
 - Not complicated – sanitation
 - Water dust roads and around the packhouse
- Introduce clean fruit and bins into the packhouse
 - Have less dust particles in aqueous solutions – filtration systems
- Develop a system or systems that will keep dust under control
 - “Boererate.” – Irma Raspel.
 - “Innovative thinking saves money.” – Jan Landman.

Food for thought

- Maximize efficacy of chemicals, reduce fruit losses and save money
 - Sanitizers effective with microorganisms that are free in suspension
 - Consider washing and sanitizing fruit and equipment
- CRI dust suppression study kicking 2026
 - Knocking on your doors
- We CAN manage dust-related challenges better

