Global Cooling
Ripening, Precooling, and Postharvest Systems
Keeping it Cold is Not Enough™

A brief overview of forced-air pre-cooling
www.Pre-Coolers.net
The warm produce is unloaded…
…stacked in front of a fan (or two or three…)
...forming a tunnel between two rows...
…then tarped-over and cooled. Notice how the suction fans are drawing in the tarp at the front of the tunnel.
The Forced-Air Cooling Cycle

1. Warm air from the fan is directed to the evaporator.
2. The refrigerant cools the evaporator, producing cold air.
3. The cold air is directed to the berries, cooling them.
4. Warm air from the evaporator is returned to the fan.

Key:
- Warm air to evaporator
- Warm air to fan
- Cold air to berries
- Refrigerant
The Refrigeration Cycle

- **COMPRESS**
  - High Pressure Gas
  - Low Pressure Gas

- **EVAPORATE**
  - Low Pressure Liquid

- **CONDENSE**
  - High Pressure Liquid

- **EXPAND**

- **HEAT IN**

- **HEAT OUT**
Airflow in single-tier tarp tunnel, one tunnel per cooler…
Airflow in single-tier tarp tunnel, two tunnels per cooler…
The heat leaves the facility via compressors and condensers…
Pressure fans awaiting installation…
Typical Cooling Tunnels
Other Examples of Cooling Tunnels
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Tarped Tunnels

- Plenum Fan
- Evaporator Coil (Above)
- Tarps
- Side-by-side Blast Cooling Tunnels
- Optional tunnel wall and ceiling panels, optional doors
- Product flows in and out of cold room
Temp Gradients, One-Way Air

EVAPORATOR

PRODUCT

TEMPERATURE GRADIENTS

AIR TEMP

REFRIGERANT TEMP

PRODUCT TEMP
Two-High Tunnels
Two-High Tunnels, loaded one-high
Two-High Tunnels, loaded one-high
Two-high tunnels, with steel pallet stop
A better design. No duplication of fan motors, air flows are in-balance, notice how far tarp is sucked-in, and wider tarp for better air-sealing…
Inside of cooling coil/fans bulkhead, a maintenance man’s dream…
Tarps can handle differing pallet heights
Humifresh® “wet-coil” precoolers…
Vertical Airflow Precoolers…
Vertical Airflow Precoolers…
Reversing Airflow Precoolers…
VFD motor drive controllers standard…
Fans for pressure only, with cooling coils above on ceiling, single-tier
Fans for pressure only, with cooling coils above on ceiling, two-tier
Fans for pressure only, with cooling coils above on ceiling, vertical airflow
Fans for pressure only, with cooling coils above on ceiling, vertical airflow
Humidifiers can help…
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