

Israel, Haifa



Protecting Citrus Trees

Citrus orchards in Israel have been suffering from parasite-based infections and stress due to extreme heatwaves, with ambient temperatures reaching up to 50 °C. Traditional methods offer limited protection, especially under combined biotic and abiotic stress.



Intervention

We applied LIIN, a sprayable thermal insulation coating from Swarm-Link, to citrus tree trunks and major branches. The coating was applied at a thickness of 500 µm. Key properties of LIIN include:

- * Exceptional insulating capability
- * Hydrophobicity / water repellency
- * Robustness and durability

In parallel, we deployed HeatStat, a monitoring algorithm/system from Swarm-Link, to track temperature and humidity in and around the tree, as well as the tree's physiological responses to environmental changes (e.g. wilting, leaf temperature, moisture stress).

Benefits Observed

- * Protect the bark surface from extreme temperature fluctuations.
- * Lower incidence of heat-induced damage (cracking, scorching).
- * Trees showed reduced stress signs: less wilting, more stable leaf water potential.
- * Reduced parasite infection severity (parasite load lower compared to uncoated controls).

Key Features

Thermal insulation

LIIN reduces heat load on bark, lowers internal tree tissue temperature.

Moisture Management

Hydrophobic property reduces water-loss through bark surfaces.

Real-time Monitoring

HeatStat tracks environmental stress and allows for early warning or corrective actions..

