

KEY FACTORS TO A SUCCESSFUL GREENHOUSE OPERATION

The Greenhouse Industry

Greenhouses are becoming more and more important in the global agricultural economy. They are also becoming “smarter.” According to Zion Market Research, the smart greenhouse, which is a self-regulating, climate-controlled environment suitable to plant growth, is the cornerstone of a market that is expected to reach \$1.31 billion by 2022. As technology advances, greenhouses are producing crops faster and more efficiently than traditional farming methods with the clear advantage of temperature, light, humidity, and carbon dioxide control over traditional farming methods. Greenhouse crops are grown with fewer weather complications. Furthermore, greenhouses are often able to reduce the amount of chemical inputs in pesticides using screenhouse (or net-house) strategies, meeting growing market demands.

As the world faces global food shortages, greenhouses have the potential for huge impact since they can be used to effectively grow a number of crops. They can be more efficient in using land, water, and fertilizer and can re-allocate man-hours spent sowing, tending and harvesting. Greenhouses can be used to extend the growing season so as to produce food year-round, developing further revenue opportunities for growers.

“... koolfog solutions can control microclimate environments within a greenhouse facility...”



How It Works

The process is this. Operating at pressures of 1000 psi+ Koolfog produces micron-sized water droplets that, while evaporating and turning to vapor, remove heat from the air, cooling the surrounding area. The fog produced by a Koolfog system reduces temperatures and adds humidity to precise levels. The system can be designed for small or single compartment greenhouses, screenhouses and shadehouses or can be designed for large-scale operations with multiple zones. Greenhouse control systems are able to leverage Koolfog solutions to output fog at constant pressure levels, pulse output, or output using variable pressure control or staging allowing for control of microclimate environments within a greenhouse facility.

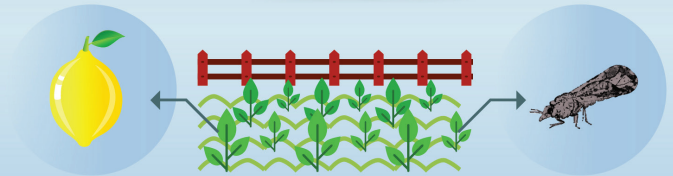
It is, however very important that the humidity around the leaves still allow the leaves to transpire water. The transpiration stream within the plant is responsible for carrying nutrients from root to leaves and to all the leaves to cool themselves. Through precise control using sensors, it is possible to fine tune fog cooling systems to optimal conditions. Research being conducted by Prof Heiner Lieth at the University of California, Davis is testing this.



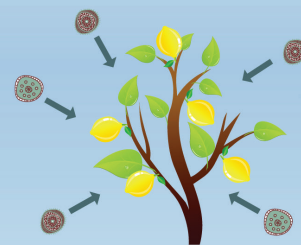
Benefits to Citrus

One area where greenhouses are having an impact is the citrus industry. Citrus nurseries are facing more and more problems from the Asian citrus psyllid. This bug can carry a bacterial plant disease that slowly kills citrus trees. The bugs are very hard to keep out of orchards and once one tree is infected all nearby trees may also become infected, until the whole orchard or nursery is affected. Thus, growers have been turning to growing citrus nursery stock in greenhouses and screenhouses. Citrus trees require precise humidification and temperature control, so a high pressure fogging system and fans are a perfect way to keep the trees healthy and growing at an optimal rate as long as the system can be automatically triggered when humidity and temperature are no longer at proper levels.

THE ASIAN CITRUS PSYLLID CRISIS

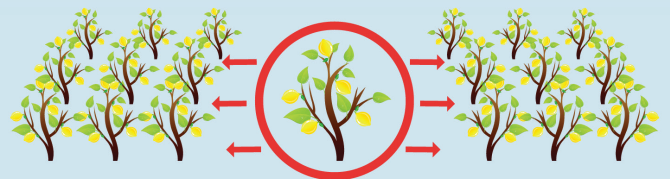


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