



# INNOVATING THE CLIMATE CONTROL LANDSCAPE

**Root-Zone Temperature  
Optimization Technology**  
Coffee Project in Dubai







Roots - Sustainable Agricultural Technologies Ltd. (ROOTS)



**ROOTS**

Sustainable Agricultural Technologies Ltd.

Israeli based, publicly traded in Australia (ASX: ROO), ROOTS is a graduate of the Israeli Chief Scientist Technological Incubator program and sells 2 disruptive, modular, cutting-edge technologies worldwide.

- 1) Root Zone Temperature Optimization (RZTO): Two-in-one root zone heating and cooling for indoors, greenhouses, hoop houses and outdoors.
- 2) Irrigation by condensation Technology (chosen among NASA techs of the month – TechBriefs Magazine)

Roots' technologies/systems assist growers increase yield, save energy, shorten growing cycles and provide supplies security. All designed to increase the grower's profitability and mitigate extreme weather effects on production and cultivation.



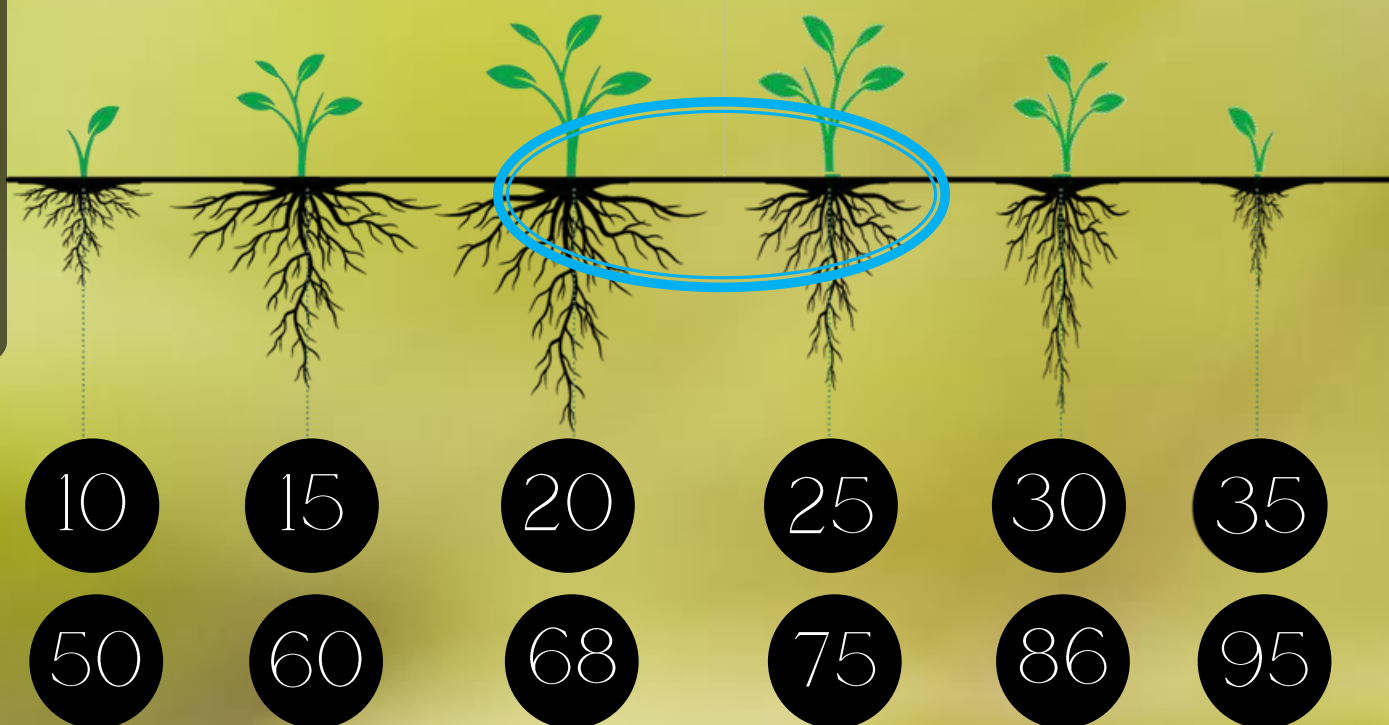




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Root temperatures is the most influential factor in plant physiology for growth, productivity, and quality  
An optimum temperature range is essential to productivity, health, and output quality







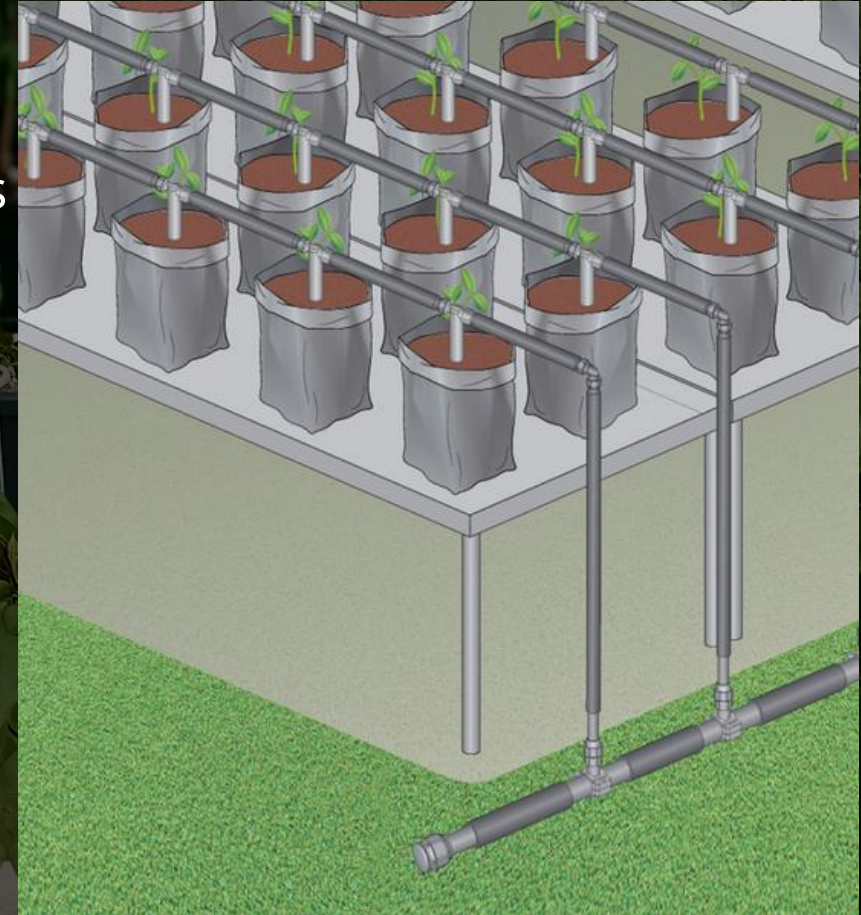
## Coffee Project in Dubai



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We installed 18,000 HEPs in 9000 Coffee plants,  
2 HEPs per plant.  
Temperature target in the system is 22 deg Celcius  
The temperature is regulated using 2 heat-pumps





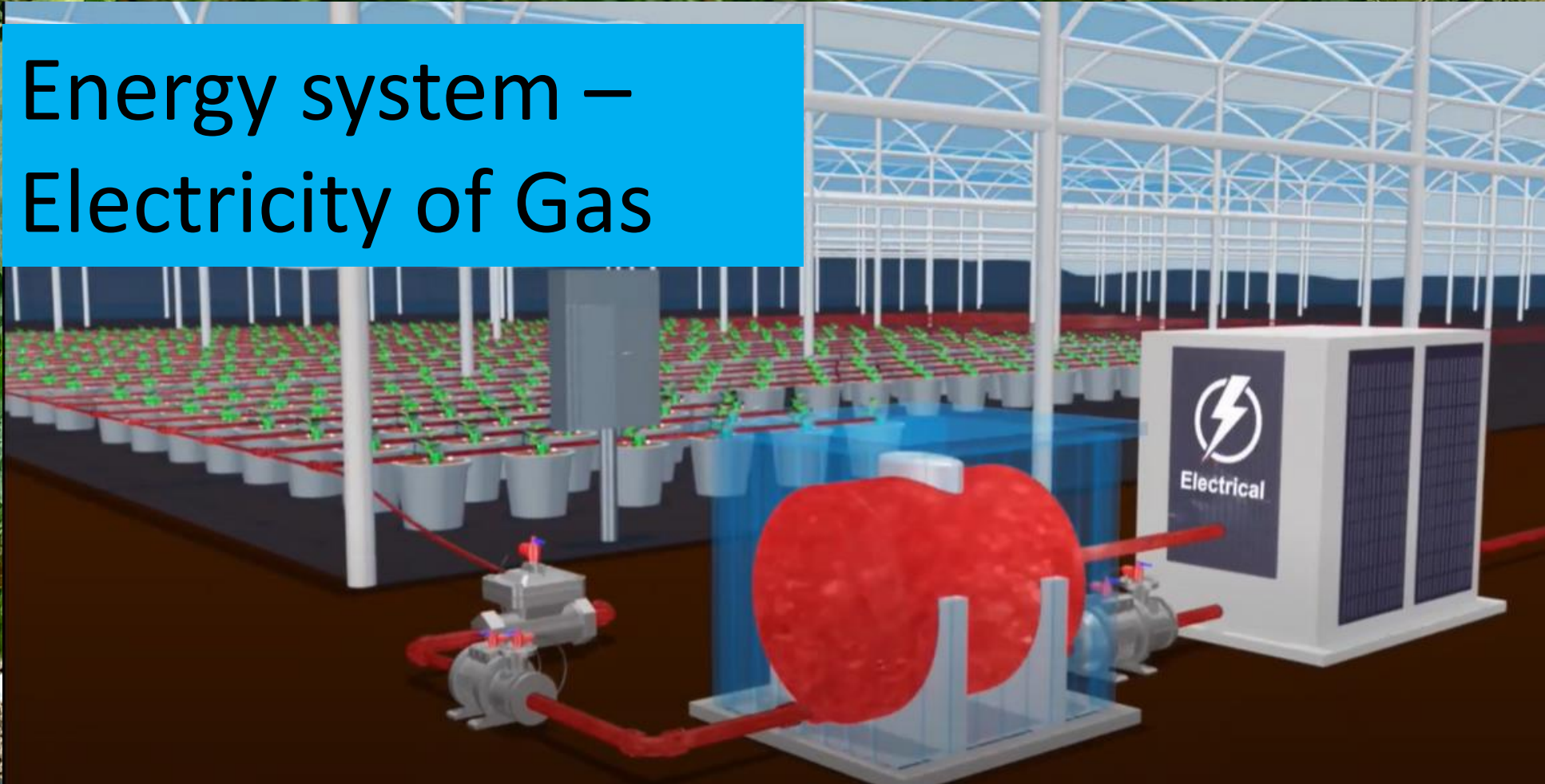


How does it work?

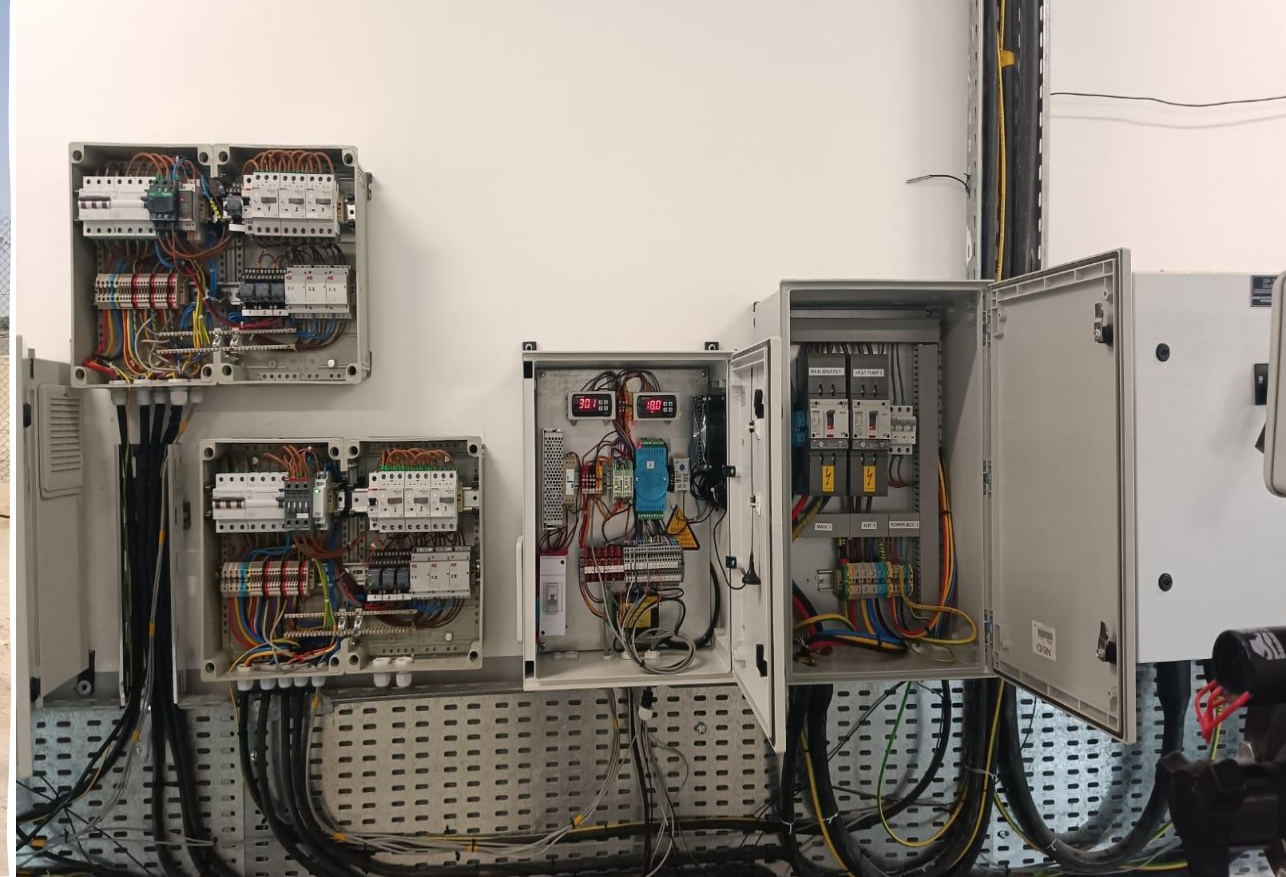


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## Energy system – Electricity of Gas







Chillers used for maintaining cooled and optimal root  
zone temperatures in very hot air temperatures





## How does it work?

- We install efficient heat pumps for root zone heating and cooling, operated either with electricity or gas.
- The system is a closed-loop, one time water fill up roots zone area cooling or heating system
- The heat pump produces a stable range of roots zone temperature year-round.

**Systems configurations come with monitoring and control equipment available for viewing in app on mobile phone and PC.**



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## System head







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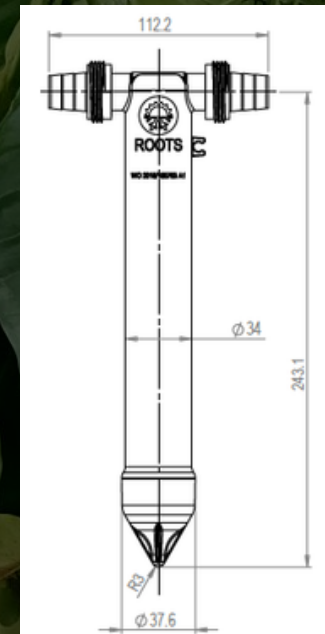


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Roots' HEP (Heat Exchange Probe) is Covered by ROOTS patent.  
The HEP unique design is use for heat exchange in any substrate, heating or colling as needed.

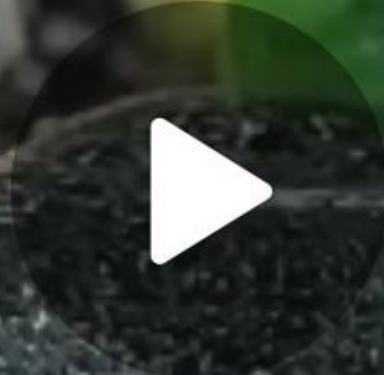






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## First week of growing post ROOTS installation



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Installation was done by **Elite agro project LTD** with on-site supervision of Roots technical team







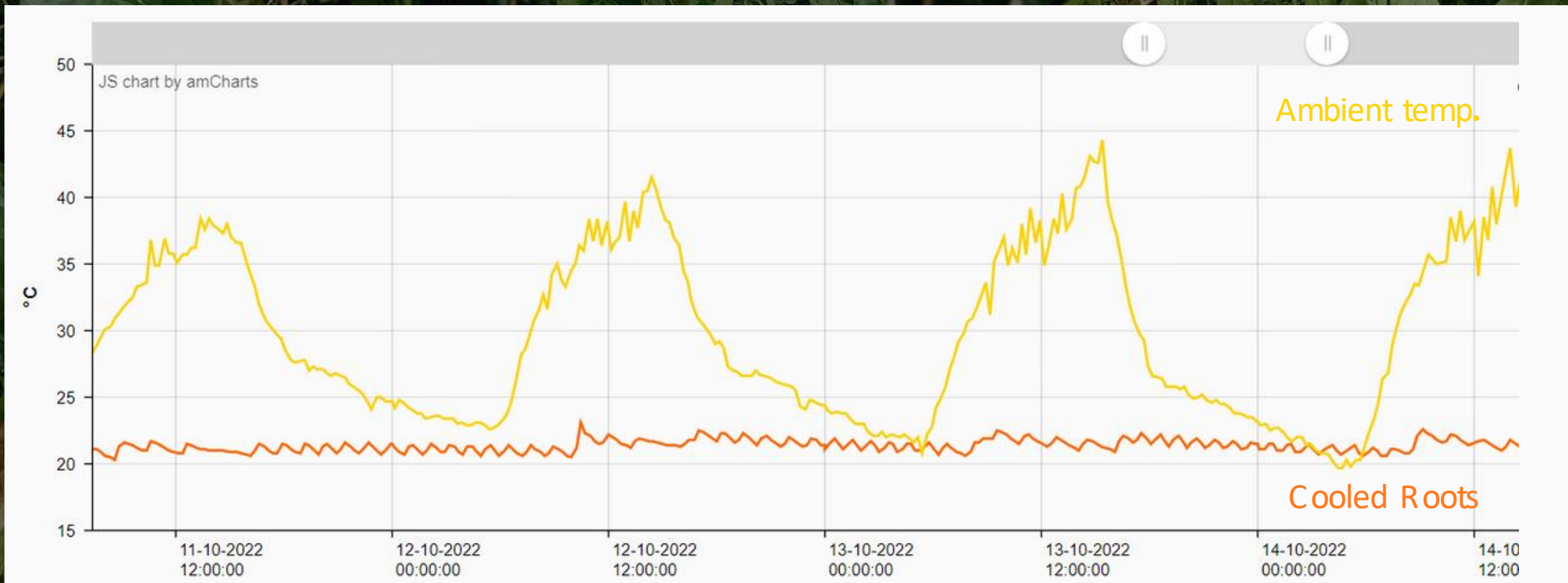
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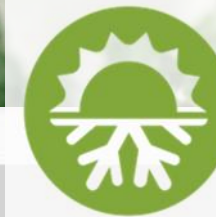
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Up to 22°C Differences between heated roots and air temp  
Roots temp regulated to steady 20-22°C

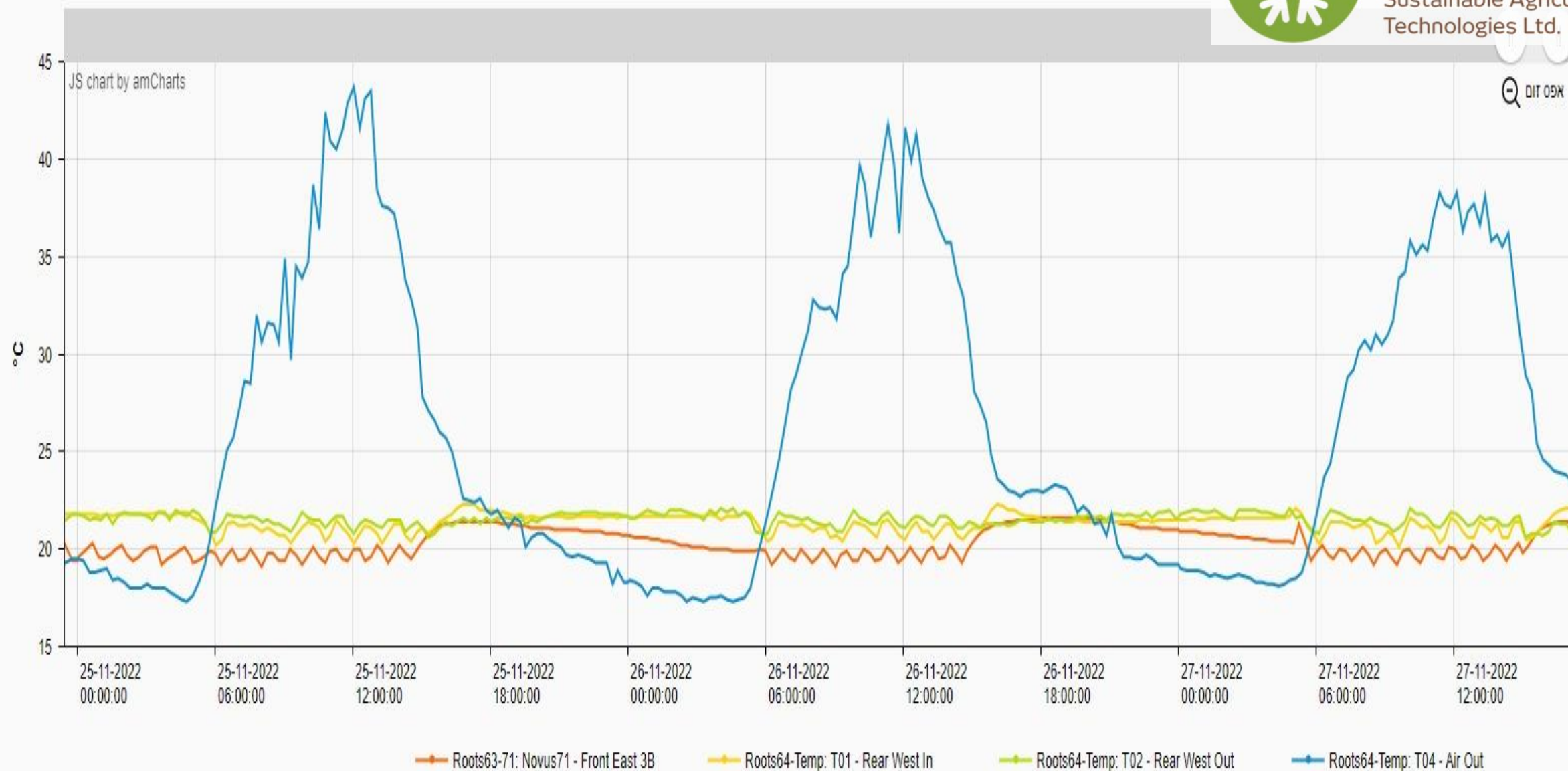






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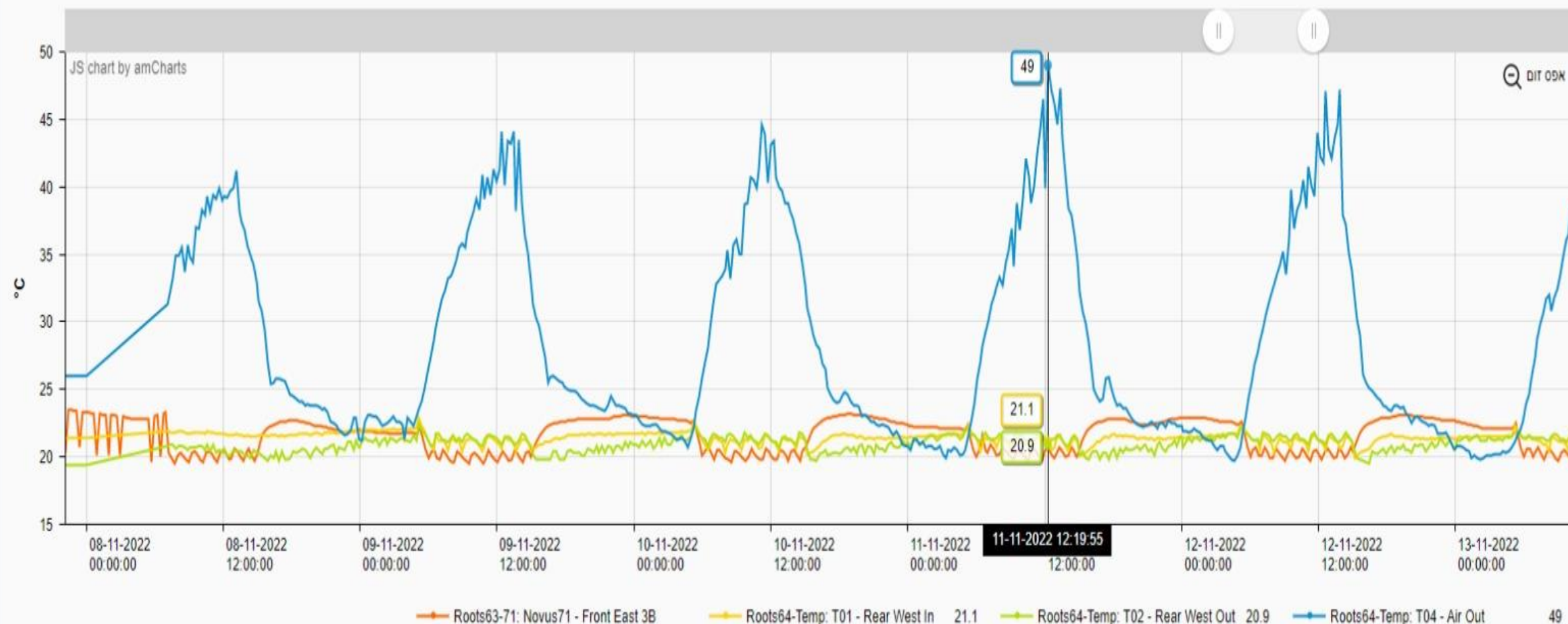


**Maintaining Cooled and stable (20-24 DC) root zone temperature even under 49 DC air temp. in the green house**




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**We offer a separate system to control the irrigation water temperatures (separately) or combined with liquid fertilizer supplied via the irrigation water**



# THANK YOU

Roots Sustainable Agricultural Technologies Ltd

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