



**ROOTS**

Sustainable Agricultural  
Technologies Ltd.

# SIGNIFICANT YIELD INCREASE WITH ROOT ZONE COOLING & HEATING SYSTEMS

## OUR CLIENTS REPORT YIELD INCREASE UP TO 60% AND MORE AT TIMES

ROOTS— DEVELOPED AND COMMERCIALIZED DISRUPTIVE, MODULAR, CUTTING-EDGE TECHNOLOGIES TO ADDRESS TWO MAJOR AND CRITICAL PROBLEMS IN AGRICULTURE: HOW BEST TO INCREASE YIELD AND PROVIDE PRODUCTION SECURITY WITH AS LITTLE ENERGY AS POSSIBLE, AND HOW TO PROVIDE IRRIGATION WATER WHERE NO WATER IS AVAILABLE WHATSOEVER. ROOTS SYSTEMS ARE BACKED BY PROPRIETARY PATENTS AND KNOW-HOW TO OPTIMIZE PERFORMANCE AND REDUCE ENERGY CONSUMPTION TO A MINIMUM ALL AIMED TO BRING MAXIMUM BENEFITS TO FARMERS WORLDWIDE.



### ROOT ZONE TEMPERATURE OPTIMIZATION (RZTO)

Root temperatures influence all parameters of plant's physiology and therefore attaining and maintaining optimum root zone temperature range is essential for a plant's robust growth, productivity, and quality. The RZTO tech is a closed-loop system providing optimal root zone temp year round and can be used with any cultivation substrates. The energy source can be one of the following three options: Heat pumps (electric or gas), Heat pumps (hybrid) with Ground Source Heat Exchange (GSHE), or GSHE alone. The system includes 12 up to sensors input + Remote control and cloud-based real-time data sharing for farmers. To date over 50 systems were installed worldwide.



### NEW PRODUCT FROM ROOTS: D-RZTO

The familiar RZTO system combined with a state of the art Drip irrigation and fertilization system 2 in 1. Roots RZTO systems are based on Ground Source Heat Exchange (GSHE) inserted coils at depth or Heat Pumps. We can now provide a new in pot T shaped heat exchange probe coupled with Drip irrigation and fertilization in one system. This provides root zone cooling & heating and irrigation/fertigation in one complete unit. ROOTS unique fertigation system drip or sprinklers) uses the same controller and same water pipe used for the heating and cooling of the roots zone for irrigation purposes. The advantages are enormous as the system is easy to install or disassembled, pots can be moved and by doing so, it can be used for many growing cycles. One control panel for controlling the roots zone temperature and irrigation is easy to operate. Using the same water pipe and controller for both irrigation/fertilization and heating/cooling the root zone is cost-effective.



### IRRIGATION BY CONDENSATION (IBC)

ROOTS IBC is a standalone, closed-loop, solar-operated system to irrigate crops by condensing water from moisture/humidity in the air on the external surface of pipes. The system's insulated water tank is filled once. Thereafter the water is continually cooled to below the dew point, and the chilled water is circulated in pipes placed on the ground surface or vertically. The humidity that condenses on the pipes flows to the soil and is used to irrigate the crops with pure, chilled water. Thus far, nine crops + Avocado trees and grapevines were fully grown and are thriving irrigated just from the humidity in the air! The IBC tech was Chosen by NASA Tech Brief's Magazine among the "Technologies of the Month" a few years ago.



## TECHNOLOGY'S ADVANTAGES

## CLICKABLE CASE STUDIES



**INCREASE OF  
YIELD QUANTITY  
AND QUALITY**



**FASTER  
GROWTH  
CYCLES**



**SUBSTANTIAL  
ENERGY  
SAVINGS**



**ADDITIONAL  
PROFITABILITY  
PREMIUM PRICES**



**IMPROVES  
UNIFORMITY AND  
SUPPLY SECURITY**



BASIL



CANNABIS



ASAPRAGUS



AVOCADO



CUCUMBER



TOMETOES



LETTUCE



STRAWBERRY



FLOWERS



CHIVES



**PUBLICLY TRADED CO.  
LISTED DEC 2017 ON ASX.**



The technology provided significant yield increase and multiple other benefits among farmers in Israel, North America and China thus confirming Netafim results obtained in their R&D farm

**INTELLECTUAL PROPERTY**



A number of utility and design patents were granted and awarded in multiple key territories around the world

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Roots' Root Zone  
Temperature Optimization  
(RZTO) technology new  
probe for pots & open tops