



ROOTS

Sustainable Agricultural Technologies Ltd

Investor Roadshow Presentation

8 – 16 March 2018

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Investment Risks

- **Risk of Israeli company – political, economic and military:** The Company is incorporated and based in Israel. Accordingly, political, economic and military conditions in Israel and the surrounding region may directly affect the Company's business. Additionally, the Company is prone to the applicability of Israeli law and Israeli Government grants.
- **Intellectual property:** Although most of the existing IP owned or licensed to the company are granted, there is a risk that other manufacturers may decide to attack the validity of the existing or newly filed IP. In such case the company will have to defend its IP in lengthy and costly legal procedures.
- **Slow penetration rate in the agricultural industry:** Agriculture is a conservative sector and adoption speed of new technologies is slow. Disruptive technologies, such as the Company may not be subject to such a slow rate of penetration but it's an existing risk that must be taken into account.
- **Competition:** There is a risk that competitors will introduce into the market place new and better technologies and will undermine the success and penetration rate of the Company's technologies and products. Additionally, there is significant competition in the agricultural technology industry generally, more so in greenhouse heating technologies and less in cooling technologies.
- **New technology with limited feedback and lengthy testing cycles:** The Company's technologies are new in the agricultural sector and as such require lengthy testing cycles (usually a year) on its own and in new territories. This may delay achieving sales and revenue forecasts contemplated by the Company.
- **Limited commercial sales to date:** There are limited commercial sales to date. This is due to the experimental nature of the technology, slow adoption rate of new technologies by the agricultural sector and the limited funds available to allocate to sales efforts to date.
- **Reliance on key personnel:** Success of the business will depend on the Directors and the officers of the Company to develop the business and manage operations, and on the ability to attract and retain key quality staff and consultants.
- **Liquidity Risk:** The Company anticipates that a substantial number of shares will be classified as restricted securities by ASX upon Admission, which will comprise a percentage of the issued share capital on an undiluted basis.
- **General Market Risk.**



Corporate Overview

IPO Dec 2017	\$m	5.0m
Market Cap @ \$0.50	\$m	30.5m
Cash on Hand	\$m	~4.0m
Enterprise Value	\$m	24.5m
Shares on Issue	\$m	61.0m
Top 20 Shareholders	%	54.72%
Escrowed Shares	%	48.6%

Roots', founded in 2012, is a graduate from the Israeli Office of the Chief Scientist's Incubator program.

International operations across Australia, China, Israel and Spain and planned geographic expansion.



Corporate Overview

An Agricultural Technology Innovator



Roots is focused on developing, producing and commercialising technologies addressing food production security, quality enhancement and access to irrigation water



The only known two-in-one, low energy, root zone heating and cooling system world wide



One technology provides water for irrigation by condensation in an environmentally sustainable manner



Combined experience and unique know how in agronomy, engineering and remote data management and control



Board of Directors



Dr Sharon Devir
Co-Founder, CEO,
Chairman & Exec Director

- Dr Devir is CEO and Co-Founder of Roots
- Co-Founder of Rimoni, an Ag-Tech fund and Sailcrop, an abiotic stress seed treatment
- Former CEO of NGT, a technology incubator which sold one of its portfolio companies to Colgate for USD\$100m
- Former CSO of AFIMILK dairy management systems
- Agriculture faculty lecturer at the Hebrew University
- Awarded Channel 2's "Man of the Year", Israel
- Ph.D. in Agriculture and Environmental Sciences from Wageningen University, the Netherlands
- Bachelor of Science and a Masters of Science from the Technion Institute of Technology, Israel



Boaz Wachtel
Co-Founder
Non-Exec Director

- Mr Wachtel is Co-Founder and Executive Director of Roots and inventor of Roots' core technologies
- Co-Founder of two ASX listed medicinal cannabis companies; Creso Pharma Limited and MMJ Phytotech Limited
- Masters in Management and Marketing from the University of Maryland
- Former assistant army attaché to the Israeli Embassy in Washington DC
- Guest Lecturer at the UN Conflict Resolution conference
- Published 25 publications on water and he is a frequent lecturer on Ag-Tech, Middle East water issues and sustainability



Tal Misch Vered
Non-Exec Director

- Ms Misch Vered is a Non-Executive Director of Roots
- Currently sits on the board of four publicly listed companies: Telsys Ltd, Medipower Public, Opal Balance Investments Ltd and Mordechai Aviv, Keren Hishtalmut le Ovdei Medina
- Previous CEO of Gmul Real Estate Ltd and CFO of Gmul Investment Company Ltd
- Bachelor of Accounting & Economics from Tel Aviv University
- Masters in Philosophy of Science from Tel Aviv University (Magna Cum Laude)



Graeme Smith
Non-Exec Director

- Mr Smith is a Non-Executive Director of Roots
- Highly awarded industry expert
- Published over 50 works over the last 20 years
- Former President, Chairman, Board Director and Member of both local and international Greenhouse, Hydroponic, Cropping and Horticultural groups
- Current MD of Graeme Smith Consulting (www.graeme-smithconsulting.com)
- Current equity partner and greenhouse horticultural technical advisor for Nectar Farms with plans for a 40ha climate resistant glasshouse in VIC and NSW, Australia
- Certified Practicing Agriculturist (CPAg) from the Australian Institute of Agricultural Science and Technology



Adam Blumenthal
Non-Exec Director

- Mr Blumenthal is a Non-Executive Director of Roots
- Brings over a decade of corporate finance and investment banking experience
- Mr Blumenthal has played a lead role in advising and supporting multiple organisations across a broad spectrum of industries
- Director of multiple ASX listed companies
- Bachelor of Commerce
- Masters of Business Administration from Australian Catholic University





A Compelling Business Opportunity

Increasing Demand for Food, with Supply Constraints ... Leaves Roots Well Positioned to Grow

Problems facing agriculture:



Demand for food outstrips supply



Water shortages



Severe weather conditions and global warming



Ecosystem degradation



High usage of chemicals in fertiliser



High energy prices



Two Major Issues Roots is Addressing

1. Sustainable optimising
of plant's root
temperatures and yield



2. Water shortages in
areas with no access to
water grids, wells or rain

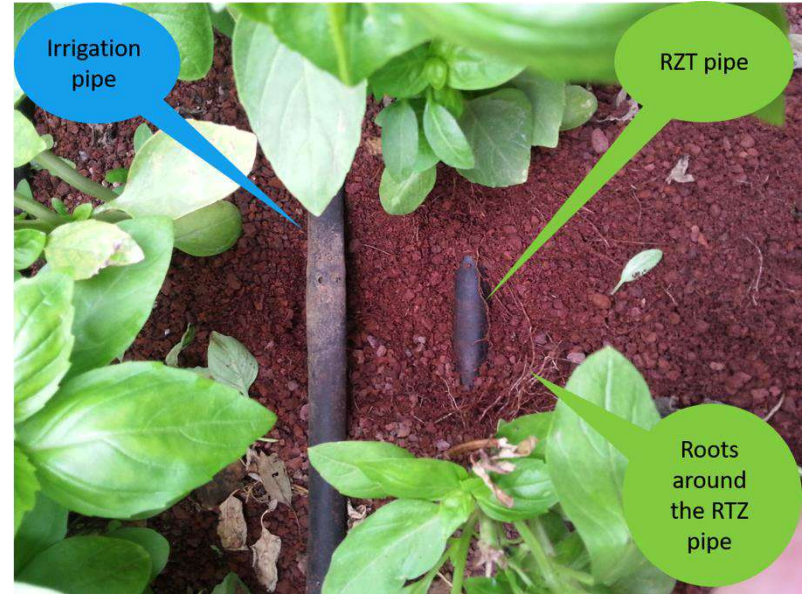




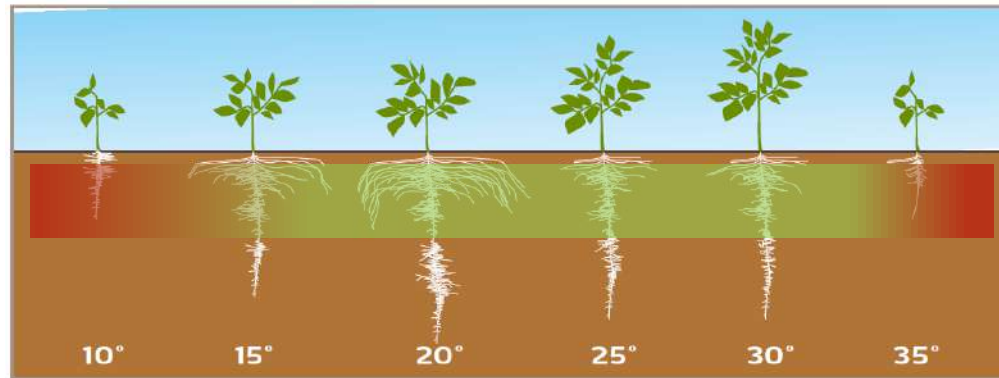
Technology 1: Root Zone Temperature Optimisation Control System

Root Zone Temperature Optimisation (RZTO) Control System

- **Root temperature is the most influential factor in plant physiology for growth, productivity and quality:**
 - An optimum root temperature generally ranges between 12-28°C
 - The optimum range is essential for a plant's robust growth, productivity and output
- **Roots' patented, closed cycle, agricultural system utilises ground source heat exchange principles:**
 - Cools and heats root zone temperatures to stabilise the optimum temperature range
- **The result:**
 - Increase of yield quantity and quality
 - Shortening growing cycles
 - Substantial energy savings by heating the root zone area only during the winter and cooling it during the summer with one system



Effects of Soil Temperature on Root Development



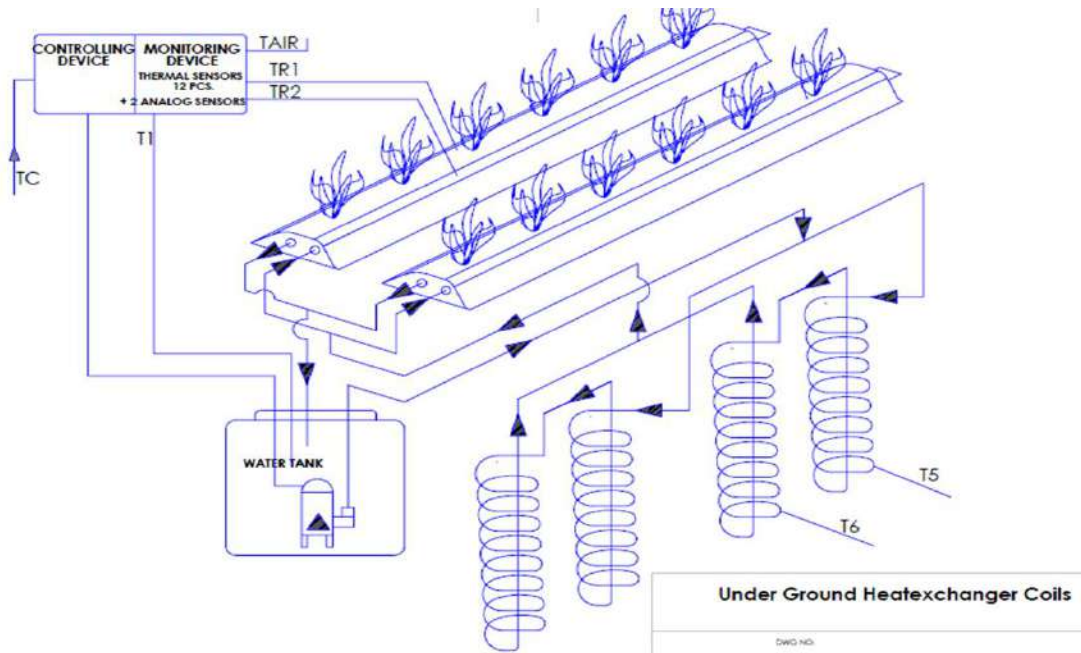
REF: SATTELMACHER ET AL - 1990

Roots agricultural system maintains an optimal temperature range all year round



The RZTO System

Ground Source Heat Exchange principles for the smart control and management of root-zone temperatures year round





Technology 2 & 3: Additional Growth Opportunities from R&D

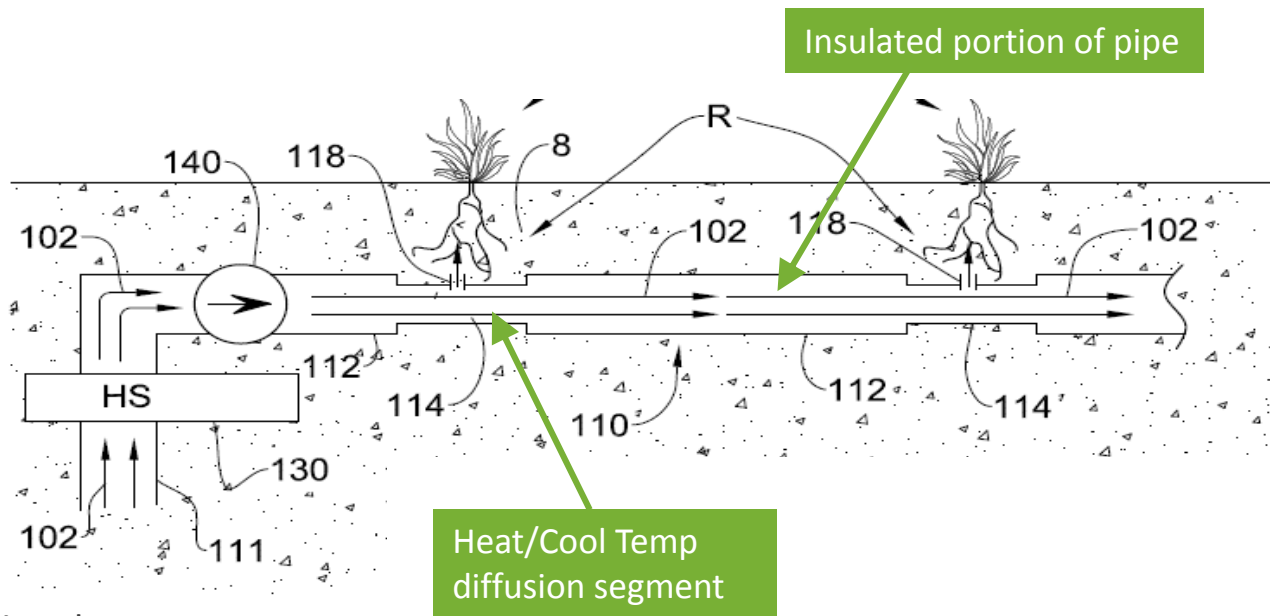
2. Irrigation by Condensation (IBC) – R&D

- Water shortages have a significant impact on the food production chain
- Irrigation by Condensation is a standalone, closed loop, solar operated system to irrigate crops by condensing air/soil humidity on the external surface of pipes with running cold water for irrigation
- In many cases, no additional irrigation is required to maintain plant survival and harvest quality
- Independent from water and electricity grids
- Allows farming in remote locations which are unsuited to food production due to water shortages
- Cold water irrigation- cools the roots and reduces its water requirements
- Increases crop production and number of seasonal cycles and improves quality



3. R&D Patented for Smart Pipe Fertigation and RZTO

- Smart management of combined root zone heating/cooling with underground irrigation and fertigation to facilitate optimal nutrient absorption by the roots, resulting in crop yield increase and healthier plants
- Delivers hot or cold temperature directly to the roots, thus minimizing heat loss between plants
- Irrigates at the root zone level – saving a separate upper or embedded drip irrigation installation
- The emitted nutrient fluid can serve for irrigation, fertilization, and pesticing



Legend:

- 110: pipe + drippers
- 102: Fluid charged with ground source heat
- 114: heating / cooling area
- 118: drippers
- 130: ground source heat exchanger





Case Studies



Fruits, Flowers and Vegetables

Cucumbers: Heated in Winter versus Untreated

Using Ground Source Heat Exchange¹

- Upfront Cost: \$8.5 USD/m²
- Typical Payback Period: 2-4 years
- Typical Yield Increase: 20%-60%
- Premium Pricing due to offseason output



1. Typical Installation, based on Roots' customer 4 rows in each, 76m x 7.4m, 21 spans. ~1.18 Hectare
2. Reflects 55% gross profit to Roots

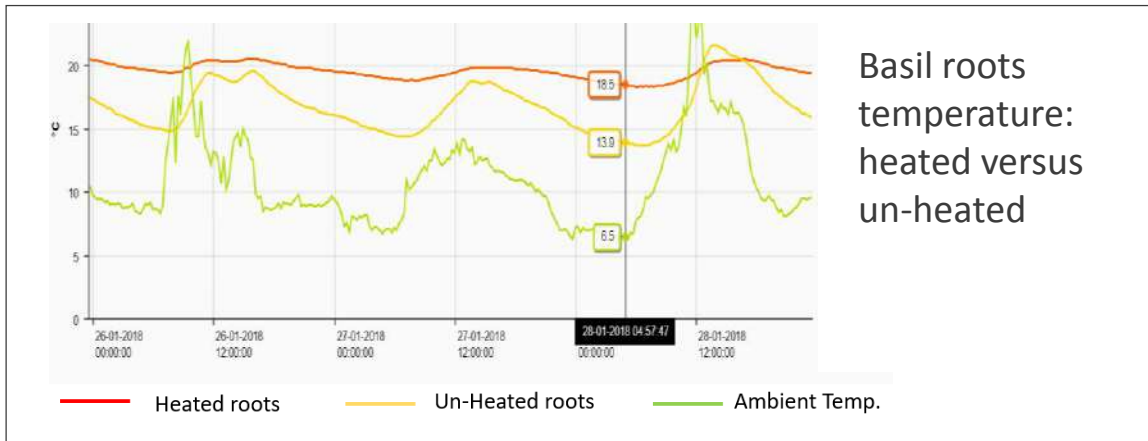


Herbs

Basil: A summer crop – requires a high temperature for normal development

Winter planting growing took place in January – February 2018 in Carmia:

- Installation proved heating the roots zone on cold nights allows basil to grow in the cold winter months
- Heating the root zone improves the plant's growth rate and increases the crop yield during the cold winter months
- 66% additional yield and 35% size increase, increasing profitability, benefiting from premium prices, return on investment in less than 2 years*



Basil roots temperature: heated versus un-heated



*The presented results are based on heating only during 3 months a year, the RZT contribution for cooling was not included in the analysis



Pilot Testing – Strong Yield Improvements

Heating Root Zone

Crop Type	Location	Facility	Yield Increase	Comments
Basil	Jordan Valley	Low tunnels, Tuff beds	30%	
Basil	Sea shore	Greenhouse	66%	Ground source heating only, farmer received premium prices
Strawberry	Sharon area	Greenhouse, hanged insulates beds	25%	Shortened growing cycle in 3 weeks, improved quality, elimination of additional air heating
Cucumbers	Sharon Area	Greenhouse, Soil	100%+	Conducted by Netafim, Magal experimental site
Flowers	Sharon Area	Greenhouse, Tuff beds		Shortening time to market
Lettuce	Sharon Area	Open field	50%	50% Increase in fertilization efficiency
Lettuce	Jordan Valley	Net house, Tuff beds	45%	

Cooling Root Zone

Cucumbers	Sharon area	Greenhouse, Soil	25%	Hot Winter
Herbs	Jordan Valley	Greenhouse, Tuff beds	Maintain Yield	Without roots cooling system, the farmer could not grow a thing. Ambient Temp. of 40 to 50 C° degrees
Cherry Tomatoes	Jordan Valley	Greenhouse, Tuff beds	20%	Heat pump
Tomatoes, type 870	Jordan Valley	Net house Tuff beds	30%	Planting on mid summer end of summer harvest, Heat pump
Lettuce	Jordan Valley	Net house Tuff beds	50%	Shortening growing period from 10 weeks to 5 weeks
Lettuce	Israel Valley	NFT	10%	Significant energy saving – 60%

All pilot projects and results above were monitored by Roots in collaboration with in instances the Israeli Government, Netafim and the farmer.



Root Zone Technology Optimisation (RZTO)

The technology is comparable to the revolution of drip irrigation, which means targeting the root zone area and not the canopy

Advantages over existing options including:

- Pioneering of a **two-in-one system** - able to both heat and cool plants at the root zone area
 - There is no known company with RZTO optimization technology that uses sustainable low energy ground coils heat exchange system both for heating and cooling
- **Increased yield and quality**, with reductions in growing cycles
- **Energy efficient**, saving up to 80% of energy compared with air heating
- **Faster ROI** than competing solutions, which are expensive to run
- **Addresses climate management problems**
- **Real-time results tracking** via smartphone and PC software
- **Eco friendly** - competes favourably with fossil-based air heating companies and air cooling mats for plants





Attractive Go-To-Market Strategy



Multiple Sources of Revenue from Commercialisation

- **Up-front sales to be made with integrators and dealers across a range of products:**
 - Heat dripping pipes
 - Ground source heat exchange coils
 - Generic plastic parts
 - Excavation and labour
 - Heat pumps
 - Control systems
- **Post sales service to provide additional sources of revenue**
 - Heat pump service and warranty
 - Monthly monitoring and consulting
 - Heat dripping pipes

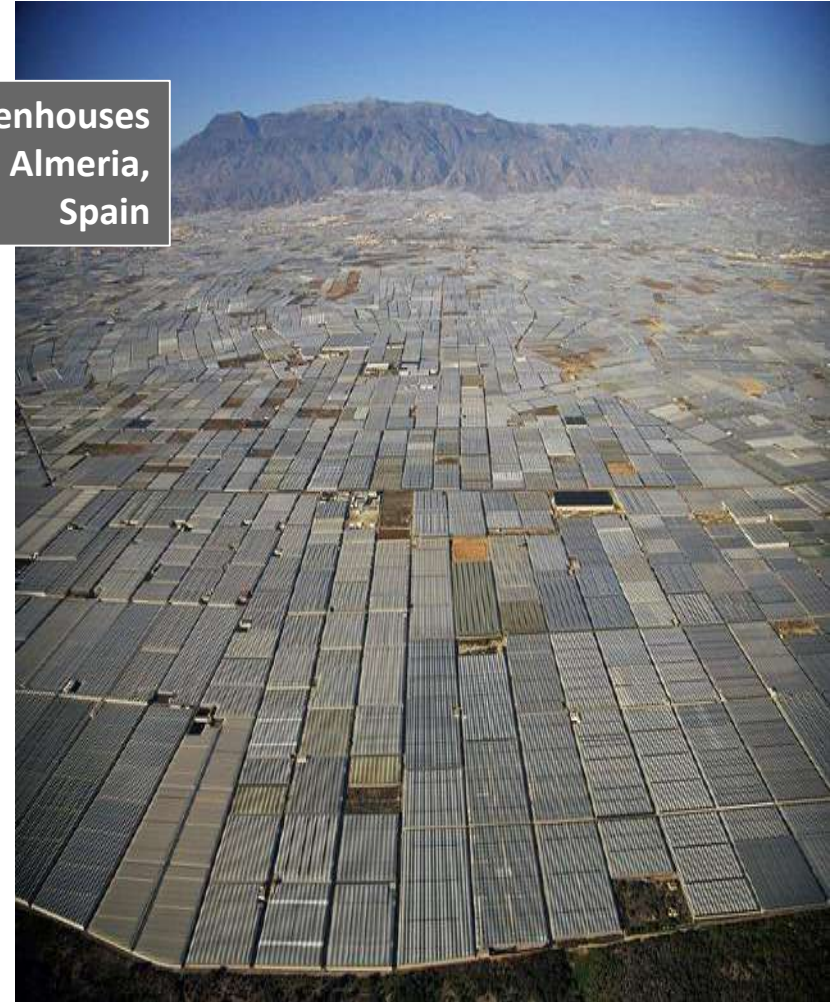


Targeting Customers Across Crop Varieties and Geographies

- **With multiple applications, Roots target customers are farmers who operate with:**
 - Greenhouses
 - Shade nets
 - Low tunnels
 - Hydroponics
- **RZTO technologies can be applied to a range of key target crops including:**
 - Vegetables and fruits
 - Herbs
 - Flowers
 - Possible integration in trees
- **Total world greenhouse vegetable area is 1.2 million acres (489,214 Hectares)***

* Source: *International Greenhouse Vegetable Production* – Statistics 2017 Edition)

Greenhouses
in Almeria,
Spain



RZTO Global Commercialisation

RZTO is already in use across Australia, China, Israel and Spain



3 Pilot projects in Almeria and 1 Pilot project in Huelva, Spain: Strawberry, Cucumbers, Tomatoes, Watermelon

9 Pilot projects, 7 Commercialised projects and 2 R&S sites in Israel: Herbs, Leafy vegetables, Tomatoes, Cucumbers, Flowers, Avocado

First 8 Acres system sold in China (5yr commercial agreement with Dagan valued at \$19m): Vegetables, NFT, Flowers

2 Pilot projects in Perth, WA: Apricots, Strawberry





Intellectual Property



Registered Intellectual Property

Roots have an extensive patent portfolio and continues to invest in its intellectual property across 15 countries

1 | 

Patent family: Irrigation method and system

- Patents granted across Australia, Europe, Israel, Mexico, USA and UK

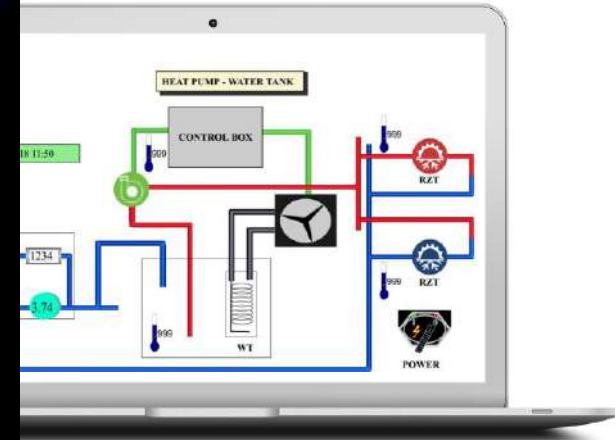
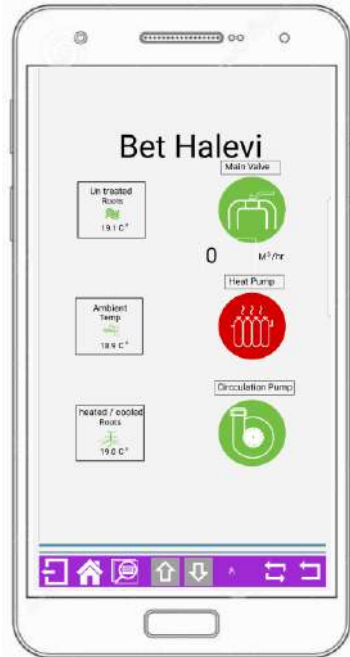
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Patent family 2: Heat delivery system and method

- Additional IP recently filed in the US, Australia, Europe, China and Mexico
- A revolutionary heat dripping pipe that diffuses the heat/cold only near the roots and not between them and allows combined underground fertilization and water emittance.



Proprietary Monitoring Software





Investment Highlights

Investment Summary



Uniquely positioned

- Roots has a disruptive technology which is attracting significant attention in the rapidly growing Ag-tech investment community
-



Clear path to commercialisation

- RZTO already commercialised in Israel and China
 - IBC proof of concept completed, commercialisation to start at the end of 2018
 - Additional products, backed by IP are in the R&D and pilot production phase
-



Experienced management and global leaders of Root-Zone Cooling

- The only known technology with two-in-one heating and cooling ground source heat exchange technology
-



Substantial progress to date

- RZTO engineering and commercialisation has further advanced post field testing
- World wide interest in all three innovative technologies is accelerating





ROOTS

Sustainable Agriculture Technologies Ltd

Roots Sustainable Agricultural Technologies Limited

Registered Office

a: C/- Mirador Corporate, Suite 4, 4/11 Ventnor Ave, West Perth WA 6005

ph: +61 (08) 6381 0054

e: info@rootssat.com

w: www.rootssat.com

