

**05 March 2018**

### **Successful winter pilot study on basil obtains a 66% increase in yield**

- **Average plant size increased by 35%**
- **Successful growth of a traditional summer season crop in winter**
- **Crop yield increased by 66%**
- **Avocado proof of concept to be conducted over four months in Kibbutz Eilon**

**Roots Sustainable Agricultural Technologies Limited (ASX: ROO, Roots or Company)** has successfully conducted a pilot in winter where the roots of traditional summer basil plants were heated using Roots' patented RZTO technology increase yield and average plant size by 66 and 35 per cent respectively.

The pilot was conducted in winter over 39 days between December 2017 and February 2018, on a 50-acre organic farm in the Carmia region of southern Israel. Using the ground source heat exchange version of Root's RZTO system, the basil roots were heated an average five-degrees warmer compared with control plantings to achieve these results.

The successful pilot of basil, significantly only grown in summer months, shows the benefits of Roots' RZTO technology based on ground source heat exchanger can have for farmers in zones with wide temperature variations enabling them to increase yields and profits dramatically through more efficient crop management while using substantially less energy.

Roots CEO, Dr Sharon Devir said, "This pilot proves that heating the roots zone on cold nights allows farmers to grow basil in winter and that heating this root zone improves plant growth rates and increases the crop, therefore increasing profitability for the farmer by allowing them to extend their growth periods with relatively low energy costs and gain premium prices for produce."

"Being a summer crop, basil needs high temperatures for normal development making it prohibitive to grow in winter in many parts of the world. In the Carmia region the rise in energy prices for heating greenhouses and decrease in returns meant many farmers abandoned basil in favour of other crops – the farmer in the pilot had not grown basil for three years for these reasons. However, this farmer can now benefit from higher, premium prices for a crop that is normally out of season in the region. Therefore, his return on investment of the system is only two years."

The Roots RZTO heating system managed to heat up the roots of the basil seedlings and provided increased protection against cold. It stabilized the temperature range between day and night.

"We're now conducting for the first time a proof of concept on avocado trees. This will take place in a plantation in a relatively cool area of northern Israel – Kibbutz Eilon. For four months, the roots of

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mature avocado trees will be heated by the Roots RZTO system. The influence of heating mature roots will be monitored and physiological variables such as absorption of imprints, quantity of phosphorus, ripening and growth rates will be measured. We are hopeful it will provide further evidence of the diversity of crops that can benefit from the Roots RZTO system.

**Basil Winter Pilot Dec 17 – Feb 18, Carmia region, Israel**  
**Comparison of harvest volume - 12 plants in each box**

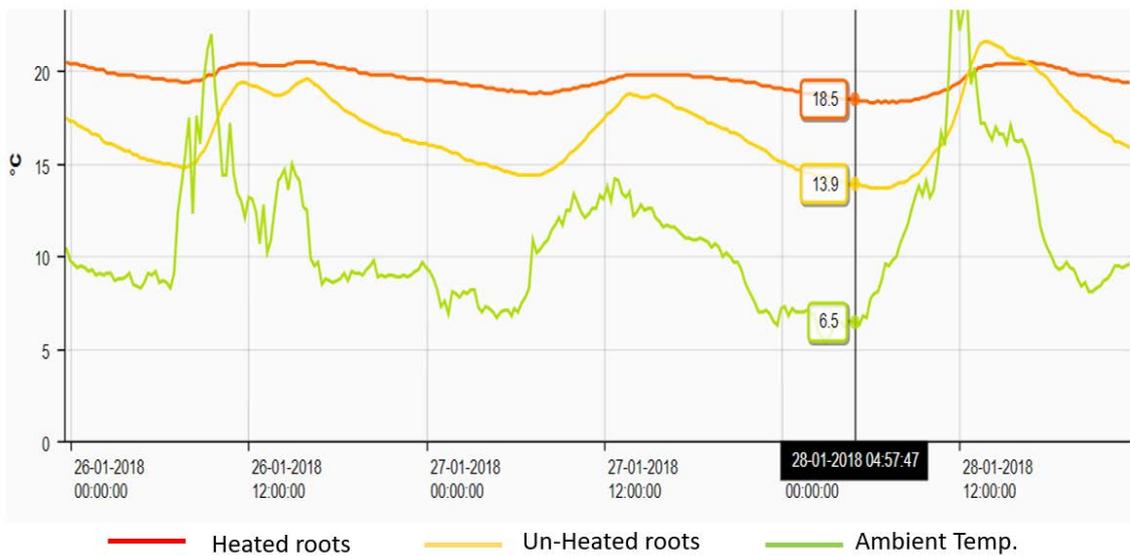


Un- heated



Heated

**Basil Winter Pilot Dec 17 – Feb 18, Carmia region, Israel**  
**Comparison between heated and unheated plantings**



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#### **About Roots Sustainable Agricultural Technologies Ltd:**

Israeli-based, Roots Sustainable Agricultural Technologies Ltd. is developing and commercialising disruptive, modular, cutting-edge technologies to address critical problems being faced by agriculture today, including plant climate management and the shortage of water for irrigation.

Roots has developed proprietary know-how and patents to optimise performance, lower installation costs, and reduce energy consumption to bring maximum benefit to farmers through their two-in-one root zone heating and cooling technology and off the grid irrigation by condensation technology.

Roots is a graduate company of the Office of the Israeli Chief Scientist Technological Incubator program.

More information [www.Rootssat.com](http://www.Rootssat.com)

#### **About Root Zone Temperature Optimization (RZTO):**

Root Zone Temperature Optimization (RZTO) optimises plant physiology for increased growth, productivity and quality by stabilising the plant's root zone temperature. Leveraging the principle of Ground Source Heat Exchange (GSHE), Roots installs a closed-loop system of pipes. The lower part is installed at a depth where soil temperature is stable and not affected by weather extremes, and the upper part in the target crop's root zone just below the soil surface. Water flowing through the lower pipes is charged by the soil's stable temperature. The heated (or cooled) water is pumped through the pipes installed in the root zone, where the heat (or cold) is discharged.

This significantly increases yields, increases growing cycle planting options, improves quality, mitigates extreme heat and cold stress while significantly reducing energy consumption by stabilising and optimising the roots zone temperature.

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