

31 January 2019

Roots begins to scale up orders and enters additional markets in Q4 2018

December 2018 Quarterly Report and Appendix 4C

Highlights:

International marketing and sales

- **First RZTO sale in medical cannabis market in Israel**
- **Completed first commercial order for RZTO technology in South Korea**
- **Israeli Government subsidy delivers first RZTO basil sale (Roots' custom-made pipe embedded machine expedited the installation)**

Technology

- **RZTO cooling technology increases yield in chives pilot study**
- **Excellent interim results using RZTO heating technology in open field cannabis**
- **Entered the floriculture sector with successful RZTO cooling pilot on Alstroemeria (Peruvian Lily)**
- **Australian patent granted for RZTO smart pipe system**

ROOTS Sustainable Agricultural Technologies (ASX: ROO, the "Company" or "ROOTS") is pleased to provide its quarterly update for the three months ending 31 December 2018.

Commenting on the Company's progress over Q4 2018, CEO Sharon Devir said, "We continue to demonstrate the significant value our Root Zone Temperature Optimisation ("RZTO") heating and cooling technology adds to farmers with sales for use on lettuce, basil and medical cannabis crops, following successful pilots in these sectors. While initial sales have been modest to date, each of these markets are large, providing us with significant long-term global growth opportunities.

"The ability to grow crops year-round with our patented root zone technology, despite extreme external weather conditions, was further demonstrated in successful pilots on chives, open field cannabis and the large floriculture market. Successful pilots remain key to expanding our presence in existing and new markets and territories.

"During the quarter, we made significant advancements with testing our Irrigation by Condensation technology, in line with our business plan."

Financials

The Company's cash balance as at 31 December 2018 was US\$593k.

The Company continues commercialisation efforts and product engineering in new markets, investment in demonstration and pilot installations as well as ongoing new product development and collaborations. The attached Appendix 4C contains the Company's cash flow statement for the quarter.

Operational updates during the quarter

Ongoing project updates

South Korean ag-tech market

The installation of two RZTO systems for Roots' first commercial order in South Korea commenced during the quarter. Valued at US\$16,000, the order followed the August 2018 distribution agreement with Ezfarm. The project was built in collaboration with Teshuva Agricultural Projects, a leading hydroponic greenhouse builder and technology integrator. Roots' RZTO system is being used with "TapKit", a Nutrient Film Technique (NFT), to stabilise the nutrient temperature of crops.

Israel basil market

During the quarter, Roots sold and delivered a half acre RZTO system for use on basil crops in Israel to a customer who was eligible for an up to 30% subsidy provided by the Israeli Ministry of Agriculture. A custom-made pipe embedded machine was used during the installation, which expedited the process, providing more economic benefits to the customer.

The installation followed a successful pilot with the farmer during the Israeli winter where the roots of basil plants (traditionally grown in summer) were heated an average of five-degrees warmer than the control group.

Israel medical cannabis market

During the reporting period, Roots secured its first sale of its RZTO technology in the ag-tech sector serving the lucrative medical cannabis market. The sale in central Israel, a fully legal medical cannabis jurisdiction, followed promising interim proof of concept cooling results on medicinal cannabis planted in greenhouses in July. Roots is in the process of installing its RZTO heating technology in four areas within the greenhouse, including plant quarantine, mother plant, clones, rooting greenhouse and growing-tables.

New projects

Successful RZTO cooling pilot on chives

A successful greenhouse pilot using Roots' RZTO cooling technology on chives increased plant fresh weight by 257 percent, to 268 grams. The cooled chives plants continued to grow for 55 days, while the control crop virtually stopped growing after four weeks. The pilot was conducted during the Israeli summer from August through to October at Roots' research site in central Israel. Using the hybrid ground source heat exchange version of Roots' RZTO system, chives crop roots were cooled to remain relatively stable around 25 degrees centigrade, despite air temperatures in the greenhouse frequently topping 36 degrees. In comparison, roots of control planting fluctuated between 27 and 31 degrees.

Promising interim cannabis RZTO heating open field results

During the quarter, Roots released interim results for the world's first RZTO heating pilot on cannabis in an open-field. The results showed a 40 to 272 percent increase in average cannabis plant wet weight. Roots' technology was used on several cannabis strains in various RZTO heating treatment architectures (total of 216 plants) and corresponding control groups (total of 81 un-heated plants) in an open field during late fall in Washington State. Cannabis roots were heated to stabilise root temperatures at optimal degrees, despite air temperatures dropping below zero degrees centigrade.

with heavy frost conditions. Based on the local Washington State price per gram (US\$0.30), the interim yield increases equated to an additional income of US\$60,000 to US\$405,000 per acre.

Australian patent granted for RZTO smart pipe system

In November, the Australian Patent Office granted Roots a patent for a key part of its RZTO technology. Titled *Heat delivery system and method* the patent relates to a multi-purpose 'smart pipe' system which diffuses heat or cold directly at a plant's root zone level, rather than between plants, where pipe system segments are insulated. The patent helps to solidify Roots' innovation and IP leadership and provides additional barriers to potential competitors. It encompasses 29 approved features and runs until April 2035.

Successful entry into new segment with first floriculture in a commercial installation

Roots entered the floriculture sector during the December quarter, when successful RZTO cooling results on Alstroemeria (Peruvian Lily) in Israel was reported. The farmer used Roots' technology to cool the crop during the Israeli summer between September and October in a quarter of an acre greenhouse. Results showed growth and cultivation of flowers with cooled roots started eight weeks earlier than control plants with non-cooled roots. The extended growing season allowed the farmer to obtain a premium price of more than double the standard rate for out of season flowers, as it was the first time a commercial grower was able to harvest flowers during the summer season. The early blooming accounted for a 20 percent increase in production, equivalent to 150,000 flowers per hectare. In Israel, the ability to harvest flowers year-round will double the farmer's yield and deliver a return on investment within a year.

Sales Orders

During the quarter, Roots secured sales orders across multiple crops and geographies. The Company generated a first sale order of US\$16,000 in South Korea for two RZTO systems, a sale order of a RZTO system to a basil farmer in Israel of US\$15,000 (also granted by the Israeli Government Agricultural Ministry), and an initial RZTO sale order to a medical cannabis farmer in Israel of US\$34,000.

Outlook

Following Roots' success with initial sales in key markets, the Company expects to secure further RZTO sales across multiple crop varieties and territories in the near future – such as the recent A\$278,000 Dagan sale in China. Some of these sales are expected to be facilitated by distribution partners, including Ezfarm in South Korea, and Dagan in China. RZTO pilot results, including those on cannabis crops, continue to attract strong interest from key market participants, as the business looks to secure additional customers in new segments.

The Israeli government has approved Medical Cannabis exports and Roots is expecting to significantly expand sales to the entire Medical Cannabis segment.

In line with the Company's growth strategy, Roots will continue to perform RZTO proof of concept and pilot demonstrations with new and potential customers across multiple crops and geographies. As existing pilots are successfully completed, Roots expects to convert these into sales.



The Company continues to move ahead with the commercialisation of its Irrigation by Condensation (IBC) technology and anticipates launching a solar operated and electric version of the system during 2019

-ENDS-

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

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+Rule 4.7B

Appendix 4C

Quarterly report for entities subject to Listing Rule 4.7B

Introduced 31/03/00 Amended 30/09/01, 24/10/05, 17/12/10, 01/09/16

Name of entity

Roots Sustainable Agricultural Technologies Ltd

ARBN

619 754 540

Quarter ended ("current quarter")

31 December 2018

Consolidated statement of cash flows		Current quarter US\$'000	Year to date (12 months) US\$'000
1.	Cash flows from operating activities		
1.1	Receipts from customers	37	209
1.2	Payments for		
	(a) research and development	(61)	(663)
	(b) product manufacturing and operating costs	(111)	(324)
	(c) advertising and marketing	(136)	(649)
	(d) leased assets	-	-
	(e) staff costs	(166)	(679)
	(f) administration and corporate costs	(57)	(395)
1.3	Dividends received (see note 3)	-	-
1.4	Interest received	-	-
1.5	Interest and other costs of finance paid	-	-
1.6	Income taxes paid	-	-
1.7	Government grants and tax incentives	-	-
1.8	Other (institutes, IPO costs)	(69)	(229)
1.9	Net cash from / (used in) operating activities	(563)	(2,730)
2.	Cash flows from investing activities		
2.1	Payments to acquire:		
	(a) property, plant and equipment	(14)	(49)
	(b) businesses (see item 10)	-	-

Consolidated statement of cash flows		Current quarter US\$'000	Year to date (12 months) US\$'000
	(c) investments	-	-
	(d) intellectual property	-	-
	(e) other non-current assets	-	-
2.2	Proceeds from disposal of:		
	(a) property, plant and equipment	-	-
	(b) businesses (see item 10)	-	-
	(c) investments	-	-
	(d) intellectual property	-	-
	(e) other non-current assets	-	-
2.3	Cash flows from loans to other entities	-	-
2.4	Dividends received (see note 3)	-	-
2.5	Other	1	(14)
2.6	Net cash from / (used in) investing activities	(13)	(63)

3.	Cash flows from financing activities		
3.1	Proceeds from issue of shares	-	-
3.2	Proceeds from issue of convertible notes	-	-
3.3	Proceeds from exercise of share options	-	-
3.4	Transaction costs related to issues of shares, convertible notes or options	-	-
3.5	Proceeds from borrowings	-	-
3.6	Repayment of borrowings	-	-
3.7	Transaction costs related to loans and borrowings	-	-
3.8	Dividends paid	-	-
3.9	Other (IAA related)	(6)	(6)
3.10	Net cash from / (used in) financing activities	(6)	(6)

4.	Net increase / (decrease) in cash and cash equivalents for the period		
4.1	Cash and cash equivalents at beginning of quarter/year to date	1,098	3,544
4.2	Net cash from / (used in) operating activities (item 1.9 above)	(563)	(2,730)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(13)	(63)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	(6)	(6)

+ See chapter 19 for defined terms

Consolidated statement of cash flows		Current quarter US\$'000	Year to date (12 months) US\$'000
4.5	Effect of movement in exchange rates on cash held	77	(152)
4.6	Cash and cash equivalents at end of quarter	593	593

5.	Reconciliation of cash and cash equivalents at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	Current quarter US\$'000	Previous quarter US\$'000
5.1	Bank balances	593	1,098
5.2	Call deposits	-	-
5.3	Bank overdrafts	-	-
5.4	Other (provide details)	-	-
5.5	Cash and cash equivalents at end of quarter (should equal item 4.6 above)	593	1,098

6. Payments to directors of the entity and their associates

- 6.1 Aggregate amount of payments to these parties included in item 1.2
- 6.2 Aggregate amount of cash flow from loans to these parties included in item 2.3
- 6.3 Include below any explanation necessary to understand the transactions included in items 6.1 and 6.2

Current quarter US\$'000
72
-

Salaries and wages paid to Directors and/or Director related entities
Corporate advisory fees paid to a Director related entity

US\$50K
US\$22K

7. Payments to related entities of the entity and their associates

- 7.1 Aggregate amount of payments to these parties included in item 1.2
- 7.2 Aggregate amount of cash flow from loans to these parties included in item 2.3
- 7.3 Include below any explanation necessary to understand the transactions included in items 7.1 and 7.2

Current quarter US\$'000
41
-

Payments for research and development to a related entity.

8. Financing facilities available <i>Add notes as necessary for an understanding of the position</i>	Total facility amount at quarter end US\$'000	Amount drawn at quarter end US\$'000
8.1 Loan facilities	-	-
8.2 Credit standby arrangements	-	-
8.3 Other (please specify)	-	-
8.4 Include below a description of each facility above, including the lender, interest rate and whether it is secured or unsecured. If any additional facilities have been entered into or are proposed to be entered into after quarter end, include details of those facilities as well.		
N/A		

9. Estimated cash outflows for next quarter	US\$'000
9.1 Research and development	(130)
9.2 Product manufacturing and operating costs	(151)
9.3 Advertising and marketing	(176)
9.4 Leased assets	-
9.5 Staff costs	(195)
9.6 Administration and corporate costs	(156)
9.7 Other (provide details if material)	-
9.8 Total estimated cash outflows	(808)

10. Acquisitions and disposals of business entities (items 2.1(b) and 2.2(b) above)	Acquisitions	Disposals
10.1 Name of entity	N/A	N/A
10.2 Place of incorporation or registration		
10.3 Consideration for acquisition or disposal		
10.4 Total net assets		
10.5 Nature of business		

Compliance statement

- 1 This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.
- 2 This statement gives a true and fair view of the matters disclosed.



Sign here:
(Company secretary)

Date: 31 January 2019

Print name: Sarah Smith

Notes

1. The quarterly report provides a basis for informing the market how the entity's activities have been financed for the past quarter and the effect on its cash position. An entity that wishes to disclose additional information is encouraged to do so, in a note or notes included in or attached to this report.
2. If this quarterly report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, *AASB 107: Statement of Cash Flows* apply to this report. If this quarterly report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standard applies to this report.
3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.