



31 October 2019

Roots develop new product, secure commercial sale and enter plant-based meat market

September 2019 Quarterly Report and Appendix 4C

Highlights

- **Developed new heat exchange stub targeting the nursery, cannabis and greenhouse markets.**
- **Secured A\$87,000 sale of RZTO system and heat exchange stub to Israeli medical cannabis producer.**
- **Sale of RZTO system to US cannabis grower shown to increase flower yield by 40 percent.**
- **RZTO pilot on basil crop successfully increases total plant yield by 30 percent.**
- **Trial protein planting program underway, examining impact of RZTO in increasing protein content to enter into plant-based meat market.**

Roots Sustainable Agricultural Technologies (ASX: ROO, the “Company” or “Roots”) is pleased to provide its quarterly update for the three months ending 30 September 2019.

Commenting on the company’s progress over Q3 2019, CEO Sharon Devir said, “Roots is continuing to deliver impressive technical results, demonstrating the significant benefits of our root zone heating and cooling technology in mitigating external weather conditions on numerous crops and growing conditions.

“We have strengthened our product offering this quarter, launching a heat exchange stub for the nursery and greenhouse markets which reduces RZTO installation costs in pots and grow bags. This new product has already assisted in securing a sizeable sale within the cannabis market and we believe our t-shaped stub opens up substantial opportunities with growers of high-value crops.”

“Strategically we remain focused on addressing global growth trends, such as the legal cannabis and plant-based meat markets. Roots’ technology supports the growing trend for meat alternatives, estimated to reach US\$27.9Bn by 2025, by increasing crop yield and maximising profit margins for producers.”

Financials

The company’s cash balance as at 30 September 2019 was US\$298,000 (A\$435,00).

Roots expects the cash burn rate will remain in line with expectations as it continues to invest in commercialising installations in several territories and sectors, and scale-up sales and marketing activity within the North American cannabis market. The attached Appendix 4C contains the company’s cash flow statement for the quarter.

After this quarterly reporting period, Roots announced on October 23 a placement of A\$820,000. Funds raised will be used to commercialise RZTO in various jurisdictions, increase marketing and sales activity as well as pursue cannabis and hemp opportunities in North America.

Operational updates during the quarter

Roots develop heat exchange stub, secures sale

During the reporting period, Roots developed a patent-protected heat exchange stub to control pot, grow bag and soil temperatures in the lucrative nursery, cannabis and greenhouse markets. The stub is designed to be inserted into the tops of pots and grow bags, significantly reducing installation costs associated with Roots' RZTO technology and increase temperature control efficiency.

The stub enables the mobility of pots and grow bags during the growing cycle while chains of stubs with insulated pipes in-between can be used for row installations. During a pilot at Roots' research hub in Israel, the stub effectively maintained soil temperatures in pots at optimal ranges despite air temperatures exceeding 40°C.

After the end of the reporting period, the stub was part of an A\$87,000 RZTO sale to Israeli medicinal cannabis producer UNIVO. Roots expects it will serve as an additional source of post-sale revenue for Roots.

Expansion into plant-based meat market

In August, Roots initiated a trial planting program examining the effects of its RZTO technologies on several protein-laden crops with the aim of increasing the content of protein used in meat-replacement products. The global demand for plant-based meat replacements is estimated to reach US\$27.9Bn by 2025¹.

Bean and pea crops were planted at Roots' research and development hub in central Israel, where the protein content of these crops is being measured in a two-part program.

Initially the impact of root zone cooling will be measured, then in the autumn and winter, a second round of crops will be tested using root zone heating. Roots are seeking to replicate results produced on beans, where RZTO was effective in increasing yield by 40 percent.

Results from each plot will be compared with a control plot planted under the same ambient conditions with findings expected to be established in December.

Successful results with RZTO technology on cannabis

During the quarter, Roots' RZTO heating technology successfully increased the harvest yield of cannabis flowers by 40 percent at two separate growing facilities in California. Following the initial sale in April 2019, the installation was completed during early spring with growing taking place throughout summer amid severe temperature fluctuations. In addition to increased yield, the projected number of harvests per year is predicted to double through a 30 percent reduction in annual growth cycles.

¹ <https://www.marketsandmarkets.com/ResearchInsight/plant-based-meat-market.asp>



These results are consistent with those achieved by other North American and Israeli cannabis growers and further validate the value of RZTO value in improving resilience to adverse weather conditions.

Roots will present its first installed cannabis system results and the new "Stub" at the Emerald Cup, one of the cannabis industry's key event North America events, which will take place in Emerald county in northern California in December.

Basil pilot successful under extreme heat

Roots used its RZTO cooling technology to successfully increase the yield of basil plants by 30 percent under extreme heat in the Arava desert in Israel, with ambient air temperatures at times reaching above 40°C.

While basil is traditionally grown and harvested in warmer months, the plant is highly susceptible to extreme weather conditions, leading to high mortality rates for producers and unprofitable farming practices. By cooling the crop roots to optimal temperatures, Roots reduce plant mortality by more than 60 percent, resulting in a 30 percent increase in yield compared to uncooled control crops.

Similar results were achieved near the Mediterranean Coast where Roots' RZTO technology was used to heat the roots of basil to increase yields by 66 percent and increase plant size by 35 percent.

Grape harvest irrigated solely by IBC

Roots has successfully conducted the world's first table grape harvest, irrigated with its patented Irrigation by Condensation (IBC) solar and/or electric system which irrigates crops only by the condensation of humidity in the air on the external surface of pipes with cold running water at night.

The vines, planted in May 2018 and harvested in July 2019 at the Roots research and development hub in central Israel, were sustained throughout the year.

IBC technology has now sustained nine crops including grapevines, avocado trees, beans and alfalfa, with new crops recently being planted including wheat, sorghum and chives.

Roots presents its unique IBC technology at Agrinvest

Following the successful grape harvest mentioned above, Roots presented its world-first IBC technology at the prestigious Agrinvest event in Israel on 26 September. Agrinvest is one of the biggest events in Israel for agtech, bringing together hundreds of investors and global agriculture experts with companies from more than 20 countries.

Roots' IBC technology was among 12 selected companies from over 50 applicants to present in the 'Best Agtech company' category to an independent committee of Israeli business and industry leaders, international investors and government representatives.



Roots' IBC system was specifically designed to enable small and medium scale farmers to grow entire food crops using irrigation sourced only from humidity in the air, even in remote semi-arid areas

Outlook

Roots is continuing to focus on commercialisation of its RZTO and IBC technologies in its key markets of China, North America, Israel, Spain, Italy and Korea.

As the only two-in-one commercial root zone heating and cooling technology, Roots has a unique offering within the high-value cannabis and meat replacement markets. Negotiations with multiple growers and producers are underway and Roots is confident of converting successful RZTO pilots into sales, particularly within the North American cannabis sector. The establishment of a US-based team will further assist in increasing sales activity in this important market.

Roots' entry into the growing plant-based meat market offers significant opportunities for Roots to commence discussions with sizeable growers in this space.

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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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

ABN

619 754 540

Quarter ended ("current quarter")

30 September 2019

Consolidated statement of cash flows	Current quarter US\$'000	Year to date (9 months) US\$'000
1. Cash flows from operating activities		
1.1 Receipts from customers	16	89
1.2 Payments for		
(a) research and development	(45)	(139)
(b) product manufacturing and operating costs	(9)	(70)
(c) advertising and marketing	(123)	(531)
(d) leased assets	-	-
(e) staff costs	(182)	(548)
(f) administration and corporate costs	(109)	(368)
1.3 Dividends received (see note 3)	-	-
1.4 Interest received	-	-
1.5 Interest and other costs of finance paid	(1)	(2)
1.6 Income taxes paid	-	-
1.7 Government grants and tax incentives	-	-
1.8 Other (institutes)	28	11
1.9 Net cash from / (used in) operating activities	(425)	(1,558)

2. Cash flows from investing activities

2.1 Payments to acquire:

(a) property, plant and equipment	(3)	(9)
(b) businesses (see item 10)	-	-
(c) investments	-	-

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Consolidated statement of cash flows	Current quarter US\$'000	Year to date (9 months) US\$'000
(d) intellectual property	-	-
(e) other non-current assets	-	-
2.2 Proceeds from disposal of:		
(a) property, plant and equipment	12	12
(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)	(2)
2.6 Net cash from / (used in) investing activities	8	1

3. Cash flows from financing activities		
3.1 Proceeds from issues of shares	-	731
3.2 Proceeds from issue of convertible notes loan converted to CDIs	-	573
3.3 Proceeds from exercise of share options	161	161
3.4 Transaction costs related to issues of shares, convertible notes or options	-	-
3.5 Proceeds from borrowings	-	-
3.6 Repayment of borrowings (convertible loan converted to CDIs)	-	(88)
3.7 Transaction costs related to loans and borrowings	-	(157)
3.8 Dividends paid	-	-
3.9 Other (IIA related)	11	8
3.10 Net cash from / (used in) financing activities	172	1,228

Note: Subsequent to the Quarter, on 25 October 2019, the Company completed a Placement to Sophisticated and Professional investors, raising a total of A\$817,000 before costs at a Placement price of A\$0.043 per share.

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	538	593
4.2 Net cash from / (used in) operating activities (item 1.9 above)	(425)	(1,558)

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Consolidated statement of cash flows		Current quarter US\$'000	Year to date (9 months) US\$'000
4.3	Net cash from / (used in) investing activities (item 2.6 above)	8	1
4.4	Net cash from / (used in) financing activities (item 3.10 above)	172	1,228
4.5	Effect of movement in exchange rates on cash held	5	34
4.6	Cash and cash equivalents at end of quarter	298	298

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	298	538
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)	298	538

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**

(76)

-

Salaries and wages paid to Directors and/or Director related entities

Corporate advisory fees paid to a Director related entity

US\$55K

US\$21K

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**

(2)

-

Payments for research and development to a related entity.

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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	573	573
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.		

On February 2019, the Company has received a financing commitment by way of execution of a convertible securities agreement with CST Capital (hereafter: the Investor), in which the Company borrowed a total amount of up to AUD 1.62 million (\$1,212 thousand) via the issue of convertible notes (hereafter: the Notes). The Notes will be issued in two tranches with a face value of AU\$1.00 per Note (Face Value), with 1,650,000 collateral CDIs over fully paid ordinary shares (CDIs) to be issued to the Investor prior to the first purchase of 900,000 Notes. The first tranche is for an amount of AU\$0.81 million. A subsequent tranche of up to AU\$0.81 million will be issued at a later date subject to mutual consent between Roots and the Investor. The Notes will be interest-free and convertible.

The Notes can initially be converted at 130% of the 5-day VWAP prior to issuance of the applicable tranche. From 65 days following the date of issue, the Notes can be converted at the lower of 130% of the 5-day VWAP prior to issuance of the applicable tranche and 90% of the lowest daily VWAP during the 15 trading days preceding the conversion date. Other than with the prior written consent of the Company, in any calendar month, upon issuance of a tranche, the Investor will receive options equal to the face value, multiplied by 0.2, divided by the closing VWAP prior to issuance. The options will be exercisable for 18 months and have an exercise price equal to 160% of the 5-day VWAP prior to issuance of the options.

On 19 February 2019, the Company issued 1,935,484 Unlisted Options (exercisable at \$0.14 on or before 19 August 2020) being the Options relating to the first tranche of Notes.

9. Estimated cash outflows for next quarter	US\$'000
9.1 Research and development	87
9.2 Product manufacturing and operating costs	-
9.3 Advertising and marketing	124
9.4 Leased assets	-
9.5 Staff costs	175
9.6 Administration and corporate costs	99
9.7 Other (provide details if material)	-
9.8 Total estimated cash outflows	485

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10. Acquisitions and disposals of business entities (items 2.1(b) and 2.2(b) above)	Acquisitions	Disposals
10.1 Name of entity		
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 October 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.

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