

Final Report

Scouting responses to labour challenges in Australian horticulture

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Startupbootcamp

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AS23004

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Scouting responses to labour challenges in Australian horticulture (AS23004)

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Public summary

Hort Innovation is currently undergoing a refresh of the Hort Frontiers Program. Part of this refresh will be to explore new ways for Hort Innovation to engage with new technology development from early-stage companies (such as startups and scaleups) for the benefit of the Australian Horticulture Industry.

This work was undertaken to pilot test an accelerator (Startupbootcamp FoodTech Tasmania) that can search for and identify innovative technologies and startups focusing on labour production shortages that will attract global talent to Australian horticulture R&D and offer opportunities for partnerships or collaborations. In addition to the search for innovative solutions and new technologies to the labour challenges, two Hort Innovation staff were trained on lean startup methodologies including specially designed training modules to help to de-risk adoption of startup technologies and innovative solutions on-farm and in horticulture production businesses.

Startupbootcamp FoodTech Tasmania is a three-year partnership (2022 – 2024) between Startupbootcamp and the Tasmanian Government. Additional partners involved in the program in 2023 include Meat & Livestock Australia, Norske Skog (Boyer), Aldi Supermarkets Australia, Ducane Brewery and the Department of Agriculture, Fisheries and Forestry.

Startupbootcamp's scouting approach is unique in Australia in that it searches for and conducts outreach to early-stage companies from all over the world. The scouting approach is informed by industry partner innovation and technology requirements (such as the horticulture sector labour challenge) to ensure companies recruited have technologies or solutions that can deliver value to the Australian market. Startupbootcamp employs a combination of artificial intelligence and machine learning scouting tools, as well as staff with deep domain knowledge to deliver highly relevant companies to its corporate and government partners.

International startups and scaleups are recruited to the FoodTech Tasmanian accelerator program to help them achieve certain outcomes such as:

- accelerate validation of their business models,
- partner with industry (such as horticulture producers) to conduct pilot studies to de-risk commercialisation,
- improve their ability to gain investment,
- scale their product or service into a new market or sector,

From a long list containing thousands of companies, startups and scaleups progress through a series of interviews and due diligence stages to reduce them to a shortlist of less than 100. Two companies were selected on to the 2023 FoodTech Tasmania program with technologies relevant to the labour scouting challenge:

- Nanobubble AgriTech, a New Zealand scaleup with water technology relevant to orchards and pasture/turf,
- TriBus, a startup from the USA with technology designed to decrease input expenses such as water and fertilizer.

An additional shortlist of forty companies were identified from this labour scouting project, ten completed due diligence data and recommended pathways to progress have been provided. The data includes case studies or testimonials of projected labour savings of at least 15% (e.g. through reduced farm scouting or harvesting labour), and/or significant efficiency savings (such as less water, lower fertilizer, or pesticide costs) through on-farm adoption of their technologies and services.

Information on the horticulture-specific shortlist is available by contacting Hort Innovation R&D Manager for Emerging Technologies Tom McCue.

Keywords

Labour saving technology; startup engagement; pilot studies; input cost reduction; new technologies; technology scaleup; open innovation.

Introduction

Background

The purpose of the Advanced Production Systems Fund is to invest in strategic research & development programs for an "Increase productivity & profitability of Australian horticulture through cropping system intensification and innovation programs targeting the whole of horticulture". The fund's vision is "Using innovative practices and technologies, prepare Australian horticulture growers to adopt the "Future Smart Farms" that are more efficient and highly productive.

The three investment themes in the fund are as follows:

- 1. Tools and advanced technologies
- 2. System Design: Practice and Management
- 3. Innovation and Disruption

This project is a pilot to engage with experienced, industry-focussed global startup accelerator Startupbootcamp (SBC) and engage via the FoodTech Tasmania program. The scope of work is to pilot SBC's global innovation scouting methodology for searching for and identifying innovative technologies and services from startups and scaleups focussing on labour production shortages, under the Advanced Production Systems fund. Based on the last six years of SBC's accelerator programs operating in Australia, it is also anticipated that this approach will help to attract global talent to Australian horticulture R&D.

Traditional procurement methodologies such as an open tendering (RFP/RFQ) process may not attract a wide range of applicants, especially from the startup ecosystem, or from outside of Australia. Startups, by their very nature operate in a lean and agile way, whereas the procurement processes of Australian Research and Development Corporations are often lengthy, rigid and require significant levels of risk mitigation which is likely to be unappealing to startups to engage with. At Hort Innovation, all procurements follow a similar RFP/RFQ process however this is also under review with challenge-based investments proposed.

Outcomes

Scouting was expected to identify at least two early-stage and scaleup companies with the potential to provide labour savings and efficiency technology and product solutions to trial within the Australian Horticulture sector of at least 5%. The actual outcomes highlight that there is far greater potential available – over 40 companies were identified and provided due diligence data, at least 10 of which have potential to deliver much greater labour savings (more than 15%) and deliver decreased input costs and increased yields with higher quality for certain crops.

Significance for Industry

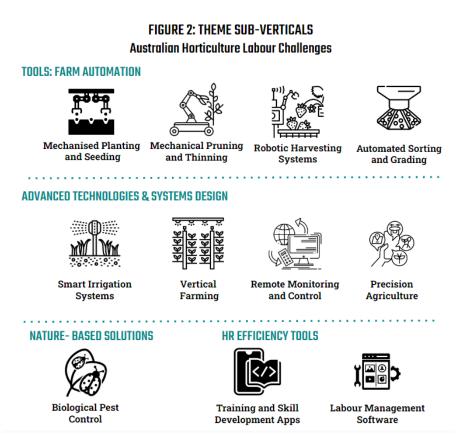
Identification of early-stage startup and scaleup companies through leveraging SBC's scouting methodology to identify companies with promising technologies has the potential to initiate many new opportunities for industry to trial technologies not yet found in Australia. By scouting on a theme or challenge-based approach, SBC can uncover dozens of relevant companies, quickly triage these through a due diligence process so that Hort Innovation industry stakeholders can engage with only the shortlisted companies and avoid wasting precious time and effort on companies that may not be ready to engage (due to technology or commercial immaturity).

Methodology

SBC scouts, inspires & connects with new businesses, leveraging our huge innovation ecosystem of startups and scaleups. The initial phase of any SBC accelerator program or scouting service is the Global Scouting Process, as shown in Figure 1.



SBC utilizes a combination of machine learning and artificial intelligence tools to search multiple data sources for technologies and solutions from early-stage startups through to scaleup companies globally. SBC's proprietary machine learning tools are trained on data sets from previous scouting projects and informed by the Horticulture Industry Labour Challenges stakeholder interviews and the 11 sub-verticals provided in the RfP and as shown in Figure 2.



The first scouting stage is to look beyond the current industry vertical (in this case horticulture) and broaden the search to include adjacent industry overlaps (e.g. wine, grains, landscaping, food processing, mining, and energy). By broadening the search beyond horticulture, we increase the chances of finding disruptive technologies that can challenge the current status quo and unlock significant innovation opportunities.

A typical scouting for an accelerator program (such as FoodTech Tasmania scouting for 2023) results in a long list of between 15,000 and 20,000 companies. With a narrower theme and fewer sub-verticals, scouting typically results in between 1,000 and 2,000 companies.

The SBC scouting team utilizes additional machine learning models to triage and shortlist to a greatly reduced number of companies, depending on the client requirements. In this project, the tools utilized several screening filters such as:

- Company size < 50 employees
- Investment stage of Series A or earlier
- Founding date, no earlier than 2010.

Companies that fall inside these parameters are most likely to be classified as startups or scaleups and be at a suitable stage for this program.

Outreach and Due Diligence

Following triaging, SBC proactively outreaches to companies inviting them to an initial interview. For this project an A/B test was performed: half of the companies included a link to the Hort Innovation press release to assess whether providing client identification increased or decreased outreach success. Typically, when SBC sends out scouting outreach the client requests that their company details are kept private until after due diligence.

The due diligence process before the interview, and data is confirmed via the interview process. Following the interview, if the company's technology or services were deemed to be a relevant fit for the themes, a secondary due diligence process is initiated.

Due diligence for this project was collected over two stages and included:

- Company name registration number and jurisdiction
- Sales or investment pitch deck
- Team information (number of employees, capability, location)
- Technology and commercial (including manufacturing) readiness
- Previous investment success and whether the company is currently raising capital
- Case studies, pilot trial summaries and / or client testimonials to provide evidence of the company's ability to deliver labour and/ or efficiency savings relevant for the Australian horticulture sector.
- Selection of preferred next steps.

Summaries of the companies selected for outreach were presented to the Hort Innovation project team and a subset to an external industry stakeholder panel for confirmation of their suitability. Feedback from the external industry stakeholder panel and the project steering group suggested several additional parameters for due diligence and defined the types of labour or efficiency savings in terms of "costs of inputs" such as labour (e.g. on-farm scouting, sampling etc.), fertilizer, water costs, pest control and "costs of outputs" such as labour (e.g. harvesting, grading and sorting etc.) and productivity and quality parameters such as increase yield or improved quality.

Interviews

Interviews with founders or senior leaders from early-stage companies are a very important part of the SBC scouting process. SBC senior program and scouting staff are trained in personality trait-based psychometric methods, and several have human resources or psychology backgrounds. The interview process is designed to quickly establish human-centered capabilities such as coachability, collaboration potential and communication skills. Coachability, collaboration and communication capabilities of founders can make the difference between a successful or unsuccessful partnership with a corporate partner, or participation in an accelerator program.

Startups entering all global Startupbootcamp accelerator programs are required to complete a personality profile as part of the due diligence process. Personality profiling was not provided to startups found from the labour scouting but was included for the 10 companies selected for the Food Tech Tasmania 2023 program (including Nanobubble AgriTech and TriBus).

Pathways for Companies to Engage with Hort Innovation

Companies were also asked to select which pathways they would like to take to progress further with Hort Innovation. The options provided were:

- Present at an upcoming AgTech Showcase.
- Participate in an ongoing Hort Innovation funded project as a technology solution provider.
- Respond to potential investment opportunities such as Tenders, Request for proposals (RfPs).
- Enter the funnel for potential future investment.
- Accelerator scale up to fast track Australian / overseas market entry.
- Accelerator startup for earlier stage companies.
- opt out.

Companies were able to select more than one option.

Capability Development and Intrapreneur-in-Residence Program

Two Hort Innovation staff participated in the 2023 program as Intrapreneurs-in Residence (IIR). IIRs are given access to SBC's digital accelerator content, invited to all masterclasses and pitch events, and encouraged to mentor startups on the program.

Timing

Scouting for an accelerator program is normally conducted over a 3-month period. For the FoodTech Tasmania 2023 program, this was conducted between April and June 2023, prior to this project being contracted.

For this project four weeks of scouting and four weeks of interviews were originally planned. Including reporting, a 7-week project was expected as shown in Figure 3.

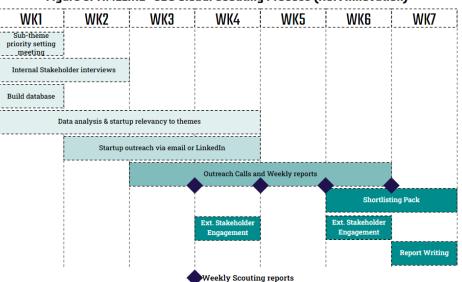
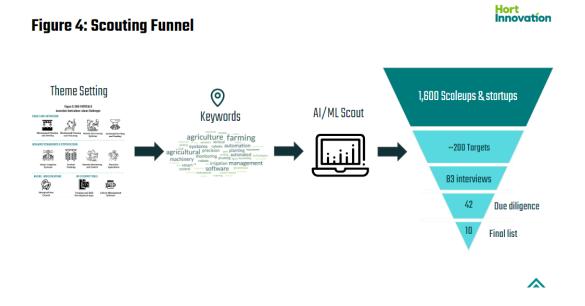


Figure 3: TIMELINE- SBC Global Scouting Process (Hort Innovation)

Results and discussion

The scouting resulted in over 1,600 companies being identified as potential candidates to meet Hort Innovation's 11 subverticals for labour saving. Figure 4 visualises the scouting funnel completed for this project.



SBC sent 220 outreach requests, As discussed in the Methodology section, an A/B test was conducted with the outreach where approximately 50% (114) received an outreach email that did NOT mention that the client was Hort Innovation, and the other ~50% (106) received an email that included the link to the press release issued by Hort Innovation on the 11th of December 2023 (https://www.horticulture.com.au/hort-innovation/news-events/media-releases/2022/worldwide-search-for-labour-saving-tech-underway/).

The results of the A/B test for the outreach via email and LinkedIn are summarised in Table 1.

Step	Description	Executed Steps	Meetings	Opens	Clicks	Replies
1	Outreach – no client mentioned	114	12.3%	59.7%	27.2%	18.4%
	Outreach – client mentioned	106	17.0%	50.9%	29.2%	17.9%
2	Follow up – no client mentioned	68	4.4%	44.1%	8.8%	10.3%
	Follow up – client mentioned	67	4.5%	41.8%	10.5%	7.5%
3	Final follow up	118	1.7%	39.8%	2.5%	4.2%

Table 1: Results from A/B test outreach via email and LinkedIn

Outreach requests followed by two subsequent reminders resulted in 83 companies being interviewed. The contents of the interviews are not for public release as many contain commercially sensitive information but have been provided to Hort Innovation. Following interviews and a project steering committee meeting with Hort Innovation, a summary of the top 60 companies was produced and shared with the project steering team.

At this stage it was agreed that a second stage of due diligence was required as each company shortlisted had provided a wide variety of evidence to support their labour savings claims. SBC requested all 60 companies complete further due diligence, including provision of evidence such as case studies or testimonials that back up their labour saving, efficiency, or productivity claims.

A total of 44 companies responded to this request, with 2 declining to progress further due to a lack of interest in the Australian market. The data received was summarised in a confidential report provided to Hort Innovation. This data is not for public release as it contains significant amounts of commercially sensitive data.

Quality of the Due Diligence data

Even after the second due diligence request there was a wide variety and quality of due diligence data provided by the respondents. Later-stage companies with traction in-market were better able to provide higher quality validated data as their commercial traction was being leveraged to help them scale.

All due diligence data has been summarised in one-page summaries and provided (along with pitch decks and case studies) to Hort Innovation. The non-confidential summary of companies shortlisted by sub-vertical is contained in Table 2. Note: three additional sub-vertical areas were also identified that offered labour, efficiency, and productivity opportunities: Pollination, Product quality Assurance and Soil Analysis.

Table 2: Summary of	f Projected Labour ,	/ Input savings /	Productivity increase achievable by Sub-vertical.

Sub-vertical Theme	No. of Companies shortlisted	Company stage (startup/scaleup)	Projected labour & input savings, or productivity increase.
Mechanised Planting & Seeding	1	Startup	Too early stage
Mechanical Pruning & Thinning	2	Startup (2)	Too early stage
Robotic Harvesting Systems	3	Startup (2), Scaleup (1)	Labour decrease 58- 80%
Automated Sorting and Grading	1	Startup	90% quality labour reduction
Smart Irrigation Systems	2	Scaleup (2)	30% water savings
Vertical Farming	3	Startup (2), Scaleup (1)	90% water reduction
Remote Monitoring and Control	6	Startup (6)	Scouting labour decrease,
Precision Agriculture	13	Startup (6), Scaleup (7)	Water decreases 40% Yield 3 x increase
Biological Pest Control	3	Startup (2), Scaleup (1)	Yield increase by 25- 40%
Training and Skill	2	Startup (1), Scaleup	Training time reduced
Development Apps Labour Management Tools	1	(1) Startup	by 90% 15% labour cost reduction
Pollination	2	Startup (1), Scaleup (1)	\$26k/hectare benefit
Product Quality Assurance	1	Startup	50% quality improvement
Soil Analysis	1	Scaleup	75% labour cost reduction
TOTAL	42	26 Startups / 15 Scaleups	

Pathways

Shortlisted companies each selected several pathways for future engagement with Hort Innovation. Unsurprisingly most were interested to learn more about the future investment funding that is envisaged under the refreshed Hort Frontiers investment fund. The data provided via due diligence stages will provide a strong base of companies to enter the Hort Innovation investment funnel.

All companies were encouraged to register as Delivery Partners via the registration process available on the Hort Innovation website.

Feedback received from interviews with some Australian scaleups and UK-based scaleups is that the level of cash cofunding is a challenging amount of cash for a scaleup to provide. This contrasts with some InnovateUK project co-funding which provide 50% co-funding (e.g. Innovate UK <u>Advanced route to market demonstrator</u>).

The summary of the responses from the 42 companies is shown in Table 3.

Table 3: Responses to Pathway options from Shortlisted Companies

Pathway	# companies
Present at an upcoming AgTech Showcase.	24
Participate in an ongoing Hort Innovation funded project as a technology solution provider.	39
Respond to potential investment opportunities such as Tenders, Request for proposals (RfPs).	33
Enter the funnel for potential future investment.	34
Accelerator - scale up - to fast track Australian / overseas market entry	22
Accelerator - startup - for earlier stage companies.	10
Opt out	3

Startup companies that responded to the due diligence request were also encouraged to apply for the FoodTech Tasmania accelerator. At the time of writing, seven companies had applied.

Discussion

This project has successfully demonstrated that utilizing an international accelerator for their proactive scouting has uncovered many startups and scaleups previously unknown to Hort Innovation with clear pathways for next steps. From those that were known, many of the companies interviewed had either responded to RfPs (unsuccessfully) or had not identified a clear pathway for engagement. A few Australian companies were already engaging through a lead provider such as Agriculture Victoria.

The ten companies in the final shortlist have provided clear metrics of how they can help the Australian Horticulture Industry achieve labour savings of far greater than 5%, decrease input costs, and deliver greater quality and yield.

Outputs

Table 5. Output summary

Output	Description	Detail
Weekly Scouting Reports	Summary of companies by theme. Not for publication	Four weekly scouting reports were presented in steering group meetings. These reports contain short company snapshots such as: Company name and website; description of value proposition; company stage (investment received and type of funding); no. of employees, link to website and country.
		Digital copies of each report have been provided to Hort Innovation to a Hort Innovation SharePoint link.
		Sections of these reports can be made available to interested producers at Hort Innovation's discretion.
Company Due Diligence Report	Report containing due diligence data from companies	One summary report containing due diligence information such as Company registration number; Sales or Investment pitch deck; some financial information; customer testimonials or case studies; technology readiness; commercial readiness and manufacturing information (for hardware)
		Digital copies of the summary report and collected case studies and pitch decks have been provided to Hort Innovation to a Hort Innovation SharePoint link.

Outcomes

Table 6. Outcome summary

Outcome	Alignment to fund outcome, strategy and KPI	Description	Evidence
Awareness: this project has provided Hort Innovation with at least 10 companies that it could engage with now for pilot projects with metrics on projected labour or productivity benefits that the startup/scaleup technology can deliver	Advanced Production Fund	 Data is now available for target stakeholders to be shared in a variety of forums such as: AgTech showcase Company becomes a provider or delivery partner for an existing or new project 	Case studies and testimonials provided by companies scouted.

Monitoring and evaluation

Table 7. Key Evaluation Questions

Key Evaluation Question	Project performance	Continuous improvement opportunities
To what extent has the project	42 companies provided due diligence	Provide a template for a case study

identified companies that can help Australian horticulture achieve labour and efficiency savings?	data to varying quality. 10 companies were shortlisted from this list with validated ability to deliver labour savings of >15% and examples of efficiency savings such as 30% water savings.	detailing appropriate metrics so that companies have a clear view of what is being requested.
To what extent has the project highlighted companies of relevance to levy payers that have labour challenges?	The project set out to identify a minimum of two companies, however all ten shortlisted companies are of relevance to levy payers. e.g. Mycionics robot harvester for mushrooms reduces labour by 58- 80%	Scouting for companies can be streamlined through aligning to the annual scouting for FoodTech Tasmania accelerator, or through an ongoing process with 2-3 scouting challenges per year.
Is there grower/stakeholder support for a new extension project?	Potentially. By involving three industry expert stakeholders from AustChilli, Simplot and Costa Group there is opportunity for some of the companies to work on an extension project.	See recommendations section
Have regular project updates been provided through linkage with the industry steering committee?	Yes. Weekly project updates were provided during the scouting phase, and two external industry stakeholder group meetings were held.	SBC recommends a final report briefing session with the industry stakeholder group.
How did the Hort Innovation procurement, contracting and project management processes help or hinder the progress of an agile project such as this, especially given its short time frame?	The contracting process from initial proposal, and then from RfP to contract was lengthy and cumbersome. A lack of clarity of how much detail was required for the proposal (including the maximum number of pages) was not included in the RfP. As this is the first time SBC has been engaged in Hort Innovation's procurement process, there was a lot of additional reading to cover the requirements. Reading the documents to understand how to respond to the RfP took nearly as long as the proposal itself. The processes seem to be written for a very specific provider type such as an R&D delivery partner (University or Research organization) rather than an agile fast-moving company. Feedback received during interviews from startups and scaleups that had previously tried to engage with Hort Innovation was consistent with our experience. Companies stated that the length of	Hort Innovation should consider a more lean engagement process designed for early-stage companies. Update RfP for Frontiers projects to include a maximum page limit. Startupbootcamp has developed proprietary models for such engagement through running global startup accelerators such as the Shell Start Up Engine. An option that could be investigated is to utilize SBC's scouting methodology to identify companies and then partner these up with existing delivery partners (such as Universities or state-based research groups (such as Agriculture Victoria) for on-farm market validation projects.

	time for Hort Innovation to respond	
	following tender closure, lack of feedback (if unsuccessful), lengthy contracting process, extensive project management and reporting requirements and the requirement for 70% cash co-funding are all major barriers to wanting to engage directly.	
	In the startup ecosystem this can literally cause an early-stage company to avoid RDC's as cash flow is low, and their money and resources are better spent on validating their business model directly with growers.	
	A quote from one Australian scaleup "the people are all trying to do the right thing to keep the innovation fly wheel running, however the processes that are so slow that it ends up having the opposite effect".	
	Another Australian scaleup stated: "We actively avoid working directly with RDCs and have found a way to work through another provider such as Agriculture Victoria as they just pay us for our work, no need for laborious reporting or co-funding".	
	One international startup advised: "We had responded to a RfP several years ago and received little helpful feedback as to why our application was unsuccessful".	
What efforts did the project make to improve efficiency	Due to the time taken to contract this project, all co-funding that would have been available to pay Hort Innovation the co-funding payments had been paid out by the time the contract was signed. As a result, this contract was provided with an exemption from paying the co-payment fee upfront. This was helpful however SBC are still unsure as to whether this creates issues with GST treatment.	Consider alternative options (such Deliver Partners providing appropriate evidence that co-funding payments have been made via cash payments).

Recommendations

• Practical application of the project findings:

Hort Innovation should consider a leaner engagement process designed for early-stage companies. Startupbootcamp

has developed proprietary models for such engagement through running global startup accelerators such as the Shell Start Up Engine.

- Possibilities of future RD&E that directly flow from the work undertaken and its results:
- . Continue to utilize global scouting methodologies to identify suitable early-stage companies for new project areas: provide partnership opportunities to work with existing delivery partners such as Universities or state-based research groups (e.g. Agriculture Victoria) for on-farm market validatory R&D projects. Publication of finding the success or failure of new technologies is beneficial for both startups and researchers.
- Development and adoption activities that would ensure full value from the project's findings for industry:

To ensure future adoption activities, SBC recommends that at least one public stakeholder engagement session is held, inviting industry partners such as growers and researchers to engage and identify collaborative extension activities.

Refereed scientific publications

N/A

Intellectual property

No project IP or commercialisation to report.

Acknowledgements

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- Arjan Jongkees and Scott Morris from Simplot Australia
- David De Paoli from AustChilli
- Jesse Reader from Costa Group

And the 83 startups and scaleups for their cooperation in this project.

Appendices

All appendices are commercially sensitive information for the scouted startups. This information has been provided separately to Hort Innovation