

vegenotes





VG16083: PROTECTED CROPPING – REVIEW OF RESEARCH AND IDENTIFICATION OF R&D GAPS FOR LEVIED VEGETABLES

FACILITATORS

Project VG16083 was completed by Colo Consulting.

INTRODUCTION

Australia has a modest but growing protected cropping industry, with estimates of vegetable production varying between 498 hectares and 1,300 hectares. Cucumber, zucchini, capsicum, eggplant, lettuce, Asian greens and herbs are among the vegetables produced in this environment, with tomatoes by far the most dominant crop. Soilless growing media is also dominating the sector.

At its most basic, protected cropping is the use of glass or polythene to improve conditions for the crop grown inside the structure, but the higher end of the sector includes the use of sophisticated equipment to help growers reliably meet high-volume contracts and quality measures.

ABOUT THE PROJECT

Focusing on four broad areas including productivity, technology, plant protection and environment, the project *Protected cropping – Review of research and identification of R&D gaps for levied vegetables* (VG16083) investigated the issues specific to protected cropping, current R&D in the sector, and the relevance of international R&D to the Australian industry.

MAJOR FINDINGS

Reviewing about 100 pieces of research, a clear gap emerged in relation to the very high solar radiation loads experienced in Australia in summer – it is often double that of Northern Hemisphere countries, where most of the international research is conducted. Given this, research is required to properly understand the effect of solar radiation loads on protected cropping systems. This should apply to low-tech, medium-tech and high-tech protective structures to be relevant.

Studies also have the potential to examine six key areas including light levels and conditions, root zone management, biostimulants, pollination, real-time monitoring of plant conditions, and biological suppression of root pathogens.

“Light quality has a huge impact on crop development as it will control things like leaf development, flower initiation and fruit set,” Project Lead Dr Kelvin Montagu said.

“To deliver improved farm productivity and profitability, the six research gaps need to be integrated.”

At the top end, the most relevant R&D areas exist in atmospheric manipulation, robotics and automation, and energy. Much of this knowledge will be imported, but it is vital to create linkages with existing Australian R&D projects – such as addressing the high radiation loads through smart glass technologies or supplementary lighting – to develop technology relevant to local conditions.

This includes Western Australia’s Edith Cowan University and

its advanced glazing system for solar energy harvesting and radiation control, while Swinburne University in Melbourne is leading project VG15038 – *Investigating novel glass technologies and photovoltaics in protected cropping*. This project will trial smart glass that can adjust light intensity and spectrum in addition to semi-transparent photovoltaic glass. This glass could simultaneously generate electricity and allow the rest of the light to pass through to the crop.

CONCLUSION

Australia has a reliance on international hydroponic and protected cropping literature, with the report revealing that Australia contributes a small amount of research – less than five per cent – to the protected cropping world literature.

“But what you really need, to access the 95 per cent that Australia doesn’t do, is a group of researchers that are well connected internationally and can bring in that knowledge and adapt it to local conditions,” Dr Montagu said.

A substantial body of Australian research exists, however the review recommended that it needs to be repackaged to be relevant for protected cropping through the levy-funded Soil Wealth/Integrated Crop Protection project, the National Vegetable Extension Network and VegPRO training pathways. This may require additional resources to develop technical extension materials.

Scope exists for further R&D in the use of LED lighting, promoting rhizobacteria in hydroponic systems, and the unique Australian issue of pollination due to a lack of bumble bees in the environment. Given the vast diversity and range of growing conditions in Australia, it was impractical to adopt a one-size-fits-all approach.

“The big opportunity lies not in one specific technology, but the integration of our understanding about everything from how the temperature of the root system impacts on fruiting through to how the light levels impact plant development,” Dr Montagu said.

“When you bring those things together, and monitor the plant and the environment and link them all together using crop models, then you really start to be able to optimise the environment and the management of the crop for productivity.”

Environmental impacts, such as water usage, greenhouse gas emissions and nutrient management, should also be reviewed as the industry matures.

ACKNOWLEDGEMENTS

This project is a strategic levy investment under the Hort Innovation Vegetable Fund.

VG16083 was funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.



VG16016: MARKET OPPORTUNITY FOR VEGETABLE JUICES

FACILITATORS

Project VG16016 was completed by Horizon Consumer Science.

INTRODUCTION

Led by Horizon Consumer Science Vice President Michael Feely, the project *Market opportunity for vegetable juices* (VG16016) was undertaken to help Hort Innovation and the vegetable industry better understand the market opportunity for vegetable juices in Australia.

In its course, the project estimated the size and composition of the Australian vegetable juice market, identified consumer attitudes and behaviours, and suggested what might lead to an increase in consumption.

ABOUT THE PROJECT

The research was conducted in three stages, with each stage informing the next.

Stage one qualitative research explored consumer behaviour. An online survey of 2,138 consumers was administered in stage two to estimate the size and composition of the market, and what potential exists to attract existing consumers and non-consumers. The third stage included one-to-one qualitative interviews with growers and stakeholders to assess which of the opportunities offer the most potential, and how to realise them.

MAJOR FINDINGS

The vegetable juice market in Australia is small. Vegetable juice consumption is the equivalent of three per cent, or 98,000 tonnes, of annual vegetable production in Australia. In addition, only a small number of vegetables are used in vegetable juices (including carrots, celery, beetroot, cucumber, kale, spinach and capsicum), while the broad array of vegetables that could be used in juices are either not used or are not popular.

The project revealed that 80 per cent of Australians have tried vegetable juice, but only 15 per cent are regular consumers (two to four times weekly). The cost and taste of store-bought juices (only 41 per cent of consumers were satisfied) are barriers to greater consumption.

Regular consumers are not mainstream consumers – they tend to be health-conscious, reside in urban centres and have higher disposable incomes. Regular consumers persist to acquire the taste for vegetable juice and many (40 per cent) make their own vegetable juice, which makes consumption more affordable and gives them more control of what goes in their juice (they can be more liberal with fruit to improve the taste).

Importantly, about half of the respondents consume vegetable juice in the morning at a time when, according to Mr Feely, people are least thinking about vegetables. Mr Feely said the feel-good factor of consuming vegetable juice is a primary motivation.

“Consumers feel like they are starting the day off on the right foot, and it’s a quick and convenient way of consuming the

quantity of vegetables that most people know they should be consuming. Taste is somewhat secondary,” he said.

“It’s a difficult market because the reality is that vegetables juiced on their own don’t taste that good and need some sweetness component to make them better, which means fruit. Then you have the concerns about the sugar content from the fruit.”

Incorporating herbs, such as mint, basil, coriander, parsley, chives and ginger are opportunities to improve taste. Consumers say they would respond to tastings in supermarkets, but most juice companies do not have a budget for this.

CONCLUSION

“The main message from the research is that more cooperation and collaboration in the industry will be required to change perceptions of vegetable juice and ultimately increase vegetable juice consumption,” Mr Feely said.

The project found that the lack of a dominant commercial vegetable juice presents an opportunity to create an ‘Australian Farmer’ juice brand. To minimise risk, collaboration among growers within a region to create a multi-function plant (like the proposed Lockyer Valley facility) where vegetable juice is one component of the operation would make the most financial sense. By eliminating the middle man, growers could lower the cost of juices for consumers and reduce wastage of not-quite-right produce the supermarkets reject.

Mr Feely suggested a basic marketing plan outlining the four Ps – position, products, prices and promotion – to overcome the barriers. This encompassed:

- Product ideas such as: an Australian Farmer Juice product; wonky fresh vegetable packs for use in soups and juices; a Yakult-style shot to entice consumers who don’t like vegetables; and frozen fresh fruit and veg juice mixes that simply need to be dropped into a juicer.
- Ways of improving the price to consumers.
- Promotion recommendations, such as long-term tastings to develop a consumption habit.
- A recommendation to relocate vegetable juices from the fruit juice fridge to the fresh produce section of supermarkets.

ACKNOWLEDGEMENTS

This project is a strategic levy investment under the Hort Innovation Vegetable Fund.

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THE BOTTOM LINE: PROTECTED CROPPING – REVIEW OF RESEARCH AND IDENTIFICATION OF R&D GAPS FOR LEVIED VEGETABLES (VG16083)

Project VG16083 involved a review of the R&D gaps for levied vegetables in Australia's protected cropping sector and was structured around four broad areas: productivity, technology, plant protection and environment.

To have the greatest relevance, six research gaps need to be applicable to all levels of protected cropping. These include light levels and conditions, root zone management, biostimulants, pollination, real-time monitoring of plant conditions, and biological suppression of root pathogens.

R&D is required to specifically focus on Australia's unique issue of high light and radiation loads during summer. This should include linking with emerging projects at Australian universities on smart glass, solar energy harvesting and photovoltaic applications. It is also important to note that Australia contributes less than five per cent to the protected cropping world literature. It is recommended that researchers who have international contacts bring in knowledge from around the world to share back home, while existing research needs to be 'repackaged' to tailor it to protected cropping.

A more proactive role in R&D should be encouraged but a one-size-fits-all approach won't work. Instead the focus should be on integrating all knowledge of crop management and environment to optimise productivity.

FURTHER INFORMATION

For more information, please contact Dr Kelvin Montagu at kelvin.montagu@gmail.com.

The final report for this project is available on InfoVeg. Readers can search 'VG16083' on the InfoVeg database: ausveg.com.au/infoveg/infoveg-database.

THE BOTTOM LINE: MARKET OPPORTUNITY FOR VEGETABLE JUICES (VG16016)

Vegetable juice consumption in Australia is limited and forms the equivalent of three per cent, or 98,000 tonnes, of annual national vegetable production. Only a small number of vegetables are most suited to vegetable juices (including carrots, celery, beetroot, cucumber, kale, spinach and capsicum), while the broad array of vegetables that could be used in juices are either not used or are not popular. In light of this, Project VG16016 aimed to identify the market opportunities for vegetable juices in Australia.

Qualitative research was conducted in three stages and found that 80 per cent of consumers have tried vegetable juice but only 15 per cent consumed it regularly. The earthy taste of vegetable juices and the cost and taste of commercial juices was also inhibiting uptake; therefore an opportunity to improve the taste of vegetable juices by incorporating herbs such as mint and basil were identified.

The project proposed a basic marketing plan outlining the four Ps – position, products, prices and promotion – to overcome the barriers to vegetable juice consumption. The creation of an 'Australian Farmer' juice brand has the potential to reduce the waste of vegetables that do not meet specification, while a Yakult-style shot or freezer juicing packs could capitalise on convenience. Relocating vegetable juices to the fresh produce section of supermarkets could also be considered.

FURTHER INFORMATION

For more information, please contact Michael Feely at mfeely@market-research.com.

The final report for this project is available on InfoVeg. Readers can search 'VG16016' on the InfoVeg database: ausveg.com.au/infoveg/infoveg-database.

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Please contact Michelle De'Lisle at AUSVEG via email at michelle.delisle@ausveg.com.au or call 03 9882 0277 to submit topics for potential inclusion in future editions of *Vegenotes*.

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