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IN THIS ISSUE:

- **Updating and republishing valuable vegetable industry resources**

HIA R&D project number: VG12087

Project VG12087 conducted a review of existing vegetable industry inputs for updating and republishing.

- **Prioritisation of vegetable crop commodities and activities for mechanisation**

HIA R&D project number: VG13081

Project VG13081 developed a priority list of vegetable crops for future investment in mechanisation R&D.





Updating and republishing valuable vegetable industry resources



Facilitators:

Project VG12087 was completed by project leader Dr Gordon Rogers, with assistance from Dr Jenny Ekman, both from Applied Horticultural Research.

Introduction

Over the years the Australian vegetable industry, together with government departments, private companies and Horticulture Innovation Australia, has developed a wide range of resources, tools and guidance materials for growers on topics ranging from soil management to post-harvest handling.

Although still valuable today, many of these resources are no longer useable. Some are out of print, while others contain out-dated information or need to be republished in a more accessible format.

About the project

Recognising the importance of preserving this information, a team from Applied Horticultural Research set out to collate, review and prioritise around 300 vegetable industry resources for republication.

A steering committee was formed comprising grower representatives, as well as members from HIA, AUSVEG, the former vegetable Industry Advisory Committee and the Applied Horticultural Research project team led by Dr Gordon Rogers.

Dr Jenny Ekman, from Applied Horticultural Research, said part of this process aimed to explore new methods of communication, which she said was vital for an industry that needs to keep pace with advances in information technology.

“As information is becoming instantaneously available online, we thought that some resources could be reformatted to make them electronically accessible and easily searchable by

smartphone or tablet,” she said.

Dr Ekman said it was hoped that the project would ensure that valuable information was refreshed and made readily available to vegetable growers.

“It was surprising to find that some resources (that were only a few years old) were already difficult to locate,” she said.

“We wanted to make sure that vegetable growers could continue to access information regardless of changes in the industry. For example, changes in state-based departments of primary industries.”

Key outcomes

The committee agreed that information guides on pest, disease and disorder identification were both highly valued by growers and suitable for republication. However, it also argued that print guides could be expensive to publish and distribute.

The proposed alternative is what Dr Ekman describes as a “pest and disease identification app” that could act as a central repository for a wide range of materials, be readily updated and widely distributed at little cost.

“Potentially, this app could offer a range of interactive features that could provide a better long-term solution,” she said.

To satisfy both demands, Project VG12087 developed an app for iPhones, iPads and Android systems, along with five printed field guides illustrating pests, diseases and disorders relevant to brassicas; baby leaf vegetables; sweet corn; sweetpotato and carrots; and celery and parsley.

Whereas some materials are based on previous publications, others are entirely new, collated from various sources to meet a new and growing need.

Dr Ekman said the app contained 250 individual insect, disease and disorder records and was illustrated with more than 880 photographs.

Launched at the National Horticulture Convention on the Gold Coast in June 2015, the app is free to download and searchable by keyword, pest type, crop type or all three.

“While other apps have been developed in the past for pest and disease identification, these mainly focused on either home gardeners or broad acre crops – coverage of vegetable crops is extremely limited,” Dr Ekman said.

She added that as far as the team was aware, the Veg Pest ID app was unique to the Australian and international industry.

“We have already had around 4,000 local downloads, which is a fantastic result,” she said.

“There are great possibilities for expanding the app down the track, but these rely on regular updates, particularly as new operating systems are produced for mobile devices.”

Dr Ekman said even though many growers consulted during the research agreed that the app was “the way of the future”,



the attraction of printed material remained strong.

“Both have their place, particularly as aids to identification of pests, diseases and disorders of vegetable crops,” she said.

To download the app, please visit ahr.com.au/news/pest-and-disease-identifier-released and follow the prompts.



THE BOTTOM LINE: VG12087

- Pest and disease identification guides are immediately useful for growers. Together with the Veg Pest ID app, the resources provide vegetable growers with information that is up-to-date, easily accessible and available for the long term.
- Maintaining, improving and further developing the pest and disease identification app will be an ongoing project for the vegetable industry.

Acknowledgements

This project has been funded by Horticulture Innovation Australia using the National Vegetable Levy and funds from the Australian Government.



Prioritisation of vegetable crop commodities and activities for mechanisation

Facilitators:

Project VG13081 was completed by project leader John McPhee and Associate Professor Colin Birch, both from the Tasmanian Institute of Agriculture, with collaboration from the National Centre for Engineering in Agriculture, University of Southern Queensland, Queensland Department of Agriculture and Fisheries and Forestry, and Macquarie Franklin Pty Ltd.

Introduction

Compared to many exporting countries, Australia is a high-cost producer of vegetables. In addition to a high cost of production, the vegetable industry faces slow growth in domestic demand, market dominance by major retailers, competition from cheap imports and downward pressure on commodity prices.

Labour costs are also commonly reported as a major production cost, averaging around 30 per cent of the total farm costs across the national industry. These costs are considerably higher for those sectors that rely on manual labour for tasks such as transplanting and hand harvesting.

John McPhee, from the Tasmanian Institute of Agriculture, said adoption of mechanisation and automation technology presents an opportunity to significantly reduce production costs.

“While in some vegetable industries all aspects of production, from land preparation to irrigation and harvesting, are already highly mechanised, in others manual labour is still required for tasks such as selective harvest,” he said.

“Even within the mechanised activities, there are opportunities for improved on-farm mechanisation and automation.”

The Strategic Investment Plan 2012-17 for the Australian vegetable industry identified the need for mechanisation R&D and improved uptake of mechanisation technologies as important factors for reducing production costs in the vegetable industry.

About the project

Project VG13081 was initiated by the Market and Value Chain Development Design Team to prioritise vegetable commodity crops for future investment in mechanisation R&D.

The study produced a prioritised list of crops and activities that can be used to inform future decisions on mechanisation and automation R&D funding for industries that contribute to the National Vegetable Levy.

Prioritisation was a staged process that involved reviewing a broad range of vegetable commodity production data and assessing the potential for production expansion.

A portion of the work also involved reviewing reports from past projects related to mechanisation in vegetable production, scanning for new or near-new market technologies and consultations with reference growers.

Mr McPhee, who led the project, said economies of scale for R&D investment, commercial development and adoption of new mechanisation technologies could be achieved with industry collaboration.

He said the focus should be on crops that have higher value or greater production volumes, areas and enterprises, or technologies that could be applied across sectors.

“A number of projects related to horticultural mechanisation in the Australian vegetable industry have been conducted over the past decade, but these have tended to focus on the technological requirements for harvest of specific crops, precision agriculture and other emerging technologies,” he said.

“None of the previous projects reviewed the relative importance of various crops as the basis for determining mechanisation priorities.”

Recommendations

Mr McPhee said the data collated and reviewed during the project highlighted a number of key areas of importance for the future of R&D investment in mechanisation, automation, robotics and remote sensing (MARRS).

“The vegetable industry is diverse and complex,” he said.

“No single mechanisation opportunity is a priority for all sectors of the industry.”

Based on the analysis, Mr McPhee recommends that future investment in mechanisation R&D should focus on the following areas, which are listed in priority order:

- Harvest – lettuce, broccoli (possibly combined with cabbage and cauliflower).
- Transplanting – broccoli (possibly combined with cabbage and cauliflower), lettuce.
- Research and development synergies – broccoli, cabbage and cauliflower (for harvest mechanisation); Asian and bunching vegetables.
- Controlled traffic farming.
- Robotics, machine vision and sensors.

They are further categorised as ‘crop-based’ and ‘production system-based’ priorities.

He said each of the priorities had a different focus, “although some areas of interest clearly overlap”.

“For example, robotics – in a harvest context – has a very strong labour reduction focus, whereas in the context of data acquisition and crop management, the focus is more about reducing inputs, although labour would still be reduced.

“Similarly, wide-span technology is very much about soil sustainability and reduction of inputs, although greater labour efficiency is also a benefit.”

The provision of this information to Horticulture Innovation Australia and relevant groups within the vegetable industry will help to inform decisions regarding the efficient allocation of funding resources for relevant R&D in the area of MARRS.



THE BOTTOM LINE: VG13081

- Adoption of mechanisation and automation technology presents an opportunity to significantly reduce production costs faced by Australian vegetable growers.
- To optimise yield and quality within resource constraints, mechanisation must be integrated with agronomic requirements and practices.
- Managing the impacts of variability with precision techniques is an important component of current and future approaches to mechanisation.

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*Please contact Alexander Nugent at AUSVEG on 03 9882 0277 or email Alexander.Nugent@ausveg.com.au to submit topics for potential inclusion in future editions of **vegenotes**.*

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PO Box 138, Camberwell, Vic, 3124

T: 03 9882 0277 | F: 03 9882 6722

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