Final Report

# Nuffield Scholarship for Those in The Horticultural Industry

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**Delivery partner:**

Nuffield Australia

**Project code:**

LP15000

**Project:**

Nuffield Scholarship for Those in The Horticultural Industry – LP15000

**Disclaimer:**



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# Summary

Nuffield Australia has been supporting innovative and progressive Australian primary producers for over 65 years. We are committed to developing the future leaders of Australian agriculture and agribusiness through our longstanding scholarship program, supporting primary producers who strive for excellence in their chosen field and industries.

The objective of a Nuffield Scholarship is to award primary producers with a life-changing scholarship to travel overseas and study an agricultural topic of choice to increase their knowledge, management and leadership skills. It is a 16-week study program consisting of both group and individual travel.

Under project LP15000, Leadership and People Development Fund, Hort Innovation supported Emily Rigby, Ross Pirrone and Mitchell McNab to each complete a 2016 Nuffield Scholarship.

- Ross Pirrone, from Ayr in Queensland's Burdekin region, has been supported by Hort Innovation to study advanced and cost-effective horticultural growing systems, with an emphasis on tropical and sub-tropical protected cropping technology.
- Emily Rigby, from Mapleton in Queensland, was supported by Hort Innovation to investigate greenhouse production systems specifically for subtropical climates, with a focus on low and high-technology protected cropping. She also investigated new or underutilised crop species, which led to research into the medicinal cannabis industry.
- Mitchell McNab, from Shepparton in Victoria, was supported by Hort Innovation to investigate innovative robotics technology for the horticultural sector, with a particular focus on implementation in fruit growing and packing operations.

## Ross Pirrone

Ross concluded that farm-to-farm collaboration, linking of whole national supply locations on a specific product line or supply amalgamations of multiple lines into a collaborative production entity with the ability to share or pool research data and resources can create an efficient way to fast-track the development of chosen protected technologies and will increase the likelihood of the project being successful.

Ross made a number of recommendations in his report, including gaining a solid understanding of the specific horticultural crop's environmental thresholds that will limit productivity in regard to temperature, transpiration, nutrition, through an in-depth investigation and consultation with an industry scientist or researcher.

## Emily Rigby

Emily's research concluded that protective cropping offers a viable, productive growing system that meets the financial, environmental and social requirements of the future. Growth in protected cropping and related technologies will continue to rise around the world in response to climate risk in order to minimise risk and ensure continuity of quality supply.

Emily also made a number of recommendations in her final report, including increasing R&D investment across all levels of protected cropping technologies for subtropical climates to improve climate control, increase yields and optimise resource management while lowering capital investment and operating costs for more efficient, sustainable production.

Emily's research also identified medicinal cannabis as a highly valuable new crop species for production in the Australian, subtropical climate. It is further recommended to investigate and determine optimum cultivation practices for cannabis production using protected cropping practices.

Mitchell McNab

Mitchell McNab e has completed his scholarship research and presented to his peers and industry at the 2017 Nuffield National Conference. His leadership roles in the industry have increased significantly since be awarded his Scholarship and he has recently been appointed Chairman, Fruit Growers Victoria Ltd. His final written report is not available at the time of this report.

# Keywords

Nuffield Scholarship

Protected cropping

Production

Crop

Subtropical

Climate

Greenhouse

Investment

Yield

Consultation

# Introduction

If Australian agriculture is to compete and succeed internationally, Australian farmers need to lead the world in best practice. They need to recognize changing consumer preferences, adopt new technologies and production practices, and maintain the sustainability of their operations. Nuffield Australia, through the Nuffield Scholarship Program, is committed to equipping farmers with the knowledge they need to meet this goal.

Each scholar acquires knowledge and skills as a result of 16-weeks of scholarship study. The primary output is a substantial, evidence based 10,000-word final written report, which provides the outcomes from the research and recommendations for industry regarding the study topic. Writing is part of the scholarship experience and good writing is strongly encouraged to build the reputation and profile of both the scholar report and Nuffield Australia.

In addition to the written report, all scholars present the findings of their study verbally at the Nuffield National Conference, held in September annually. This major event on the Nuffield calendar is rotated between the states and territories. This presentation provides a summation of the businesses and individuals visited by scholars, concluding remarks regarding the research, and recommendations for industry. These presentations are recorded and made publicly available.

The benefits of the Nuffield Scholarship do not cease on the scholar's return to Australia. Rather, as a consequence of the experience, the scholar is generally committed to a life-long involvement in the international Nuffield network driven by a thirst for continued learning.

Ross Pirrone, Emily Rigby and Mitchell McNab received a 2016 Nuffield Scholarship supported by Hort Innovation, as part of the Pool 2 Leadership and People Development Fund.

Following his scholarship research, Ross Pirrone's business has set about the construction and crop production trials of his own 2000m2 research facility at Ayr. He and his family began the process of implementing, evaluating and refining the different techniques, crops and management systems to get a better real-world perspective on what information from industry, current research literature and his Nuffield research was practical in his climate and what elements of other global systems may be of use if coupled with other new or existing technology. To date, this research facility has conducted yield, production cost and quality trials and evaluations on tomato, cucumber, rockmelon, eggplant and capsicum crops, each with multiple seed varieties through the whole spectrum of seasonal conditions.

Emily Rigby completed a Bachelor of Science (majoring in environmental management) at the University of the Sunshine Coast (USC) and later returned to complete first class honours in horticulture. Emily began working as a research scientist in ornamental horticulture complimented by teaching scientific research methods and statistics at USC. Her initial role was post-harvest research scientist before taking on the role of project manager.

As part of her scholarship, Emily visited growers and researchers in humid subtropical climate regions of China, United States (Florida) and Costa Rica (tropical climate) and Mediterranean subtropical climate regions including Italy, Spain and Israel.

Emily is in a number of industry roles. She is President of the Australian Society of Horticultural Science (AuSHS), Chair of the International Protea Working Group (IPWG), a board member of Protected Cropping Australia (PCA) and advisory member of the Australian Institute for Medical Cannabis (AIMC). Emily's efforts have also contributed to her selection as a Qld Finalist of the National Rural Women's Award.

Mitchell McNab is a fifth generation orchardist and manages his family's H.V. McNab & Sons orchard and cold storage complex. Their 64-hectare orchard is planted to six pear varieties, five apple varieties and plums and produces more than 2800 tonnes of fruit annually. Mitchell says historically the focus of the business has been on growing fruit for processing, but the emphasis is now firmly on fresh fruit supply and packing for domestic and overseas markets. He has completed his scholarship travel and research as previously reported and and presented to his peers at the 2017 Nuffield National Conference. His final written report are not available at the time of this report.

Nuffield Farming Scholarships give a unique opportunity for primary producers to stand back from their day-to-day occupation, and to study a subject of interest. Applicants do not need academic qualifications but need to persuade the selectors that they have the qualities to make the best use of an opportunity that is only provided to 18-24 primary producers per year.

# Methodology

Ross Pirrone, Emily Rigby and Mitchell McNab were selected as 2016 Nuffield Scholars via a formal and established selection process, which included input from Hort Innovation.

This project had the following activities and timelines:

- 1st April 2015: Applications for 2016 Scholarships opened.
- 30th June 2015: Applications for 2016 Scholarships closed.
- Mid-July 2015: State-based selection panels short-listed applicants by face-to-face interview.
- August 2015: Final selection interviews were held in Melbourne, Victoria.
- September 2015: Scholars announced at the Nuffield National Conference, which included scholarship briefing and Awards Dinner, held in Albury, New South Wales.
- March 2016: Participation in the Contemporary Scholars Conference (CSC), held in Cavan, Ireland.
- June – July 2016: Participation in the Global Focus Program (GFP) with other scholars.
- July 2016 – September 2017: Individual study undertaken (8-9 weeks).
- September 2017: Verbal presentation completed at the Nuffield Australia National Conference, held in Darwin, NT.
- Late-2018/Early-2019: Written report finalised and released.

**Contemporary Scholars Conference – March 2016**

Ross, Emily and Mitchell participated in the 2016 Contemporary Scholars Conference in Cavan, Ireland in March 2016. The CSC a week-long program for all newly selected Nuffield Scholars from around the world. New Scholars are introduced to a worldwide network of farmers and agriculturalists and establish close ties with like-minded organisations. It provides an experience that stretches scholars mentally and emotionally and draws them to a wider view of agriculture and its pivotal role in society. A full report is available here: http://www.nuffieldinternational.org/csc-conferences/2016/2016-csc.html

**Global Focus Program – June-July 2016**

The three scholars have completed their Global Focus Programs (GFP), an integral part of the scholarship, responsible for 40-50 per cent of the scholar bursary. Over six weeks, scholars visited six-to-eight countries on three continents. As a group of eight-ten scholars, they investigated agricultural marketing and trade issues, environmental issues and experience different social and cultural aspects of each region. The participating scholars are all leading primary producers not just from Australia, but also other Nuffield countries worldwide who have their own unique skills, knowledge and industry contacts to share.

Ross departed Australia on Tuesday 7 June on the "Japan" GFP which had a total of 11 participants, including eight Australian Scholars, two Irish scholars, one New Zealand Scholar and one scholar from the UK. They also travelled to Singapore, where they were briefed about global agriculture then visited the following countries and regions:

- Indonesia (11-15 June)
- Japan (16-25 June)
- Israel (26 June-2 July)
- The Netherlands (3-9 July)

- USA, Washington DC (10-13 July)
- Illinois, USA (14-21 July)

This group returned to Australia on 22 July.

Emily and Mitchell departed Australia on Tuesday 7 June 2016 on the "China" GFP, travelling with seven other scholars, three scholars from Australia, two scholars from Ireland, one scholar from New Zealand and one from the UK. They travelled to Singapore, where they were briefed about global agriculture before departing and touring the following countries:

- The Philippines (12-13 June)
- China (14-24 June)
- Canada (25 June – 1 July)
- USA, Colorado (2-8 July)
- USA, Washington DC (9-12 July)
- UK (13-20 July)

They returned to Australia on 21 July.

**Individual Study – January-August 2017**

Ross, Emily and Mitchell completed eight weeks of individual travel, studying their chosen topics as part of their Nuffield Scholarship research.

Ross visited:

- Japan – High end indoor specialty melons/fruits and vertical indoor farms.
- Israel – A widespread look at a range of crop protection structures and infrastructure systems.
- The Netherlands – An analysis of high-tech horticulture buildings and systems specific to low light and heat environments.
- USA – Lower tech protected horticultural production but at a massive scale.
- Mexico – A comprehensive simultaneous review of production methods, structures and crops in a climate very similar to Australia.

Emily visited growers and researchers in humid subtropical climate regions of China, United States (Florida) and Costa Rica (tropical climate) and Mediterranean subtropical climate regions including Italy, Spain and Israel.

Mitchell studied the overseas use of robotics and other labour-saving technologies in horticultural industries when he visited China, Italy, Poland and the USA. He also travelled to other parts of Australia through his scholarship.

**Verbal Presentation Findings – September 2017**

Emily presented the findings of her study at the 2017 Nuffield Australia National Conference, which was held in Darwin, NT, on Wednesday 20 and Thursday 21 September 2017.

Mitchell presented the findings of his study at the 2017 Nuffield Australia National Conference, which was held in Darwin, NT, on Wednesday 20 and Thursday 21 September 2017.

Due to an extension request, Ross presented the findings of his study at the 2018 Nuffield Australia National Conference, which was held in Melbourne, Vic on Wednesday 19 and Thursday 20 September 2018.

# Outputs

Ross and Emily have presented the findings of their study to their peers at the Nuffield Australia National Conference.

Verbal Presentation:

Ross's presentation:
https://www.youtube.com/watch?v=8p03O6Xffi8&index=12&list=PLWdEyVDhYCcJfyWuxFQd0R8qX-E8FOcWh

Emily's presentation: https://www.youtube.com/watch?v=7N_VgTv00tI

Mitchell's presentation:
https://www.youtube.com/watch?v=BvTlho13Dmk&index=17&list=PLWdEyVDhYCcJx60TJHrmmc8m5SKqDYYP5&pbjreload=10

Written Report

Ross's final 10,00 word written report with recommendations can be found here:
http://nuffieldinternational.org/live/Report/AU/2016/ross-pirrone

Emily's final, 10,000 word written report with recommendations can be found here:
http://nuffieldinternational.org/live/Report/AU/2016/emily-rigby

# Outcomes

The beneficial results of this are a significant boost to the horticultural sectors' understanding of the international forces affecting the industry and the need to adopt new technology and management practices to continue to maintain productivity growth. Other beneficial results include informed leadership in the industry, encouragement for greater participation by younger farmers in the horticultural industry, nurturing of a mindset amongst young farmers to take a global perspective of their enterprises, encouraging an ethos of lifelong learning and membership of an elite group of farmers around the world – an invaluable lifelong network of contacts and information transfer.

# Evaluation and Discussion

Ross. Mitch and Emily have completed Nuffield Scholarships and gained knowledge and a greater understanding of the international forces affecting the horticultural industry. They have also gathered knowledge of new technology and management practices that can be adopted in their business to drive productivity growth. They will continue disseminate the findings of their studies to the horticultural industry to further enhance productivity.

There are number of key recommendations to assist growers in increasing the value in the horticulture industry that feature in their final findings. They will continue to grow into leaders in their sector, have an ethos of lifelong learning and encourage greater participation by younger farmers.

Other learnings from this project include:

- The creation of more leaders in agriculture from within the horticulture industry.
- Producing a network of Nuffield Scholars internationally, to enhance knowledge transfer.
- Providing a direct and immediate understanding of changing consumer preferences and trends.
- Delivering the latest new global innovative, technological advances directly from Scholars.
- Assisting to create a legacy of leaders in agriculture for future generations.

# Recommendations

Recommendations from the study can be found in the individual video presentations and written reports listed above in the Outputs section of this report.

# Scientific Refereed Publications

Ross's report link: http://nuffieldinternational.org/live/Report/AU/2016/ross-pirrone

Emily's report link: http://nuffieldinternational.org/live/Report/AU/2016/emily-rigby

Mitch's final report is not available at this time.

# Intellectual Property/Commercialisation

No commercial IP generated.

# References

A full list of references can be found in each individual support.

# Acknowledgements

Acknowledgements can be found in the individual written reports and in their verbal presentations.

Investors make a monetary contribution to support each scholarship annually. Nuffield Australia Farming Scholarships acknowledges the generous contribution that Hort Innovation provides to the program to assist in the development of our most important resource in agriculture – human capital – as they are key to ensuring a profitable and sustainable industry in the long-term.