Final Report

Facilitating the Development of the Australian Pineapple Industry – Stage 3

Project leader:

Rachel Mackenzie

Delivery partner:

Growcom Australia

Project code:

PI15000

Project:

Facilitating the Development of the Australian Pineapple Industry – Stage 3 – PI15000

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Level 8
1 Chifley Square
Sydney NSW 2000

Telephone: (02) 8295 2300

www.horticulture.com.au

Content

Summary

This project, *Facilitating the development of the Australian Pineapple Industry – Stage 3* was the third iteration of industry development projects following a similar approach and running 1/12/2015 – 1/6/2018. The project objective was to enhance the adoption of innovation and technology in the Australian pineapple industry through brokering research and development (R&D) information and facilitating capacity building. The desired outcomes of the project were to increase the profitability and sustainability of the Australian pineapple industry through uptake of improved natural resource management (NRM) practices, increased understanding of biosecurity obligations, better engagement with the supply chain, increased leadership capability and improved agronomic practice.

The delivery model was based on the previously highly effective combination of regional study groups, an annual field day and a regular newsletter as the main activities. The field days remained well attended and supply chain interaction improved over the life of the project. Whilst the project certainly maintained the pre-existing high level of industry cohesion and made modest gains in relation to the uptake of NRM practices and understanding of biosecurity it did not increase leadership capability and there was no evidence of improved agronomic practice. Whilst growers remain very supportive of an IDO project in theory, the declining participation in study groups and tours and lack of interest in taking up leadership roles reflects disengagement in the process.

From the perspective of the broader industry and government, the IDO project and particularly the field day remain an important conduit to communicate with the pineapple industry and there is significant value in keeping these communication channels open.

The project was ended 5 months premature, in June 2018, after advice from the industry and the Growcom that the delivery model was not effectively achieving the project outcomes and was not the most efficient spend of the pineapple levy. It was identified that without investment in the primary R&D to underpin practice change, then even the most robust delivery model will lose traction. The project was developed under a strategic plan which did not clearly articulate the link between changed practices and profitability and these links were not adequately explored in the conceptualization of the project.

It is clear that there is a need for a complete reframing of how industry R&D is communicated to pineapple growers and how growers are supported to take up new practices. It was considered that the small levy means very little pineapple specific R&D is undertaken beyond chemical management and this makes it difficult to foster changed practices and maintain engagement in extension. In a bigger industry with a larger levy, there is a clear argument for a pure IDO role but the balance of activities was not appropriate for the size of the pineapple industry. It could also be argued that much of a traditional IDO role is building industry cohesion and for historical reasons, the pineapple industry is already very cohesive, so investment should focus more on maintaining this cohesion as a mechanism to foster practice change, rather than as an end in itself.

Keywords

Pineapples, industry development, natural resource management, biosecurity, leadership, industry cohesion, supply chain connections

Introduction

The Australian pineapple industry has undergone major structural change in the last 15 years and has moved from largely growing for processing to a much more significant focus on the fresh market. This transition has occurred largely since the Golden Circle cannery moved from being a grower owned co-operative to owned by a private multinational company. The number of growers has also significantly reduced in that time.

Since the inception of the pineapple levy in 2007, the industry has strongly supported the provision of an industry development function through an Industry Development Officer (IDO). This project, PI15000 *Facilitating the development of the Australian Pineapple Industry – Stage 3* was the third iteration of industry development projects following a similar approach. The project objective was to enhance the adoption of innovation and technology in the Australian pineapple industry through brokering R&D information and facilitating capacity building.

This project was commissioned after an independent review of stage 2 undertaken by Coutt's et al which determined that the IDO approach was well supported by levy payers and was the most appropriate at that time to maximize the engagement of industry in the RD&E process[1]. The key mechanisms for engaging growers were twice yearly study groups held in each region and an annual field day. Available levy funds meant that the IDO could only be funded three days per week. Ms Georgie Townsend filled the IDO role from Nov 2015 to May 2017, after which the position was filled on a temporary basis by existing Growcom staff to deliver on key outputs such as the annual field day.

As the project progressed it became evident that the balance between R&D and industry development activities occurring in the industry was not optimal, as the proportionally high investment in the industry development function meant there was limited funds to undertake actual R&D. The partner technical project PI12008 ended in November 2016. It should also be noted that the pineapple itself is a unique crop as it is the only edible bromeliad and R&D undertaken for other commodities cannot easily be transferred to the pineapple industry without ground-truthing in field conditions. Anecdotal evidence from study group leaders was that the study group model was getting tired with no real new information to impart.

The industry development officer (Georgie Townsend) resigned in May 2017 and it was decided that this presented a good opportunity to survey growers and reframe the investment. The survey results strongly indicated an ongoing desire for industry development activities but indicated there was a need for more field based trials to ground-truth new practices and encourage uptake. The field day was considered to be an important tool for communicating with growers and ensuring knowledge exchange between grower and growing regions. It was considered that there was a need to merge the best attributes of the IDO project and the technical officer.

After significant consultation with industry and Hort Innovation, it was decided to prematurely end this project and initiate a new project with a greater technical field based component (PI17001). Whilst it is unfortunate that the project ended early, an ongoing benefit of the industry development projects has been to maintain a high level of industry cohesion and engagement by growers in how levy funds can be most effectively spent as evidenced by the 50% industry response rate to the survey.

[1] Coutt's et al 2015

Methodology

This project began 1/12/2015 and ended 1/6/2018 and targeted all Australian pineapple growers. Historically the pineapple industry has been confined to Queensland, but a large farm has been established in the Northern Territory owned by an existing pineapple company. There are four major pineapple growing regions in Queensland; North Queensland (including NT), Yeppoon, Bundaberg and South-East Queensland.

The project was delivered by a part-time industry development officer (0.6 FTE), Georgie Townsend, employed by the industry representative body Growcom. Growcom is a Queensland based membership organization and the pineapple industry provides advice to the Growcom Board through the Australian pineapples leadership group advisory committee. This leadership group represented a community of practice and to foster exchange of ideas between regions and provide industry leadership, the group was funded to meet annually through this project.

The key extension delivery mechanism was the twice yearly study group meetings in each region. The basic format of the study groups comprised a farm walk, guest speaker discussing relevant R&D outputs and a farm critique to transfer knowledge between growers (a tell, show, do model). A new element added to this project was greater interaction between study groups with growers from different regions participating in each group. In 2016 the North Queensland study group was held in Darwin for the first time and there was such significant interest in attending that it was expanded to being a study tour open to all pineapple growers. The study groups were thoroughly minuted to provide a record of conversations and to provide access to the growers who were unable to attend.

In addition to the study group meetings, the annual pineapple field day presented a significant opportunity to share knowledge throughout the industry and provide a mechanism for guest speakers to present on industry issues. The field day is held in a different region each year and involves a number of site visits and extension opportunities. The field day was also supported by a comprehensive booklet which provided a take-home resource for growers.

The study groups and field day were complemented by quarterly editions of the *Pineapple Press* newsletter which was sent to all growers with the purpose of synthesizing and presenting new research.

An industry website was meant to provide a platform for storing study group minutes, editions of Pineapple Press and other resources. A grower log-in was provided to all growers. Webinars were also identified as extension mechanisms in the original project brief.

A key function of the IDO was to act as an information hub and regular emails were sent to growers alerting them to issues of interest. The IDO was also in regular telephone contact with growers.

Building leadership skills was identified as a key deliverable within the project and the community of practice was opened up to a greater number of growers. Specific efforts were made to increase the number of young people participating in pineapple leadership activities.

A key barrier to the development of the industry was identified as poor linkages with the supply chain in relation to production figures and poor data regarding supply. To overcome this, the project facilitated by-monthly packhouse meetings between the major players in the supply chain, the IDO and key industry support staff. This activity was complemented by a concerted effort to increase the presence of supply chain players at the field day to assist in mutual understanding of the pressures and requirements to ensure the best quality product is reaching Australian consumers.

The project was overseen by a project reference group which met bi-annually.

Outputs

Program logic and monitoring and evaluation plan

The program logic and monitoring and evaluation plans were based on Bennett's hierarchy[2] which serves as a useful tool to align project activities to desired outcomes, outputs and objectives. The program logic and

[2] Bennett 1975

monitoring and evaluation plan can be found in Appendix 1.

Annual work plans

The annual work plans were based on the program logic and can be found in Appendix 2.

Employment of a pineapple IDO

A dedicated pineapple IDO was employed from the inception of the project in November 2015 to May 2017. After that period the position was filled on a temporary basis by existing Growcom staff to deliver on key outputs such as the annual field day.

Study Groups

Study groups were held in each of the four regions twice yearly initially and then annually from 2016 until the resignation of the IDO. The study groups also represented an important opportunity to link with Queensland DAF staff, industry agronomists and other Growcom project team members.

Annual study tour

In 2016 a highly successful tour was undertaken to the Northern Territory. Thirty-five growers attended and considered it to be an important learning experience. In light of the success of the NT study tour, a tour to Melbourne was organized in 2017 to tap into innovative approaches from other horticulture commodities and to link to the Melbourne markets, a major destination for fresh pineapples. Whilst those who attended the tour were very positive about it, numbers were small (seven growers in total). Detailed reports on both study tours can be found in Appendix 3.

Annual Pineapple Field Day

The pineapple field day continued to be the premier event for information dissemination for the pineapple industry with successful field days being held in 2016, 2017 and planned for July 2018. More than 80% of pineapple growers attend the field day which is held over two days and combines technical talks with field walks. The field day also offered the growers significant opportunity to network with market agents, chemical resellers and other important supply chain players. Detailed reports on the field days can be found in Appendix 4. Hort Innovation has consistently had a significant presence at the pineapple field day.

Rural Discovery Day

The IDO and key growers participated in the Rural Discovery day in both 2016 and 2017 and presented to more than 80 school children each year.

The Pineapple Community of Practice

The Community of practice comprised the study group leaders, the DAF extension officer, key pineapple agronomists and Growcom as well as invited guests and met twice yearly over the life of the project. In an effort to promote participation by younger growers in leadership roles, a young grower from South East Queensland joined the group. It was this group that identified the mismatch between the generation of new R&D information and the provision of extension services by the IDO. There was also a strong feeling that there was insufficient technical support on-ground for growers with the loss of key agronomists from the industry. This group also shaped the program for the field days and discussed key issues such as the perceived pineapple glut at the beginning of 2018.

Pineapple Press

Seven editions of pineapple press were published and, in addition to these, a number of pineapple stories featured in Fruit and Vegetable news and these can be found here:
https://www.dropbox.com/sh/qhdxttu131pl0lz/AAA_OdcC_tk_eXaWhVIEp9Zia?dl=0

Promotion of Hort Innovation membership

Hort Innovation membership was promoted at appropriate opportunities throughout the life of the project. Hort Innovation staff were given an opportunity to present at the field days in 2016, 2017 and 2018.

Packhouse teleconferences

The packhouse teleconferences were held every two months and were useful in identifying such issues as natural

flowering and drought impacts.

Project reference group meetings

These were held regularly until the resignation of the IDO in May 2017 and then have been conducted on an as needs basis thereafter.

NRM and biosecurity report

The pineapple IDO project had the key objectives of improving the profitability and sustainability of the pineapple industry through uptake of research and development in natural resource management and biosecurity. To assess progress against these objectives a specific report was undertaken. The report concluded that whilst progress in both these areas had been made there was significant potential to improve practice. For more detail, please see appendix 5 for the full report.

Outcomes

It should be stated at the outset that this project was ended 5 month premature on advice from the Community of Practice because it was considered that it would not effectively deliver on the outputs and outcomes as described in the project description. The methodology was sound in theory and had been effective for many years but there was a strong sense that without the primary driver of new R&D information to extend to growers or new methods to adopt, engagement in the project would continue to drop. This project was initially conceived to partner with a more technical project, PI12008, but this project was not re-funded due to lack of clear outcomes.

The pineapple industry has always been characterized by high engagement and participation by growers and this was fostered by the study group model and the successful field days. The issue is translating engagement and participation into practice change on-ground.

Progress toward each outcome is articulated below:

Take up leadership positions and adopt new and innovative changes and practices on their farms.

The study group leaders form the main leadership positions within the industry. In the life of the project a young grower now represents the South East Queensland growing region and has been proactively involved in initiatives such as the development of the Pineapple Strategic Plan. Participation in the study groups has also given that grower the confidence to participate actively in the South East Queensland water quality project funded by the Queensland Department of Environment.

Succession plans have not been developed for each study group as interest and participation in the study groups declined over the life of the project. It became obvious that the small size of the industry means that those who have an inclination towards leadership have already undertaken leadership roles in the past. There is a need for a more fundamental approach to fostering and mentoring leaders and potentially looking at options for a more incremental uptake of leadership roles.

With the exception of the practices actively measured in the NRM report (Appendix 6) the adoption of innovative practices is difficult to assess as there were limited new and innovative practices to extend to the growers. The growers did not engage with the website at all so this could not be used as a tool to track engagement. The growers who attended the Victorian Study tour were exposed to new practices but it is unknown as to whether they have made changes on farm as a consequence.

Have a better understanding of the supply chain and wholesaler, retailer and consumer demands.

The packhouse teleconferences have been moderately successful in strengthening relationships between supply chain players and have assisted with managing supply and demand. For example, Cyclone Marcia had a significant impact on pineapple production initially but was followed by a high degree of natural flowering events and an unexpected increase in supply. This was effectively managed by the sector as the packhouse tele conferences enabled this to be identified early.

Since the inception of the project the participation by other members of the supply chain in the field day has increased significantly and this has certainly served to strengthen the bonds between supply chain components. The greater linkages between supply chain participants is evidenced by the support for an “over-supply and waste” panel session proposed for the 2018 Field day with participation from retailers, wholesalers, packhouses and growers.

The packhouse meetings have also helped shape the marketing program and enabled greater linkages between the Hort Innovation Marketing Manager and the key supply chain players in the sector.

Develop a better understanding of natural resource management

Based on a survey undertaken a year after the inception of the project, more than 30 percent (31.03%) of respondents had actually changed erosion and sediment control measures on their farm as a consequence of attending study groups or the pineapple field day and nearly 40 percent believe that erosion control methods are worthwhile and beneficial. Around half of the growers in the sector responded to the survey so is a very statistically accurate reflection of grower practice. Interestingly far fewer growers indicated their knowledge, skills or aspirations in relation to erosion control had changed as a consequence of attending the study groups/field days. A possible conclusion is that the study groups/field days gave them practical tools to make the changes rather than changing their underpinning attitudes. More detail is provided in the NRM report.

Encourage improved agronomic practice. Raise awareness amongst growers about latest practices and new research and developments.

As discussed previously, a major shortcoming of this project was the lack of new R&D information to extend to growers outside of the NRM sphere. Whilst the project was successful in linking growers to R&D outcomes in the NRM area, these projects were not funded by the pineapple levy.

Prevent a potential Biosecurity issue.

Biosecurity and chemical management were key topics at all pineapple events during the life of the project. Whilst it is difficult to attribute direct cause, a potential emergency plant pest was reported, identified and communicated to industry according to the protocols of the EPPRD. This correct and effective response is a reflection of the increased capacity of the sector to understand their biosecurity obligations. In addition, the Chair of Australian Pineapples has had one on one training from PHA as to their responsibilities under the Deed as the industry representative on the National Management Group and attended the PHA AGM and associated seminars. The capacity to direct some of the industry biosecurity levy to attendance at PHA meetings has assisted in ensuring that industry can effectively participate in these important processes.

Monitoring and evaluation

The project was originally conceived to contribute to the achievement of the following objectives of the Australian Pineapple Industry Strategic Investment Plan 2011-2016:

Objective 1 –Ensure the consistent, sustainable and profitable supply of quality Australian pineapples.

Objective 3 - Ensure the Australian pineapple industry is resourced and aligned to lead and facilitate evolving supply and demand.

The specific objectives of the project were to:

- Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes by empowering the next generation of growers to take up leadership positions and adopt new and innovative changes and practices on their farms.
- Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes and a better understanding of the supply chain and wholesaler, retailer and consumer demands.
- Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes in natural resource management.
- Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes through improved agronomic practice. Raise awareness amongst growers about latest practices and new research and developments.
- Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes and prevention of Biosecurity issues.

Whilst key evaluation questions were not determined at the outset of the project each of these objectives will be discussed in terms of project effectiveness, relevance, appropriateness and efficiency. It should also be stated that in the conceptualization of the project the outcomes were inadequately defined and therefore difficult to measure.

The early termination of this project is strong evidence that it did not adequately address the objectives articulated above and whilst it is possible to piecemeal pull out the evaluation responses related to various bits of data it is evident that there were deficiencies with how the project was conceptualized.

Firstly the links between profitability and sustainability of the industry and the objectives outlined above were never clearly defined and there was no detailed analysis of what the barriers to improved profitability were. According to the independent review, the delivery methodology was highly effective in previous projects[3] so obviously there was an issue with the content of the information being put forward. It was a contention by the growers that there was no new R&D information to extend therefore the delivery mechanisms were just rehashing old information. The growers themselves no longer saw the link between participating in the project activities and improving their business performance.

At an overall level the project could be considered to be partially effective in that it did deliver the outcomes as expected for NRM uptake and biosecurity as identified above and in the Appendices. That said there was no underpinning metric to measure how much these changed practices resulted in improved profitability and/or sustainability.

The project was not particularly effective in engaging new growers in leadership roles which reflects the lack of engagement in the study groups which were the cornerstone delivery mechanism across the whole project. Industry cohesion is still high in the pineapple industry and the field days were still highly successful, attracting more than 80% of growers and a significant number of supply chain partners on most occasions.

There was almost no evidence of improved agronomic practice as a consequence of the project but this can again be explained by the fact that there were no improved practices to extend to growers as such, outside the NRM sphere. Whilst efforts were made to expose growers to innovative practices in other industries, the non-technical nature of the IDO function meant that they were not taken up by the pineapple industry.

The project was reasonably successful in improving understanding of biosecurity at an industry level but

[3] Coutts et al, 2015

observational evidence at study groups and field days suggests that practical application of on-farm biosecurity was not being taken up. Again there was a lack of specific technical information to relay to growers and whilst general discussions certainly did raise awareness and result in an effective response to the suspected emergency plant pest, there is still a long way to go.

Project beneficiaries were effectively engaged throughout the project and the strong interest in the interstate study tour to NT highlighted that if new and relevant information was being presented then growers were willing to engage. The actual engagement processes were effective but the lack of new content made it difficult to maintain industry interest.

An overall observation is that the industry development project can only be effective if there is new research and information to convey to growers that clearly impacts their business. There also needs to be a clear link between any new practice and an economic benefit to growers or industry as a whole. The small quantum of levy funds available means that a more efficient approach would be to combine a more technical function with the industry development function and have more clear and specific practice change objectives that are linked to profitability and sustainability. It should be stated that perhaps the objectives of the project were overly ambitious for the quantum of funds available and that it did deliver reasonable value over the life of the project but was not considered the best use of limited funds.

Recommendations

Recommendation 1 – Link the industry development function more closely with a technical capacity to translate research from other industries and apply it to pineapples.

There is lots of good R&D in other horticulture commodities that could potentially be taken up by the pineapple industry. Whilst this project exposed the growers to some of this information, the non-technical nature of the role meant there was limited ability to identify research that could be transferred to pineapples but more critically there was no capacity to actually translate that research and make it relevant to pineapples. Additionally, the inherent conservatism of growers meant that they were unlikely to take up research that had not been specifically tested in-field for pineapples. Even in relation to R&D projects specifically relating to new chemistry for pineapples, there is a need for field based trials to show the effectiveness of new use patterns.

Recommendation 2 – define the outputs more specifically in relation to practice change and link them better to the overarching objectives of profitability and sustainability.

From a methodological perspective it is recommended that more specific practice change outputs are defined and these are benchmarked at the beginning of the project so it is easier to focus on and deliver measurable outcomes. A cost benefit analysis of specific practices would assist in encouraging growers to change their practices. There also needs to be a more robust link between on-ground practice change and overall industry development as increased production alone is not the answer to increased industry profitability.

Recommendation 3 – take a more professional approach to industry communications and link better to other industry initiatives.

The industry communication outputs of the project need to be developed by communications professionals to increase their usability and uptake.

Recommendation 4 – maintain the Field day as the key opportunity for industry engagement and interaction.

The field day continues to be very successful and has evolved from just a grower forum to an important opportunity for the full supply chain to interact. The field day could potentially be an opportunity for the industry to hear from other horticulture commodities about their innovative practices or lessons learnt rather than just hearing from pineapple industry speakers.

References

Coutts J&R (2015), Facilitating the development of the Pineapple industry – Stage 2: Review Report 2015

Bennett, C (1975) Up the hierarchy. Journal of Extension. [On-line], 13(2). Available at: https://www.joe.org/joe/1975march/1975-2-a1.pdf

Intellectual property, commercialisation and confidentiality

No project IP, project outputs, commercialisation or confidentiality issues to report'

Appendices

Appendix 1 – Monitoring and Evaluation Plan

Appendix 2 – Annual workplans

Appendix 3 – Study tour report

Appendix 4 – Field day reports

Appendix 5 – NRM report

These appendices can be found by following this link

Appendix 1 -Monitoring and evaluation plan

The Industry development officer has set up the project in the Bennett's Hierarchy framework. This framework clearly sets out seven steps

1. Input/resources
2. Activities
3. Participation
4. Reactions
5. KASA change
6. Practice change
7. End Results

The five areas that the Industry Development Officer will be looking at over the life of the project are:

- Leadership and innovation
- Market Intelligence and supply change management
- Natural resource management and sustainability
- Improved agronomic practice
- Biosecurity

Another row was added to each table to show how monitoring and evaluation will be used to determine changes in the industry over the life of the Project.

Leadership and Innovation		Monitoring and evaluation
End Result/objective	Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes by empowering the next generation of growers to take up leadership positions and adopt new and innovative changes and practices on their farms.	Overall industry profitability data over life of project Track changes in Study Group area leaders Through the use of Survey Monkey, every 12 months ask growers to identify which platforms they are using to access information about the industry.
Practice Change/outcomes	Over the course of the 36 month project an identified succession plan for each region. New growers taking up roles of responsibility in leading the industry. Adoption of new innovative practices which lead to greater profitability and sustainability.10% of growers actively engage with modern communication technologies such as webinars and social media. 50% of growers actively using Australian Pineapples Website to access Study Group meeting minutes, Australian Pineapple Group meetings and other relevant industry information. 20% Grower participation in Community of Practice (COP) for Pineapples	Each study group has its own succession plan Survey of growers to determine how many are using modern communication tools. Track website use Monitor attendance at Community of practice groups
KASA Change	20% of growers in each study group indicates that they understand the need for succession and feel they have the skills to take on a leadership role by participating in leadership activities.	Survey (Annually)
Reactions	All participants in leadership activities have a positive opinion of the activity.	survey

People Involvement	60% of the growers from each region attending a Study Group located in their Growing Area. To attend one other area's Study Group meeting once per year. 20% of the growers attend targeted electronic media training and internet skills training. Aware of benefits of joining COP	Study group attendance records

Activities/outputs	• Study Groups – grower area leaders report to grower group about activities being coordinated across the industry • Study groups held at other commodities to foster cross-industry relationships and learn from other growers. • Community of Practice (COP) for pineapples with regional representatives • Field Days, growers work together to put together the activities for the Field Day. This includes talking to local businesses to support the field day, work with agronomists and run trials which will be viewed and talked about at the field day • Meeting with the Project Reference Group (PRG) to discuss direction of IDO Project and ensure that it aligns with Strategic Plan and expectations in the industry • Rural Discovery Day – grower participation talking with school aged children about farming and related jobs • Pineapple Press as a source of communication for growers to find out about new technology, training, workshops and upcoming events • Promote HIA membership and participation • Industry Development Officer to link with DAF Staff, Agronomists, international Pineapple Industry Leaders to be familiar with latest innovations and best practices in the industry	• Activities completed

	• Support grower lead excursions through email, phone and sms contact – encouraging growers to collaborate with others when they are planning trips to markets, interstate or to see other farms. • Targeted electronic media training and internet skills training	
Inputs	• IDO • Key stakeholders form the industry supply chain • Growcom – Industry representative body staff who facilitate or organise workshops and training • Skills training for IDO to improve facilitation skills to improve information sharing (as per the Coutt's report)	

Market Intelligence and Supply Chain Management		
End Result	Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes and a better understanding of the supply chain and wholesaler, retailer and consumer demands.	
Practice Change	Over the course of the 36 month program, packhouses continually participate in market intelligence and supply chain management related projects. At least 50% of growers are utilising industry market intelligence data, as evidenced by industry survey respondents.	Industry Survey every 12 months Packhouse participants survey every 12 months about usefulness of meetings and how they are using the information in their own businesses

KASA Change	Understand the barriers that prevent knowledge sharing Aware of benefits of information sharing across the industry that benefits individuals and packhouses to work on a coordinated approach to ensuring a consistent supply of quality fruit to market. Growers aware of the outcomes of supply chain management related projects e.g. Growers understanding induction of flowering times in regions, supply of suitable varieties during summer and winter seasons.	Survey
Reactions	Undertake conversations with packhouse representatives and growers following market visits, field days and continue to realise the benefits of information sharing to ensure a consistent supply of high quality fruit during summer and winter seasons.	Survey
People Involvement/Participants	Targets the whole Pineapple Growing Industry	Data from Packhouse meetings

Activities	• Packhouse meetings to inform HIA Marketing Manager about supply levels and quality of fruit • Produce minutes from Packhouse the meetings and distribute via email to meeting attendees • Regular contact with market service providers to ensure alignment between activities • Support grower lead Market visits through distribution of information • Attendance of Agents and Merchants at Field days and study groups where possible to better understand the whole supply chain. Agents and Merchants provided the opportunity to address growers and other stakeholders about the direction of the fresh fruit market • Develop a general flower induction schedule (Refer to Chapter 5 of BMP in line with core strategy 2.1 of the Strategic Plan vision for Australian Pineapples to achieve by 2016.)	• Activities completed
Inputs	• IDO • Supply Chain managers • Key Stakeholders • Marketing manager • HIA support staff • Packhouse managers	

Natural Resource Management and Sustainability		
End Result	Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes in natural resource management	Through the use of Survey Monkey, every 12 months ask growers to identify what changes they have taken up as a result of R&D extension in natural resource management Data of how many pineapple growers each year have completed the Hort360 BMP
Practice Change	30% increase in the adoption of improved Erosion control programs and increase in awareness of new products eg – Hort360 – Horticulture BMP No AgVet chemical violations Best Practice Manual	Data collection of how many growers have completed the Hort360 BMP Record if there have been any Agvet chemical violations
KASA Change	Understand the latest technology, have an improved attitude to NRM Aware of programs, literature and trials which improve sustainability of their farms	Survey
Reactions	All study group participants have a positive engagement with this component of the program	Survey
People Involvement	60% of growers participating in activities that raise their awareness of best practice NRM and sustainability.	Attendance at Study Group reported

Activities	• Study group walks – Farm critiques, guest speakers • Work with DAF staff and growers to make regular updates to BPM by referring to it at Study Groups and Field Days • Visit trial sites at study groups and field days • Include profiles of growers using best practice, about programs for erosion and control practices and government and private programs for NRM management schemes, incentives etc. in Pineapple Press and Fruit and Vegetable News. • NRM award at field day awarded to growers by a relevant sponsor • IDO to work with DAF Staff and other NRM projects such as Healthy Waterways, Burnett Mary Regional Group for Natural Resource Management, Reef Catchments Ltd, Land Care and etc to connect growers with suitable projects, Grower profiles of industry leaders in the Fruit and Vegetable News magazine • Develop two webinars around NRM and Sustainability topics for growers	• Activities completed • Attendance at Study Groups recorded
Inputs	• IDO • Hort 360 – Horticulture Best Practice Manual • DAF R&D trials • Private businesses trials with growers	

Improved Agronomic Practice		
End Result	Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes through improved agronomic practice. Raise awareness amongst growers about latest practices and new research and developments	Undertake a benchmarking of Growers (Plan, collect information, analyse, implement changes, measures overall changes in behaviour) in November 2016 and annually from there on in to understand who uses the Best Practice manual and other information and technology available to them.
Practice Change	75% of Growers using best available practices as outlined in the Best Practice manual and technology available to them. Growers are aware of the opportunity to implement trials and try new practices and implement the results from privately funded research trials and share with other growers via study groups and YouTube videos.	Data collection on how many growers have implemented any new practices. Survey growers about to find out if they are aware of trials and R&D and if they have participated in available trials and R7D
KASA Change	Aware of latest research (knowledge) Understand how to implement changes in practices on farm (skills) Actively seeking out new information (attitudes and aspirations)	Survey

Reactions	All study group participants find the day useful 75% of pineapple growers read the R&D sections of the pineapple press Undertake surveys and lead discussions with growers to understand their current practices. Collate data from surveys, questionnaires and conversations to understand the changes in Knowledge, Attitude, Skills and aspirations	Survey
People Involvement	• 60% of the growers from each region attending a Study Group located in their Growing Area. To attend one other area's Study Group meeting once per year • 80% of growers being represented the Field Day or a employee from 80% of Pineapple Farms attending the Field Day • 10 % of individual growers implementing changes and adopting new practices after visiting study groups on farms where privately funded trials are being conducted.	• survey

Activities	• Study groups and Field day – Guest Speakers, go on farm walks and develop in field exercises to demonstrate how to best use the Pineapple Problem Solver Field Guide • Facilitate exercises to share information at study groups about grower production activities. Eg Fertiliser practices, spray equipment • Visiting growers who are participating in R&D trials run by privately owned companies • Include articles in pineapple Press about agronomic practices • Work with stakeholders and growers to develop a more streamlined strategic method of data collection • Develop You-tube clip around Improved Agronomic Practices for growers	• Activities completed
Inputs	• IDO • Technical Officer • Industry stakeholders • Agronomists	

Biosecurity		
End Result	Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes and prevention of Biosecurity issues.	

Practice Change	To have more than 90% of the industry aware of Biosecurity Obligations within 9 months of the new legislation being brought in July 2016 30% increase in the take up of on-farm biosecurity measures No AgVet chemical violations	Survey growers on information updates in Pineapple Press, emails and the Australian Pineapple Website about biosecurity updates.
KASA Change	• Understand legislation and obligations • Aware of how programs to help them implement change • Aware of best practice with regards to biosecurity • Have the skills needed to implement an on-farm Biosecurity program • Aware of the Industry Biosecurity Plan developed by PHA	• Survey
Reactions	• 60% of growers have a positive experience with Biosecurity training. Undertake surveys and lead discussions with growers to understand their current practices • Collate data from surveys, questionnaires and conversations to understand the changes in Knowledge, Attitude, Skills and aspirations	• survey
People Involvement	95% participation in one or more activities that increase the knowledge of growers General Biosecurity Obligations and new legislation.	Survey Undertake observations at Study Group meetings

Activities	• Exercises to share information about AG Vet chemical practices • Include 5 articles in the Pineapple Press over a 15 month period from Biosecurity Qld to delve into Grower Obligations. • include relevant articles in the Fruit and Vegetable News and share information on Australian Pineapples website, at field days and study groups • Look at cross-industry practice for weed and pest management exercises at Study Groups • Distribute updated biosecurity plan • Initiate activities at Study Groups and Field Day including AG Vet chemical awareness, spray equipment demonstrations • Communicate responses to import applications and suspected or confirmed incursions or exotic pests • Develop You-tube clip around biosecurity for growers	• Activities completed
Inputs	• IDO • Technical Officer • DAF Biosecurity Staff • PHA Staff and resource materials • IDO manager • Infopest	

Appendix 2 Pineapple Industry Development Officer Workplans

2016

Objective	Action/Activities
Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes in natural resource management	1. Four Study Groups – conduct farm walk critiques in collaboration with PI13006 Arranging Study Group farm walk critiques with question and answer sessions with agronomists, technical officer and extension officers available to address questions from growers. Invite other Department of Agriculture and Fisheries and other Natural Resource Management project staff along to Study Groups. 2. Updates are required suggested for the Best Practice Manual. Best Practice Manual reflecting most recent R&D trials in the industry and accurately reflecting best practices in the industry. Using chapters from the BPM and Problem Solver Guide as topics for discussion at the Study Group meetings. 3. Field Day Trials and demonstrations (see text below). 4. NRM award at the Field Day and Study Groups.
Objective	**Action**
Leadership and Innovation Objective: Improve the profitability and sustainability of the Pineapple Industry through the uptake of Research and Development outcomes by empowering the next generation of Growers to take up leadership positions and adopt new and innovative changes and practices on their farms.	5. Engage growers in the different regions to take up positions as Study Group leaders. Look at past areas where Study Group leaders where positioned and reengage grower s in that region to consider becoming Study Group leaders. 6. Invite associated companies to come and demonstrate their new latest technology. Work with R&D officers and staff from Queensland Department of Agriculture and invite them to come along to the Study Groups (6-8 per year) and at the Field Day (1 per year) to present on new information.

	7. Increase use of the Australian Pineapples Website by using it as a place to find information relevant to growers. Increase usage by sending the growers links to where information has been posted. This year aiming to have an increase of 15% traffic to the website. Growers actively engaging in modern communication technologies such as webinars and social media. 8. Develop a Community of Practice meeting to discuss the role of the Industry Development Officer Project.
Objective	**Action**
Market intelligence and supply chain management – getting a better understanding of the supply chain, wholesaler, retailer and consumer demands.	9. Improved communication between packhouses and between packhouses and growers and between packhouses and wholesalers. Discuss marketing activities at packhouse meetings to ensure that they align with fruit supply and individual packhouse marketing activities. 10. Invite market agents and merchants to the Pineapple field day as sponsors or the events where they can have the opportunity to address growers.
Objective	**Action**
Improved agronomic practice – Raise awareness amongst growers about the latest practices and new research and developments.	11. Industry events: Annual Industry Field Day held 21 and 22 July 2016 12. All new growers entering the industry to have a copy of the Best Practice Manual and the Pineapple problem solver field guide. 13. Surveying growers to find out about their agronomic practices and then measuring change in their practices at the 2nd study group to be held in the second half of the year in each of the four study group regions. 14. Quarterly *Pineapple Press* newsletter (March June, September, December) Pineapple Field Day Booklet (July) & industry website updates (regularly updated with new information including Study Group minutes from the 7-8 meetings per year, Pineapple Press newsletters 4 issues per year, Pineapple Field Day Booklet in July, Biosecurity Information (as required)

	and Biosecurity Plan (April), video links (of Queensland DAF produced videos);
Objective	**Action**
Biosecurity – prevention of biosecurity issues.	15. Keep growers informed about biosecurity issues. Ensure that growers are aware of basic biosecurity practices when attending study groups and the Field Days farm visits. Engage with Biosecurity Queensland to keep growers up to date with changes in Queensland Biosecurity laws that come into effect in July 2016.

Workplan 2017

Objective	**Action/Activities**
Improve the profitability and sustainability of the Pineapple Industry through uptake of Research and Development outcomes in natural resource management	1. Four Study Group meeting. Each meeting will include a farm walk and critique; question and answer sessions with agronomists. Invite other Department of Agriculture and Fisheries and other Natural Resource Management project staff and other relevant stakeholders to attend the Study Groups. A Study Group tour will be organised and held in the first half of the year. The IDO will organise a trip and it will be a two night stay away in Melbourne, Victoria. 2. Updates are required suggested for the Best Practice Manual. Best Practice Manual reflecting most recent R&D trials in the industry and accurately reflecting best practices in the industry. Using chapters from the BPM and Problem Solver Guide as topics for discussion at the Study Group meetings. 3. Field Day Trials and demonstrations. 4. NRM award at the Field Day if there is a deserving recipient.
Objective	**Action**
Leadership and Innovation Objective: Improve the	5. Review Study Group leaders. Look at past areas where Study Group leaders where positioned and reengage grower s in that region to consider becoming Study Group leaders.

profitability and sustainability of the Pineapple Industry through the uptake of Research and Development outcomes by empowering the next generation of Growers to take up leadership positions and adopt new and innovative changes and practices on their farms.	6. Invite associated companies to come and demonstrate their new latest technology. Work with R&D officers and staff from Queensland Department of Agriculture and invite them to come along to the Study Groups (5 per year) and at the Field Day (1 per year) to present on new information. 7. The Australian Pineapples Website is a place to find information relevant to growers. The IDO will continue to update the content of the website however it has been acknowledged that most growers get their information through face to face events, email and telephone conversations with the IDO. 8. Convene a Community of Practice meeting to discuss the role of the Industry Development Officer Project.
Objective	**Action**
Market intelligence and supply chain management – getting a better understanding of the supply chain, wholesaler, retailer and consumer demands.	9. Improved communication between packhouses and between packhouses and growers and between packhouses and wholesalers through bi-monthly meetings Discuss marketing activities at packhouse meetings to ensure that they align with fruit supply and individual packhouse marketing activities. Undertake data collection at the packhouse meetings and distribute this to HIA Marketing Manager and Industry Relationship Manager after each packhouse meeting. 10. Invite market agents and merchants to the Pineapple field day as sponsors or the events where they can have the opportunity to address growers.
Objective	**Action**

Improved agronomic practice – Raise awareness amongst growers about the latest practices and new research and developments.	11. Industry events: Annual Industry Field Day held 20 and 21 July 2017 12. All new growers entering the industry to have a copy of the Best Practice Manual and the Pineapple problem solver field guide. The IDO will give the contact details for Simon Newett, at the Department of Agriculture and Fisheries who will organise a copy of the Best Practice Manual for them. 13. Surveying growers to find out about their agronomic practices and then measuring change in their practices at the 2nd study group to be held in the second half of the year in each of the four study group regions. 14. Quarterly *Pineapple Press* newsletter (March, June, September, December) Pineapple Field Day Booklet (July) & industry website updates Biosecurity Information (as required) and video links (of Queensland DAF produced videos) and new biosecurity information as needed;
Objective	**Action**
Biosecurity – prevention of biosecurity issues.	15. Keep growers informed about biosecurity issues. Ensure that growers are aware of basic biosecurity practices when attending study groups and the Field Days farm visits. Engage with Biosecurity Queensland to keep growers up to date with changes in Queensland Biosecurity laws that come into effect in July 2016.

Appendix 3 – Study tours 2016 and 2017

NT Tour June 2016

Key points from Northern Territory Study Group Tour

Coastal Plains Research Station

- Biosecurity is very important
- Each farm should be protecting themselves
- It takes very little to ensure you protect your farm from the spread of disease
- Outside visitors find it easy to comply with your biosecurity measures.

Piñata at Humpty Doo

- Natural flowering is avoided in the hotter conditions of the NT
- Biosecurity is taken very seriously; foot baths are a good way to avoid contamination
- Limit the movement of plant tops from farm to farm and from region to other regions to avoid bringing pests and diseases from one farm to another.
- Keeping your workers busy all year round is an important measure to keep good staff employed and happy working on your farm.
- In extreme hot conditions, limiting the herbicides applied to your crop will reduce the recovery time.
- Hand weeding is an important weed control method to avoid crop damage in hot conditions.
- Bringing your plant in away from the edge of the formed beds in areas with intense heavy rainfall will reduce the chance of root exposure.
- The width of the walkway between rows can prevent the plants from laying over on their side
- Iron is good for developing a good fruit colour

Mango Packing Shed

- Co-ownership of major infrastructure can have financial benefits and promotes a cooperative environment. Also allows positive lessons to be shared rather than acting competitively.
- Investment in tracking technology can help with systemic issues that arise in the field but are only discovered in the packing shed.

Mango Farm – Katherine

A simple cost benefit analysis can have a major impact on your bottom line and the time taken to investigate can save you money in the long run. For example the use purchase of white poly pipe

instead of black poly pipe. White polypipe can last up to 10 years and only costs 10% more than black poly pipe which lasts 5 years on average.

Asparagus Farm – Katherine

- Timing can be very important when wanting to grow a profitable crop. So knowing accurate market information can provide a competitive advantage for your business.

Red Dirt Melon Farm

- Biosecurity again is a top priority
- All visitors must adhere to strict biosecurity measures
- The larger the size of the farming operation in remote areas the more likely it will be successful, as you need scale out in there to succeed.
- Dust is blown off the trains and fruit before it enters the shed, this stops dirt movement
- Planting direction can produce shadows that help protect your plants from sunburn

A survey of the growers who attended the Study Group found that the following points were of particular interest to them:

- Biosecurity is very important
- Each farm should be protecting themselves against potential biosecurity threats
- Natural flowering is avoided in the hotter conditions of the NT
- Biosecurity is taken very seriously; foot baths are a good way to avoid contamination
- Limit the movement of plant tops from farm to farm and from region to other regions to avoid bringing pests and diseases from one farm to another.
- Co-ownership of major infrastructure can have financial benefits and promotes a cooperative environment. Also allows positive lessons to be shared rather than acting competitively.
- Iron is good for developing a good fruit colour
- Keeping your workers busy all year round is an important measure to keep good staff employed and happy working on your farm.
- A simple cost benefit analysis can have a major impact on your bottom line and the time taken to investigate can save you money in the long run. For example the use purchase of white poly pipe instead of black poly pipe. White polypipe can last up to 10 years and only costs 10% more than black poly pipe which lasts 5 years on average.
- Timing can be very important when wanting to grow a profitable crop. So knowing accurate market information can provide a competitive advantage for your business.
- Biosecurity again is a top priority
- All visitors must adhere to strict biosecurity measures

- The larger the size of the farming operation in remote areas the more likely it will be successful, as you need scale out in there to succeed.
- Dust is blown off the trains and fruit before it enters the shed, this stops dirt movement
- Planting direction can produce shadows that help protect your plants from sunburn

Date	Time	Location	Overview
04/05/2017	5.00am	Melbourne wholesale Market - Epping	Market tour, including flower markets followed by breakfast
	7.30am	VB Sculli Warehouse	tour
	8.15	Depart for Maffra	
	10.00	Morning tea	
	11.15	Arrive at Dicky Bill fresh salads	Dicky Bill grows, packages and sells leafy greens (mesclun, spinach and wild rocket. Hugh Reardon owner/manager took growers through the operation.
		Farm tour of Dicky Bill	- Netafim Irrigation and Fertigation equipment - Hoaf Weed Burner – Weeds that are burnt by steam, to reduce pesticide use on farm - Valley Fabrication Harvester demonstration - Wild Eye Moisture Probes – soil moisture monitoring tools - Shed Tour o Bin to Crate Line o Wash Line
		Valley Fabrication Harvester Demonstration	Only one of its kind in Australia. Built in the US. Harvests 8-10 tonne/hour with 2m bed spacings. Uses wild eye moisture probes which feed information back into farm management systems and decision making.
		Apunga software demonstration	Apunga is a full lifecycle farm management system developed by Hugh Reardon. It enables growers to drive efficiencies across your business and streamline every aspect of farm planning and day-to-day management—all with one simple, scalable and seamlessly integrated cloud—based solution.
		General discussion on HR practices at Dicky Bill	Discussed the importance of fostering positive staff attitudes, hiring and firing staff, general workplace culture and communication with employees.
		Farming Apps	Overview of farming apps used by Dicky Bill – - Veg pest ID (http://ahr.com.au/news/pest-and-disease-identifier-released/) - Planimeter is a maps ruler tool to measure area, distance, perimeter, bearing, angle and GPS coordinates on map. You can set notes for each point and use this app for mapping or store your favorite locations or landmarks and create GPS tracks.(https://play.google.com/store/apps/de

			tails?id=com.vistechprojects.planimeter&hl=en) - Whats app – (https://www.whatsapp.com/ a free messaging App - Davis weather link (real-time weather information) (https://www.davisnet.com/weatherlink/)
05/05/2017	7am	Flavorite Tomatoes - Warragul	Flavorite is the 3rd largest glasshouse operation in Australia. Approximately 20ha of hydroponic tomatoes and capsicums. Growers toured the facilities with Karen Swanpoel IPM Manager who showed them the whole facility from nursery to packing shed. Growers saw grafting of tomatoes, irrigation and IPM practices. Biosecurity, robotics and packshed automation were high on the agenda
	12pm	Return to Melbourne – end of tour	

Appendix 4 – Field day reports

Field Day 2016

The Pineapple Field Day was held in Central Queensland on the 20 and 21 July. Over 60% of the growers attended the two day event. There were also representatives from most parts of the supply chain; including market agents from all major markets across Australia; Queensland Department of Agriculture and Fisheries staff and Workplace health and safety Queensland; the local catchment group, rural suppliers and other ancillary suppliers; chemical companies and representatives from Growcom, the Pineapple peak representative body.

The Field Days includes visits to four farms in the Tanby and Bungundarra areas. The farm tour included looking at a number of long term research trials and anerosion and sediment product application was demonstrated.

The Field Day meeting included chemical access training and accreditation, updates from Horticulture Innovation Australia's Pineapple Industry Relationship Manager and the Marketing Manager, Growcom.

The Pineapple Field day was considered highly successful by all that attended. The agenda included information sessions, training (Chemical Access training), R&D trials and time for catching up with company representatives, Department of Agriculture and Fisheries staff, stakeholders and other growers.

Although a formal survey was not carried out with the growers, the IDO gathered feedback from individuals through telephone conversations and at the Study Groups which were held in the second half of the year. Verbal feedback included that they thought the day had a good balance between types of information, such as R&D, Policy, marketing, trials and demonstrations balanced with plenty of social time to talk and meet other growers, sponsors and relevant stakeholders. The only feedback received was that it would be good to have a open invitation sent to all market agents across Australia to ensure that any that are interested in attending the Field Day are aware of the dates and can plan to attend if they so desire.

The next Field Day will be scheduled in the same format as 2016 Field Day, as the balance worked well. It will be held on the 21 & 22 July 2017 in South East Queensland. This will provide substantial time for any trials to be established for viewing at the Field day next year. Preparations began immediately following the conclusion of the previous field days to ensure that any trials that were planned were coordinated with the Industry Development Officer.

Field Day 2017

56 growers (approx. 70% of industry) attended the field day and were able to view R&D trials on:

- FertiCote Controlled Release Fertiliser Trial: Effects on pineapple crop establishment. Location Oakes Farm Yandina
- Controlled Release Fertiliser: Effects on pineapple productivity and N leaching. Location Robert Frizzo & Ian Fullerton's farm

- Edge of Field Denitrification Bioreactors: Reduction of environmental N impacts. Location G.O. Pike & Sons Farm
- Nitrogen Budgeting in Pineapple: Quantification of nitrogen use efficiency and environmental losses. Location Pumicestone Catchment of South East Queensland

The field day was also attended by eight market agents and sponsors from across the supply chain as well as speakers from Horticulture Innovation, the ACCC, the Queensland Department of Agriculture and Fisheries and Queensland Drones.

Pineapple Field Day program

Thursday 20		
9am	Delegates collected by bus from their accommodation and arrive at Oakes & Sons for registration	
10 am	Morning Tea, sponsored by Orora. Welcome from Stephen Pace and CDIF Solar to present	
10.45	Barmac trial demonstration by Renier Scheepers, Area Sales Manager	
11.30	Grower discussion on future IDO role (non- growers will be taken back to Valdora Hall)	
12	All delegates return to Valdora Hall for spit roast lunch sponsored by A-Gas Rural	
12.45	Guest speakers from Growcom (Rachel Mackenzie), Hort Innovation Australia (Astrid Hughes and Craig Perring) ACCC (Cynthia Tupicoff)	
2.30	Happy hour drinks sponsored by Nathan Gleeson at Oakes & Sons includes demonstration of Plough equipment by David Evans Group	
3.30	Bus departs Oakes & Sons and returns delegates to their accommodation	
6.30	Delegates to arrive at the Maroochy RSL for pre-gala dinner drinks, sponsored by A-Gas Rural	
7.30	The Gala Dinner at the Maroochy RSL will commence, will feature guest (NRL) speakers, sponsored by Tropical Pines and AustSafe Super .	
Friday 21		

7.30	Breakfast at Alex Surf Club, sponsored by Apunga	
8.45	Bus departs from Alexandra Headland for Glasshouse Mountains	
9.15	Bus departs from Glasshouse Mountains Community Hall for local farm visits, sponsored by Hort360	
9.30	Delegates to arrive at Robert Frizzo's farm, Beerwah for farm tour and trial discussions. Guest speakers David Defranciscis, Burdekin cane farmer	
10.30	Bus departs from Robert Frizzo's farm for Bonny Rig (Ian Fullerton)	
10.45	Arrive at Bonny Rig, This will include a morning tea sponsored by Incitec Pivot, Garth Sanewski – Natural Flowering trial, Stuart Irvine-Brown, Dept of Agriculture and Fisheries and Coochin Creek Co-op controlled release fertiliser trial	
11.55	Bus departs from Bonny Rig to G.O Pike & Sons	
12.10	Delegates arrive at G.O Pike and Sons for tour with Adam Pike and presentation on Nitrogen Edge of Field Barrier Bioreactor with Stuart Irvine-Brown from the Dept of Agriculture and Fisheries	
12.45	Bus departs G.O Pike and Sons for Glasshouse Mountains Community Hall	
1pm	Lunch at Glasshouse Mountains Community Hall sponsored by Lindsay Rural. Over lunch presentations from Hort 360 (Anna Geddes), Dept Agriculture & Fisheries (Simon Newett), Qld Drones (Tony Gilbert), Apunga (Richard Ward), Work Health and Safety rep	
3pm	Happy hour sponsored by Lindsay Rural	
4pm	Delegates are returned to their accommodation	

Appendix 5 -Report on Uptake of NRM practices and Biosecurity practices in the pineapple industry

The pineapple IDO project has the key objectives of improving the profitability and sustainability of the pineapple industry through uptake of research and development in natural resource management and biosecurity.

Specific practice change objectives were:

- To have more than 90% of the industry aware of Biosecurity Obligations within 9 months of the new legislation being brought in July 2016
- 30% increase in the take up of on-farm biosecurity measures
- No AgVet chemical violations
- To have a 30% increase in the adoption of improved erosion control programs and increase in awareness of new products such as Hort360

These practice change objectives are underpinned by changes in knowledge, attitudes, skills and aspirations relating to:

- Understanding of legislation and obligations
- Aware of how programs to help them implement change
- Aware of best practice with regards to biosecurity
- Have the skills needed to implement an on-farm Biosecurity program
- Aware of the Industry Biosecurity Plan developed by PHA

The main mechanism for evaluating the effectiveness of the IDO project in facilitating these changes was through a survey conducted in November 2016 and data from other programs relating to best management practice. The survey was reported on in full in Milestone 103 however specific findings related to biosecurity and NRM are documented here.

Natural Resource Management

The survey conducted in 2016 had a 50% (n=29) response rate from industry which means that it is a reasonable indicator of practice change across industry.

More than 30 percent (31.03%) of respondents had actually changed erosion and sediment control measures on their farm as a consequence of attending study groups or the pineapple field and nearly 40 percent believe that erosion control methods are worthwhile and beneficial. Interestingly far fewer growers indicated their knowledge, skills or aspirations in relation to erosion control had changed as a consequence of attending the study groups/ field days. A possible conclusion is that the study groups/field days gave them practical tools to make the changes rather than changing their underpinning attitudes. While this figure indicates that the deliverable for the overall project has already been met, further work can be done to improve practice in this area.

The IDO played a significant role in facilitating the involvement of pineapple growers in the industry wide Hort360 program focusing on sediment and nutrient. This program, funded by the Queensland

government and delivered by Growcom had significant engagement with the pineapple industry. Key activities were:

- a demonstration of the Stonewall polymer application used for erosion control supported by a hort360 presentation at the 2016 pineapple field day
- a presentation on using LiDAR technology to form an Erosion Management Action Plan and a farm walk to 'erosion hotspots'.

LIght **D**etection **A**nd **R**anging (LiDAR) is a remote sensing technique that maps a 3D view of a property. It captures information such as vegetation, elevation, contours, flow accumulation and direction and can be used to model drainage plans for water logging, soil moisture, soil depth as well as identify erosion hotspots. From this 3D modelling Erosion Action Management Plans (EMAP) can be derived and implemented for individual farming needs. This includes proposed farm drain placement and estimates on tonnes of soils saved per year figures.

Erosion Management Action Plans are designed to minimise erosion and soil loss from farms. The majority of maps designed for this program focus on mapping surface water flow and erosion hotspots on a farm scale and designing mitigation measures. Five pineapple growers have received maps with a further six in preparation. There will be a follow up workshop in July detailing how these maps can be used on farm to achieve maximum outcomes.

Five pineapple growers have also received maps NDVI mapping. NDVI **N**ormalised **D**ifference **V**egetation **I**ndex uses near-infrared technology to measure crop biomass or "green canopy density" by accurately measuring tiny differences in light absorption and reflection.

NDVI can detect problems associated with poor or 'patchy' growth such as:-

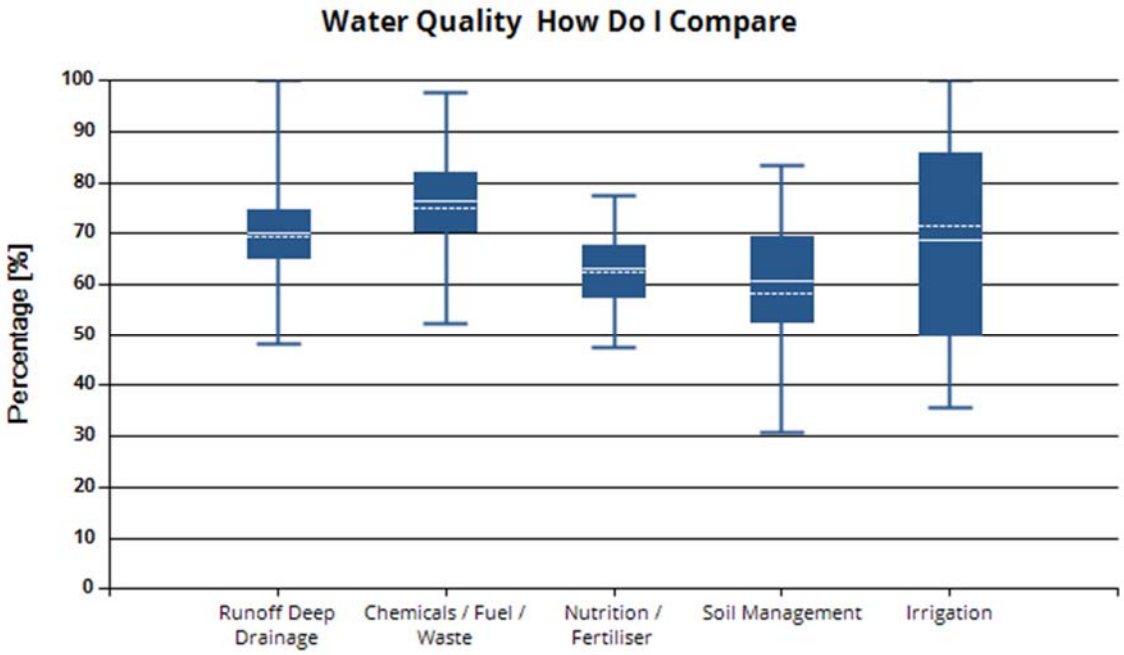
- nutritional disorders
- water-logging
- poor drainage
- compaction
- pest and disease pressure
- soil types as well as spraying & fertiliser mishaps

It also doubles as a management tool which enables growers and agronomists to confirm that crop growth & uniformity is progressing as it should be. This tool gives the grower the ability to intercept 'invisible' crop damage early which can significantly boost yields and allows growers to better manage their most expensive crop inputs based on crop health and plant density.

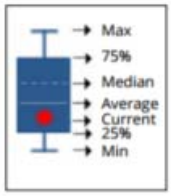
Thirty pineapple growers across Queensland have completed the Hort360 water quality module and the graphs below indicate how well they are tracking. Growcom through the IDO and other project staff have also worked closely with the Queensland Department of Environment and Heritage in designing a project specifically targeting nitrogen use in the Pumicestone region as there have been

extremely high levels recorded in local waterways. This project is aligned with a QDAF project looking at using nutrient budgeting to optimise nitrogen use in pineapples and reduce off-site impacts. The IDO has been critical in building the links between the growers and the project teams and will continue to support the project as it develops.

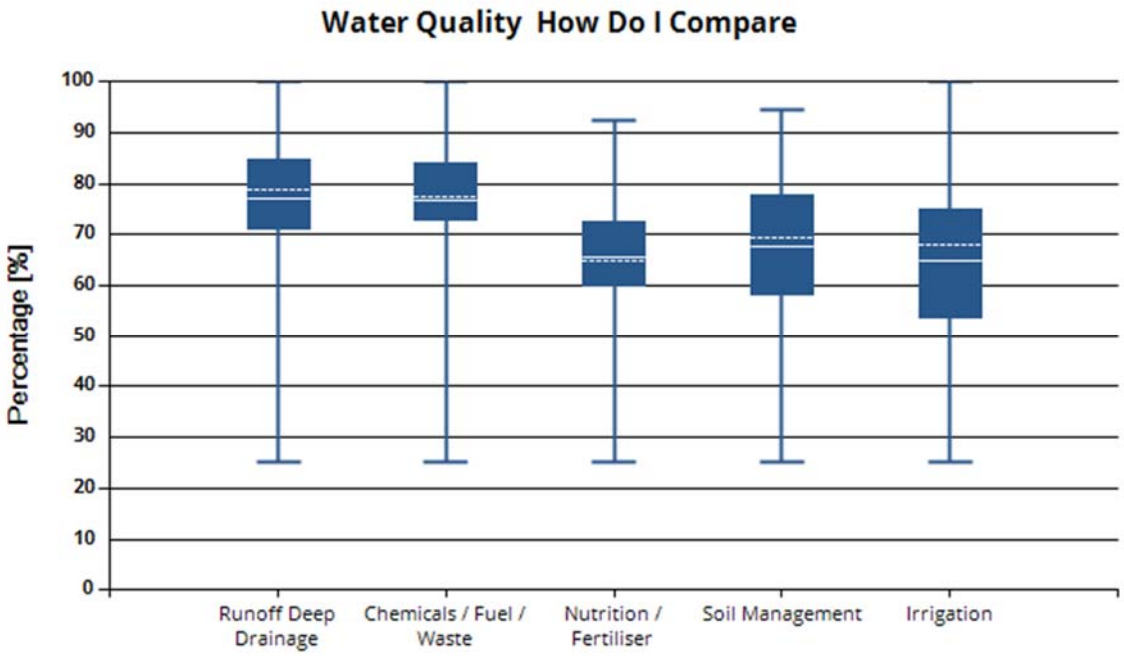
Chart 1: Pineapple growers that have completed the Water Quality module. Chart indicates approximately 35 pineapple growers have completed the Hort360 Water Quality module from across Qld.[1]



- From this data it can be interpreted that the pineapple industry as a whole needs to focus on soil management and nutrition as the majority of growers are only sitting slightly above compliance (50%). Individual growers need significant support with soil management and resources can be directed to better assist those individuals. Pineapple growers tend not to irrigate unless it is particularly dry, so whilst there is considerable variability within the industry it is not a high priority area for action.
- Chart 2 shows the response of all growers who have undertaken the water quality module (720 WQ modules have been completed by 400 growers across all commodities in Queensland)



[1] Chart legend. The red dot is provided for individual growers to identify where they sit.



By comparing the two charts we can see that pineapple growers are less effective at managing deep drainage (average score for all growers is 9% higher than for pineapple growers) but have less variation than the industry as a whole. Pineapple growers score similarly with regard to chemical, fuel and waste management

In relation to nutrition and fertiliser practices, pineapple growers score slightly less well overall compared to all growers and the same was the case for soil management. That said there was a big spread in practice within the pineapple industry.

As irrigation is not commonly used within the pineapple industry there is no value in making this comparison.

In conclusion the data from the survey as well as the actual data generated from the Hort360 modules highlights that while good progress has been made, there is significant potential for improved NRM practice within the industry.

Biosecurity

The 2016 survey indicates that while nearly 35 per cent of respondents have an increased knowledge about biosecurity and how it might impact on their farm, only 6.9% have made actual changes on farm. This is concerning considering there has been a finding of a potential exotic plant pest and the whole industry has been engaged in discussions about the implications of this pest to their business. The Growcom Chief Advocate gave a presentation on the finding of the potential plant pest at the pineapple field day (80 growers in attendance) as well as sending out numerous industry updates via email.

Conversations with industry leaders within the banana industry highlight how difficult it is to change on-farm practice until there is a major industry crisis. The pineapple industry is acknowledged as one

of the more cohesive of the horticulture commodities however this collegiate spirit can have negative implications in terms of basic biosecurity practice as growers are accustomed to driving their vehicles around other farms. Many growers who attended the Northern Territory study tour commented on the more stringent biosecurity requirements such as foot baths and vehicle control.

It is proposed that the second round of study groups in 2017 have a practical biosecurity focus with an emphasis on showcasing biosecurity best practice rather than just talking about it. Growcom is also investigating opportunities to develop an on-farm biosecurity module for Hort360. The results in the NRM area highlight how effective a specific Hort360 module has been in driving practice change and identifying areas of concern.

Whilst it is not directly aligned to biosecurity there has been an increased focus on best practice in relation to chemical management over the duration of the project. The pineapple industry has recently regained access to the herbicide diuron but only to growers who have undertaken a diuron certification administered by Growcom and approved by the Queensland government. 50 growers have undertaken the diuron training which was delivered at the pineapple field day and at a separate South East Queensland training session at Elimbah.