CENTRAL QUEENSLAND PINEAPPLE STUDY GROUP 8 MARCH 2016

Moyle Boto's farm, 248 Tanby Post Office Rd, Yeppoon

TAKE HOME MESSAGES

The new extension project is underway with two study group workshops per year in each of the four regions and demo trials being set up to be followed at workshops and also in the "Pineapple Press" and online on the new pineapple industry website.

Take a few minutes to complete the CQU on-line survey about adapting to extreme weather events (see page 7) https://www.surveymonkey.com/r/tropicalfruitCQ

Carpet scraps can be used for an effective, low cost measure to reduce soil erosion.

The Annual Pineapple Industry Field day will be held at Elimbah in SEQ from Thu 25th to Fri 26th July.

CQU is conducting research into automated assessment of natural flowering % and fruit maturity

CQU is also conducting some research on nematode management.

Monitor for African black beetle, mealybug and red mite, and maintain prevention measures.

New nutrient and sediment catchment load limits expected as part of new Great Barrier Reef (GBR) protection measures

Funds available to subsidise measures to reduce off-farm deposition of soil, pesticides and fertilisers

Happy campers at Cawarral

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Present (23 + 9 = 32)

Local growers (19): Stephen and Beau Black, Moyle, Noel, Dallas, Connor, Wade, Trent & Cal Boto, Clinton Bradford, Jake and Ryan Brooks, Ben Clifton, John Cranny, Bob Daniels & Chris Williams, Dale & Peter Sherriff, Nathan Stevens.

Growers from other regions (4): Robert Pace (NQ), Adam & Trish Payne (Bundaberg), John Steemson (Bundaberg).

Non-growers (9): Joe Craggs (Tropical Pines), Lee Dendle (Elders, Rockhampton), Bridie Carr and Simon Newett (DAF Qld), John Metelli (QRIDA), Simon White, Stephen Xu & Jady Li (CQU, Bundaberg), Tim Wolens (Agri Supply Global)

Apologies: Doug Jones (Kraft Heinz Golden Circle), Harry Bradford & Mick Cranny, Michelle Haase (Growcom, Bundaberg)

Agenda

- **1 pm –LUNCH, tea, coffee, soft drinks.**
- 1:30 pm - Welcome, acknowledgements, introductions, outline of the afternoon's programme.
- 1:35 pm
  - Overview of new extension project – Simon Newett & Tim Wolens
  - Update of industry issues including levy spend & funded projects – John Cranny
  - Plans for Annual Pineapple Industry Field Day in SEQ 25-26 July 2019 & Field Day in 2020 – John Cranny
  - Call for nominations for pineapple industry awards – John Cranny
  - Pesticide update – including current registrations & permits – Simon & Tim
  - Developments with Great Barrier Reef protection measures – Simon
  - Information on grants available via Growcom for reducing off-farm deposition of soil, pesticides and fertilisers - Simon
  - Upcoming production & forecast data collection – Bridie
  - Ideas for pineapple posters & videos – Simon, Bridie & Tim
  - Queensland Rural & Industry Development Authority (QRIDA) – John Metelli (5 mins)
- 1:55 pm – Overview of the farm operation – Moyle Boto
- 2:05 pm – Nominate farm critique leader
- **2:06 pm – First half of farm walk**
- **2:45 pm – DRINKS** break and complete the **Pre-project Survey** at shed (Drinks sponsored by Elders)
- Experimental use of drone and hyperspectral images for measuring natural flowering and fruit maturity – Stephen Xu, CQU Bundaberg
- Nematode management research – Jady Li, CQU Bundaberg
- $5,000 grants GBR. Contact Michelle Haase, Growcom, Bundaberg. 0428 586 890
- **3:20 pm – Second half of farm walk**
- 4:00 pm – Farm critique, discussion, evaluation of the day, **DRINKS & SNACKS**
- Request for growers to answer e-survey on "Business impact of extreme weather on pineapples in Central Queensland" – Sabrina Haque (CQU Masters student)
- **4:30 pm**. Finish

Australian Pineapples – John Cranny

John outlined the state of the R&D funds and Marketing funds:

Hort Innovation Strategic levy investment | PINEAPPLE FUND

Current financial operating statement

	R&D	Marketing	Total
	2017/18	2017/18	2017/18
	Jul-Jun	Jul-Jun	Jul-Jun
Opening balance	**148,935**	**41,755**	**190,690**
Levies from growers (net of collection costs)	200,925	88,655	289,581
Australian Government money	96,067	-	96,067
Other income*	8,357	1,266	9,623
Total income	**305,350**	**89,921**	**395,271**
Project funding	139,842	50,556	190,398
Consultation with and advice from growers	19,028	7,408	26,437
Service delivery – Base	6,565	2,395	8,960
Service delivery – Shared	9,941	3,627	13,568
Service delivery – Fund specific	16,759	4,448	21,207
Total expenditure	**192,135**	**68,435**	**260,570**
Levy contribution to across-industry activity	4,012	-	4,012
Closing balance	**258,137**	**63,241**	**321,379**
Levy collection costs	11,746	6,496	18,241

At the end of 2016/17, the industry's pro rata share of levy funds were committed to strategic reserves, and so have been deducted from the 2017/18 opening balance seen here.

* Interest, royalties

This is the list of projects currently funded by the pineapple industry:

Pineapple industry projects:

- Pineapple Integrated Crop Protection Program - PI17001 (this project)
- National pineapple breeding and evaluation program - PI17000 (Garth Sanewski)
- Pineapple industry minor use program - PI16000 (Jodie Pedrana)

Across-industry projects:

- Melon and pineapple industry (Strategic Agrochemical Review process - SARP) report updates - MT18007
- Various data generation investments - AT17000, ST15029 and MT17012
- Consumer behavioural and retail data for fresh produce - MT17015
- Australian Horticulture Statistics Handbook 2015-2018 - AH15001

For more information about your levy investments, financial information and general industry information please visit the below link: https://www.horticulture.com.au/growers/pineapple-fund/

Networking whilst enjoying some home baking from the Boto family

THE NEW PINEAPPLE EXTENSION PROJECT: "PINEAPPLE INTEGRATED CROP PROTECTION PROGRAM"

The intended outcome is "Improved viability and sustainability of the Australian pineapple industry".

The project commenced in November and will run for 4 ½ years. It is co-funded by pineapple grower R&D levies which are matched through the Federal Government through Hort Innovation and also co-funded by the Queensland Government through the Department of Agriculture & Fisheries (DAF).

There are three project partners - DAF (Simon Newett and Bridie Carr), Agri Supply Global (Tim Wolens) and Growcom (Janine Clark and Natalie Brady).

Tim pointed out that the industry decided not to appoint a new Industry Development Officer but instead to fund a more technical role with focus on advancing the industry through reinstating research and development.

Moyle grows Smooth Cayenne (mainly Clone 34) for the fresh market

DAF will:

- Lead the project
- Deliver two grower study group workshops per year for each of the four regions
- Produce two videos for growers (suggestions welcome)
- Produce two posters for growers (suggestions welcome)
- Maintain international networks
- Conduct a review of plant nutrition, and pest and disease practices. This will involve a review of practices here and overseas, a review the research literature and a report with recommendations for the industry
- Collect pineapple production and forecast data for the Australian industry twice per year
- Update chapters in the Best Practice Manual as required
- Investigate software options for the collection of trial data, production data and as a tool for keeping farm records

Agri Supply Global will:

- Establish 17 to 19 demonstration trials around the industry on the following topics:
    - Site selection, layout and drainage
    - Ground preparation, fallow management and bed formation
    - Management of erosion and sedimentation
    - Best practice, new and innovative crop nutrition practices pre- and post-planting
    - Integrated pest and disease management (IPDM) strategies, with a focus on expanding the range of management options available, reducing reliance on broad-spectrum pesticides and improving environmental performance.
- Collect data and report on the progress and results of these trials
- Use these trials as the focus for many of the study group workshops.
- Regularly update growers on the progress of these trials through the “Pineapple Press” newsletter and the growers’ section of the Australian Pineapples website
- Conduct cost/benefit analyses of trial treatments where appropriate

Tim is looking for trial sites at Rollingstone and Yeppoon and is also asking for ideas for trials. If you are interested in hosting a trial or have a good idea that needs testing please contact Tim Wolens on 0409 848 076.

Growcom will:

- Organise and conduct the annual Pineapple Industry Field Day
- Produce and distribute the quarterly pineapple industry newsletter “Pineapple Press”
- Develop the grower section of the industry website to provide information including:
    - a ‘page’ for each demonstration trial with layout, treatments, progress reports, photographs, results and the ability for growers to add post comments
    - minutes from the study group meetings
    - chapters of the Best Practice Manual
    - links to the industry videos
    - upcoming events

The project will link with other activities such as DAF's project conducted by Stuart Irvine-Brown and Rachel Abel "Investing in our environment for the future"/"Resilient Rivers" (e.g. installing bioreactors, reducing fertiliser leaching etc), and Growcom's "Hort 360" project which also focuses on improving the quality of water leaving the farm.

The project partners will work together on all activities and will also set up a "community of practice" for the growers hosting trial sites.

Sunburn has been an issue this summer, even for fruit sitting upright. Heatwave conditions were experienced in November.

PRODUCTION DATA COLLECTION - BRIDIE CARR

As in previous projects, industry production data will be collected twice a year and reported back to industry. Industry production data is an important statistic to collect for the industry, as it helps to keep the industry informed of its size and development and to encourage investment. It is used for industry planning purposes, by agrichemical companies for pesticide registration purposes, and government for aligning resources and funding.

Historically, Simon Newett has collected this data by calling each individual grower, repeating the last forecast figures that were provided to him, and then asking for an update on these. Though this method has been satisfactory in the past, there is room to make this collection process more efficient and easier for both the collector and those providing the data.

A conversation between DAF and Golden Circle has taken place to see whether there is potential for crop production data that is routinely collected by the cannery to feed into the collection of industry wide data. We are aware that this method will not capture the fresh market data, so a plan will be made on how to collect this alongside the cannery figures. In order to gather this data a disclaimer

will need to be signed for those that supply fruit and production data to Golden Circle to allow DAF access to this information. For those that only supply fresh market a simple, user-friendly spreadsheet will be developed and circulated. Please pass on any feedback or ideas you may have on improving the collection of production data.

The type of information that will be asked for is:

- Production volumes
- Forecasted volumes
- % ratooned
- Varieties being grown
- Spread of harvest

We hope that all growers will adopt the spreadsheet so that future production data collection can be an easy and pain free exercise for all involved.

ANNUAL PINEAPPLE INDUSTRY FIELD DAY

The 2019 Annual Pineapple Industry Field Day be held on

Thursday 25th and Friday 26th July in South East Queensland.

The central venue will be Fullerton Farms near Elimbah and visits also planned to Piñata and Seven Peaks farms in the Wamuran area. The program will have a lot of technical content, agronomy, visits to trials and machinery displays. In the meantime growers are asked to nominate people for each of two awards to be presented at the gala dinner on the Thursday evening – the 'Rudy Wassman Award' for a promising younger member of the industry and the 'Col Scott Award' for someone who has made a significant contribution to the industry.

EXTREME WEATHER EVENTS: A CASE STUDY OF CENTRAL QUEENSLAND FRUIT GROWERS OF IMPACTS ON BUSINESS– A CQU STUDY

Sabrina Haque, a Masters student at CQU in Rockhampton, is conducting this study and would be very grateful if growers would give 15 – 20 minutes of their time to complete a short online survey by clicking on the following link:

https://www.surveymonkey.com/r/tropicalfruitCQ

Amongst other goals this project is intending to find out "how tropical fruit farming systems can be better supported to adapt to events such as cyclones, floods and heatwaves."

It is in your interests and those of the pineapple industry to participate in this survey so I strongly urge you to spend the 15 – 20 mins necessary to answer this survey. Very many thanks.

More detail on the study was provided on a flyer that was handed out at the study group workshop, contact Sabrina via s.haque@cqu.edu.au or **0470 265 416** if you'd like a copy of the flyer or you have any queries.

QRIDA BRIEFING - JOHN METELLI

John Metelli is a regional area manager for the Queensland Rural and Industry Development Authority, based out of Rockhampton. There are nine regional area managers based throughout regional Queensland that provide up to date information on QRIDA's programs to producers, small business operators, bankers, accountants and government agencies. They are also available to meet on-farm to help producers with their queries and assist with their applications. John welcomed anyone to reach out with any questions they may have, or to set up an appointment to discuss their needs.

Ph: (07) 4936 1872
Fax: (07) 3032 0390
Mobile: 0417 775 245
Email: john.metelli@qrida.qld.gov.au

FARM WALK AND OVERVIEW

Moyle Boto gave an overview of his farming operation before we headed out into the field. Moyle grows Smooth Cayenne for the fresh market and Clone 34 is the main variety which he finds has a low number of slips. They try and produce all their own planting material and this is achieved by applying Maintain® to 15,000 plants per year to yield enough slips to plant 50,000 per year. Planting material is graded into three sizes (small, medium and large).

View from the shed northwards over Moyle Boto's farm

His double row pineapple beds have 1.5m centres and pineapples are planted 250mm apart down the row which works out at about 53,000/ha or 21,500/acre. Pineapples are planted by MacIntyre designed planters – Moyle has a cam planter and a drag planter. He plants short ('basket') rows across the slope. Planting material is graded into small, medium and large size grades.

DAP is the only fertiliser applied as a pre-plant. Fertiliser is applied as a post-plant drench starting at two months of age using a hose winder until plants are big enough to boom spray. In addition two side dressings of 77S are applied, once at four months of age and once at six months, 1 tonne/ha at each application.

Talstar® and Ridomil® are applied for symphylids and phytophthora respectively. Diazinon is applied for scale and mealy bugs every two months.

Split applications of weedicide are applied post plant (diuron and bromacil). Verdict is used to spot spray grasses from a quad bike and has been found to be very effective.

White spot triggered by wind damage

The farm is quite exposed to wind and it is difficult to apply sprays at times.

The heatwave in November (10 days of over 39°C) resulted in some sunburn damage. Moyle also believes that it led to natural flowering which will need a harvest in May this year instead of November – a full 6 months earlier than planned. Moyle thinks that Clone 34 is a bit more susceptible to natural flowering than other clones.

Moyle also mentioned they were experiencing some issues with copper deficiency on the farm. This was seen by some of the leaves having an absence of trichomes and an oily like appearance. They have been top dressing with copper sulphate to try and alleviate the issue.

Mild case of copper deficiency – absence of trichomes (leaf hairs) gives leaves an 'oily' appearance

Carpet drains have been set up on the farm to try to minimise bed and soil erosion. Carpet off-cuts are collected from a local supplier and then cut to size. It is used on the end rows of beds which are most susceptible to erosion on the property. Moyle praised the results they were getting with the drains and has found them to be doing a great job at keeping the soil where it should be. His tips included making sure the joins overlapped to prevent lifting, as well as burying the ends of the carpet at each end into the soil to hold it in place. He also said that the freshly laid carpet drains struggle to move after a few rain events given the weight kept it in place.

Carpet off-cuts to reduce erosion

There has been some quite significant red mite damage in young plantings caused by infected planting material. This has resulted in some uneven growth. Abamectin has been trialled to control red mite but has found to be cause phytotoxic to pineapples. Further trials will be undertaken. Tim also talked about mealy bug in fruit and how it is becoming quite evident across the industry. (see photo on page 16 below).

Red mite damage, old damage (left) and more recent damage (right)

Uneven growth caused by red mite damage in early development

Moyle's crop destruction approach is to mulch the crop first, allow it to break down somewhat and then use a rotary hoe. The rotary hoe will only be used once there is a sufficient moisture in the soil, this is for preventing damage to the hoe blade. Moyle uses a 12 month fallow and is a strong believer in fallow crops, cowpea and **forage sorghum** are commonly used in the summer months and generally good growth is obtained which smothers the weeds. Oats are used in winter. Both Moyle and Noel mentioned the beneficial effect that fallow crops have on the biology of the soil and the improvements it has made on their farm.

The soil pH was 4.1 a few years ago but he now prefers a pH of around 5. Calci-prill is applied at 2.5 t/ha (1 t/acre) and this is incorporated prior to planting.

Moyle built a new dam in December 2017. It is in a central location on the farm and is valuable for spraying, irrigation and as a house supply. Water is pumped from the dam to a tank at the highest point on the farm. Moyle irrigates fields prior to planting. John Steemson from Bundaberg commented that one of the reasons he started to grow pineapples was because he didn't expect to have to irrigate them but in the past few years the seasons have become more extreme and now it is essential at times to irrigate pineapples. The weather through this past summer in Bundaberg has been very dry and with constant wind day and night and he has been forced to irrigate. He believes that the most important times to irrigate are after planting, just before and after flower initiation. John believes that irrigation should be planned for any large new pineapple development.

NEW NUTRIENT AND SEDIMENT CATCHMENT LOAD LIMITS EXPECTED AS PART OF NEW GREAT BARRIER REEF (GBR) PROTECTION MEASURES, and INFORMATION ON GRANTS AVAILABLE

Simon mentioned that if a new bill passes in the Queensland parliament farmers could expect new measures relating to best practice management to protect the GBR.

Simon then provided information from Michelle Haase at Growcom in Bundaberg about $5,000 grants available to subsidise action on farm to reduce off farm deposition of soil, pesticides and fertilisers. If you would like to follow this up please contact Michelle Haase - **Mobile:** 0428 586 890 **Email:** mhaase@growcom.com.au

NEMATODES RESEARCH IN PINEAPPLE - Yujuan (Jady) Li from Central Queensland University

Dr Jady Li is a nematologist from CQU and made a presentation to the group covering some background information on nematodes, her current Telone field trials and results, implications for the pineapple industry and future direction.

The major plant pest nematodes are 'root knot nematode' (RKN), 'root lesion nematode' (RLN) and 'reniform nematode' (RFN). These nematodes prefer sandy/clay loam soils. RKN have a damage threshold of 1-5 nematodes/200ml soil at 12 months (first crop) and this can result in a 30-60% yield loss in a ratoon crop.

Root knot nematode, root lesion nematode and reinform nematode

Jady has a current trial at John Steemson's property where she is looking at how effective Telone is at controlling RKN. The trial was planted in April 2018 after a 3 month fallow crop. The treatments include a Telone application vs a control. Soil nematode sampling was conducted 3 and 10 months after planting.

The trial found that significantly higher densities of other plant pest nematodes (threat to plant health) and free-living nematodes (in soil) were found in the control treatment when compared to the Telone after 3 months of planting. Interestingly, there was no distinct difference of any nematode group found between treatments after 10 months of planting.

The results showed that RKN populations might quickly increase over the damage threshold level from a very low population during the 10 months planting period, even with a Telone application. Therefore, a pre-planting nematicide may not necessary during pre-plant when root knot nematode populations are very low (especially after 3-6 months of fallow). More beneficial nematodes were seen in the control than the Telone treatment, which indicates the side effects from chemical control in terms of soil health.

Monitoring soil for RKN population could help growers avoid unnecessary nematicide applications and prevent nematodes becoming a chronic problem. There is also a need to look into alternative product choices as well as explore application timing and method strategies for improvements in efficacy and control. Such strategies as residue retention, the input of organic matter, nitrogen fertiliser, the use of rotation crops and tillage practices also needs to be looked into, as these are possible IPM strategies that could be adopted to help control nematodes.

IMAGING APPROACHES FOR NATURAL FLOWERING AND FRUIT MATURITY ASSESSMENT IN PINEAPPLE - Chengyuan (Stephen) Xu from Central Queensland University

Dr Stephen Li is based at CQU and works in the precision agriculture space. The capabilities in this area include drone imaging, non-invasive fruit quality assessment, sensors for crop monitoring, and agriculture information platforms with automated data processing and visualisation. Stephen has conducted some preliminary studies that include looking into natural flowering populations and harvest maturity decision-making tools for pickers. He also presented some of the technologies used in other industries.

Imaging and spectral technology is currently used in the mango industry to determine fruit maturity through dry matter content. This information can then be loaded into farm maps to monitor block maturity of which an app has been developed by CQ Uni data muster team.

Drone imaging can be used to detect natural flowering as well as assessing crop heterogeneity (uniformity) with NDVI. Drone imaging offers higher resolution and also more flexibility than satellite imagery.

Stephen is researching the use of drone captured images to see if there is potential for them to be used for assessing the level of natural flowering. This information is needed to help the grower decide whether to conduct an extra harvest round. For this application, a drone is flown at an altitude of 10m. The images captured have a resolution of 0.4cm which is enough to detect a fist sized pineapple flower. Images are downloaded to an iPad and a programme is being developed that will tell you the % of natural flowering in the field, the stages of the flowering and an estimated picking time for each flowering.

Images taken by the drone at 10 m altitude for use in identifying the level of natural flowering, the stage(s) of flowering and predicting when they will need to be picked.

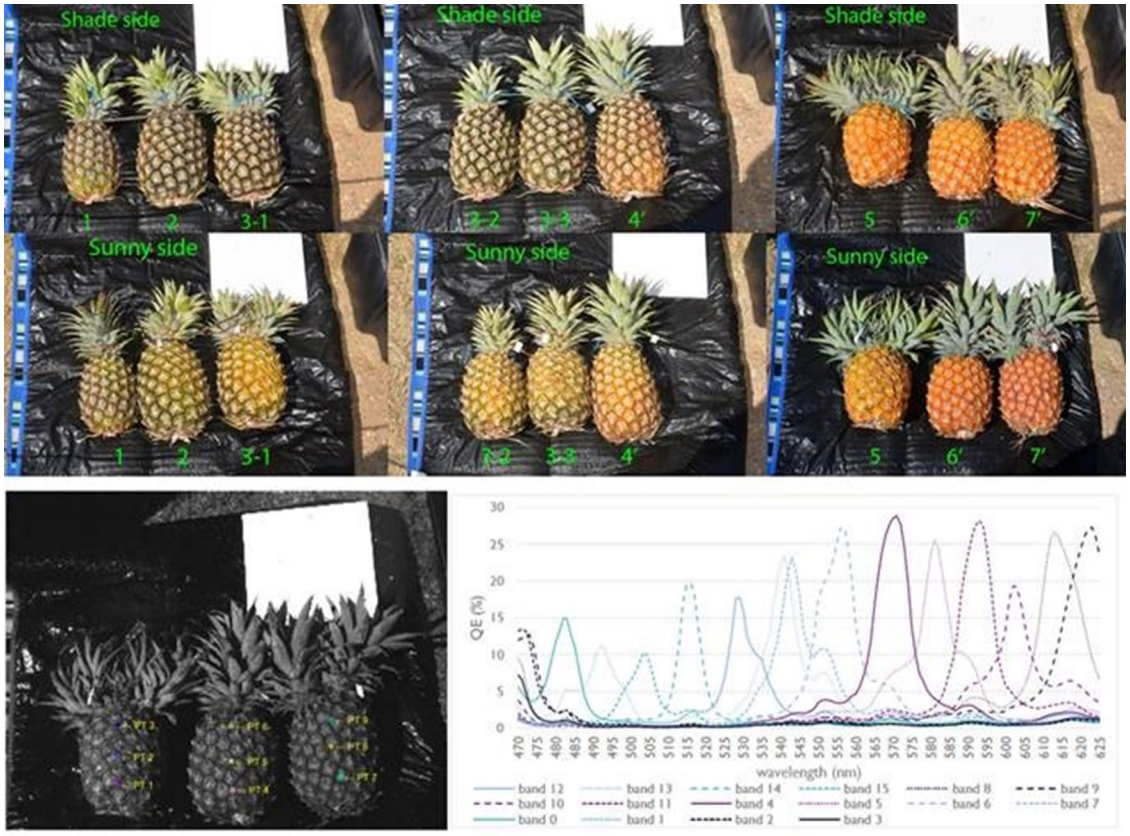
Images can also be collected for data analysis for natural flowering in a block by mounting a GoPro camera to the spray boom.

Image of natural flowering taken from a GoPro mounted on a spray boom

All technologies working together have great potential to help the grower have a greater understanding of crop physiology and stages of maturity throughout the block. With the input of data from all sources such as drone imaging, farm block information and mapping this could result potentially feed into a web interface that could be developed to help visualise and inform the results to the farm manager or operators. Assisting with information such as:

- Sampled area as a % of the whole paddock
- Natural flowering rate %
- Distribution of flower stage/fruit size
- Spatial distribution of flowers
- Suggested picking time and load

Stephen is also looking into using hyperspectral determination (non-destructive and uses wavelength readings) to measure fruit maturity in the field to help inexperienced picking staff recognised what a mature fruit looks like for that picking round. For this application the plan is to be able to measure fruit maturity based on the refraction of the pineapple shell which is calibrated with the dry matter and sugar content. A picker would be provided with a ‘gun’ to test fruit in the field at the start of the picking day and thus learn to recognise which fruit are ready to pick that day.



Research is also being conducted by CQU to be able to measure fruit maturity using an instrument that uses refraction from the pineapple shell, if successful a tool could be developed to help train inexperienced pickers how to recognise fruit that is ready to harvest.

EVALUATION OF THE DAY

Question	**Show of hands**
How did you like the new format with more time in the field and less time in the shed?	90%
Was the length of the meeting about right?	50% - felt a bit rushed
Were the field visits useful?	90%
Was it a good day for 'networking', i.e. catching up with other growers and service providers?	100%
Is there is something that you have seen or learned today that could result in you making a change (even a small change) on your farm?	50%
Can you suggest any improvements for the next meeting?	Fewer items on the agenda and to start the meeting earlier
Any ideas for the venue and topics of the next meeting?	October or time with 'Pine Fest'

A few of issues to be on the lookout for. Top: African black beetle. This beetle had just flown into a patch in SEQ and was starting to burrow into the bed to feed on pineapple roots. Right: Mealy bug in fruit. By missing regular control practices mealy bug numbers can build up and even be found within the flower cavities on fruit (having entered the flower). Live insects in or on fruit can lead to rejection. Below: Red mite is often unseen but affects profitability.

NEXT MEETING

"Pine Fest" is being held on the 11th, 12th and 13th of October this year, so it was suggested that we hold the next workshop the morning of Friday the 11th of October to coincide. Finishing up mid-afternoon to fit in with the "Pine Fest" programme. The venue is likely to be in Bungundarra.

Simon Newett, Bridie Carr and Tim Wolens

These workshops are part of the project "Improved viability and sustainability of the Australian pineapple industry" (PI17001) which is a strategic levy investment under the Hort Innovation Pineapple Fund. The project is delivered by the Department of Agriculture and Fisheries, Agri Supply Global and Growcom and funded by Hort Innovation using the pineapple industry research and development levy, with co-investment from the Queensland Department of Agriculture and Fisheries, and contributions from the Australian Government.