Welcome

On many fronts, PARDI is now turning research into improved commercial agri-business practice. Reflecting on my own research with smallholder vegetable farmers in Fiji, we sometimes forget that the real stars are the people of the Pacific.

It is easy to assess and make judgement of agri-business and production practice, but when the endemic supply chain constraints that growers in the region need to confront on a daily basis are taken into account, it is hard not to be impressed by their perseverance to beat the odds.

In an effort to better capture PARDI activities and achievements at the local level, we have started to create a series of short You Tube stories. Our first two clips – one an introduction to improving livelihoods in the South Pacific and the second on vegetable post-harvest research – were recently launched.

And, as always, our six-monthly newsletter seeks to keep PARDI connected to the diverse and important concurrent research and development work in the region.

Thanks as always for your ongoing support of PARDI and the people in the Pacific.

Steven Underhill
PARDI Project Leader
New PGS farmer group achieves first commercial tomato shipment

A new participatory guarantee systems (PGS) farmers group from Qereqere on the West Bank – Sigatoka, have achieved their first commercial shipment of tomatoes to the Shangri-La Resort and Spa in Fiji and received forty per cent more money for their produce due to its quality and presentation.

Formed through the PARDI PGS vegetable project, the group have worked with PARDI researchers in recent months to implement value chain improvements and post harvest quality systems that enable them to ensure their crops meet defined quality standards such as reliable freshness, minimal damage and professional packaging.

According to PARDI researcher, Rob Erskine-Smith, the farmers’ group were delighted with the increased profit gained through their commercial shipment.

“The Qereqere group rose to the occasion and delivered an impressive shipment of ten 15kg crates of tomatoes for which they were suitably rewarded,” said Rob.

“All concerned were very happy with the improved income and have already started to discuss how to continue farming for commercial sales into the next season in 2014.”

The first commercial shipment of tomatoes is a great achievement for the West Bank farmers and one PARDI researchers hope to see replicated by other farmer groups in the region. Further assistance into the future will be needed to help local industries build capacity and establish strong trading practices.

PGS vegetable research under the banner of PARDI is a partnership involving AVRDC – The World Vegetable Center, the University of the Sunshine Coast, local farmers and government representatives.

For more information contact Rob Erskine-Smith: rob.erskine.smith@gmail.com

To view our photo story of the commercial shipment day, go to the Cropping section of this newsletter.

Pearl business skilling workshops

Business skilling workshop plans for pearl farmers in Fiji and Tonga are near completion. The workshops will be conducted by Bill Johnston (QDAFF) and Damian Hine (UQ) in October and November this year and are jointly funded by the EU-IACT program. In Fiji, separate workshops will be tailored to the round-pearl (export) and ‘domestic’ sectors of the industry. The Fiji workshops extend on a workshop held in 2011 and will validate and build on economic models developed at that time. In Tonga the workshop will develop detailed economic models for half-pearl (mabé) and pearl handicraft production for the first time.

Pictured above: Locally-crafted pearl handicrafts are sought after by tourists. PARDI business skilling workshops help the South Pacific realise the value-adding potential of their cultured pearl industries.
Breadfruit workshop shows scale of work

A recent breadfruit workshop held at Nature’s Way Cooperative Nadi, Fiji, highlighted the scope of research being undertaken by the Pacific Breadfruit Project (PBP) team and gave attendees the chance to see the PBP’s great progress including plans to have 10,000 trees planted in orchards by 2014.

PARDI crops and horticulture component leader, Shane Dullahide, attended the meeting, which he said reinforced the potential of the breadfruit industry in Fiji.

“Through the Pacific Breadfruit Project, growers and business along with researchers are beginning to identify and develop the important components needed to expand breadfruit in the region so that this commodity may become a significant export industry in the future,” Shane said.

“The PBP team are identifying some of the more promising varieties and propagation of these varieties for larger scale, commercial production. As a result, they are building on available nursery stock and helping local farms to transition to orchard production with viable inter-row crops.”

For more information on PBP, contact Kyle Stice: kyle@kokosiga.com

Pacific cocoa stakeholders form direct purchasing links

Earlier this year, PARDI assisted stakeholders from Vanuatu and the Solomon Islands visited Singapore to meet with major bean buyers to solicit feedback on bean quality. Direct purchasing relationships between SolKom and CGA and respective Singapore buyers have since been established. These links will enable the cocoa industry to significantly boost income now and into the future.

For more information contact: randy.stringer@adelaide.edu.au

Fisheries research benefits from student input

The involvement of postgraduate students in the project (tilapia value-adding and socio-economic aspects of caulerpa harvesting and sales in Fiji) is broadening the outputs from the project. Studies of the biomass of harvested caulerpa beds will, for the first time, provide information on how environmental impacts can affect overall harvesting. Involvement of multiple postgraduate students in Fiji and Tonga cultured pearl research is proving to broaden research outputs and increases scientific rigour. Resulting international publications raise the profile of the project, ACIAR and Pacific science.

Contact for more information:
Contact: Paul Southgate: paul.southgate@jcu.edu.au
Protective cropping work progresses with five new structures

PARDI/ACIAR protective cropping research has made a significant leap forward with the recent delivery of five ventilated 18m protective structures to Fiji and Samoa.

Trial sites in Fiji include Sigatoka and Koronivia (Ministry of Agriculture Research Stations), and a farm demonstration site in Tavua (Mun Sami Napier’s farm). The Samoan sites are at the Ministry of Agriculture & Fisheries Research Station in Nu’u and Edwin Tamasese’s Farm (“Tapatapao”) near Apia.

The new protective structures will play a critical role in a range of upcoming trial work that will focus on boosting vegetable productivity in the region. Collaborative activities will include ACIAR integrated crop management and PARDI participatory guarantee research and will involve tomato, capsicum and lettuce crops.

For more information contact: Elio.Jovicich@daff.qld.gov.au

Farm losses attributed to poor on-farm ripening

An assessment of postharvest loss and associated contributing factors was undertaken earlier this year by PARDI for Fiji’s west and east bank Sigatoka PGS farmer groups. Most postharvest wastage has been attributed by PARDI to poor on-farm ripening practices. Remedial strategies are being developed for local grower groups and similar postharvest assessments in the Solomon Islands are planned for later this year. Fiji postharvest work is covered in more depth in the Cropping section of this newsletter.

Contact: Steven Underhill: s.underhill@uq.edu.au

Solomon Islands industry development workshop

A canarium industry development workshop will be held in the Solomon Islands in October to share information across the Pacific and plan for the future of the PARDI project. The PARDI canarium project team will share their research findings and generate a stronger awareness of the canarium industry in the Solomon Islands.

An impressive line up of presentations will also be given by representatives from all partner countries. Two field days are also planned, one to a canarium plantation with trees from different provenances in the Solomon Islands. The other field trip to remote villages on Rendova Island where participants can learn about traditional processing techniques. Solomon Island government constituents, members from non-government organisations and farmers are invited to attend.

For more information contact Elektra Grant: EGrant@usc.edu.au
Pacific bioreactor system proves to be a huge success

The SPC Centre for Pacific Crops and Trees (CePaCT) has had enormous success in optimizing tissue culture production rates using a temporary immersion bioreactor system.

CePaCT’s improved capacity is the direct result of the group comparing two types of tissue culture systems: the culturing of plantlets in glass and or polycarbonate culture vessels containing normal semi-solid artificial nutrient medium versus plantlets cultured in bioreactor system.

The bioreactor system has sped up the growth rates of breadfruit seedlings, and has improved the ready-availability of field planting material by two to three months in contrast to more traditional tissue culture system. Plantlets produced via the bioreactor system have also outperformed plantlets produced through the normal tissue culture system.

The PARDI-funded Pacific Breadfruit Project (PBP) in Fiji was recently supplied with 120 tissue culture seedlings and over 200 tissue culture breadfruit seedlings were supplied by CePaCT for field research by the Ministry of Primary Industries Department of Agriculture late last year.

The success of the bioreactor method has facilitated production and distribution of breadfruit seedlings to Palau, Nauru, Marshall Islands and Fiji. More requests are in the pipeline for breadfruit and other crops including taro and cassava.

CePaCT currently has one bioreactor purchased with funding from the AusAID International Climate Change Adaptation Initiative and is hoping to secure a few more bioreactors in the near future.

This research is carried out by Ms Arshni Shandil and supervised by Valerie Saena Tuia of the Genetic Resources team of the Land Resources Division.

For more information contact:
Valerie S. Tuia: Valeriet@spc.int.
First impressions of the South Pacific

How does a person feel when, for the first time, they step into a part of the South Pacific and experience firsthand, a unique environment that is rarely exposed? As the PARDI communicator who recently visited some of the more remote and traditional farming areas of Fiji, I can say it is an eye-opening yet rewarding experience. From the minute I arrived in Nadi on a hot Sunday afternoon in August, until I departed six days later, my head and heart were bursting at the seams absorbing a country and a culture of people who do it tough but at the same time reflect a sense of pride and generosity.

The reason for my trip was to travel with some of PARDI’s cropping researchers to take a range of video footage for YouTube clips depicting the impact of agricultural research in the region. The conditions for filming were pretty rugged. Heat combined with dusty, isolated locations and blaring sun meant there was little time to set up filming shoots. Given the broad scope of activities that our scientists cover and the large number of people with whom they connect, we spent the week racing from one location to the next along bumpy roads in an effort to cover the Coral Coast and Sigatoka Valley.

Several days into my trip, after overcoming some of my fears (i.e. drinking *kava, going to the loo in a tin shack surrounded by bullocks), I began to see the incredible beauty of the country and the people around me. Men, women and children alike pull together to perform daily tasks without the support of fundamental infrastructure or technology. The consistent patience displayed by the country’s farmers to carry out daily activities under these conditions had me transfixed. Markets abound with colourful produce sold by women who have slept on concrete floors overnight in readiness for the morning shoppers. Children accompany their parents on long journeys without the luxury of an iPod or a knapsack full of treats, their eyes wide open taking in the simple pleasures in life.

My recollection of Fiji is by no means intended to make light of the poverty or the day-to-day life of locals; quite the opposite, it is more to reflect on how incredibly well these people operate in a climate full of challenges. Village communities are alive and well in Fiji and with the right sort of support, such as that provided through ACIAR’s PARDI project, there is a bright future for Fiji’s farmers and in turn local communities and the country’s economy.

Bula!
Thank you Fiji.

*Kava is a crop of the Western Pacific. Plant roots are ground or crushed and mixed with water to create a drink that has a sedative effect. Kava is a popular drink at local ceremonies.

PARDI communications update

As we enter into the final year of the first phase of PARDI, our aim is to depict the strength of cooperative research and extension activities and the importance of our work in helping to alleviate poverty in the region. As mentioned in Steven Underhill’s introduction, we recently released the first of a series of short PARDI YouTube clips to highlight the local impact of our work. Your feedback on these will be most appreciated. Please do not hesitate to contact Julie Lloyd if you have any queries or if you have PARDI-related material that you would like to communicate: jlicore@internode.on.net.
Market studies and the whole value chain

In the past 12 months as part of the PARDI project, the University of Adelaide in partnership with the University of the South Pacific, University of the Sunshine Coast, Griffith University and Pacific Island Bureau of Statistics and Departments of Industry and Agriculture, have undertaken three major consumer and market place studies across Fiji, Vanuatu and Solomon Islands. These studies include:

- Retail transformation market study in Fiji – 1000 households
- Solomon Islands teak supply capabilities and global market analysis
- Vanuatu tourist consumer research study for canarium and chocolate products.

The studies directly support PARDI commodity projects (high-value vegetable crops, cocoa teak and canarium nut) by providing important information on domestic markets and underlying consumer purchasing behaviour (including the high-value tourist markets).

Retail studies give insight into buying habits

Through the Fiji retail transformation study, 1000 urban Fijian households and all major Fiji food retailers, processors and hotels/resorts were surveyed to help gain insight into the whole food industry in Fiji. This project dovetails into a number of other PARDI projects including the University of the Sunshine Coast-led vegetable project which aims to better connect smallholder farmers to the hotel and resort markets.

The urban household data is being analysed and preparations are well underway for a large producer survey and a trader survey which will complete the picture of the whole food chain in Fiji. When this study is finished, key insights will be made available on the PARDI website along with other reports including the teak global market analysis which was conducted over the past nine months.

Consumer surveys pinpoint potential

PARDI market and consumer research for the Vanuatu and Solomon Islands canarium industries is designed to integrate with PARDI’s value adding and development project activities.

The initial aim of the work (during the first phase of PARDI in 2010-2011) was to identify broad market opportunities, including whether or not there is the capacity and the interest in the regions to develop productive nut industries. Our work identified enormous potential. Research is now focused on understanding specific consumer groups to gauge their perceptions and willingness to pay for different types of value-added canarium products.

Target markets identified in our work include:

- Tourists in Vanuatu
- Food service and Hotels in Solomon Islands
- Export Markets like Australia once domestic demand is fulfilled and industry capability increases.

In the last year, we focussed our surveys on tourists as they left Port Vila and screened out the ones who didn’t eat nuts. Some of the early insights from this research found that:

feature continued > > >
• Most tourists (67%) were Australian residents
• 77% arrived by plane, 15% by cruise ship, 85% were travelling in groups or with families
• 90% of tourists surveyed bought a souvenir while in Vanuatu
• 30% bought nuts weekly, 60% monthly
• When eating out while on holidays, cafes were preferred followed by restaurants, buying food from central markets, supermarkets and takeaway respectively.
• Attitudes towards local food showed two types of consumer groups: those who actively seek out local food and those who are aware of local food but hadn’t tried it because they need know more about the produce.
• Key perceptions of the nut in order of importance were healthy, fresh, organic, nutritious, cheap and tasty.
• Purchasing motivations included to consume personally or with friends/family while in Vanuatu and to purchase because they are a fresh, healthy and an affordable gift.

Defining canaruim commercial opportunities

In late 2012, we also contacted 50 prominent nut companies in Australia to understand their requirements and possible interest in the commercial opportunities for canarium in the Australian market. Of the 50 companies surveyed, 16 agreed to be part of the study and 25 surveys were completed by a mixture of CEO’s, buyers and research and development managers. Each company was provided samples of the plain dried nuts, compositional and nutritional test results and some background into the nut’s origin and history. Some feedback included:
• Most respondents (67%) believed canarium nuts have commercial appeal in the Australian market.
• Nine out of sixteen companies declared they would be interested in using canarium nuts in their business.
• Some companies suggested specific market segment opportunities in health stores, gourmet foods, boutique stores, bakery and confectionary and as a cooking ingredient.
• Most common processing opportunities described by the respondents were roasting, salting and as an ingredient in other foods. A number of the companies commented on how well flavour is enhanced by roasting.

The next phase of this work involves developing and trialling a range of nut products. In 2014, our team will help to research and refine production and processing techniques and compare different types of value added products among our target consumer groups.

For more information contact:
Craig Johns: craig.johns@adelaide.edu.au
The PARDI Project Update covers our research and development progress since the last PARDI newsletter in April 2013. All PARDI work is focused on the same goal:

to create sustainable livelihood development outcomes for the South Pacific crop, fisheries and forestry sectors.

Breadfruit update

Important breadfruit variety trials now underway

New variety trials have been established in recent months as part of the PARDI-funded Pacific Breadfruit Project efforts to develop a stable supply of high-performing breadfruit varieties for future commercial production in Fiji.

A trial planted in May this year at Legalega Research Station in Nadi is set to evaluate breadfruit trees derived from different propagation methods. The trial involves 45 breadfruit trees of the Bale kana variety, 15 marcotted trees, 15 root sucker trees and 15 tissue culture trees.

Preliminary data collection will focus on comparing tree vigour by measuring stem girth and tree height. Other data collected will include height and occurrence of lateral branches, time to first fruiting, overall yield and performance of trees under strong winds.

The Fiji Ministry of Primary Industries Research Station in Seaqaqa on the island of Vanua Levu is the first trial site to receive tissue cultured breadfruit trees for field evaluation as part of the current round of variety trials. The tissue culture breadfruit trees were produced by SPC’s CePaCT division as an output from a series of trials they are conducting under the Pacific Breadfruit Project.
Nadi farmer invests in Fiji’s first commercial breadfruit orchard

Nadi farmer, Ratu Josateki Nalukuya (Tui), recently committed to significant investment in the local breadfruit industry by formally establishing Fiji’s first commercial breadfruit orchard.

In partnership with the Pacific Breadfruit Project (PBP), Tui has now planted 255 breadfruit trees at his farm in Legalega. The farm is strategically located five minutes from the Nature’s Way Cooperative (NWC) quarantine treatment facility in Nadi which will one day treat his breadfruit for export.

The orchard is spread across four blocks covering around 2 ha. Two varieties have been planted - Utodina (1/3) and Bale kana (2/3). It is estimated Tui's first orchard will come into production around 2018 with full production by 2020.

Based on yield estimates taken from the limited information available for the Caribbean breadfruit industry and other sources, it is anticipated that this orchard will produce conservative estimates of around 4 tonnes of marketable fruit in 2018, and build up to around 40 tonnes of marketable fruit by 2020.

Tui is also working closely with the PBP on intercropping between the breadfruit trees and rapid multiplication of pineapple planting material to ultimately provide a cash flow while he awaits his fruit crop to come on stream. Tui is intercropping breadfruit with pineapple, eggplant, cassava and kumala and plans to focus on pineapple as the primary intercrop.

Number of commercial breadfruit farmers increases

The number of commercial breadfruit farmers in Fiji has risen to 17 as a result of access to high quality trees from the PBP. The 17 farmers are considered commercial because they have planted at least 50 trees (1 acre) of a preferred export variety and are following a package of management practices to prepare for fresh exports.

Interest from potential farmers has been overwhelming and expansion has only been limited by the availability of breadfruit trees. It is expected that another 500 trees (10 acres) will be planted by the end of 2013.

Prior to the beginning of the PBP, there were no commercial breadfruit farmers in Fiji. In total, 1,100 breadfruit trees have been planted which equates to around 22 acres. The established breadfruit orchards include conventional square or grid planting patterns and plantings along farm perimeters. Several of the square-of-grid orchards are utilizing the area between rows to
intercrop, primarily with cassava and other staple food crops. This development of breadfruit orchards has taken place primarily in the Western Division of Viti Levu (between Sigatoka and Rakiraki), due to the proximity to the quarantine treatment facility at NWC and the Nadi International airport and orchards have been established on a range of soil types.

“Interest from potential farmers has been overwhelming and expansion has only been limited by the availability of breadfruit trees.”

Supplier network makes development possible

The development of commercial breadfruit orchards on Fiji’s main island of Viti Levu is made possible through the purchase of planting material (root suckers) from a network of farmers and villages around the islands of Taveuni and Vanua Levu. Through an extensive awareness campaign over 18 months, and tremendous support from the Cakaudrove Provincial Office and Tutu Rural Training Centre, the breadfruit planting material supplier network has expanded to nearly 240 people.

In the most recent collecting breadfruit collecting mission to the island of Vanua Levu (July 2013), 15,000 root suckers were purchased from seven villages in Natewa District in the Province of Cakaudrove.

Prior to the mission, district representatives informed the Turaga ni Koro’s (Village Headmen) of the collecting date, quality requirements and purchasing arrangements. The PBP along with district representatives then travelled to the seven villages to grade and purchase the root suckers. The root suckers were then transported by truck to the jetty where they travelled by boat to Viti Levu.

PBP staff would like to thank the Roko Tui Cakaudrove and his team for their support which has enabled a strong business partnership between the PBP and the breadfruit planting material supplier network.
Research stations evaluate tissue culture breadfruit

In July 2013, a trial was established at the Ministry for Primary Industry’s (MPI) Legalega Research Station in Nadi to evaluate breadfruit trees derived from different propagation methods. The trial involves a total of 45 breadfruit trees of the Bale kana variety, up to 15 marcotted trees, 15 root sucker trees and 15 tissue culture trees.

Preliminary data collection will focus on comparing tree vigor by measuring stem girth and tree height. Other data to be collected will include height and occurrence of lateral branches, time to first fruiting, overall yield and performance of trees under strong winds.

The MPI research station in Seaqaqa on the island of Vanua Levu was the first to receive tissue cultured breadfruit trees for field evaluation. The tissue cultured breadfruit trees were produced by SPC’s CePaCT division as an output from a series of trials they are conducting under the PBP.

Vegetable News

Knowledge empowerment through postharvest supply chain research

In recent months, we have continued our analysis of vegetable postharvest supply chains in Fiji in support of the PARDI participatory guarantee project. Building on last year’s work, our team recently completed postharvest handling and logistic-based stress analysis for East Bank Sigatoka farmers and peri-urban farmers around Nausori. This research has highlighted the significance of postharvest tomato ripening practices as a primary contributor to postharvest wastage.

To assist farmers in the Sigatoka Valley, our team recently held two on-farm postharvest training workshops (East and West Bank) with another workshop planned for Naurosi farmers in the coming months. Our approach is about knowledge empowerment rather than the more traditional skilled-based training. This approach focuses on providing farmers with postharvest handling information to enable them to make more informed business decisions. Supporting this, a series of postharvest handling posters have been prepared and made available for local farmers.

Our partnership with the FIJI Ministry of Agriculture magnifies the impact of our work and is of enormous benefit. The partnership engages local extension officers who ensure wider farmer attendance at these events and help PARDI to distribute our supporting educational material.

The benefits of understanding postharvest supply chains

In addition to identifying postharvest handling issues, this research is providing our team with a greater understanding of current postharvest handling supply chains in Fiji.

We now know that transport driver behaviour (speed and truck load and consignment configuration) is more important than road conditions. Fruit transported on roads around peri-urban production in Nausori tend to
experience more in-transit vibration risk than those being transported down the east/west bank roads along the Sigatoka River.

Our research has also highlighted that transport logistics influences on-farm postharvest behaviour. Where farmers own their own truck, there is tendency towards single weekly transport to markets, particularly when supplying more distant markets. Farmers often employ high-temperature-forced ripening practices to meet weekly consignment schedules, which often lead to significant postharvest wastage. By comparison, those farmers who are more reliant on middle-men commonly use multiple consignments with better underlying ripening practices.

**Progressing our work to the next stages**

Our team is currently engaged in a series of other experiments relating to postharvest issues and enhancing value chains to benefit farmers. In August this year, we purchased an entire harvest of tomatoes that were on-farm ripened and transported to market. Our team assessed this large volume of fruit through the commercial chain and are now assessing post-market shelf-life potential. We are also assessing whether different stages of tomato ripeness influence commercial in-transit damage.

One of the questions that is close to the hearts of many farmers is ‘how do we compare with other vegetable farmers in Fiji in terms of postharvest quality and wastage’. Work now being undertaken by Salesh Kumar (USP PhD student) and Binesh Prasad (USP master student) has started to develop the essentials of best practice protocols so farmers can have benchmarks by which to measure the performance of their farms. Binesh recently completed a large assessment of postharvest handling practices from a range of vegetable crops across all the major production regions in Viti Levu, Fiji. Binesh is also obtaining interesting data about perceived and actual postharvest wastage, which is challenging the traditional view that Fiji farmers are often poorly connected with market-based postharvest loses. Finally, Binesh and Mua have just completed an extensive assessment of postharvest wastage in the main fruit and vegetable municipal markets in Fiji. In this study, we concurrently assessed wastage (and associated causes) of a range of fruit and vegetables in Sigatoka, Suva and Nausori over a full trading week, providing further insight into postharvest handling performance at the market-end of the supply chain. Collectively, there is intent to expand this work to Solomon Islands in the coming months.

**Solomon Islands PGS targets education**

During the first half of 2013, the Solomon Islands component of PARDI’s vegetable participatory guarantee systems (PGS) research has made good progress despite inclement weather and changes to the team and original work plan. In particular, a series of workshops has proven to be very successful and farmer groups and farmer/buyer networks are being formed.

**Training covers fundamentals**

Since early 2013, several market-oriented skills training workshops were delivered to local community representatives. Training covered simple record keeping, costing structure, cash flow planning, tax return requirements and contract negotiation. Local supplier groups have taken part in training in recent months on PGS contract and business skills. Farm manager in Aruligo, John Maeli, and his farmer group (including seven male and five female growers) participated in discussions on supply arrangement (including costs and supply cycle). As a result of the
meeting, it was agreed that John will supply his network of farmers with tomato seedlings to grow and will purchase the resultant produce from the local farmers. Also during the first half of the year, the Areatakiki and Aruligo network of producers were involved in training on contract selling (ask and offer negotiation), costing structures and supply cycle.

Building supplier networks

A fundamental part of the Solomon Islands research is to enable farmers and supply groups to form strong networks with buyers for future agri-business. The PGS research has made good progress developing a buyer inventory. Those approached this year include the Shilla group of restaurants and eateries, Monarch Caterers, King Solomon Hotel, Elshadai Café, Lime Lounge.

PARDI supplier network research is enabling positive communication between buyers and farmers. This year PARDI research has instigated meetings between suppliers and buyers to understand how they can meet each other’s requirements and potentially form future contracts.

For more information on the latest Solomon Islands PGS work contact Jennifer Carter: JCarter@usc.edu.au.

Snapshots from the first commercial tomato shipment

Left: Tomatoes are sorted and graded by members of the Qereqere PGS group and PARDI project PGS staff in preparation for the ‘trial shipment’ of commercial tomatoes.

Above: Grade one premium quality tomato.

The Aruligo and Sasa PGS groups meet including the group leader John Maeli (centre with red T-shirt) by Noel Roposi (left - MAL marketing officer), Jaw-Fen Wang (AVRDC project manager), and Andrew Sale (PGS consultant).
An important component of the PARDI participatory guarantee systems (PGS) project is to develop a series of pilot-level farmer groups with the ability to market high-value crops to resorts and other outlets. To achieve this, the project is working with farmer groups to implement value chain improvements and appropriate post-harvest quality systems.

This season, researchers from the PGS project worked with the Qereqere farmers PGS group from Sigatoka’s West Bank to prepare and deliver a consignment of tomatoes to the Shangri-La Resort & Spa. The ‘trial shipment’ of tomatoes was well received and attracted a premium price. This trial will serve as a model for future commercial shipments of Fiji-grown tomatoes and if successful, will create livelihood benefits for local farmers.

PARDI’s PGS vegetable research is a partnership involving AVRDC – The World Vegetable Center, the University of the Sunshine Coast, local farmers and government representatives.

For more information contact Rob Erskine-Smith: rob.erskine.smith@gmail.com.

“...the project is working with farmer groups to implement value chain improvements and appropriate post-harvest quality systems.”
International postharvest technology course to benefit the South Pacific

University of the South Pacific horticultural research student, Salesh Kumar, completed a two-week intensive internationally recognised ‘Postharvest Technology of Horticultural Crops’ course at the University of California-Davis in July this year.

PARDI sponsored Salesh, the only student representing the South Pacific islands, to help raise his professional standing and to benefit the region’s horticultural industries at large. The course included five days of classroom and laboratory lectures followed by a week of field visits. Salesh said that he returned to Fiji equipped with fundamental and practical knowledge on postharvest technology which could benefit South Pacific horticulture industries.

"Many communities across the South Pacific have not yet realized the true potential of their horticultural industries and incorporating better postharvest technologies holds a lot of potential," said Salesh.

"Similarly, intermediaries could reduce postharvest losses by incorporating postharvest technologies in the fresh produce supply chain.

“In developing countries such as South Pacific island countries, major postharvest losses often occur at the beginning of the supply chain. Growers and intermediaries lack basic postharvest technologies to maintain the quality of fresh fruits and vegetables.

“We need to be aware of issues such as the importance of cooling fruit and vegetables after harvest, the right time to harvest and the importance of temperature management along the supply chain.”

The course was conducted by some of the world’s leading postharvest specialists and covered a broad spectrum of topics. Day one covered maturation and maturity Indices, postharvest biology, problem diagnosis in produce handling, water loss and postharvest quality, fruit ripening biology and technology, quality factors, ethylene in postharvest, standardization and inspection. Many aspects of postharvest technology were covered throughout the course including food safety and temperature management.

“During the second part of the course, we visited several local conventional and organic fruit and vegetable farms, and grading, packing, cooling, storage, shipping, railways transportation facilities," said Salesh.

“Almost all the activities at the facilities we visited are advanced, large-scale and mechanized. As such there was a lot to learn from this type of study with regards to what works and how successful ideas can be modified to suit current postharvest techniques in the South Pacific.”

Consumer preference and changing trends was another area covered during the course. Horticultural experts noted that apart from adjusting practices to meet sensory preferences, the latest research reflects that consumers prefer to have knowledge on how fruit and vegetables are produced and can favour certain value adding practices.

“For, example some prefer organically grown fruits and vegetables, with no or minimal use of chemicals. The general consensus is that a grower will be more successful and economically viable if he or she sells sought-after produce,” said Salesh.

From a personal level, the course has provided Salesh with the opportunity to improve networking with other participants and postharvest specialists. He also learnt how to use post-harvest equipment and how to identify some common postharvest diseases. Salesh intends to use this knowledge to educate growers, intermediaries and consumers on the importance of postharvest technologies and work towards reducing postharvest losses.

For more information contact: Salesh Kumar; Salesh.kkumar@gmail.com
Cultured pearl Fiji

Spat collection program proves successful

A major bottleneck to the sustainability and expansion of the Fiji cultured pearl industry is a regular and reliable supply of young oysters (‘spat’). To address this, in 2012 the PARDI pearl project, together with Fiji Fisheries, initiated phase one of a national spat collection. Spat collectors were deployed close to all pearl farms in Fiji in November last year at three sites on the north coast of Viti Levu, four sites at Vanua Levu and two at Taveuni.

To date, recruitment of oysters to spat collectors has been quantified and oyster growth is being analysed to allow comparison between sites. There has been excellent recruitment of oysters to spat collectors at all but one of the study sites, giving farmers ready access to large numbers of oysters for the first time.

Phase two of the spat collection program will begin later this year. Our aim is to increase the number of spat collectors at sites of high recruitment, relocate collectors with poor recruitment to other sites, and introduce spat collection to partner communities that are interested in entering the pearl industry through spat supply to farmers.

Establishing a national spat collection program addresses the Fiji government’s goal to mitigate potential impact on the pearl industry from cyclones, such as Cyclone Tomas, which wiped out industry spat supply (then occurring in Savusavu Bay only) in 2010.

Top right: Examination of spat collectors at Namarai, Viti Levu, owner of the Namarai Pearl Farm, Atilla Decsi, looks on from the boat.

Right: Vigorously growing black-lip oysters (*Pinctada margaritifera*) on a spat collector near the Namarai Pearl Farm, Viti Levu.
Developing Fiji’s and Tonga’s mother-of-pearl (MOP) handicraft sector

PARDI project, PRA 2010:001a focuses on the development of the cultured pearl industries in Fiji and Tonga. A primary component is to bolster supply of oysters to pearl farmers to overcome a critical bottleneck for the industry.

Since the project began in 2010, a national spat collection program has been successful in improving oyster supply. These activities will be expanded in 2013 to further support development of pearl farming activities. This program provides potential for communities to become involved in supplying oysters to pearl farmers and other users, such as those in the handicraft sector.

Running concurrently with this project, PRA 2010:001b has assessed the value chains and market structures for pearl farming in Fiji.

In Fiji, we have identified an annual market value of around F$10 million for the mother-of-pearl (MOP) handicraft and pearl sector of which only around 10% is met by local production. These significant findings indicate that there is considerable scope for the development of the MOP handicraft manufacturing sector in Fiji. Such development can be supported by the increasing availability of MOP material from the PARDI operation and continued expansion of the national spat collection program.

Together, these factors provide the basis for the new PRA “Assessing potential for developing the mother-of-pearl (MOP) handicraft sector in Fiji” which is now being developed within the PARDI Fisheries program. It will be lead by Theo Simos of the University of Adelaide and will begin in September, 2013.

Cultured pearl Tonga

Development Plan for Tonga

A key objective of the PARDI Pearl project is completion of a Development Plan for the Tongan pearl industry. This requires extensive consultation with stakeholders and, when completed, will provide a framework for industry development. Industry representative, Tevita Taumaipeau, was contracted to compile the plan. He has extensive experience in research and policy development and has played key roles in the development of the Fiji pearl industry in government (Fiji Fisheries) and private sectors. Mr Taumaipeau made two consultation trips to Tonga in 2012 and 2013 and, at a recent meeting with the Tongan Pearl Growers Association (TPGA) in Vava’u, obtained endorsement from the Association for presentation of the plan to the Minister. The draft plan will soon be finalised and presented to the Minister in November, 2013.

Hatchery production

A successful hatchery run in Tonga in May 2013 produced an estimated 30-40,000 spat destined for pearl farmers in Vava’u. Pearl farming in Tonga relies on hatchery production and prior to the PARDI pearl project activity has included upgrading the hatchery culture system at the Tonga Fisheries hatchery facility at Sopu to support increased production. This hatchery activity was assisted by Chris O’Keefe, hatchery manager at J. Hunter Pearls Fiji, and represents increasing links and collaboration between the pearl industries in Fiji and Tonga. Another hatchery run is planned for November.
Cultured Pearls Fiji and Tonga

Publications

A one-day workshop was recently held at USP to scope potential publications from the PARDI Fisheries component activities. Attended by Paul Southgate (JCU), Theo Simos (UoA), Anand Chand and Suwastika Naidi (USP) and Pranesh Kishore (PARDI pearl project scientist), the workshop provided opportunity to scope the potential for discipline-specific and cross-disciplinary publications. The major outcome from the meeting was a list of proposed publications and agreed roles and responsibilities for authors and co-authors.

For more information on the pearl research contact:
Paul Southgate: paul.southgate@jcu.edu.au
Anand Chand: anand.chand@usp.ac.fj

Pictured is a hand-made item from Suva by Arron Mahesh Prasad. Arron paints and then puts vanish on shell. He sells door-to-door in Suva and makes $200 per week. Each item sells for $10.

Tilapia

Janice Natasha, ACIAR-funded MSc student, has submitted her thesis for examination [Natasha, J., 2013. Post-harvest Processing of Tilapia for Potential Commercialisation in Fiji. Supervisors: Dr Jimaima Lako and Prof G. Robin South].

Value-adding work in Fiji will concentrate on smoking and kippering, as these were the favoured products for the domestic market according to two national taste evaluation events in Samoa and Fiji. A cost-benefit analysis of the smoking process will be conducted in the coming months. This will include product development, market analysis, packaging, labelling, etc.

The PARDI team continues to work with potential private sector product developers.

For more information contact G. Robin South: robin.south@orda.com.au
Sea grapes (*Caulerpa racemosa*)

Through prudent use of funds, the Fisheries project has been able to extend the sea grapes research through to the end of 2014. This is enabling our team to concentrate on completion of our work with sea grapes, including a year-long sampling of standing stock at two sites in Fiji.

Initial results demonstrate the vulnerability of the industry to extreme climate events, such as cyclone Evan at the end of 2012, and to coastal development. To help address the vulnerability of natural populations, we hope to conduct field trials during the coming year for grow-out of sea grapes as part of collaboration with a new ACIAR-funded project on the seaweed industry. This research will be led by Dr Nick Paul, James Cook University.

A new post-graduate student from Tonga, Kaione Loumoli, has commenced his master’s research on the socio-economic aspects of the sea grapes industry in Fiji. Kaione is funded through the ACIAR/USP Post-graduate scholarship scheme.

Also on the priority list is to complete HACCP plan for the sea grapes cold-chain, including the development of a booklet for harvesters and vendors.

Collaboration continues with Fiji-based sea grapes export company Pacific Seaweeds on the development of an export market for sea grapes to New Zealand.
Update: ‘Developing markets and products for the Pacific islands and PNG canarium nut industries’

Canarium opportunities on the rise

Processing research is moving ahead and the capacity of the canarium industry is growing in Vanuatu and the Solomon Islands. New markets for canarium products are opening up as more processors become involved and buy larger quantities of product from farmers. The canarium industry in Vanuatu has increased since the start of the project and now includes five companies that are either processing or value adding canarium (see below).

Canarium companies in Vanuatu

- Charles Long Wah (trading as Pacific Nuts formerly Kava Store), Charles recently sold his Kava business. Charles is buying solar dried nuts from people he has trained. Steven Atunesia from Nguna Island is solar drying the nuts and supplying to Charles. Many other solar dried products (e.g. peanuts) are appearing in the market in Port Vila.
- Lapita Café- this business is producing snack nuts and oil and is reporting strong demand.
- Activ is buying nuts for oil and planning to conduct trials on snack nuts.
- Volcanic Earth is buying oil for cosmetics.
- The Summit Estate is buying canarium oil to manufacture cosmetics. They have also started to cold press their own oil.

Interest among farmers in Vanuatu is strong with recent activities by Vanuatu Department of Forestry staff on Malekula, Malampa province. Interest in the canarium Industry in the Solomon Islands is also strong. The Nut Grower’s Association Solomon Islands (NGASI) now has 500 members and is led by Richard Pauku (Maraghotel Holdings).

The maturing industry in Vanuatu is creating new markets for farmers to sell their canarium nuts. Lapita Café commenced processing snack nuts in 2011 and is now producing snack nuts and oil. Demand for canarium products is so strong that they plan to triple production in the coming season. Natural skin care group, Volcanic Earth, is value adding to canarium oil by making cosmetics.

Canarium products Vanuatu

(Left to Right): Oil - Lapita Café; Salted nuts - ACTIV; Nangi oil cosmetic products - Summit Estate
Research to improve nut quality and boost food safety

The PARDI canarium project has had scientific impact through generating data, providing scientific equipment and providing training. Processors in the Solomon Islands and Vanuatu have benefited in recent months from training on nut quality to improve quality and shelf life. In particular, project staff from the University of the Sunshine Coast and University of Adelaide are working in partnership with processors to improve processes for drying.

Shelf life testing is now underway. Early results indicate that nuts need to be drier when packaged than currently is the case to prolong storage. Drying trials have focused on kernel drying, rather than drying nut in the shell, as processors have indicated that they wish to crack the nuts fresh and dry the kernels. Trials show that temperatures above 60°C will reduce kernel moisture content to below 5% in only 1 hour whereas drying at 50°C does not reduce moisture substantially below 10%.

Microbiological analyses have been undertaken on canarium samples. Different phases in the food production chain were sampled. Nuts from Solomon Islands and Vanuatu were assessed by a registered food laboratory in Australia.

Test results of samples taken through the processing chain indicated that samples were mostly acceptable for Australian food standards. Some marginal results indicated possible hygiene problems during food preparation and some results of unprocessed product were unsatisfactory for Australian food standards. This highlights the need to improve food safety standards during processing.

Benchmarking indicators have been established for each country. These include current plantings and harvesting, monies received and capacity to supply and be involved in the industry. Field work is planned in both countries that will help to determine how capacity and capability of stakeholder groups has changed.

The canarium season is upon us and fieldwork will also occur soon in Vanuatu and the Solomon Islands. Further training is also being planned for the months ahead (See story on Solomon Islands workshop in “News”).

Tamarind inception workshop proves successful

The PARDI forestry team recently conducted a tamarind inception workshop to help enable the continuing evolution of the industry in Vanuatu. The event was held at Epau village North Efate on August 29 and presentations were given in the local dialect, Bislama, as well as in English. Around 40 stakeholders attended including representatives from the Department of Industry and the Department of Forestry, University of the Sunshine Coast, University of Adelaide, processors (Lapita café and Charles Long Wah) and local farmer association members.

Pictured above right: Participants at the tamarind inception workshop

Pictured right: Forestry project leader, Helen Wallace, at the tamarind workshop
Presentations highlight amazing progress

The tamarind workshop summarised a host of information on the potential of tamarind and ways in which industry stakeholders can benefit by value-adding to the fruit.

PARDI value chain researcher, Craig Johns, reported that recent research has shown that the demand for sweetened tamarind products exceeds supply in Port Vila. The area’s major supermarket currently sells around 58 kg of tamarind candies each week. Additionally, there is unmet demand among restaurants for unsweetened tamarind.

During a presentation by PARDI researcher, Elektra Grant, the latest finds on drying tamarind using solar dryers was discussed. Solar drying has been shown by PARDI research to be an efficient way to stabilize the product. Tamarind contains natural preservatives (tartaric acid) and once dried to water activity of below 0.6 is a very stable product.

For more information contact Helen Wallace: HWALLACE@usc.edu.au

More nuts needed to supply expanding manufacturing base

The recent tamarind workshop provided a great opportunity for PARDI researchers to exchange tamarind and canarium information with project partners from the Department of Industry Vanuatu and the Department of Forests, Vanuatu.

Of note was a discussion with Loan Viji and Joseph Tungon from the Department of Forests Vanuatu during which the pair highlighted that building the country’s resource base is important for canarium given the industry has grown (see ‘Canarium opportunities on the rise’ earlier in the Forestry section of this newsletter).

Discussions throughout the meetings highlighted a shortage of supply of canarium. Lapita and the Summit Estate noted certain canarium products have sold out in recent months and businesses now have to wait until the new season.

Local businesses are also seeing an increase in demand for other agroforestry products. In particular there are expanding markets for tamarind, tamanu for oil, natapoa (Terminalia catapa) as a sugar coated nut, and fruits syziguim, and pomatia pinnata.

Underpinning all of this is the fact that food security is also an emerging issue in some urban centres due to population growth and little variety in the staple foods. There is a need to diversify the food resource base and introduce shade tolerant food crops for agro forestry systems.

For more information contact Helen Wallace: HWALLACE@usc.edu.au

Canarium value chain maps

Following are value chain maps for the Solomon Islands and Vanuatu canarium industries. These have been produced as part of the PARDI Forestry project.

For more information contact Craig Johns: craig.johns@adelaide.edu.au

Pictured is Steven Atunesia from Nguna Island with some of his processed nuts.
TOTAL VOLUME OF NUTS

FARMER
Production & Primary Processing

Harvested but rejected

Consumed at home, in village or bartered within or between villages (Raw, roasted or Value Added)

Community based Organisations (CBO’s)

Museli maker

Frangipani ice cream

Varivao

Maragho nuts + oil

Value Adding Opportunities

Broken nuts

NUT CONSUMER

Small scale
Central Market
Varivao Stores
Maragho Stores
Individual retailers
Chain retailers
Food Service, Hotels

Export

Production
SECONDARY PROCESSING
MARKETS
TOTAL VOLUME OF NUTS

FARMER
Very limited processing

Consumed at home, in village or bartered within or between villages (Raw, or Value Added)

Rural markets and stalls
Urban markets
ACTIV store
Kava store
Individual retail outlets
Chain retailers
Food service, hotels

Farmers sell as nut in shell or as raw kernels
Smaller processors
ACTIV (snack nuts and oil)
South Pacific Nuts (mainly sugar coated kernels)
Lapita Cafe (mainly biscuits)

Cosmetics Manufacturers (oil)

NUT CONSUMER

PRODUCTION
SECONDARY PROCESSING
MARKETS

NOTES
Harvested but rejected
Not harvested
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