

Quality Systems to Compete in a Global Market Place Study Tour

Marc Jackson
Global Fruit Protection

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Quality Systems to Compete in a Global Market Place.

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contribution and matched funds from the Federal
Government*



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Aims

From this tour the aim would be that these growers come back to Australia and implement some of “world’s best practise” so that they can compete in a global market place. The growers will have an understanding of how to deal with international marketers and buyers and will be prepared when the time comes for Australian export bananas. These growers will also be aware of global best practice in competing within the Australian market.

Project dates

19th July – 29th July 2010

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This project has been funded by HAL using your contribution and matched funds from the Federal Government and attending growers funding.

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Media Statement

Some of Australia's major bananas growers instigated a study tour to Central America to study quality systems to compete in the markets of Australia and globally. The trip was coordinated by Australian company, Global Fruit Protection with funding jointly provided by the participating growers and Horticulture Australia Limited.

Central America proved a range of banana growers, both conventional and organic, providing fruit to America and Europe. These growers were chosen as they are leaders and innovators of Central America production.

Noticeable was the dedicated labour force. The key staff are well trained and work effectively to produce export quality fruit. All work on the farms are regimented and done in a timely manner with special attention to fruit quality. Banana jobs are in high demand and considered well paying long term professionals. Farms are using protective devices to protect the fruit during the growth period and during harvesting and transport to the packing shed.

Transfer to Australian production has started with growers using the Australian product, "Clipslips". The difficulty with labour is that it's expensive, now equating to over 40% of the cost of production. Australian labours don't consider the high value of being well trained and professional, although this mindset can be changed by training etc.

Project Background

Deluca Banana Marketing (DBM) has approached Global Fruit Protection as a consultant to offer growers an opportunity to study world's best practice in banana production.

I have studied world banana production after being awarded a Nuffield Scholarship in 2001. I have also worked with consultants from all over the world in production systems in banana. I have farmed bananas for 20 years and have worked for the largest multi-national fruit producer and marketer, and invented the banana "clipslip" holding world patents. The clipslip is a protective device that fits between the hands of bananas as they grow to protect the bananas from tip scaring, bag rub and harvest damage.

DBM (Deluca Banana Marketing) are the largest marketers of quality bananas in Australia and represent just under a quarter of all bananas marketed at 5,000,000 boxes per year. DBM is based in Brisbane and has sales all over Australia to the major chains.

Part of my consulting work is finding an export market for Australian bananas, hence the title of this study tour. DBM along with other marketing groups have shown interest in exporting, especially during times of oversupply. One of the major issues in export is quality and what is expected in markets outside Australia. Japan has been targeted because there retail price is high enough to pay for the high priced Australian product. Also Japan markets fruit by the product rather than just a commodity market. Japan is also a quality market and showing the growers what is expected by this tour will help them when they start exporting. Also the major chains are expecting world quality fruit to be presented on the shelves for consumers to purchase.

Exporting and quality systems is also a strategy that Australian banana growers should use to protect themselves against future and current threat of imports. Consumers will demand better quality fruit and reasonably priced fruit and if they are not being provided with that now, they will pressure for

imports. I also believe that an exporting country will not look that lucrative to exporting countries, therefore making countries look twice to the financial implications.

All Australian banana growers will be invited to attend this study tour.

A detailed report will be submitted to the ABGC for publication in the Australian Banana Magazine.

Aims

From this tour the aim would be that these growers come back to Australia and implement some of world's best practise so that they can compete in a global market place. The growers will have an understanding of how to deal with international marketers and buyers and will be prepared when the time comes for Australian export bananas.

Costa Rica

Costa Rica is a small strip of land of 51,200 Km² between North America and South America. The abundant vegetation and protected National Parks makes this area the richest in Central America. Over 25% of Costa Rica's territory is protected and less than 1% is used for banana production. All banana farms are on the Caribbean Coast and use the port city Limon to dispatch the fruit. This strip of land is about 120km wide from the volcanic mountains to the Atlantic Ocean.

Banana production accounts for 16% of exports from Costa Rica generating some US\$800,000,000 in income and employing 40,000 direct jobs and 100,000 indirect jobs. Costa Rica is the second largest to Ecuador, exporter of bananas in the world, and sells around the 100,000,000 18.4 kg boxes per year to the United States and Europe. The United States account for buying 57% of the production with the rest shared among European countries.

Bananas are Costa Rica's biggest agriculture export and the biggest employers. Around 92% of the population of Costa Rican's eastern Atlantic region depend directly or indirectly on the banana industry. Bananas contribute 12% of Costa Ricans national income. Hi-Tech is being supported by the government, the result of a very good education program in Costa Rica. Tourism is Costa Rica's biggest money earner.

Ecuador

The banana growing areas span from 1° to 5° below the Equator. Ecuador has a distinct wet season and a distinct dry season. Rain is recorded in December through to May while no rain is recorded from June till November. Anything will grow in this very fertile country and Ecuador produces some of the best fruit at the lowest prices. Bananas are the No.1 export of fresh fruit. With its vast expanse of land, Ecuador also produces large amounts of mango, pineapple, coco, lemons/limes, soybeans, sugar, rice, coffee and tobacco. Teak and timber plantations are now very lucrative. The banana areas of Ecuador are broken up into three areas; the biggest is between Quevedo and Santo Domingo about 200 km inland along the Rio San Pablo and its tributaries. This is a very fertile valley between the Andes and the coast with the average size of farms being 150 hectares. The second area is between Guayaquil and Quevedo and in this area is a lot of smaller farmers of about 30 hectares. The third area is south of Guayaquil in the Machela area where most of the 4,500 farmers are. The average in this area is 5

Hectares. Machela has its own port for shipping. The leading exporter from Ecuador is Naboa, with Reybanpac then Dole.

Itinerary

19-Jul	Monday	Guayaquil, Ecuador
20-Jul	Tuesday	Maria Cecilia Farm, Farm practices and quality spec. for Europe V US afternoon Banana Porto Dole Shipping
21-Jul	Wednesday	Dole Plantations. In Quevedo. Banana. View social responsible programs (schooling) DALE FOUNDATION, Magdalena Farm Dole supplier. Visit Dole Research Centre.
22-Jul	Thursday	Magdalena banana farm 60 years old. Visit two Pineapple plantations Quality and Marketing, farm practices
22-Jul	Thursday	Meeting with Association Ecuador Banana Export. AEBE
25-Jul	Sunday	San Jose, Costa Rica
26-Jul	Monday	Meet with Romano Orlich inspect plantation and packing shed. Observe quality systems and packing protocols
		Meet with Researches - Corbana inspect research centre, view latest advancement in pest and disease controls.
27-Jul	Tuesday	Farm Visit__University EARTH__ view Facilities Working university Banana farms, Direct marketing, Packing and Quality, Banana by- products, Bamboo housing, Bocachi. Etc.
		Lunch at the university
		Palm Heart farms and factory Largest plant in Central America exporting worldwide. Composting, field practices and harvesting and manufacturing production.
28-Jul	Wednesday	Meet with San Alberto manager Rafal Hidalgo Inspect farming operations and packing shed operations. View quality systems.
		Edwardo Gomez CORBANA Directors
		Travel to San Jose

Details of Findings

Ecuador and Costa Rica are two of the largest exporters of bananas worldwide and therefore their quality is of a very high standard. Ecuador produces approximately 260million 18.4kg cartons per year which is approximately double what Costa Rica produces. In comparison, Australia produces approximately 21million 13kg cartons per year which is roughly 6% of Ecuador's production.

The high standard of quality and seemingly minimal waste was the main interest for the Australian growers. The waste varied across the farms in both Ecuador and Costa Rica, from insignificant to 30%. The fruit quality has no doubt improved over the years as the farm systems and processing methods have developed.

Systems implemented in the field which differ from Australian methods include:

- Wages – all staff are paid on a contract basis, by piece rate, each job can be monitored for payment. In Ecuador the average pay rate per day would equate to between US\$15 and US\$17 per day while in Costa Rica it's double at US\$30 per day. This pay rate includes all government required payments like taxation and health benefits. While similar piece work is used in Australia, the rates at which staff are paid are dramatically different: from A\$150 to US\$30 in Costa Rica.



- Quality monitoring – all staff's quality of work is monitored on a regular basis. The entire farms visited had both staff workmanship and quality of workmanship and outputs monitoring in place. Intensive records were kept on all aspects of the work on the farm and these were benchmarked against other areas of the farm and displayed in the packing sheds. The record keeping was very intensive and when put together with production records each area of the farms could be measured for all costs and productivity.
- 1 person responsible for 1 section of the plantation (usually 1Ha). This ties in with the above two statements, each area is benchmarked so by dividing the farm into smaller cells the persons working in that area can easily be monitored. Problem such as faulty workmanship or quality problems can be easily identified. The use of this system interested the Australian growers.
- Each bunch is visited more than once for maintenance. All farms had different methods of fruit care but the basics method of the five visits are:



1. Bag as soon as the bud falls, a DOW Lorsban (chlorpyrifos) impregnated plastic strip is tied just above the bud, and then a DOW Lorsban (chlorpyrifos) or CHEMPLAS Biflex-impregnated (Bifenthrin) bag reduces flower thrip damage. Also the tip of the bell is cut for two purposes: firstly when the bag is placed over the bud the bag should not tear and secondly it is assumed that when the hand sheaves (bracts) start to come away from the hands and curl up, they will drop away easier, as opposed to staying on the hand and rotting.



2. This visit the bud sheaves (bracts) is removed and those that are not easily removed are cut from the hand.



3. The flowers are removed at this visit. The hands are flat and at right angles to the stalk and at this stage the flowers are easily removed by wiping your hand across the tips of the bananas.



4. The last three hands are removed at this stage.



5. The final visit is to install the proactive devices that protect the hands from scaring or bruising during the growth stages and harvesting and transport back to the shed. Many types of devices were used and the common two were super protectors (nun-collar) and plastic inserts (diapers).

Harvesting methods differ from farm to farm but the two main types are: (1) a chain and rope, pulley system, where after the bunch is cut, it's lowered carefully onto the shoulder of the worker. (2) The second system is where the fruit is grown without pads, the pseudostem is cut and the upper part of the plant rests on a pole. The bunch is now hanging at an easy, workable height. Plastic covers are fitted over the hands to prevent rubbing between the whorls and much thicker pads are fitted between each hand. Both these systems were very time-consuming although each group was to harvest 450 bunches per day using the rope and pulley technique, and 200 bunches/day/ 4 man team using the pole and pads method.



Above left: the farm hand is checking the calibration of the fruit for suitability for export. The measurements are 42/32” which equates to 37mm. Above right: this is the apparatus/ladder used; note the hook for securing the devise into the crown of the banana plant and the pulleys for letting the bunch down to the carrier.



The harvester cuts the stalk, the chain and rope is secure and once he is down on the ground will lower the bunch onto the pad on the carriers shoulder.



The bunch is safely on the shoulder of the carrier and he can now take the bunch to the cableway for transportation the packing shed.



John Deluca shows off the type a pillow or shoulder pad used in the harvesting process. This will be one of the learning's adopted in Australia.



Top left: the cutter is padding between the hands. Top right: the pole has a spike that embeds itself into the pseudostem leaving the bunch at a workable height. Right: two carriers use a bamboo pole to carry the bunch to the cableway.



Motorised cable tractor capable of transporting 50 bunches to the packing shed.

All work is manual – no tractors are used in the Central American and South America production systems. The farms are set out in such a way that drainage canals are set 20 metres apart. That is a banana plant will not be more than 10 metres from a drainage point. The other system that prevents vehicular traffic and can make it very dangerous is the cableway system for transporting the fruit from the fields. This system is manually operated by one man towing 20 bunches at a time, or up to 50 bunches with a mule or motorised cable tractor.



18 Kg packing procedure



A pad is used for the correct placement of the first layer of fruit.



This pad remains in position and the first layer is completed.



The plastic is pulled over the first row of fruit.



Packing the second layer.



Once the second layer of fruit is completed the padding is removed ready for the third layer.



Before packing the third layer the cardboard liner is placed over the fruit. Note the plastic for protection.



The cardboard and plastic is replicated for the fourth layer.



The fourth layer completed.



A plastic strip is placed between the inner and outer whorls of the top row to prevent fruit rub during transport.



Finally, the plastic is pulled over the top layer ready for lidding.

This is an 18kg banana carton packing procedure. During the trip, farmers were noted packing different styles for different customers and examples are singles for display counter sales, consumer packs (cluster packs in plastic bags), lower fruit quality standards packs, hand packs and cluster packs.



Single packs



Local packs/ returnable crates



Consumer packs



Transporting the fruit from the field to the shed via cable systems. This system is used on all the farms we visited. This line was pulled by a labourer and he will pull a maximum of 20 bunches. Mules and cable motors are the other two options and they can pull up to 50 bunches at a time. The padding is more important between the hands because to bunches move up and down as the carrier rides over the hangers.



Once the bunches arrive in the shed they are divided in lines of fruit, through a points system just like a railway. Areas are defined by the row the bunches are placed in, and this is used for monitoring and food safety traceability and benchmarking the different areas of the farm.

Bags were different to those used in Australia



The bags used in Costa Rica and Ecuador are thinner and softer than the reusable bag that we use in Australia. Some of these bags were impregnated with Lorsban (chlorpyrifos) and Biflex (Bifenthrin) and some farmers were using chemical-free bags but using impregnated plastic strips under the bag. These strips were tied on the stalk above the first hand and another impregnated strip was tied at the lower part of the bunch. These bags are a one use and are 15 to 18 microns in thickness. The entire waste bags are collected for recycling. The air holes were notably different from farm to farm, some farmers used small pin like holes while other used punched hole. The amount also differed from farm to farm. The reason is that during the wet season the bags with the most hole or airflow are the better option to limit moulds and fungus. It's the opposite for the colder seasons where the holes are reduced to keep the warmer and humid air in to help the filling process.

The Super Protector



The super protector is a protective device that fits between the hands of fruit as they grow. The stops tip scaring, wind rub, harvest damage and more importantly transport damage. The pad is made from EPE low-density polyurethane and is 4mm and 5mm thick depending on farmer's preference. Using the super protectors made for straighter and more uniform hands, ease of pack and visually the packs looked even and were well presented. The other option used was a plastic insert or sleeve that was placed between the inner and outer whorl. This product has the nickname 'diaper'. This product has been used in all export countries for many years and is still widely used in Costa Rica, some farms in

Ecuador and the Philippines. Another option was that some farmers were not using any protective devices except at harvest. The farmer would then fit plastic sleeves over the hand the thicker pad for transport to the pack house. Other farmers would just use the thick pads for transport back to the shed, an example is the photo on the previous page with the red and blue pads.

Picking “pillows” inserted when fruit was picked



There are variations of the concept, but all farms either used this method an apparatus, or used a bamboo pole to cart the bunches to the cableway for loading. There was someone to help the carrier unload his bunch, that person also sponged the stalk or wrapped plastic over the stalk to stop any latex/ sap damage. The first photo has the inner tube from a motor bike tyre inside to give the bunch the cushioning and protection needed during transport.

Quality monitoring.



Quality monitoring – various methods were used to monitor the quality of the fruit coming into the shed – all bunches were weighed, fruit quality/waste was measured. The top left photo shows the farmers check of maturity for export. One banana from each bunch is removed and sliced as shown. The banana on the right is yellow and therefore will not go for export. Even though the banana is hard green, the yellow is indicating that this bunch has reached maturity and will begin ripening on its own. One in every ten bunches are weighed, finger lengths measured, girths measured and recorded. Any faults are also recorded. Each farmer has an accurate record of production numbers for any given part of the farm.

Packing material in the box



The packing material was mainly a cardboard sheet with holes as shown and a plastic tube liner. This liner and plastic are used in a way that separates the fruit from each layer. The purpose is to protect the fruit from any crown damage and rub damage. The plastic always covered the cardboard sheet and protects the fruit from rubbing against the cardboard.

Applying stickers to the fruit



All fruit was stickered and represented the buyer of the fruit. This particular farm was selling fruit to Dole. The stickers are applied by hand.

Crown Sealing



Crown sealing is a requirement for export. The reason is to stop crown end rot, common to bananas that spend a length of time in cold chain. Crown end rot fungus rots the crown of the banana even when the bananas are still green. They are unsalable once crown end rot takes a hold so it's critical that every hand is treated. Above left, is a flood recirculation system that floods the tray of bananas as they pass under. Above right, is the most common method of application, a gravity feed hose incorporated into a paint brush. The labourer will paint every crown that passes. Citric Acid was used for organic bananas and a mixture of Tecto, active *thiabendazole* (Syngenta) & Alum Sulphate used for conventional bananas. The alum sulphate is used as a sealer to stop latex/sap staining after packing and transport. Tetco is a fungicide that protects crown end rot developing. Tetco, active *thiabendazole* (Syngenta) is registered for use in bananas in Queensland for crown end rot at 400ppm but is very rarely used.

De-handing and clustering methods and tools used



The left photo shows the two different de-handing methods used. One is where the hands are removed with the stalk attached. This is done by starting at the bottom of the bunch and slicing straight through the stalk. The cluster behind is the same method used in Australia, and that's done either by a spade or a hook knife as shown in the photo on the right.



Hook Knives for clustering



Spade



Clustering fruit



Clustering was done by two methods: The first is where the clusterer would sort and cluster the hand in the water and on completion would pass the finished cluster into the next trough. The second method and most commonly used, is where the clusterer will remove the hand of bananas and place them onto a small rubber padded bench for clustering and sorting. Once the clustering and sorting is complete, the clusters are then moved into the next tank for selection.

Processing system





There are many variations to the processing and packing system but in general all processing plant consisted of two troughs, the first one for clustering into and the second for the clean, clustered fruit. The length of the tank and the time the cluster remains in the water is important to stop the latex/sap flow. Once the fruit reaches the end of the tank, staff will then place the cluster onto a tray. This includes all sizes of fruit where the smaller fruit will be placed in one line on the tray, the second line of fruit will be larger and the final line will consist of the biggest fruit sizes. These trays are filled and move onto a weigher. The weigher seems very experienced to know what cluster to remove and replace with a larger cluster or smaller cluster. Once that's completed, the tray moves on to have stickers placed on the fruit and then along for either a fungicide bath or a fungicide treatment with a paint brush. The trays then move onto the packers. The main concern for the packers is presentation of the fruit; packers do not worry about the weight.

Another obvious difference apparent on the Banana farms visited in Costa Rica and Ecuador compared to Australia were the employees. The majority are long-term and committed employees with them and their families having been in the banana industry all their lives. The knowledge that these employees have in terms of handling the fruit and also methods of processing are invaluable and something that cannot be taught in a short period of time as is sometimes required in Australia.

An example of the awareness that the employees possessed was apparent in the level of care/attention given to each individual bunch during field maintenance. I personally was impressed by the way the fruit was handled both in the field and the shed. It seems as though each step of growing/maintaining/processing bananas has been investigated in detail to ensure the methods used are the most beneficial to the quality of the fruit.

Some of these systems could not be implemented in Australia due to the cost of labour and work place health and safety regulations but there are many that could be trialled.

Technology transfer strategy and methodology/activities

There are a number of methods and technologies identified in South America that could be transferred to Australia. It is imperative that these methods are investigated and adapted to our farms in the quest to improve our quality and reduce our waste.

The methods observed during the trip all of which are different to the methods used in Australia. Methods such as: (1) the use of the nun's collars – as the size of the collars hold the bag away from the fruit therefore reducing rubbing; (2) a protective padding used when humping to reduce bruising

etc; (3) de-flowering at an early stage – note the staff's intuition to use a method (banana leaf) to stop latex/sap burn; (4) Fruit care at an early stage; (5) Transporting fruit to the packing shed via cable system; (6) trialling various de-handing & clustering methods, together with sufficient staff education and training are things that could be implemented in Australia to help improve quality.

Implementing additional staff training in particular on bunch care timing and fruit handling is imperative. Training key staff could involve study tours so they can see firsthand the quality measures and staff commitment.

The success of these methods depends not only on the way they are implemented but also the timing of the processes. Each job/process must be done on time for them to be a success.

These are just a select few methods that were seen throughout South America but there are a number of different variations from farm to farm. These are the technologies that Australian growers should be adapting to their field and process systems. Some of these practices have been adopted in Australia, like the use of the clipslips and now one proactive farmer is installing a cableway system.

Dissemination to the Australian banana industry will be by way of sending this report out to every grower either as a leaflet or incorporated within the Australian Banana Magazine. The Department of Primary Industries will also be provided with all notes and this report. The note will also be provided to HAL.

Evaluation and measurement of outcomes - impact and adoption

Fruit waste reduction, Class A fruit will improve the long-term sustainability of Australian banana farmers improving returns and profitability. Australia banana growers may one day have to compete in a global market place and by adopting new technologies and methods Australian banana farmers will keep pace with global quality trends. The impact of adopting world's best practice will result in these select growers remaining leaders in the industry, for others to follow.

The high cost of labour in Australia will always be a drawback when labour accounts for over 40% of the costs of production, while aerial spraying would account for the major costs in Central America.

Discussion & Recommendations

Although it is unlikely that Australian banana farmers could implement all of the methods used in Ecuador and Costa Rica due to our high labour costs and regulations, the methods mentioned are just a few that could be trialled in the endeavour to improve quality.

A suggestion was that we could train staff by using experienced staff from Costa Rica and Ecuador. While this suggestion is very good, how do we change the mindset of the Australian staff that are itinerant or backpackers that keep moving on. Banana production is a very labour intensive and while there is dedicated staff within the industry there are just not enough to fill the whole industry. It seems that banana jobs are highly sought after and are long term in Central America, and are valued jobs.

The success of these methods comes down to changing the mindset of both the farmers and the employees. One must be open to change and improvement for the methods to take effect and be a success. The only way to do this is to continuously educate staff through training and positive criticism as well as re-iterating general awareness for the handling of the fruit.

Participants

Tony and John Deluca and Alan Engeman from Deluca Banana Marketing said that black sigatoka was a standout. The costs of controlling black Sigatoka make up more than half production costs with over 60 spray cycles per year. The amount of disease pressure and the devastating effects concerned the group and that if black Sigatoka got a foot hold in Australia the disease would decimate the Australian banana industry.

Bunch protection stood out and the use of the super protector (nun's collar) meant that the bunch is protected right from the growing stage into the shed. This device (nun's collar) protects the fruit from tip scarring, wind damage (the bag is held away from the bunch), and during harvesting and transport to the shed. Because consistent clean fruit came into the shed the flow through of fruit was noticeably quick and ran smoothly. The equated to high productive with very little waste. DBM have produced a CD with all the photos and movies along with a hand out and have passed that onto their growers and the supermarket chains.

Peter Inderbitzin Swiss Farms, the quality of fruit and how most of the fruit was packed rather than discarded. The super protectors (nun's collars) are a must for quality and increasing productivity. This trip convinced us to improve in our quality. Peter has since ordered a container of the super protectors and is looking at having the fruit care division divided into separate blocks for each person so that he can monitor the performance of each group.

Dennis Rigato the main points that stood out was the amount of staff the farms employ compared with the employment on Australian farms. The cableway system would be more efficient but that's adding costs that we cannot afford. If we don't want to add extra costs, then we have to do what we do better. Training, doing the job better and crop timing will help fix some of our quality issues without adding to our costs.

Dennis and Peter Howe, Howe Farming like the trough system and want to build a pilot system to trial. The only hesitation is the double handling and extra costs manually moving fruit from the de-handing trough into the packing trough, but on the upside staff will be able to sort the fruit better because they are lifting the whole hand from the water and through that shifting process will be able to look for faults. The de-handing knives seem to be safer on the fruit avoiding cuts, but are harder to use but that may be technique. The amount of drainage and the lack of insect pest problems, they don't bell inject. All the labourers were well trained and see the banana industry as a career rather than just a job to go to. The super protectors (nun's collars) and the cableway system definitely reduced waste and improved quality along with the packing process. We should be packing in 18 kg boxes, the pack is tight and suits bananas perfectly. As soon as we arrived home I displayed posters of fruit quality so our staff could learn from the Central American farming practises. I also produced a manual of the quality procedures that stood out.

Stephen Mackay, Mackay Estates The attention to detail, visiting the bunch many times and using the super protector meant that when the fruit arrived in the packing shed, the quality remained and the

process through the shed was efficient. It was obvious that Costa Rican farms had more pricing pressures because of the higher cost of labour and that was noted by the fieldwork being behind and the lesser amount of fruit care. This did not seem to affect the outputs of the sheds and the quality packed and noticeable was the different styles of packs to suit their customer's requirements. They have come up with a model that works under the threats of rising costs. We can implement some of the techniques like the super protector and be more efficient with our bunch care to reduce waste. Australians need to value our island status in regards to quarantine because of the devastating effects of black Sigatoka. We are a lucky country because we don't have the disease pressure from surrounding back yard farmers and if we did and black Sigatoka got a hold, it could never be controlled.

Jonathon Eccles Australian Banana Growers Council

Juliana Henderson Researcher

For the Australian banana industry to remain competitive in a global marketplace, we need to capitalise on our strengths. The cost of production due to high labour costs is always going to hinder profitability for Australian banana growers. However, there are still opportunities to maximise profits by reducing wastage and increasing product quality.

The Australian banana industry strategic plan has among its key objectives: (1) the goal of increasing production efficiency which will give a 5% increase in profit/kg and (2) a projected 15% increase in consumer demand by 2014. To achieve these goals we need to find ways to produce the best possible product without adding substantially to production costs.

Banana producers and their farm workers in both Ecuador and Costa Rica have invested much time and thought into procedures which result in a high quality product. While sound, it is not practical nor financially viable for Australian growers to adopt many of these practices. The in-field bunch maintenance in Central America is quite labour-intensive as the strategy relies on the highest possible quality fruit being produced from the outset so that when it arrives in the packing shed, there is little or no wastage. In the packing sheds, the staff are dedicated to their roles and although each person is trained to do all jobs, they generally specialise in the one procedure and so become experts. This approach is possible as Central American banana workers consider banana production as a highly valued career and so are retained as permanent staff, unlike Australia where a large proportion of labour are itinerant workers. The result is the production of an aesthetically-pleasing and delicious, export-quality product.

Despite these differences, there are some protocols learned in Central America which don't have major financial implications and which could offer Australian growers some fruit quality improvements and therefore increased profit yields.

- Many of the growers on the tour have expressed interest in using ‘super-protectors’ (or nun’s collars) to protect the bunch during growth, harvest and transport to the packing shed.
- Similarly, the growers were interested in the tools used for de-handing and clustering and in fact, purchased some hook knives to trial in Australia for clustering.
- A simple pad constructed from an inner tube was seen as a viable solution to protect the bunch as it is transferred on the shoulder from plant to waiting transport back to the shed.
- Incorporating a deflowering step would prevent damage to the fruit, particularly during transport from farm gate to market. In Central America, this step is carried out in different ways with the most labour intensive being in-field during bunch checking and bagging visits. The least labour intensive but equally effective for preventing damage after boxing, is flower end removal by hand in the packing shed. In Costa Rica, this was seen being carried out on whole bunches following hosing down but prior to de-handing. Removal of flower ends also removes a common source of post-harvest fungal infection, which although it doesn’t affect the quality of the fruit, looks less appealing at the point-of-sale. Another advantage of removing flower ends before clustering is that less plant material ends up in the clustering tanks, which in turn means less filtration is needed.
- The introduction of individually stickered, banana ‘singles’ for retail as a quick snack alternative may provide both a growth market and an avenue to decrease banana wastage in the package shed. In one Ecuadorian packing shed, such marketing meant little more than the banana bunch stems were lost to waste.
- Introducing quality control inspection points in the field as well as the packing shed would lead to a better understanding of where procedures could be improved.
- Although expensive in terms of initial outlay costs, at least one grower is planning to install a cableway system on his farm to improve in-field transport and fruit quality, and in the longer term, to reduce field labour costs.

From a disease perspective, the opportunity for Australian growers to see first hand the damage caused by black Sigatoka in the field was invaluable. The growers were able to gain an appreciation of the effects this disease would have on their livelihoods should black Sigatoka become established in Australia. Since my last visit to Costa Rica in 2002, fungicide applications have increased from 50 to up to 70 per year. This is a dramatic increase in fungicide usage, particularly when the push worldwide is to decrease fungicide application, and the necessity has undoubtedly arisen from an increase in fungicide resistance by the pathogen and the constant environmental pressure brought about by high rainfall periods. Novel methods of black Sigatoka control are being investigated by the Costa Rican banana research institute, CORBANA. Secondary metabolites from *Trichoderma* (fungus) and *Bacillus* (bacteria) have been found to affect germination of black Sigatoka spores. Trials investigating the effectiveness of tea tree oil in black Sigatoka control are also being carried out and I will continue my contact with the scientists to learn the outcomes of these and other investigations.

In Ecuador, disease pressure was considerably less due to lower rainfall. However, infection by black Sigatoka, nematodes, rust thrips, black weevil, mealy bugs still occurs. Fewer fungicide applications are necessary (at one farm only 16 cycles per year) and fungicide resistance and nematode monitoring is performed in a basic laboratory. In an interesting application, garlic (50kg in 200L of water) is successfully being used for control of rust thrip.

Other interesting disease findings included:

- The inability to locate banana Freckle disease (caused by *Guignardia musae*) on plantation or feral bananas in either Ecuador or Costa Rica, confirms that this disease is not likely present in Central America.
- On at least one occasion the symptoms of Moko Disease were sighted in Costa Rica in the pseudostem of a plant which had just been harvested.
- A notable decrease in the number of spiralling whitefly infestations was seen compared to those seen in 2002.

On a personal level, the opportunity to join the banana growers and wholesalers on tour as they inspected banana production in Central America was of enormous value. I have learned a tremendous amount from our hosts, plantation owners, Central American researchers, but mostly as I listened to the Australian contingent as they dissected the practices out to find ways to improve the productivity and quality on their farms. Field trips such as these provide great insight to the diseases as well and assist me with the design and development of disease assays, particularly with respect to sampling strategies. This is something I wish to explore further at home and I intend to take up offers made to me by growers and wholesalers to visit their properties to further discuss disease issues and control strategies.

Finally, it is my opinion that the Australian growers need to grab hold of the most valuable asset they have available to them. Australian Bananas are perceived as a 'clean and green' industry and this is a status which many exporting countries envy. Maintaining and promoting our disease-free and lower pesticide use status gives us a niche market in the world and one which we can capitalise on in both the domestic and export markets.

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