



Australian Government  
Australian Centre for  
International Agricultural Research



# Bougainville

## CHOCOLATE FESTIVAL | 2019

**"WORLD CLASS BEANS FOR WORLD CLASS CHOCOLATE"**

*Sub-theme: Creating opportunities for our farmers for our future*



### COME AND SEE VARIOUS COMPETITIONS AND DISPLAYS:

- ▶ FARMER COMPETITIONS:
  - BIGGEST BEAN AND BIGGEST POD
  - CHOCOLATE COMPETITION
  - COCOA BUDDING
  - CLONE IDENTIFICATION
- ▶ DISPLAYS:
  - CHOCOLATE DISPLAY BY 2018 GOLD WINNERS
  - FERMENTATION DRYING PROCESS
  - TIMBER MILLING
  - PNG COCOA BOARD, RICE MILLING
- ▶ COMMUNITY COMPETITIONS:
  - SCHOOL CHOCOLATE MAKING
  - SCHOOL QUIZ
  - POD THROWING
  - COCOA SACK RACE
  - TUG OF WAR
- ▶ ENTERTAINMENT
  - CULTURAL GROUPS
  - LIVE BANDS

Date: 7<sup>th</sup> - 8<sup>th</sup> (Wed - Thur) August 2019

Venue: Independence Oval, Arawa, ARoB

## Bougainville

Cocoa has been grown on Bougainville for over 100 years.

It started as one of a number of crops in a German government experimental station. The initial rootstock came from German government research stations on New Britain. In turn the genetic material for the New Britain came from German interests on Samoa. Commercial interests soon took over. In most cases, cocoa was inter-cropped with coconut. Whilst the Germans were the initial drivers of the industry, Australian and British interests soon became more active.



The original cocoa material was Trinitario but today Triniatario x Amazonian hybrids have become widespread. The three main attributes sought in the hybrids are that the tree is shorter and easier to manage, they are relatively quick to bear fruit, and are more tolerant of Cocoa Pod Borer.

For the first 50 years of the industry on Bougainville, cocoa production was nearly solely plantation based. In the 1960s the industry started to change as small-holder production increased. A core feature of the plantation system was centralised quality control at the fermenting and drying stages. Regulations were introduced to continue this in the smallholder sector by specifying various minimum sizes. Well into the 1980s Bougainville had the reputation of producing cocoa of the highest quality. Some English chocolate makers used only Bougainville cocoa in their products.

A series of internal and external incidences led to a decline in the quantity and quality of the industry. Some of these were the cessation of direct shipping to England – at one stage ships would sail directly to Hull – the civil war, the invasion of the Cocoa Pod Borer, and the collapse of the plantation system.

Production on Bougainville shrunk from 20,000 tonnes to around 13,000 tonnes. It is now creeping back up due to programmes that stress orchard hygiene and intensification of production. New genetic material has been introduced and growers trained in a number of production techniques. Quality is increasing through better fermentation and drying equipment: great emphasis is now place on solar drying.

## Cocoa from Bougainville

Since 2016 Bougainville has held an annual Chocolate Festival. The growers whose samples are explained in this booklet are medal winners from the 2019 Festival.

The Festival's judging process is outlined below.

In May 2019 the Bougainville Department of Primary Industries made the call for samples to be submitted for the 2019 Festival to be held in August 2019. Interested growers were required to submit a three kilogram sample. A total of 73 samples were submitted. Growers submitting samples had to provide information regarding their geographic location, and harvesting, fermenting, and drying procedures. The information allows the project to correlate medal winners with on-farm practices and regional traits.

Upon receipt by the Department, each sample is given a number. An evaluation team led by two people trained by the Cocoa Board then assess the beans. The only information the Assessors have is the sample number. The assessors judged the beans for moisture, and the "cut test". Crucially, they examined the beans for smoke taint. From this process 43 beans were selected to be made into chocolate.

Processing chocolate was done by staff at the Bougainville Department of Primary Industries' Chocolate Laboratory. The use of the Laboratory staff is to ensure compliance with one of the major rules of chocolate judging – consistency in terms of roasting time, sugar content, grinding process, tempering, and moulding.

The roasting protocol covers weighing the beans into batches of exactly 400g then roasted in a Behmor 1600 coffee roaster at a temperature of 120°C for eight minutes followed by eight minutes of cooling. After roasting the beans are deshelled manually. The nibs are then weighed to 400g for grinding. After two hours of grinding sugar is added: we use the 70 percent formula. The mixture is then ground for another 30 minutes before being conched.

Six experts were used for judging at the 2019 Festival: four international and two nationals. Each block of chocolate was accompanied by around 100 g of the roasted but unprocessed beans. The judges used an elaborate scoring system developed by the International Institute for Chocolate and Cocoa Tasting in the United Kingdom. Judging took two full days. As each sample was judged, the individual scores were uploaded onto the Institute's computer for analysis.

Points were provided across a series of characteristics such as flavour profiles, the balance of the flavours, the complexity of the flavours, and their distinctiveness. Each sample takes about 12 minutes to score.

Based on the scores, Gold, Silver, and Bronze medals are awarded. The final breakdown was 3 Gold, 5 Silver, and 8 Bronze. Judges were given a break then were required to do a validation blind tasting on the 16 medal winners. The validation scores were remarkably close to the initial absolute scores with there being no change in medal ranking.



The four samples in this collection come from the four main production areas on Bougainville.

## Hahon Family Farms

Chris and Anastasia Poto are very happy cocoa farmers on two counts. One is that they have the satisfaction of knowing that their cocoa beans won Gold at the 2019 Bougainville Chocolate Festival held in August. The other is that the prize money will enable them to completely rehabilitate their processing facility. In turn, this investment will enable them to better assist their neighbours.



Chris' plan is to completely rehabilitate the facility. All that will remain will be the concrete slab. To start with, the fermentation boxes will be located to the left of the existing facility, at least five metres away from the current slab. Chris will be using the 4-1 system, that is, four boxes of which only three will be filled at any one time.

The new drier will be a combo drier, one that uses fire and solar. Chris and his family are already scouring the area looking for large black stones to help store the heat. Finding such stones is a bit of a challenge as the area where the Potos farm is very sandy with few rivers from which to find rocks.



Despite this small issue, the general area where Chris and Anastasia farm has a long history of cocoa farming. Many of the older people in the area refer back to what they call the "plantation times". Some of the cocoa trees in the area are more than 40 years old, tracing their origins back to what was called SG 1 perhaps one of the earliest releases from the (national) Department of Agriculture and Livestock near Rabaul and from the seed garden at Kurwina Plantation on Bougainville's mid-west coast.

More recently, there have been second generation material called SG 2. Chris is working with experts from the Australian Centre for International Agricultural Research to see if they can graft some of the older cocoa trees onto new stock as well as rehabilitate some stands of SG 1.

Despite being more than an hour's banana boat ride away from Buka, the provincial capital, the Kunua area where the Potos farm is quite densely populated. Within the immediate Potos family there are ten members. Between them they farm around 2,000 trees, processing about 30 bags of dried beans. In addition to the immediate family, Chris and Anastasia can call on a large number of relatives to provide wet beans. It is these relatives that Chris intends working with using his expanded processing facility. Chris is adamant that those who he deals with must follow his quality requirements. This is why he is dealing with wet rather than dry beans so he can control the fermenting process.

Chris has not always been a cocoa farmer. In the past, he has worked on a large number of cocoa-related projects. This is where he gained most of his cocoa knowledge. He has refined his knowledge by attending a number of cocoa-related training courses.



The Potos currently use a two-box fermentation process. They turn every day. With drying, they use the 3+2 system, that is, three days of fire drying and two days of suns.

When sun drying, they try to turn the beans every two to three hours.



## Hatokaweasil Women's Group

This is one of the newest groups of cocoa growers on Bougainville. Because of this they have been able to start with a state-of-the-art processing facility.



Their drier is a combo sun and fire system. In an effort to manage the capital outlay, the group uses a combination of UV-resistant polyvinyl sheeting and polycarbonate sheets. Black stones for storing heat can be seen in the photo.

The fermentary boxes are located at least 10 metres from the drier to prevent smoke transmission. As can be seen above, the drier's chimney reaches well above the roof.



The fermentation process uses a 3-1 system, that is, three boxes with only two filled at once. Fermentation is seven days with daily transfer between boxes.

The group does not use the mucilage bag system. On the other hand, the fermentary boxes have adequate drainage holes that are cleaned when the beans are transferred.

Drying is 3+2, that is three days fire and two days sun. If there is good sun on the first day of transfer, the group does not use fire.

The group is experimenting with the treatment of the beans at night. One experiment is to have a low fire at night if there has been no fire during the day. Another experiment is to cover the beans at night to keep the warmth in.

The group has over 330 members in the immediate area. Apart from the growing interest in cocoa, the group deals in fresh produce and copra production and marketing, and conducts a series of home economics training.

In the short time that the facility has been operating, 10 families supply beans. In the four months of operations this has resulted in 50 bags annually. When the existing suppliers are fully operational, production is expected to expand to 100 bags. This will expand as more of the 330 members in the current watershed take up cocoa.



Cocoa growing is seen as being family friendly. There is daily maintenance farm work that can be done by the mothers during school hours. During the flush, all members of the family participate. Cocoa growing can be integrated with vegetable farming.



## Justin Dissing

Justin has always been a farmer. He so enjoys being a farmer that he purchased his farm about five years ago. Justin farms over 4,000 cocoa trees on two blocks with his parents, his wife, and children who use the money for school fees.



The cocoa trees are inter-grown with bananas. The family also raise pigs.

Justin's farms are about an hour's drive away from Arawa in Central Bougainville. It is in the heartland of the original cocoa plantations established by the Germans at the turn of the previous century. His farm is contiguous to the Aropa Coconut, Rubber and Cocoa Plantation that started as an agricultural experimental station and then in 1907 became a commercial plantation established by the Bismark Archipel Gesellechaft. Many people in the region still use the "German beans" to describe the older bigger beans.

What makes these beans exceptional is their size. Justin's beans are around count 70. In the 2018 and 2019 Bougainville Chocolate Festival's Big Bean competition, the biggest beans all came from the Arawa region. Many beans were Count 50s with the winning beans being in Count 40s.

Records held in other parts of Papua New Guinea show that some of the older trees from which Justin's current trees originated has butter percentage greater than 60 percent.

After harvesting and pod splitting, Justin drains the mucilage for a day.



Fermenting is in a 4-1 system, that is, there are four boxes with Justin filling only three at any one time. Each day in a form of Chinese Puzzle, Justin and his family transfer the beans into the empty box. He ferments for seven days.

Justin usually dries using 3+2, that is three days of fire and two days of sun.



Justin's family was one of the earlier adopters of a combo drier based around using UV resistant PVC.

The piping is 5 mm steel rather than the 3 mm steel more common in the area. This helps prolong the life of the pipe and thus reduces the chance of smoke leakage. Justin is in the process of filling the piping area with dark rocks.



Justin and his family produce annually 16 bags of high quality dried beans.

## Steven Sevake

Steven is an unusual cocoa grower in that he has only come into cocoa growing in the past few years.

He grew up in Buin, in Bougainville's far south. Like many in southern Bougainville, Steven's first real work experience came when he started at the Bougainville Copper Limited mine at the nearby Panguna site well over thirty years ago. It was whilst working at the min that Steven met Elizabeth. Reflecting the area's matrilineal tradition, the land belongs to Elizabeth.



Steven and Elizabeth have two daughters, Sharon and Doricka, who will inherit the land. To equip them to be successful farmers, Steven has taught them to bud.



Steven readily admits he had little knowledge of cocoa when he first started. But he had two things going for him. Being an avid reader, he has absorbed the lessons from the *Cocoa Extension Manual* and *Cocoa Clone Management* guide. In addition, he has undertaken training provided by the Cocoa Board to be a Quality Assessor.

The other big advantage that Steven had was a great mentor in Peter Kinana. Peter is from Buin. In the 2016 Bougainville Chocolate Festival Peter was one of the six gold medal winners



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Makassar, 27 January 2017

WE ARE REPORT AS FOLLOW :

DATE SAMPLE RECEIVED : 27 January 2016

SAMPLE DESCRIPTION : Received one (1) sample said to bean and marked as follow:

### (1)PETER K NANA

#### QUALITY REPORT

Bean count per 100 gram	: 67
Bean Cut	
• Fermented Brown	: 98.00 %
• Brown/Purple	: 0.00 %
• Purple	: 0.00 %
• Slaty	: 1.00 %
• Moldy	: 0.00 %
• Infected	: 0.00 %
• Germinated	: 1.00 %
Moisture Bean	: 6.56 %
Fat & Moisture Liquor	
• Fat Content	: 57.4 %
• Moisture of liquor	: 2.1 %
Sensory	
• Comment	: Woody, Strong Sour, Winsey, Salty
• Level Fermented	: Over Fermented
• Panelists	: Iphini, Ihsa, Nova, Kelindan

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Steven happily credits Peter with teaching him about pruning, tree architecture, harvesting, fermenting, and drying. Peter is obviously a good teacher because Steven won Best in Show at the 2018 Bougainville Chocolate Festival.

Steven's first harvest was two years ago. There had been trees on the block well before he took over.



Steven exercises sun drying as much as he can. He understands that he needs to keep a buffer between the earth and the cocoa beans to prevent the build-up of moisture.



The brown mat is *saksak*, woven from palm leaves.

Apart from being a great cocoa farmer, Steven is a brilliant organiser. In the 11 years he spent at the Mine, Steven qualified to drive nearly every vehicle from a fork lift to the then monster 170 tonne dump trucks. He became a Senior Equipment Operator eventually finishing up as a Crew Instructor on graders. After he left the mine Steven became Secretary to the Southern Bougainville Council of Chiefs. Through the Peace Foundation he became a trainer in conflict resolution. He then spent a few years with the *Strongim People, Strongim Nation* project as a community development officer. Steven has turned this experience into organising growers from the region into a marketing group.

Steven has formed a group with over 50 members in the Buin-Siwai area of southern Bougainville. In fact the group has ceased recruiting in order to allow its organisational and physical structures to expand at a measured rate. All members use the combo drying facilities of Steven's mentor Peter Kinana. Current production is 100 bags, a figure that will increase once some of the current members crops come on stream and as new members are admitted. Beans are stored in one of the member's concrete floored warehouse.

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