

Supporting bulk bin exports of Western Australian seed potatoes to Mauritius

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Western Potatoes Ltd

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PT06046

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Project PT06046

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Supporting bulk-bin exports of Western Australian seed potatoes to Mauritius.

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HAL Project: PT06046

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Purpose of the Report:

The aim of the project is to increase Western Australia's exports of seed potatoes to Mauritius through:

- Reducing supply chain costs for WA growers sending seed to Mauritius
- Enable Mauritian growers to improve the quality of their potatoes and hence their returns through training in grading and storage and investment in improved facilities.

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1. Media Summary

Mauritius has been a consistent market for Western Australian seed potatoes over the past decade. However, sugar is the country's main crop with numerous large estates backed by institutional support from the Government. In recent times the sugar industry has been facing difficulties due to the reduction of the European Union quota for Mauritian sugar. As such, there is a Government backed drive to diversify and evaluate other opportunities for industry development.

Potatoes have been identified as a good option for diversification. However, the production system needs to improve and input costs need to be reduced. Clean, pathogen free seed from overseas suppliers is a major cost in the production of potatoes. As such, Western Potatoes Pty Ltd (WPPL) together with commercial partners in Mauritius decided to investigate reducing cost whilst improving seed quality and driving industry and market development.

The overall aim of this project was to increase Western Australia's exports of seed potatoes to Mauritius through:

1. Reducing supply chain costs for WA growers sending seed to Mauritius;
2. Enabling Mauritian potato growers to improve the quality of their potatoes and hence their returns through training in grading and storage and investment in improved facilities

The experiment was conducted to compare the performance of potato crops grown in Mauritius using seed potatoes (cv. Delaware) shipped from Western Australia using two different packing methods. The bulk seed was shipped either in bulk *bins* (method 1) or *bagged* in 25 kg mesh bags (method 2) after being graded, stored and exported.

The project demonstrated that labour intensive *bagged* seed potatoes resulted in a similar yield (around 25 tonnes/ha) to bulk *binned* seed potatoes when grown out in Mauritius. As such, Mauritius is interested in pursuing the bulk *binned* seed potatoes if:

- The seed is graded
- The price is much lower than 25kg bagged seed.
- The seed can be sent in 1 tonne bulk bags

The Mauritians still need to be better equipped to handle the seed (i.e. forklifts, cool stores). Additionally, further trials need to be done on exporting the seed in 1 tonne bags (as used in Europe) and trials comparing using cut and uncut seed.

2. Technical Summary

The experiment was conducted to compare the performance of potato crops grown in Mauritius using seed potatoes (cv. Delaware) shipped from Western Australia using two different packing methods. The bulk seed was shipped either in bulk *bins* (method 1) or *bagged* in 25 kg mesh bags (method 2) after being graded, stored and exported. Seed from the same crop in Western Australia was treated according to the two methods and shipped to Mauritius in May 2008.

The performance of the *bulk* and *bagged* cv. Delaware seed was compared by measuring yield and exports costs of crops grown from the 2 seed' packing' treatments in 2 locations. Results showed yield (25 to 26t/ha) were similar from plots sown with either bulk or bagged seed treatments.

Future work needs to include the evaluation of the performance of crops grown from cut versus uncut or small round seed (SRS). WA farmers can provide cheaper seed to Mauritius if they can grow higher yielding crops with a higher proportion of larger seed compared with lower yielding crops with a higher proportion of SRS. Training in the effective use of cut seed can be provided to those in the Mauritian Potato industry who require it.

3. Introduction

Mauritius has been a consistent market for Western Australian seed potatoes over the past decade (Table 1.), yet sugar is the country's main crop with numerous large estates backed by the Government. However, in recent times the sugar industry has been facing difficulties due to the reduction of the European Union quota for Mauritian sugar. As such, there is a Government backed drive to diversify and evaluate other opportunities for industry development.

Potatoes have been identified as a good option for diversification. However, the Mauritian production system needs to improve and input costs need to be reduced to make it a viable option. Clean, pathogen free seed from overseas suppliers is a major cost in the production of potatoes. As such, Western Potatoes Pty Ltd (WPPL) together with commercial partners in Mauritius are looking to reduce cost whilst improving seed quality and driving industry and market development.

Table 1. WA exports of seed potatoes to Mauritius (Source ABS)

2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008
\$824,875	\$645,543	\$673,200	\$295,970	\$897,410	\$740,000	\$1,553,013

In order to further investigate this opportunity, bulk *bin* exports of seed (as compared to *bagged* bulk seed) from Western Australia were trialed during the summer of 2007/08. Seed was graded on the back of a harvester prior to being put in a bulk bin which was then cooled and shipped. Grading and bagging normally costs approximately \$60/tonne, bags cost \$20/tonne and cool storage costs approximately \$90 per tonne. These costs represent approximately 15% - 20% of the CIF costs of exporting seed to Mauritius. The work conducted on-farm in Western Australia indicated that grading on the back of the harvester and using a bulk bin, lead to only 6% rejects on further inspection. Accordingly bulk bin exports offer the opportunity to reduce costs and increase exports.

Following the initial bulk bin trial, it was decided that in order to further evaluate the benefits of bulk *bin* versus *bagged* seed potatoes, crop assessments would be required. As such, an experiment was conducted to compare the performance of potato crops grown in Mauritius using seed potatoes shipped from Western Australia using the two different packing methods.

To support this activity, training is required for Mauritian farmers and has been provided by two leading WA seed potato growers. Additionally, a leading Mauritian farmer/researcher was trained in grading and storage systems in WA by WA growers and the Department of Agriculture and Food Western Australia (DAFWA).

The bulk bin shipping of seed from WA to Mauritius will enable WA's seed industry to reduce costs whilst not sacrificing quality. As such, the overall aim of this project is to increase Western Australia's exports of seed potatoes to Mauritius through:

- Reducing supply chain costs for WA growers sending seed to Mauritius;
- Enabling Mauritian potato growers to improve the quality of their potatoes and hence their returns through training in grading and storage and investment in improved facilities

4. Materials & Methods

The experiment was conducted to compare the performance of *cv.* Delaware seed shipped in bulk *bins* versus *bagged* seed that is graded, stored and exported. Seed from the same plots were treated according to the two systems and shipped to Mauritius. In Mauritius the seed was grown-out to compare performance. An economic analysis of costs of export of bagged and bulk bin system was undertaken.

There are 2 phases to the project:

1 *Training counterparts*

For this concept to work effectively the Mauritian counterparts will require training in the following areas:

- Bulk handling of seed
- Grading seed
- Chemical treatment of seed
- Cool storage systems
- Distribution of seed including traceability
- Downloading of data logger information
- Planning field experiments and measuring the agronomic performance of seed in the field

It was proposed that leading seed potato growers from Western Australia visit Mauritius in late 2007 to provide counterparts with training in the above areas. In addition, a member of CopeSud visited Western Australia for a month's training. The training was provided by Mr Dom Della-Vedova and Mr Kon Peos and by the Western Australian Department of Agriculture and Food (DAFWA).

The WA growers who conducted the training have a sound understanding of the production and post harvest systems. Prior to going to Mauritius the growers met with the DAFWA Potato Project team to discuss the findings to date of the two seed potato supply chain projects and to develop appropriate training materials.

The Mauritian trainee coming to WA was chosen for their technical knowledge and English language ability. Initially the trainee spent a day with DAFWA staff going through the key principles of potato grading, causes and effects of damage, the findings of recent research work and traceability systems. Once the principles of grading and post harvest were covered then the trainee spent 3 days with growers learning by spending time with the growers on their farms and in their packing sheds.

2 *Trial shipment*

A trial shipment of seed was sent to Mauritius in May 2008. The trial shipment focused on two seed treatments. Seed for each treatment was harvested from the same seed plot. One sample of the seed was treated in the bulk *bin* system and the other was *bagged*. After storage in Mauritius

the two seed samples were planted adjacent to each other on the same farm in a replicated strip trial to compare seed performance (see Appendix 1).

Bulk bin system:

Potatoes were field graded on a slowed down harvester. The seed was placed directly into bulk containers (500-750 kg wooden bins) and then shed stored to cure at ambient temperature. The potatoes were then loaded at night when the tubers are 12°C into a refrigerated container set to maintain the temperature at 12°C. The bulk-bin potatoes were shipped to Mauritius within a fortnight of harvest. In Mauritius the potatoes were unpacked from the bulk containers and re-graded and re-packed into 25 kg bags and placed into cool store.

Bagged system:

Seed potatoes were harvested with minimal grading on the harvester. The seed was then shed stored in 500 kg bins. The seed was then sent to a packer where they were cool stored at 4°C. Prior to shipping, the seed was removed from cool store, graded and packed into 25 kg hessian bags and then placed into refrigerated containers at 4°C. Upon arrival at Mauritius the seed is transported to the cool store and maintained at 4°C until required for planting.

Data loggers to measure temperature and humidity were included with the shipments. Upon arrival in Mauritius the shipments will be unloaded and the data from the loggers downloaded onto a laptop computer for analysis by WPPL.

Seed from each treatment was graded and planted-out side by side in replicated field strip trials for effective comparison. Crop management and performance was monitored by the Mauritian counterparts. At harvest the counterparts recorded yield and quality information, this information being sent to WPPL for analysis.

The issue of soil being taken to Mauritius has been discussed with the quarantine authorities in Mauritius and this does not pose a problem. However, other markets are keen to receive tubers free of soil and so the option of placing brushes on the grader will be investigated by the project.

Assumptions:

- At all times the bulk and bagged seed were treated under the same conditions and to the same procedures as far as practicable.
- Seed for both bulk and bagged transport was sourced from the same location (from the same grower, paddock and variety) and harvested on the same day.
- Both bulk and bagged seed was stored in the same cool room and for the same period of time (if possible).
- Both the bulk and bagged seed was sent in the same container
- In Mauritius both bagged and bulk seed were once kept and treated the same way.

5. Results

1 Training counterparts

Leading WA seed grower, Mr Dom Della-Vedova, visited Mauritius in early May 2008 to provide Mauritius potato growers at 3 sugar estates and staff at the Agricultural Marketing Board with basic advice on:

- Grading seed
- Chemical treatment of seed
- Cool storage systems
- Distribution of seed, including traceability

At the time of his visit, Mr Della-Vedova was alerted to a problem with soft rot in a 70 tonne consignment of Spunta tubers shipped by Western Potatoes Pty Ltd under normal practice (bagged).

It is believed the stem end rot developed in storage in Australia and the level of infection ranged from a few tubers per bag, 2%, to 15% in seed that had been held for 8 days out of storage. The problem was exacerbated with the AMB cool room being padlocked. This means inadequate airing to re-cycle stale air. At the Sugar Estates bags were tightly packed with poor airflow. Condensation was also evident. Furthermore, failure to take early action in removing affected tubers meant the disease would spread.

The entire shipment was subsequently rejected. (DAFWA) prepared a 'generic' technical report which addressed agronomic and handling issues to minimise soft rot and treatment once identified.

Mr Della-Vedova suggested that bulk shipment would reduce the incidence of such a problem re-occurring as handling was reduced and ventilation improved.

In early 2009 Marcel Lejosne (Mauritian seed potato consultant) and Christian Foo Kune (CEO Britannia Sugar Estate – largest ware potato producer in Mauritius) visited Western Australia for training. The visit was supported by Mr Dom Della-Vedova and Mr Kon Peos and by the Western Australian Department of Agriculture and Food (DAFWA).

The visit included:

- Meeting at DAFWA to review the project and its outcomes
- Meeting with Dom Della-Vedova and Kon Peos (WA seed potato growers) in Manjimup
- Visit and tour of Southern Packers pack-shed
- Field visit to seed potato plantations
- Field visit to seed and ware potato farms

2 *Trial shipment*

A contract was signed with leading seed potato grower Dom Della-Vedova from Pemberton to supply both bagged and binned Delaware potato seed for export. The crop was planted in late September 2007.

Harvesting of the seed

The Delaware seed was harvested on 17 January 2008. The bulk Delaware tubers had very little soil attached, due to the sandy nature of the soil. There was 26.515T of bulk Delaware harvested.

The bulk binned seed was placed in 40, 750kg bulk wooden disposable bins, which had been heat treated as per ISPM requirements.

15 tonnes of Delaware seed was graded and packed in 25kg bags harvested from the same plot.

The bagged Delaware was treated in the same way as the bulk binned. That is, all seed was dipped in Tecto to ensure seed potatoes are dry (tubers were left to dry for 3-4 days). Seed was also stored in a cool room at 3-4° C.

Shipping

The Containers were shipped on 28 February 2008.

The bulk was packed in two 25 foot reefer containers, 20 bins per container.

The containers were stored at 3-4 °C during shipment.

Econotarps were placed on the floor of the container to collect the soil. Most of the soil shifted during shipping to the bottom of the container onto the tarps. There was a small amount of soil collected on the tarp.

Arrival in Mauritius

The shipment of Delaware seed, sized at approximately 50g to 175g, arrived in Mauritius on 21 March 2008.

The seed was in good condition and the tubers looked good. The containers had remained at 3-4 °C though out the whole shipment. There was no condensation in the bins.

The bulk binned seed was then placed in a cold room and stored at 3-4°C together with the bagged seed from the same harvested batch.

Trials

The trial was supervised by expat Ms Ingrid Rorbye (BSc Agric (Hort)).

The bulk Delaware was graded prior to planting. It was planted directly into the field. The majority of the tubers were 50 to 175g as they had been graded on harvested when harvested. Approximately 30% of the tubers were above 175g.

Two trials were carried comparing bulk versus bagged and cut versus uncut seed (4 treatments) with 3 replicates at 2 different locations in Mauritius. One trial was on the south east coast and one on the east coast.

Location 1:Riche en Eau (south east)

In early May, 500kg of the bagged and 1 bin of the bulk (approximately 750kg) were taken out of the cool rooms at the AMB, stored in ambient conditions until sprouting and then sent to Riche en Eau (in the south east of the island) for trial purposes.

Prior to planting an NPK fertiliser (13-29-17) was applied at 1000kg/ha and incorporated.

Seed was removed from the bins and bags and the larger seed (>175g) from the bulk bins was used for cutting. The seed and seed pieces were treated with fungicides prior to planting.

Planting:

Both cut and uncut seed from the bulk bins and bags was sown 15cm deep by hand on the 2nd of June 2008 in rows 75cm apart with 37cm between seed pieces in the row. The bulk and bag seed was planted in adjoining rows. The total amount of bulk seed sown was 635kg and bagged seed was 500 kg.

Inspection of the crops on 18th of June 2008 showed germination had commenced and there was no apparent seed breakdown.

Harvesting:

Tubers from all plots sown with bagged or bulk seed were harvested on 3rd of August 2008 and the weight recorded. Yield from both bagged and bulk seed treatments were similar (Table 2.). As yields from the 3 individual replicates were combined into 1 composite sample it was not possible to test for statistical differences between means as there was no estimate of statistical variation such as standard deviation or standard error.

Table 2. Yield (t/ha) of potato (cv Delaware) grown in Riche en Eau from seed shipped in bulk or bags from WA to Mauritius in 2008

Treatment	Yield (t/ha)
Bulk	25.19
Bag	25.46

There was no data available to separate the effects of seed preparation (i.e. cut versus whole seed).on yield.

Location 2: Beau Champ (east coast)

In mid June 500kg of the bagged Delaware and the 750 kg bin of the bulk were taken out of the cold room for trial purposes at Beau Champ (on the East Coast).

There were 3 Replications of bagged verses binned and one plot of the seed from bulk bins was cut. The total bulk seed used was 640 kg and bagged seed 500 kg.

Land Preparation included 2 x Heavy discs, 1 x subsoiler and 1 x light discs. Following this an NPK fertiliser (16-22-22) was applied at 1137 kg/ha and incorporated.

Seed was removed from the bins and bags and the larger seed (>175g) from the bulk bins was used for cutting. The seed and seed pieces were treated with fungicides prior to planting.

Planting:

Both cut and uncut seed from the bulk bins and bags was sown 20cm deep by hand on 16th of July 2008 in rows 80cm apart with 37cm between seed pieces in the row. The bulk and bag seed was planted in adjoining rows. The total amount of bulk seed sown was 635kg and bagged seed was 500kg.

Harvesting:

All tubers from the trial plots were harvested on 6th of November 2008. The yield from plots sown with seed from bulk bins (25.13t/ha) was similar but 3% lower (statistical significance not known) than (26.05 t/ha) than yield from bag seed plots. As yields from the 3 individual replicates were combined into 1 composite sample it was not possible to test for statistical differences between means as there was no estimate of statistical variation such as standard deviation or standard error

Table 3. Yield (t/ha) of potato (cv Delaware) grown in Beau Champ from seed shipped in bulk or bags from WA to Mauritius in 2008.

Treatment	Yield (t/ha)
Bulk	25.13
Bag	26.05

There was no data available to separate the effects of seed preparation (i.e. cut versus whole seed).on yield.

Economic Evaluation

The cost savings from using bulk bins rather than bagged seed potato is \$14/t plus labour costs (see budgets in Appendix 3 and 4). This saving can be passed on to the Mauritian farmers to increase efficiency in the supply chain and increase profits.

6. Discussion

The project aims to increase sales of seed potatoes from Western Australia to Mauritius. Mauritius has been a successful market for WA seed and recent changes to European quotas for sugar have seen a push from Mauritius to diversify its agricultural base.

The performance of the bulk and bagged seed was compared by measuring yield and export costs for crops grown from the 2 seed treatments in 2 locations. Results showed yield (25 to 26t/ha) was similar from plots sown with either bulk or bagged seed. It was not possible to compare the yields between the two seed treatments statistically as the tuber from the 3 replicates were bulked into one composite sample. However, there is enough information from the work to show seed from bulk shipments will probably yield as well as seed shipped in bags and will result in higher profit for the farmer (and less costs to export).

Mauritius is now interested in receiving bulk *binned* seed potatoes from WA if:

- The seed is graded
- The price is much lower than 25kg bagged seed.
- The seed is sent in bags

Future work needs to compare yield and gross margins of crops grown from cut and whole seed (or small round seed) as this was not provided in this project. WA can provide cheaper seed if larger size is accepted by the Mauritian market as crops would not have to be harvested early to reduce tuber size as is required for small round seed (SRS, 35 to 100g).

Crops grown for larger seed have higher yields as they grow longer and profit is higher as a greater proportion of the tuber yield can be sold. Larger seed could therefore be cheaper than SRS for the Mauritian farmer and enable higher profits. More care is needed in preparation of cut versus SRS to prevent disease but this should be possible with the level of skill and knowledge in the Mauritian potato industry.

Other recommendations include:

- To support the revised system, the Mauritians will need new grading and storage facilities.
- They still need to be better equipped to handle the seed (i.e. forklifts, cool stores). As such, further training and assistance in these matters are required.
- Trials need to be done on shipping the seed in 1 tonne bags the same as the ones used in Europe to provide further comparison.
- Trials to be carried out in Mauritius using cut and uncut seed.

Technology Transfer

This project was initiated while Western Potatoes Pty Ltd (WPPL) was involved in exports of potatoes from Western Australia. Since late 2008, WPPL has undergone a major restructure and reorganization, and is no longer involved in exports. There has also been a turnover of staff, office relocation and new strategies developed. As such, this project has not been completed to the usual high standards of the organisation.

The Department of Agriculture and Food, Western Australia (DAFWA) has been very supportive of the project and has assisted in keeping things moving during the changes at WPPL. Further DAFWA remains focused on seed potato exports and will use these findings to drive future activities.

Findings of this project will be distributed to WA seed potato growers in the form of a flyer and summary report. We will also publish the findings in the WA Grower magazine and on the WPPL, vegetablesWA and Potato Growers Association websites.

6. Acknowledgments

- Ray Wilson (ex WPPL) for his efforts in supporting this project in the early stages.
- Paul Mattingley, DAFWA
- Ian McFarlane, DAFWA
- Peter Dawson, DAFWA
- Ingrid Fraser (Ex-WPPL employee and Mauritian contact)
- Dom Della-Vedova (WA Seed Potato Grower)
- Kon Peos (WA Seed Potato Grower)

7. Appendices

Appendix 1. Bulk Potatoes Experiment

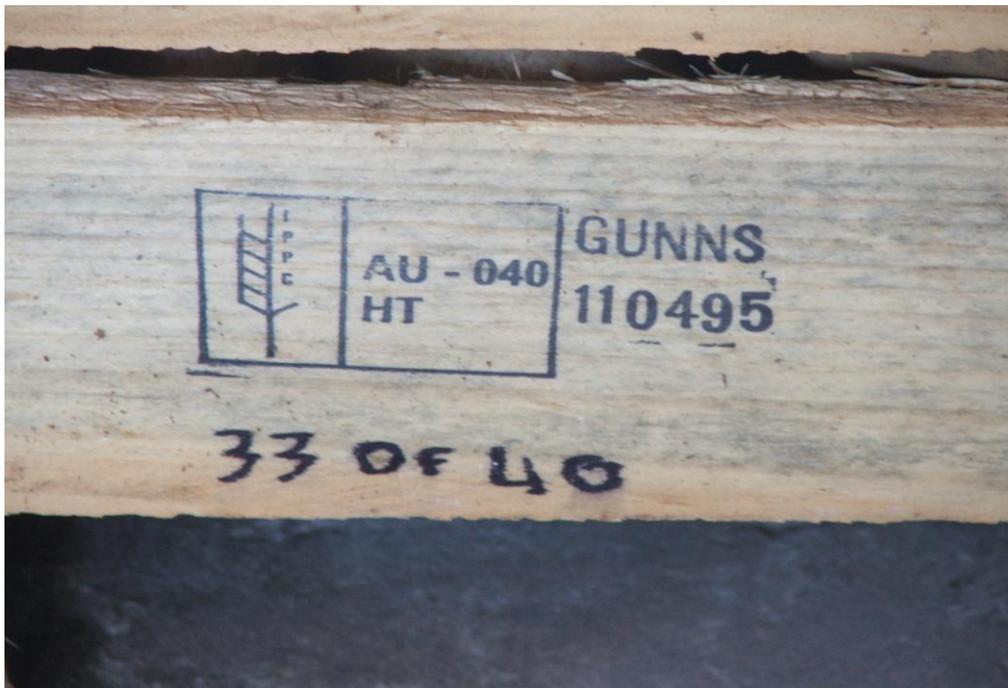
Bulk (cut)	R E P 3
Bag	
Bulk	R E P 2
Bag	
Bulk	R E P 1
Bag	
Tar Road	

PLANTING DATE	16-Jul-08	
FERTILISER RATE	1,137 Kg/ha	16-22-22
ROW SPACING	0.8 m	
PLANTING DEPTH	0.2 m	
PLANTING RATE	3,127 Kg/ha	
LAND PREPARATION	Heavy discs	2
	Subsoiler	1
	Light discs	1

Appendix 2.



Seed Potatoes in Bulk Bins on the farm in January after harvest



Heat Treatment of Bulk Bins



Arrival of Bulk Bins in Mauritius





Planting at Bulk Delaware at Beau Champ



Bulk Seed Delaware at Beau Champ Sugar Estate



Harvest of Bulk Trial at Riche en Eau

Appendix 3.

Seed Potato - Exports Costs

COUNTRY Mauritius
BUYER AMB
PORT Port Louis
VARIETY Delaware **BULK**

Description per tonne

Cost of Seed Potatoes

Shrinkage 3.50%

Cold Storage - Manjimup 3 weeks \$3.00 per bin 0.75 t/bin
 Chep Bin Hire 0 days \$0.34
 Grading 0
 Handling incoming bins \$0.00 per bin

Bins 750 kg \$50.00 20 bins
 Heat Treatment Bins 750 kg \$10.00

Tecto
 Packing

Sub-total

Transport to Fremantle

AQIS
 Pallets
 Bags - 40bags x 0.38 0 per T \$0.35
 Seed Labels 5
 Inspectons 3
 Tuber cut 10 per T \$0.50
 Doc fees 3

Sub-total

Administration / Overheads

Sea Freight

TOTAL COSTS

Manjimup		TONNES
		15
\$/t		
500	53.9%	7,500
18		263
14		203
0		-
0		-
0		-
67		1,000
13		
10		150
0		
121	13.0%	1,815
42	4.5%	630
663	71.5%	9,945
5		75
0		-
0		-
5		75
3		38
5		75
3		45
21	2.2%	308
20	2.2%	300
224	24.2%	3,362
928	100.0%	13,915

GROSS TARGET PRICE	CFR	AUD	980	14,700
NET PROFIT			52 5.34%	785

Sea Freight 20Ft	USD	2,400	
Bunker	USD	125	
Port, docs, ISPS, Origin THC	AUS	125	
	Tonnes	15	
Ratio 20Ft / 40 Ft		100%	<<<<< All 20 foot
Sea Freight 40Ft	USD	3,750	
Bunker	USD	250	
Port, docs, ISPS, Origin THC	AUS	507	
	Tonnes	25	
Ratio 40Ft / 20 Ft		0%	
AUD/USD		0.7800	224

Cool store expense \$ **18.00** /tonne/month

FOB - TOTAL COSTS \$ **704** Break-even

FOB - GROSS PRICE \$ **756**

Appendix 4.**Seed Potato - Exports Costs**

COUNTRY Mauritius
BUYER AMB
PORT Port Louis
VARIETY Delaware **BAGGED**

Description per tonne

Cost of Seed Potatoes

Shrinkage 3.50% 0.75
Cold Storage - Manjimup 3 weeks \$3.00 per bin t/bin
Chep Bin Hire 0 days \$0.34
Grading 0
Handling incoming bins \$0.00 per bin
Bins 750 kg \$50.00 20 bins
Heat Treatment Bins 750 kg \$10.00
Tecto
Packing

Sub-total

Transport to Fremantle

AQIS
Pallets
Bags - 40bags x 0.38 40 per T \$0.35
Seed Labels 5
Inspectons 3
Tuber cut 10 per T \$0.50
Doc fees 3

Sub-total

Administration / Overheads**Sea Freight****TOTAL COSTS**

Manjimup		TONNES
		15
\$/t		
500	53.1%	7,500
18		263
14		203
0		-
0		-
0		-
67		1,000
13		
10		150
0		
121	12.8%	1,815
42	4.5%	630
663	70.4%	9,945
5		75
0		-
14		210
5		75
3		38
5		75
3		45
35	3.7%	518
20	2.1%	300
224	23.8%	3,362
942	100.0%	

			14,125
GROSS TARGET PRICE	CFR	AUD	14,700
		980	
NET PROFIT		38	575
		3.91%	

Sea Freight 20Ft	USD	2,400	
Bunker	USD	125	
Port, docs, ISPS, Origin THC	AUS	125	
	Tonnes	15	
Ratio 20Ft / 40 Ft		100%	<<<<< All 20 foot
Sea Freight 40Ft	USD	3,750	
Bunker	USD	250	
Port, docs, ISPS, Origin THC	AUS	507	
	Tonnes	25	
Ratio 40Ft / 20 Ft		0%	
AUD/USD		0.7800	224

Cool store expense \$ **18.00** /tonne/month

FOB - TOTAL COSTS \$ **718** **Break-even**

FOB - GROSS PRICE \$ **756**