

# Macadamia “economics.” Report on our approx. 1000 tree Macadamia orchard 2017/2018 Season. Jan and Nick King

First up is the last report posted to the website in 2015 for the 2014 season. This is to provide the necessary background.

Macadamia “Economics” 4      Mahurangi Macadamias Ltd 2014 Season      March 2015

This is a report of our 4<sup>th</sup> year of production through to processing.

For a reference we are using the Queensland Department of Agriculture (2010) standard for macadamia industry and orchard evaluation.

## Yields

Yields vary with location, season, variety and level of management. Bearing commences in about the fourth or fifth year and reaches a peak at maturity in about the twelfth to fifteenth year. For a well-managed orchard with tree spacings of 8 m x 4 m (312 trees per ha), expected peak yields at maturity are approximately 3.5 to 4 tonnes of nut-in-shell (NIS) per hectare (12 to 13 kg per tree) at 10% moisture content. Orchards that are managed very well may do slightly better than this and conversely, poorly-managed orchards or those on poor sites may fail to reach these figures. An indication of yields for a well-managed orchard is shown in Table 1.

Table 1. Expected average yields (measured in kilograms of NIS at 10% moisture content based on 312 trees/ha)

Year	Yield per tree	Yield per hectare*
1	0	0
2	0	0
3	0	0
4	0	0
5	1	300
6	2	600
7	4	1,200
8	6	1,800
9	9	2,400
10	10	3,000
11	11	3,200
12-15	12-13	3,500-4,000

\* Figures assume that trees are pruned to maintain machinery access, light penetration and spray penetration. Note that in orchards spaced more closely, yields may reach the peak per hectare figures earlier than indicated. However, yields may then decline without pruning and good management. With good management, yields per hectare for mature trees are generally similar for all spacings.

## Prices in Australia

In summary, over the last 10 years the lowest was \$1.50/kg in 2007 and the highest \$3.60 in 2005. An indication of this year's prices is at the end of this report. 2015 prices are set to be high, partly driven by demand but also by the substantially weaker Australian dollar.

## Our Orchard

To update our orchard story, at the end of 2005 into 2006 we planted 384 GT, 410 A varieties and 95 Beaumont's as an internal shelter row on our block at Mahurangi East. The first report of our year 5 harvest was published in the NZMS newsletter in 2011. The figures from 2011 to 2014 follow:-

### 2011

GT varieties 384 A varieties 410 Beaumont 95 Total 889 trees  
336 kg delivered 308 kg dry NIS  
Sound kernel 56kg  
Reject/processing 43kg  
Crackout 32%  
Sound kernel 56%

### 2012

GT varieties 384 A varieties 410 Beaumont 95 Total 889 trees  
802 kg delivered 729 kg dry NIS  
Sound kernel 201 kg  
Reject/processing 27 kg  
Crackout 31 %  
Sound kernel 88%

### 2013

GT varieties 384 A varieties 410 Beaumont 95 Total 889 trees  
1,565 kg delivered 1,387 kg dry NIS  
Sound kernel 317 kg  
Reject/processing 111 kg  
Crackout 30.8%  
Sound kernel 74%

### 2014

GT varieties 384 A varieties 410 (Beaumont 95 not picked extensive GVB damage) Total picked 794 out of 889 trees  
1800 kg delivered 1565kg dry NIS (average 13% moisture, even with drying bins)  
Sound kernel 354kg  
Processing 149kg  
Crackout 32%  
Sound kernel 70%

Our sound kernel recovery is 23%. This year in Australia from MPC we would receive an exchange rate adjusted NZD \$3.19, by 1565kg equals NZD \$4992, with no further costs nor penalties for unsound kernel.

(Note that the model orchard we are benchmarking has NIS at 33% sound kernel recovery, a maximum 3.5% unsound kernel recovery and 10% moisture content.)

### Cost evaluation 2014

Processing costs were \$3593 plus GST

The value of the commercial kernel 366kg by \$22.50/kg wholesale equals \$8235.

Macadamia paste net of further processing charges 149kg by \$8 equals \$1192.

Total value of kernel \$9427 less processing charges equals \$5834. This is up 93% the 2013 net return. This was off 95 fewer trees.

To augment our production this year we bought kernel at \$26.50/kg plus GST so the NZ wholesale price should be adjusted up by a further \$1416 to give a net wholesale return (net of processing costs only) of \$7250. Some \$9.10 per tree. It should be noted here that cropping is very uneven between trees.

In comparison to 2013 below, the sound kernel rate was down at 71%. The GVB damage to the Beaumont's appeared to be more than 50% on the two lots of 100 nuts we tested so we decided not pick any of the crop from the 95 trees. As yet we do not spray any insecticides. We have 2 on farm driers to use in rotation. In Australia this year MPC are offering a notional price of AUD\$3.067 for 23% commercial kernel recovery. See full prices at <http://www.mpcgrowers.com.au/2015-pricing-offer/>

### Cost evaluation 2013

Processing costs were \$4111.54 plus GST

The value of the kernel is approximately 317 kg by \$22.50/kg wholesale.

This wholesale price is the average of the imported kernel price from Australia, it is perhaps only a starting point as I will discuss later.

\$7132 wholesale value of the kernel less processing charges of \$4111 gives a net return of \$3021

**However**, the net wholesale price should probably be adjusted upwards. We sell in a farmers market and as our production is well below our sell through we have purchased NZ grown kernel on the open market. The average price we have paid is \$27.50 plus GST for sound kernel and \$15.00 for processing.

Using these figures the wholesale value of the crop this year is \$10,382 + GST. Once again less processing \$4111 and dehusking/drying \$820. Net total \$5451+ GST.

Last year I wrote, 'In comparison to last year we have improved our percentage of sound kernel recovery markedly. From 56% to 88%.' This year the sound kernel recovery was 74%.

So, though we now reject all nuts under 19mm and remove all floaters we had an increased reject rate due to GVB damage and immature nuts.

In 2012 most growers indicated a lower level of GVB damage, as we did. For us 2013 saw an increase in GVB damage.

**2014** How does this compare to Australia? Going back to the Qld Agriculture Dept chart we can compare our yields with the expected average yields. I am doing this on the reduced tree numbers of 794. (The QLD model orchard is based on NIS at 10%; our NIS was at 13%). The 'Year' is the age of the tree.

	Year	Yield per tree kg	Yield per hectare
Model orchard	5	1	300 (312 trees 8x4)
Mahurangi Macs	5	.45	187 (416 trees 6x4)
Model orchard	6	2	600
Mahurangi Macs	6	.9	382
Model orchard	7	4	1200
Mahurangi Macs	7	1.76	733
Model orchard	8	6	1800
Mahurangi Macs	8	2.3	950

### What can we say in 2014?

Even allowing for reduced tree numbers production has slipped. There was loss due to wind drop, no nuts on the orchard floor picked up and processed. This would have reduced yield. Production growth per hectare has slipped to 79% of the model orchard at a trailing year behind. In 2013 it was 90% trailing a year behind. This is the case even with our higher density planting.

We have a labour input of approximately one full day per week. The fertiliser programme is haphazard. The same management regime is in place for 2015, and with the very wet spring nut set looks down for the 2015 season though nut size seems to be up.

We have put in place a perimeter rat baiting program on top of the Mahurangi residents' long established rodent control operation. There was very minimal evidence of rat damage.

We intend to spend more time on the orchard from 2016 on and this we are sure will lead to an increase in production through better management. We would hope that the actual production figure for our orchard would then continue to track the model orchard. Of interest is the comparison of GT and A varieties on our orchard in 2014.

GT's 384 trees mix of 205, 288, 207 and 201 produced 1029kg NIS with a recovery of 178 kg commercial kernel and 118kg processing grade.

A's 410 trees mix of 29, 38, 268,104 produced 771kg NIS with a recovery of 189 kg commercial kernel and 31kg processing.

These figures show that the total NIS yields were higher for the GT varieties, 2.68 kg/tree as against 1.9kg/tree for the A's. The GT were far more susceptible to GVB in 2014. The net result being both produced similar percentages of commercial kernel in 2014.

What are they paying for NIS in Australia, the following is from MPC, Macadamia Processing Co. one of the larger processors.

Our 2013 Notional Price is:

- **Conventional NIS – \$2.90/kg at 33% Premium Kernel Recovery**
- **Organic-in-Conversion – \$3.85/kg at 33% Premium Kernel Recovery**
- **Organic – \$5.20/kg at 33% Premium Kernel Recovery**

All prices are at the Industry Standard 33% Sound Kernel Recovery (Premium + Commercial), 3% Reject kernel recovery, and 10% NIS moisture.

#### **MPC 2014 Season Notional prices\***

<b>Conventional NIS</b>	<b>\$3.50/kg</b>
<b>Organic NIS</b>	<b>\$5.20/kg</b>
<b>Organic-In-Conversion NIS</b>	<b>\$4.00/kg</b>
<b>The final price in 2014 was increased by 0.15/kg</b>	

This year the following is from MPC.

#### **2015 Pricing Offer to Growers**

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Another harvest is upon us and the outlook for the 2015 season is good with growers in all regions reporting reasonable crops. The fall in the Australian dollar, the strong demand in kernel markets and the ongoing demand for NIS from China are combining to deliver outstanding prices to growers.

The demand for all tree nuts across the globe is extremely strong. A shortage of supply and strong market demand has seen the prices of all nuts increase with little or no impact on consumer demand. The work carried out by Macadamia Marketing International (MMI) since its inception in 2011 has seen significant changes in the dynamics of the macadamia kernel market. The MMI team are now applying their supply chain management skills to the nut-in-shell market and are building relationships with customers who share in our ideology of sustainable markets and value chains.

MPC has, and always will, continue to support the kernel market. We believe it is critical to ensure we have a strong and vibrant kernel market. While demand and prices offered for NIS in China are high, past experience has shown that a balanced spread of markets is critical to ensure long term stability in the industry. We will be supplying some NIS to the Chinese market but will balance this with our strong commitment to the kernel market.

## I'm pleased to announce that MPC's 2015 Notional prices are:

- Standard NIS \$4.40/kg
- Organic NIS \$5.80/kg
- Organic-In-Conversion NIS \$4.90/kg

All at 33% SKR and 10% NIS moisture content.

### Our 2015 offer includes:

- Commercial grade at Premium prices
- No Reject penalties
- Free dehusking and sorting for deliveries with up to 10% NIH
- A radius based freight subsidy
- \$2.20/kg upfront payment, 2 weeks from the week of delivery
- Anticipated final payment to the notional price by Christmas (cashflow allowing)

We have removed the whole kernel adjustment factor from our payment system this season. When the whole kernel adjustment was introduced it reflected the significant difference in prices between whole kernel and other styles. Currently that difference has reduced in kernel markets and wholes and halves receive the same price in the NIS market.

The 2015 season is nearly upon us, GT 207 are ready and begin to drop in April on our block, closely followed by the A 29s. We are looking forward to see what this season will show.

## 2017 Report

**We have jumped forward 2 years from the last report and this report concerns the 2017 season. It was a great year for macadamia in Australia. NZ107 cents to A\$1.**

MPC announced:-

A Decade of NIS bonus payments was announced by Chairman Chris Ford at the Christmas party in December 2017 with an additional \$0.30/kg payment to be made for all deliveries for the 2017 season. This brings the final prices for 2017 to:

- - \$5.50/kg for conventional NIS
  - \$6.80/kg for Organic NIS
  - \$5.80/kg for Organic-in-Conversion NIS

All at the industry standard of 33% saleable kernel recovery, 3% reject kernel recovery and 10% NIS moisture content.

**In 2017 Mahurangi Macadamia Ltd processed 3421kg of NIS. Below is where we stand in comparison to the model orchard.**

	Year	Yield per tree kg	Yield per hectare
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Mahurangi Macs	7	1.76	733
Model orchard	8	6	1800
Mahurangi Macs	8	2.3	950
	9,10	N.A	N.A
Model orchard	11	11	3200
Mahurangi Macs	11	4.2	1710

Year is age of the tree. Year 5 is 2011, Year 11 is 2017. As can be seen our orchard is still trailing Queensland Department of Agriculture model orchard. Yields per hectare are still about half of the model orchard. It must be said that 2016 was a better year for total production but climatic and pest damage reduced the 2017 crop below that of 2016. The NIS figure for 2016 was 3800 kg, year 10 figure of 1900kg per hectare. We did expect a jump in yield in 2017 as the trees mature but this was not the case. The reasons are outlined below. Our net kernel available for sale was 1053kg for the year.

Production in our block is clearly impacted by the type of weather experienced over the spring flowering period. Also, we cannot emphasise the losses to rats, in our case perhaps 20%, and we expect these losses are under reported NZ wide. Further, GVB and guava moth add to the losses by perhaps a similar amount.

The orchard is still spray free but we have steadily been increasing the rat baiting program. In Australia losses to insect damage of about 20% would be compensated for by the increased payout for organic NIS.

**Where are we with the financial returns?** Our 3421kg NIS would in Australia give us, adjusting for our 31% kernel recovery, 14% reject and 10% moisture approx. 2739kg NIS x \$5.50 = A\$15064 or NZ\$ 16119+ GST. We have not sold NIS in NZ so cannot comment on prices for NIS from processors here.

We sold our 1053kg of kernel largely through a farmers market. We sell roasted, salted and various other flavours in \$5 and \$10 bags, with macadamia butter and oil. Below is the result for the March 2018 year.

**Profit & Loss**  
**Mahurangi Macadamias Limited**  
**1 April 2017 to 31 March 2018**

<b>Income</b>	
Gate Sales	\$6,817.04
Sales	\$40,452.18
<b>Total Income</b>	<b>\$47,269.22</b>
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<b>Less Cost of Sales</b>	
Purchases	\$12,512.37
<b>Total Cost of Sales</b>	<b>\$12,512.37</b>
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<b>Gross Profit</b>	<b>\$34,756.85</b>
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<b>Less Operating Expenses</b>	
Advertising	\$265.00
Bank Fees	\$306.86
Consulting & Accounting	\$4,033.77
Electricity	\$2,032.94
Farm Development Expenses	\$478.02
Fuel & Oil	\$3,593.88
General Expenses	\$1,364.98
Interest Expense	\$9.57
MasterCard - Do Not Use	\$2,237.73
Packaging	\$776.98
Printing & Stationery	\$6.91
Rent -Kitchen	\$650.00
Repairs and Maintenance	\$568.75
Subscription	\$43.48
Telephone & Internet	\$960.22
Travel - National	\$377.09
Vehicle Expenses	\$81.18
<b>Total Operating Expenses</b>	<b>\$17,787.36</b>
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<b>Net Profit</b>	<b>\$16,969.49</b>
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## **Notes to above Profit and Loss.**

Sales of \$47,269.22 from 1000kg of kernel give us just over \$47 a kg. \$54.35 with GST.

No allowance is made for depreciation or orchard establishment costs.

Purchases in Cost of sales are the processing costs. Consulting and Accounting are high at \$4033.77, partly due to timing and setting up a new accounting package.

Electricity seems high but this includes the electric fence to keep the cattle out of the orchard, on farm drying bins, and pressure pump to cattle troughs.

Fuel and oil covers driving up on weekends to work on the orchard, tractor mowing and ride-on mowing. This would be considerably lower if we lived on site.

Sheep would also be an option to manage grass growth for part of the year if we lived on site.

MasterCard-Do Not Use covers a change in credit card provider.

Overall Operating Expenses could be lower by 3 to 4 thousand dollars, but in any one year maintenance/repair bills for tractor or other equipment could use that up.

## **Some rough comparisons.**

Selling NIS at the Australian NIS payout would have given us around \$16,000. Our expenses are \$17,800. So about even. The answer here is higher production from our trees or more trees. Costs are largely fixed so the orchard could become profitable.

Selling at the farmers market gives a higher income which more than offsets the processing costs. Our estimate of time spent on the business is some 25 hours per week. This is split between orchard, which is to some extent seasonal, and the market which is every week, rain or shine. The hourly rate of return is approx. \$13/hr. As costs are largely fixed, any increase in production would be reflected in the hourly rate.

If losses due to rats and GVB and guava moth could be drastically reduced then the rate hourly rate would have been closer to \$16/hr. To get there, obviously a robust baiting program and a spray regime would increase yields. We understand that a pheromone inhibitor for guava moth is close to being available, also, green vegetable bug biocontrol by the parasitoid, *Aridelus rufotestaceus* is perhaps a possibility.

## **The Future.**

We expect production to increase on the orchard. We think something in the region of 8 to 10 kg per tree is achievable. Perhaps in about 3 years. This doubling of production would only increase costs about 60%, to some \$47,200 including processing costs. Sales would be \$95,000 and give a profit of \$47,800. Time spent would increase to some 30 hours a week and the hourly rate (30hr x 52=1560hr) would be just over \$30/hr. Successful control of pests would increase this to closer to \$40/hr. Macadamias are slow to mature but have a very long productive life. There is time to get things right.

The above relates solely to our own orchard. Macadamias as a hobby orchard crop has its own rewards. In Australia the rule of thumb is that 3000 trees are full time for 2 people and should provide a reasonable standard of living. Roughly, on the above figures, about net \$130,000 pa selling NIS and this is the case for our friend's orchard in northern NSW with 3000 mature trees.

Our orchard at Mahurangi East is in reality a large hobby orchard, originally meant to provide a supplementary income for 2 people living an active retirement. It has taken a few years to see if this goal is going to be achieved. It seems to be on track to do so.

We were asked to update the previous 2015 Macadamia Economics by a current member of the NZMS. We have provided this information as it could be of interest to members.