Evidence Framework for Owner Reimbursement Costs for the Macadamia Industry

Version 1 – 16th October 2007

Appendix 1: Information requested for ORC development

Principle – average for the year of destruction (price) will be estimated from the current years price. The longer term average (over 5 years) will be made from the current years estimate plus the previous 4 years price (1+4)

Formula for calculation of ORCs for Perennial Tree and Vine Crops from Schedule 6, Part 4.4.13

ORC = (A – B) + C + D + E + F + G +H + I

Crop	PHA Member
Citrus	Australian Citrus Growers'
Macadamias	Australian Macadamia Society
Almonds	Almond Board of Australia
Winegrapes	Winemakers Federation of Australia
Dried Fruit	Australian Dried Fruit Association
Table Grapes	Australian Table Grapes Association
Apples and Pears	Apple and Pear Australia
Avocados	Avocados Australia
Summerfruit	Summerfruit Australia
Mangos	Australian Mango Industry Association
Cherries	Cherry Growers' of Australia
Plantation Timber	A3P
Nuts (other)	ANIC

Requirements for the Macadamia Industry (Australian Macadamia Society)

	Definition (extracted from the EPPRD)	**Evidence requirements/Authorised persons**	**Comments**
A	Loss of profit from the current Crop destroyed. = a * y * p		Approx 900 growers. <1% do not send to processors.

	Definition (extracted from the EPPRD)	Evidence requirements/Authorised persons	Comments
	a = area of tree Crop destroyed	1. If the property is contained within the AMS database, the area is to be calculated from tree number and spacing from that source. 2. Satellite imagery will be used as the first tool to calculate areas if not on the AMS database. This will depend on the specific jurisdictions capacity to access such information. 3. Aerial photographs will be used in Satellite imagery is not available. This will depend on the specific jurisdictions capacity to access such information. 4. On ground surveys using GPS data if the first two options are not available at the time of incursion and crop destruction. An on the ground survey, tree count and variety verification will be required to verify the type of crop being grown on the area at the time of the incursion. This will be carried out by an Authorised person. If the incursion is in an urbanised area, backyard surveys will also be conducted by Authorised persons.	At least 90% coverage – variety, spacings and area, Updated every 2 years
	y = expected yield based on Owners' past records, taking into account any biennial bearing patterns. In particular, Owners claiming above average yields (and prices) must produce auditable records of above average returns in previous years to justify additional amounts in Owner Reimbursement Costs. If the Owner has no records, the regional average for that Crop is to be used.	1. If actual yield cannot be determined by harvesting the crop, expected yield for the current season will be calculated for the individual grower from their processor records of delivery volume and kernel recovery averaged over 5 years. For future years the regional 5 year average based on processor records will be used. 2. Where own records are not available for averaging,	The 5 year average takes the fluctuating yield cycle into account. Processor records will be used as they are independent. In situations where the processor owns an affected crop, past records will need to be independently verified prior to use.

	Definition (extracted from the EPPRD)	Evidence requirements/Authorised persons	Comments
		the 5 year average for the region, based on processor records will be used. 3. For new plantings without crop records, the regional average for the first commercial crop of a 5 year old orchard will be used.	New property owners will need to obtain permission from previous owners for processor data release.
	p = market price at farm gate at harvest time	1. If there is a contract in place, the contract price will be used. This will be adjusted, according to contract terms, using the quality and grading values of the previous season if required. 2. If there is no contract, the price paid for a destroyed crop will be the average cash price posted for that season, adjusted for % kernel recovery of that grower. Percentage kernel recovery will be determined through processor records for that producer for the previous season. Future price (where an orchard is destroyed) will be the 10 year average for nut in shell.	
B	= Harvesting costs based on 'best practice' as estimated by State/Territory departments of agriculture, plus any other costs (such as watering or pruning costs) normally associated with Crop production between the time of tree destruction and harvest.	Best practice harvest costs to be estimated using applicable local contract prices, determined by State departments in consultation with the Relevant Parties and Best Practice Groups. Costs to be determined in accordance with the EPPRD and *Appendix 2: Schedule of costs for B – Harvesting costs based on 'best practice'.*	Costs to be determined in accordance with the EPPRD. A standard Schedule of costs will be used to estimate costs based on "best practice".
C	= Direct costs associated with the Response Plan incurred by the Owner but not normally incurred as a production expense.	This will depend on what the Response Plan requires and will need to be calculated on an Incident by Incident basis with costs estimated using standard local or regional contract prices as appropriate.	Required actions/treatments by Owners need to be specifically defined in a Response Plan. The legislative order needs to specify the

	Definition (extracted from the EPPRD)	Evidence requirements/Authorised persons	Comments
		Costs to be determined in accordance with the EPPRD and *Appendix 3: Schedule of costs for C – Any other direct costs incurred by the Owner under the Response Plan.*	actions/treatments required by the Owner.
D	= Replacement value of any capital items destroyed as part of the Response Plan.	This will depend on what the Response Plan requires and will need to be calculated on an Incident by Incident basis. Capital items for macadamia orchards might include: Wooden field bins Irrigation lines Costs to be determined in accordance with a schedule of market values for items expected to be destroyed, agreed by Affected Parties at the time of developing a Response Plan.	This will be based on the market value of capital items, replacing like with like. Capital items requiring destruction need to be specified in a Response Plan. The legislative order needs to identify the item requiring destruction. Prices will be sourced from suppliers like Landmark, Elders or other specialist suppliers at the time of the incident.
E	= Loss of net profits for any fallow period required by a Response Plan. Net profit is to be standardised based on regional gross margins calculations for the Crop in question by State/Territory departments of agriculture.	A standard Schedule of regional gross margins will be used to estimate costs based on "best practice" determined by State/Territory departments in consultation with the Relevant Parties and Best Practice Groups Costs to be determined in accordance with the EPPRD and *Appendix 4: Schedule of costs for E – Loss of net profit from a compulsory fallow*. Standard rotation pattern to be considered as 25 years unless a grower can provide evidence of a different	Information could be used from the AMS crop forecasting model, regional Gross Margins and Best Practice Groups PHA is investigating a calculation method for use when the commercial life of a tree is unknown

	Definition (extracted from the EPPRD)	Evidence requirements/Authorised persons	Comments
		intention.	
F	= Tree destruction costs 'depreciated' depending on the age of the orchard in relation to a standardised period of rotation for the tree Crop in question.	Costs to be determined in accordance with the EPPRD and *Appendix 5: Schedule of costs for F – Tree destruction costs* Standard rotation pattern to be considered as 25 years unless a grower can provide evidence of a different intention.	Tree replacement does not usually occur – has not occurred yet. Figures available from report on Cyclone Larry and actual costs for barrier tree removal and tree thinning operations. Orchard renewal is not a usual practice in this industry.
G	= 'Depreciated' tree replanting costs as for tree destruction costs.	Costs to be determined in accordance with the EPPRD and *Appendix 6: Schedule of costs for G – Tree replanting costs* Standard costs will apply for the region as agreed by the Relevant Parties.	Real values available as there are many new plantings in this industry.
H	= 'Depreciated' loss of profit during the non-bearing period of immature trees.	The yield curve and the comparative Gross Margin will be used to determine this loss. The yield curve values can be found in *Appendix 7: Macadamia Production Yield Data* Time to bearing: Years to bearing = 4.5-5 years	Crop yield – starting at about 2kg/year in year 5 – yield increases by 2kg/year until at year 12 production plateaus. Fluctuating bearing in dryland orchards may need consideration. The time lag for planting due to complete removal of old trees and land preparation (irrigation lines being laid etc.) may need consideration. The time when the land is prepared may not correspond to an appropriate planting widow or season. This may prolonging the lag time before planting and may need consideration.
I	= Value of any stored produce on farm destroyed as a directive of	This will depend on what the Response Plan requires	Code of sound orchard practice recommends

	Definition (extracted from the EPPRD)	Evidence requirements/Authorised persons	Comments
	the Response Plan including seed or nuts — as for annual broadacre Crops. If there is an opportunity following the Response Plan for modernising or upgrading the orchard — for example, closer tree plantings, more expensive varieties, or trellis plantings, the level of Owner Reimbursement Costs is to be related strictly to replacing the asset that was there. If an Owner wants to introduce more technology or better infrastructure, for example, the Owner must cover any additional costs.	and will be calculated on an Incident by Incident basis. Price and yield to be determined using the applicable method as described in "A". Amount of any stored nut can be determined by inspection at the time of the incident. This does not include dropped nuts that have not yet gone through harvesting process and incurred a harvest cost.	against storage for long periods. Processing for oil may be an alternative way to deal with product. It would have to specified in the Response Plan.

Appendix 2: Schedule of costs for B – Harvesting costs based on 'best practice'.

NOTE: These costs are estimates as at July 2006. In the event of an incursion where Owner Reimbursement Costs may be paid, the costs and values will be reviewed and updated by agreement of the Relevant Parties to allow current and case specific information to be used.

Cost	**Rationale**	**Rate**	**Comments**
$32/ Ha	Machine Harvesting	$18/hr @2 hr / Ha	3 to 5 times per season
$54/ Ha	Hand harvesting	$18/hr @3 hr / Ha	3 to 5 times per season
$32/ Ha	Dehusking	$18/hr @2 hr / Ha	3 to 5 times per season

Appendix 3: Schedule of costs for C – direct costs incurred by the Owner for all operations.

NOTE: These costs are estimates as at July 2006. In the event of an incursion where Owner Reimbursement Costs may be paid, the costs and values will be reviewed and updated by agreement of the Relevant Parties to allow current and case specific information to be used.

Cost year 3	**Rationale**	**Rate**	**Comments**
Machinery costs			
$270 / ha	Mowing & Slashing	$15/ hr by 3hr /ha	6 Applications per year Machinery
$37.50/ ha	Pesticide application	$15/ hr by 2.5hr /ha	1 Applications per year Machinery
$180 / ha	Herbicide application	$15 / hr by 2 hr/ha	6 Applications per year Machinery
$60 / ha	Fertilising	$15 / hr by 1 hr/ha	4 Applications per year Machinery
Labour Cost s			
$216 / ha	Mowing Slashing	$18 / hr by 2 hr /ha	6 Applications per year Labour
$54 / ha	Pesticide Application	$18 / hr by 3 hr /ha	1 Applications per year Labour
$216 / ha	Herbicide application	$18 / hr by 2 hr /ha	6 Applications per year Labour
$72 / ha	Orchard Maintenance	$18 / hr by 4 hr /ha	1 Applications per year Labour
$72 / ha	Fertilising	$18 / hr by 1 hr /ha	4 Applications per year Labour
Fertiliser and Mulch			
$162 / ha	North Coast macadamia Mix	50 kg/ha @ $ 0.81kg	4 applications per year
$72 / ha	Mulch supplied on farm	4 hrs /ha @$18 hr ``	1 applications per year
$25.50 / ha	Soil test	$ 85 / test	1 applications per year
Plant Protection			
$40.36/ha	Insect control metidatthion	1.25 l / ha	1 applications
$25	Insect and disease monitoring		
$112/ha	Weed Control Glyphosate	2.5 l/ha	6 Applications

$1615.36 /ha	**Total variable costs per annum per ha**		
Cost year 7	**Rationale**	**Rate**	**Comments**
Machinery			
$324.00 /ha	mowing slashing	3hrs/ha $18.00per hour	6 applications
$180.00/ha	pesticide application	2.5 hrs/ha $18.00 per hour	4 applications
$144.00/ha	herbicide application	2 hrs/ha $18.00 per hour	4 applications
$108.00/ha	fertilising	1 hr/ha $18.00 per hour	6 applications
$375.00/ha	Mechanical harvesting	3 hrs/ha $25.00 per hour	5 applications
Labour			
$216.00/ha	mowing slashing	2hrs/ha $18.00 per hour	6 applications
$216.00/ha	pesticide application	3hrs/ha $18.00 per hour	4 applications
$144.00/ha	herbicide application	2 hrs/ha $18.00 per hour	4 applications
$72.00/ha	orchard maintenance	4 hrs/ha $18.00per hour	1 application
$72.00/ha	fertilising	1hrs/ha $18.00per hour	4 applications
$216.00/ha	Mechanical harvesting	3 hrs/ha $18.00 per hour	4 applications
$216.00/ha	Hand Harvest	3 hrs/ha $18.00per hour	4 applications
$360.00/ha	Dehusk, sort and handle	4hrs/ha $18.00 per hour	5 applications
Fertiliser and mulch			
$696.00/ha	North coast macadamia mix	200kg/ha $0.87 per kg	4 applications
$12.00/ha	boron	2kg/ha $3.00per kg	2 applications
$36.00/ha	mulch supplied by farm	2hrs/ha $18.00 per hour	2 applications
$85.00	leaf test	$85.00	1 application
$25.00/ha	soil test	$85.00	per test
$25.00/ha	leaf test	$85per test	
$73.75/ha	Carbendazim	1.25 L/ha $29.50per L	2 applications

$36.93/ha	Phosphorous acid	9.35 L/ha $3.95 per L	1 application
Cost	**Rationale**	**Rate**	**Comments**
$16.00/ha	Copper oxychloride	4kg/ha $4.00per kg	1 application
Insect control			
$18.80/ha	Petroleum oil (spray additive)	8 L/ha $2.35per L	1 application
$49.50/ha	endosulfan	2.25 L/ha $11.00 per L	2 applications
$50.25/ha	beta-cyfluthrin	0.75 L/ha $33.50 per L	2 applications
$70.00/ha	Insect and disease monitoring		
Rat control			
$30.0/ha	Coumatetralyl (Racumin) farm	$101per 5kg Block	1 application
Weed control			
$56.25/ha	Glyphosate	2.5 L/ha $7.50per litre	3 applications
Harvesting and Marketing yield of 1.2 t/ha of nut in shell			
$96.00/ha	Levies	$0.08 per kg	
$60.00/ha	freight	$50 per tonne	
$3122.90/ha	**Total variable costs per annum per ha**		

Cost Year 15	Rationale	Rate	Comments
Machinery			
$135.00 /ha	mowing slashing	1.5hr / ha @ $15.00	6 applications
$120.00/ha	pesticide application	2 hrs/ha @ $15.00	4 applications
$90.00/ha	herbicide application	2 hrs/ha @ $15.00	3 applications
$60.00/ha	fertilising	1 hrs/ha @ $15.00	4 applications
$375.00/ha	Mechanical harvesting	3 hrs/ha @ $25.00	5 applications
$200/ha	Litter &Husk Application		Contract 1 application
$117.00/ha	Canopy Management	1.3 hrs/ha @ $90.00	Contract 1 application
$75.00/ha	Mulch Application	3 hrs/ha @ $25.00	1 application
Labour			
$162.00/ha	mowing slashing	1.5 Hrs/ha $18.00	6 applications
$144/ha	pesticide application	2 Hrs/ha $18.00	4 applications
$108.00/ha	herbicide application	2 Hrs/ha $18.00	3 application
$36.00/ha	orchard maintenance	2 Hrs/ha $18.00	1 applications
$72.00/ha	fertilising	1 Hrs/ha $18.00	4 applications
$216.00/ha	Mechanical harvesting	3 Hrs/ha $18.00	5 applications
$216.00/ha	Hand Harvest	3 Hrs/ha $18.00	4 applications
$54/ha	Mulch appliaction	4 Hrs/ha $18.00	5 applications
$360.00/ha	Dehusk, sort and handle	3 Hrs/ha $18.00	1 application
Fertiliser and mulch			
$1113.6/ha	North coast macadamia mix	320 kg/ha $0.87 per kg	4 applications
$16.00/ha	boron	2 kg /ha $4.00 per kg	2 applications
$250.00/ha	Lime	$100 /tonne	Lime is applied only as required to correct pH. Typically once every 3 years 1 application

$85.00	leaf test	$85.00 per Test	Average
$25.00/ha	soil test	$85.00 per Test	Average
Cost Year 15	**Rationale**	**Rate**	**Comments**
Disease Control			
$73.75/ha	Carbendazim	$29.50 per litre	2 applications
$36.93/ha	Phosphorous acid	$3.95 per litre	1 applications
$16.00/ha	Copper oxychloride	Per kg	1 applications
Insect Control			
$18.80/ha	Petroleum oil (spray additive)	$2.35 Per litre	1 applications
$49.50/ha	endosulfan	$11.00 Per litre	2 applications
$67.00/ha	beta-cyfluthrin	$33.50 per litre	2 applications
$70.00/ha	Insect and disease monitoring		
Rat control			
$30.00/ha	Coumatetralyl (Racumin) farm	$101.20 per 5kg	As needed
Weed control			
$56.25/ha	Glyphosate	$ 7.50 per litre	3 applications
Harvesting and Marketing yield of 3.5 t/ha of nut in shell			
$96.00/ha	Levies	$0.08 per kg	
$60.00/ha	freight	$50 per tonne	
$4897.83/ha	**Total variable costs per annum per ha**		

Appendix 4: Schedule of costs for E – Loss of net profit from a compulsory fallow

NOTE: These costs are estimates as at July 2006. In the event of an incursion where Owner Reimbursement Costs may be paid, the costs and values will be reviewed and updated by agreement of the Relevant Parties to allow current and case specific information to be used.

Cost	**Rationale**	**Rate**	**Comments**
	Yield per Ha 3 to 9 tonnes per ha depending on tree age, variety, density Yield	Kg of kernel per ha production based on tree age.	Yield per Ha of saleable kernel and other oil stock @ industry seasonal return Actual grower data Industry averages Yield determined by variety and historical kernel recovery data from processor
$2891/Ha	Eg 3.5 tons / Ha at 33% premium kernel recovery 0% reject and 1 % commercial	1155 kg premium kernel @ $2.50 /kg 35 kg commercial @ $0.10/ kg	Processors may also pay bonuses based on levels of reject or penalties. Need to obtain the payment details from the processor the grower supplies.

Appendix 5: Schedule of costs for F – Tree destruction costs

NOTE: These costs are estimates as at July 2006. In the event of an incursion where Owner Reimbursement Costs may be paid, the costs and values will be reviewed and updated by agreement of the Relevant Parties to allow current and case specific information to be used.

Cost	**Rationale**	**Rate**	**Comments**
$1300 –1500 Ha	Dozer to remove and chip trees	10 to15 Ha per day	Trees are removed and mulched on site tree age above 8 years
450 /Ha	Dozer / tractor stick racks	3 hr /Ha	Remove tree roots /irrigation
	Tree 1 –4 years Bobcat	$110/ hr	Root growth allows for smaller equipment
	Tree 5 – 8 years Excavator with a grab	$120/hr	Can be removed with a grab and windrowed
	Tree 8 – plus Dozer	$150/Hr	Larger tree require lager equipment
	Tree 8 – plus Forestry Flail	$ 400 /Hr	Mulches and remove trees in one process stumps and roots down to 6 cm
$100/ ha	Removal of irrigation pipe or sprinklers heads	$18/hr plus $15/ Hr Tractor 3/ha	Assumes sub mains and mains are not disturbed Pipe dragged out of orchard and stored for reuse. Irrigation may be reused may need to be sterilised if reused

Appendix 6: Schedule of costs for G – Tree replanting costs

NOTE: These costs are estimates as at July 2006. In the event of an incursion where Owner Reimbursement Costs may be paid, the costs and values will be reviewed and updated by agreement of the Relevant Parties to allow current and case specific information to be used.

Cost	**Rationale**	**Rate**	**Comments**
$3744 /Ha	Cost replant trees	$12 / Tree 312/ Ha	Grafted trees
$108/Ha	Site Preparation	$18/ per hr 6hr/Ha	Labour ring holes prep
$280/ Ha	Planting	$ 18 / per hr 3mins per tree 15.6 hr ha/ person	Labour planting watering fertiliser irrigation
$46.8/ ha	Watering	$18/ per hr 30sec/tree 2.6 hr /ha	Labour
$15/hr	Machinery cost	$15 per hour	As required for each operation Moving trees fertiliser water slashing ripping
$42.5	Fertiliser	50 kg /ha $0.85 unit	Apply 4 times a year.
$660/Ha	Irrigation	T tape $1 /Tree plus labour	T Tape will have to be upgrade to drippers at some stage in the trees growth
$1600/ Ha	Irrigation	Drippers $4/Tree plus labour	See Gross margin budget sheet
$99/ha	Mowing to mulch grass on trees	$15 per hour Machinery $18 per hour Labour	Provides moisture retention for trees

Appendix 7: Macadamia Production Yield Data

Year	Yield kg per tree	Yield kg per ha
1	0	0
2	0	0
3	0	0
4	0	0
5	1	300
6	2	600
7	4	1200
8	6	1800
9	9	2400
10	10	3000
11	11	3200
12-15	12-13	3500-4000