The Planter, Kuala Lumpur, 83 (974): 329-334 (2007)

Monthly Picking of Coconuts *vis-à-vis* Bimonthly Picking - An Economic Analysis

PATHIRAJA, P M E K[a], M T N FERNANDO AND A W A D R ABEYSEKERA
Agricultural Economics Division, Coconut Research Institute, Lunuwila (61150), Sri Lanka

Bimonthly picking is the widely-practiced coconut harvesting system in Sri Lanka. However, empirical researches suggest that monthly picking is better than bimonthly picking due to the comparative yield increase in the former. But growers are reluctant to practice monthly picking due to several factors including the unavailability of a rigorous economic analysis to convince them. A study was therefore conducted to analyse the economic feasibility of monthly picking of coconuts vis-à-vis *bimonthly picking. Data was gathered from an experiment conducted for a period of 12 years by Mathes and Marikkar (2004). Net benefits of the two practices were compared using a cost benefit analysis to find out the best practice. Incremental net benefit was used to determine the economic viability of monthly picking. And the variation of incremental net benefits due to monthly picking with the change in different land size classes was examined to find out the breakeven land size. Results revealed that the economic feasibility of monthly picking depends on the size of the land holding, price of nut as well as the types of costs incurred. However, it can be concluded that monthly picking is economical for land holders of more than three acres.*

Keywords: *Monthly picking, bimonthly picking, cost benefit analysis, net benefit, economic viability.*

Coconuts are traditionally harvested in Sri Lanka at bimonthly intervals although harvesting in 45 days and in monthly intervals is also practiced to a lesser extent. Nearly 75 per cent of the smallholders practice bimonthly harvesting while another 12 per cent do harvesting at 45 days intervals (Samarajeewa & Fernando, 2004). In case of estate owners, the corresponding figures are 41 and 33 per cent respectively (Samarajeewa & Fernando, 2005). It implies that the most preferred harvesting interval, irrespective of the size of land, is bimonthly picking, but 45 days picking is also popular among estate sector.

Mathes and Marikkar (2004) have established that monthly picking is the best practice due to several rewarding factors. They found a 30.9 per cent yield increase due to monthly picking, compared to bimonthly picking in an experiment conducted at Walpita Research Station that belongs to the Wet Zone, having sandy loam soils. Another experiment conducted at Rathmalagara Research Station (RRS) by the same authors showed a 22.4 per cent yield increase. The RRS belongs to the Intermediate Wet Zone and the type of soil is gravel. A 9.2 per cent yield increase was recorded in Poththukulama Research Station (PRS), which belongs to the Intermediate Dry Zone, having sandy loam soil. These results are summarised in *Table 1*.

The increased nut yield in monthly picking in relation to bimonthly picking was found to be due to a range of causes, including reduction of button nut fall, reduction in loss of mature fallen nuts by thieving and lesser chances of hiding nuts.

However, growers are reluctant to adopt this practice due to various reasons. The scarcity of pickers, the extra cost incurred in

[a]- email: economics@cri.lk

TABLE 1
AVERAGE NUT YIELD WITH RESPECT TO HARVESTING INTERVAL IN DIFFERENT CLIMATIC ZONES

Location	*Average nut yield (1994-2003) (nuts/palm/year)*		
	30 days picking interval	*60 days picking interval*	*Incremental yield (nuts/palm/year)*
Walpita Estate (WZ)[a]	95.7[b]	73.1	22.6 (30.92)
Rathmalagara Estate (IWZ)[a]	81.5	66.6	14.9 (22.37)
Poththukulama Estate (IDZ)[a]	94.1	86.2	7.9 (9.16)

Notes: a- Agro-climatic zones.
b- Fractions of nuts are due to averaging.
Figures in parentheses are the percentage increase of yield.

Source: Mathes & Marikkar (2004).

additional six picks and difficulties in paying monthly visits to the estates are some of them. Non-availability of a rigorous economic analysis as to prove that the monthly picking is economically more attractive than bimonthly picking is also a notable factor precluding the adoption of the practice. Therefore, the objective of this research brief is to find out the economically best harvesting interval for coconuts.

METHODOLOGY

Data

Data was gathered from an experiment conducted by Mathes and Marikkar (2004) in three different climatic zones having different soil types (See *Table 1* and *Appendix 1*). The observations were obtained for a period of 12 years in the case of Walpita Estate and for a period of five years for each of other two estates.

Analysis

A cost benefit analysis was conducted to compare the net benefit of the two different harvesting intervals. Then the incremental benefit was plotted against different prices to find out the economic viability of monthly picking. This is done for several land size classes to find out the breakeven land extent which warrants monthly picking is economically feasible. The above procedure was followed at different harvesting costs also.

Incremental profit or the benefit was determined by multiplying the increased number of nuts due to the adoption of monthly picking by the respective nut prices.

The following figures are the norms used in profit calculation:

Nuts per palm (30 days harvesting interval)	94.1[a]
Nuts per palm (60 days harvesting interval)	86.2[a]
Incremental nuts/ palm/year	7.9
Palms per acre	55
Wage rate (8 hours per day)	Rs270*
Nut collection per hour	500[b]

Field transportation of 1000 nuts	Rs250
Owner's travelling	Rs10/km
Picking (by bamboo poles) cost/acre	Rs175
Cost of climbing per palm	Rs18

Note:

[a] Based on Poththukulama Research Station data, number of nuts per palm per year was obtained.

[a] Based on Poththukulama Research Station data.

[*] 1 US $ = Rs.103.96 (year 2006).

[b] It is assumed that one man can collect 500 nuts per hour.

Wages are at current rates and obtained from a labour survey conducted by the Coconut Research Institute of Sri Lanka (CRISL) in 2005 and norms were from a cost of production survey conducted by CRISL in 2004.

RESULTS AND DISCUSSION

Incremental net benefits due to monthly picking in relation to bimonthly picking are shown in *Table 2*. It is calculated for different land size classes. Incremental costs incurred in monthly picking are deducted from incremental benefits.

On the assumption that a nut is Rs.14.00 *Table 2* depicts the following:

a. For smaller lands, say up to 3 acres (1 acre = 0.405 ha), monthly picking and bimonthly picking is indifferent in terms of economic benefits. These smaller lands usually do picking using climbers and the increased income derived from additional nuts due to monthly picking barely sufficient to cover the incremental cost involved in extra picking. So, smaller land category cannot enjoy an additional benefit due to monthly picking.

b. Economic benefits peak at 10 acres category and then declines towards 20 acres, because the owners of larger estates usually travel to their properties using their motor vehicles, and additional six visits involved to their estates due to monthly picking raises the costs.

Classification of size of land has a significant effect on net benefit per holding as well as the breakeven price of a nut. The breakeven price of a nut in a land up to 3 acres is around Rs.14/= (see *Figure 1*).

Monthly picking is not economical for a landowner of less than 3 acres, who practices picking by climbers, if the price of nut is less than Rs.14/= per nut (see *Table 3*). When the nut price exceeds Rs.14.00, it is economical for them to practice monthly picking under the wage rates and other costs used for the analysis.

For a land holding size of between >3 to 10 acres, monthly picking is economical even at when the price of a nut is Rs.4/=. When the land size is greater than 10 acres, we assume that an extra cost of travelling to the land over a distance of 100 km would be involved. This drives down the net benefit per acre per year in >10 acres land category compared to >3-10 acres category.

CONCLUSIONS

i. Economic feasibility of monthly picking depends on size of land holding (which is a surrogate for picking cost), price of nut as well as the type of picking adopted; *i.e.* whether picking is carried out by climbers or pole pickers.

ii. For >10 acres category, owner's additional travelling in monthly picking forms the

TABLE 2
INCREMENTAL BENEFITS AND COSTS BY DIFFERENT LAND SIZE CLASSES

	Acreage			
	1	*3*	*10*	*20*
Incremental benefits				
Nut price (Rs/nut)	14	14	14	14
Incremental nuts/palm/yr	7.9	7.9	7.9	7.9
Number of palms/acre	55*	55	55	55
Incremental income/palm/yr	110.6	110.6	110.6	110.6
Incremental nuts/acre/yr	434.5	434.5	434.5	434.5
Incremental income (Rs/yr)	6083	18249	60830	121660
Incremental income (Rs/acre/yr)	6083	6083	6083	6083
Incremental costs				
Picking cost/acre (climbing) @ Rs18 per palm	18	18		
Picking cost/acre (bamboo poles) Rs/acre			175	175
Incremental picking cost/yr (climbing)	5940**	17820**		
Incremental picking cost/yr (bamboo poles)			10500**	21000**
Collection of incremental nuts/yr (@ man collect 500 nuts/hr)	29.33	87.99	293.29	586.58
Wage rate/day (8hrs)	270	270	270	270
Transport cost for incremental nuts/yr (Rs 250/1000 nuts)	108.63	325.88	1086.25	2172.5
Distance to the estate (km)				100
Owner's traveling (Rs10/km)				6000***
Total incremental cost (Rs)	6077.95	18233.86	11879.54	29759.08
Incremental net benefit (Rs/yr)[x]	5.046	15.14	48950.46	91900.93
Incremental net benefit (Rs/acre/yr)	5.05	5.05	4895.05	4595.05
Benefit cost ratio (BCR)	1.00083	1.00083	5.12057	4.088165

Notes:
[x] - This is obtained by deducting total incremental cost from total incremental income
* - The average coconut stand in Sri Lanka is 55 palms per acre.
**- It is assumed that picking is done by climbers up to 3 acres and bamboo pickers do the picking in any land greater than 3 acres.
***- It is assumed that owners travel to the land by own vehicle when the land extent is 20 acres or above.

largest cost component and according to that component benefits may differ.

iii. A landowner of less than 3 acres would not benefit by monthly picking when the price of nut is less than Rs.14/= per nut. For those whose land are >3 acres, monthly picking is economical when the nut price is greater than Rs.4/= per nut.

REMARKS

- This analysis was done using the coconut yield data of Poththukulama Research Station (PRS) where the lowest nut

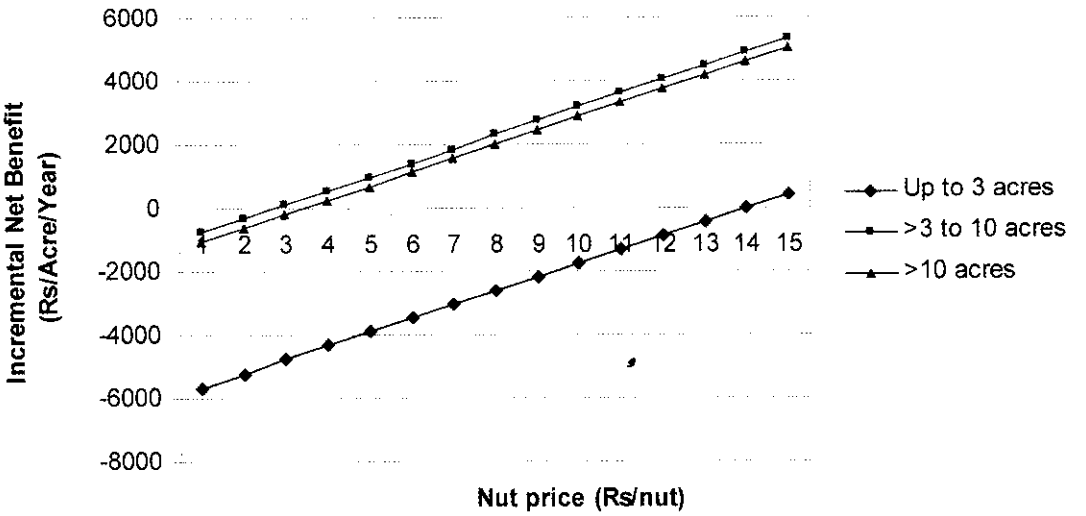

Figure 1 Variation of incremental net benefit (Rs/acre/year) with respect to price of nut and land size

TABLE 3
VARIATION OF INCREMENTAL NET BENEFIT (RS/ACRE/YEAR) WITH RESPECT TO CHANGES IN PRICE OF NUT AND LAND EXTENT

	Price of nut (Rs/nut)										
	4	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
Up to 3 acres	-4340	-3906	-3471	-3036	-2602	-2167	-1733	-1298	-864	-429	5
>3 to 10 acres	550	985	1419	1854	2288	2723	3157	3592	4026	4461	4895
>10 acres	250	685	1119	1554	1988	2423	2857	3292	3726	4161	4595

increase due to monthly picking is recorded compared to the other two research stations. The benefits of other two would be higher than the PRS as the average number of increased nuts was higher.

- If there is a possibility of using family labour and bamboo pole pickers, monthly picking would have been economical even for a land holder of <3 acres.
- No negative impact to the palm was observed due to frequent picking (monthly) during the period of experiment conducted by Mathes and Marikkar (2004), whereas there were positive impacts on the palm as the mature bunches are removed without keeping them an extended time on the palm (energy loss).

ACKNOWLEDGEMENT

The authors wish to express their sincere gratitude to Dr (Mrs) C Jayasekera, Director and Mr J M D Everard, Deputy Director (Research), Coconut Research Institute, Sri Lanka for giving us permission to publish this research brief.

REFERENCES

MATHES, D T and MARIKKAR, J M N. 2004. The impact of harvesting coconuts at monthly intervals.

COCOS, the Journal of the Coconut Research Institute of Sri Lanka, 16,56- 64.

SAMARAJEEWA, S R and FERNANDO, M T N. 2004. *The Physical Performance and Functional Efficiency of the Coconut Marketing System in Sri Lanka*, Coconut Research Institute,Sri Lanka.CARP Contarct Research Project (12/496/369).

APPENDIX 1

AVERAGE COCONUT YIELD IN PICKING EXPERIMENTS (NUTS/PALM/YEAR)

Year	*Estates*					
	Walpita		*Rathmalagara*		*Poththukulama*	
	Monthly picking	*Bimonthly picking*	*Monthly picking*	*Bimonthly picking*	*Monthly picking*	*Bimonthly picking*
1991	117.6 (4.81)	112.2				
1993[1]	51.6 (6.39)	48.5				
1994	126.4 (34.18)	94.2				
1995	98.8 (22.43)	80.7				
1996	87.5 (16.20)	75.3				
1997	107.8 (19.64)	90.1				
1998	93.8 (38.35)	67.8				
1999	106.2 (45.68)	72.9	96.1 (15.09)	83.5	109.3 (2.73)	106.4
2000	98.3 (25.86)	78.1	85.6 (30.69)	65.5	96.6 (20.45)	80.2
2001	92.7 (39.61)	66.4	92 (22.99)	74.8	97.6 (15.78)	84.3
2002	72.3 (29.34)	55.9	74.4 (15.35)	64.5	79.3 (15.94)	68.4
2003	73.4 (46.51)	50.1	74.4 (20.78)	61.6	97.1 (14.24)	85

Notes:

Figures in parenthesis are the percentage increase of yield due to monthly picking.

Source: Mathes and Marikkar (2004).

[1] After the commencement of the experiment in 1991, a significant yield increase was recorded from 1994 onwards.