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ECONOMIC LOSS OF MITE INFESTATION OF COCONUT TO INDIVIDUAL FARMERS IN PUTTALAM DISTRICT: PRELIMINARY FINDINGS

T S G Peiris, M T N Fernando and S R Samarajeewa

Coconut Research Institute

AREAS COVERED

A field survey was carried out from February to April 2003 in Kalpitiya and Wanathawilluwa areas to assess the economic loss of coconuts due to mite infestation. (Table l) Mite infested coconuts of harvested heaps were focused. So, the findings reflect the economic loss of only harvested coconuts although mite infestation also causes loosing of crop during the entire span of bunch formation in terms of button nut shedding. The latter loss is being monitored and the findings will be published soon.

Table 1 Areas covered by the field survey

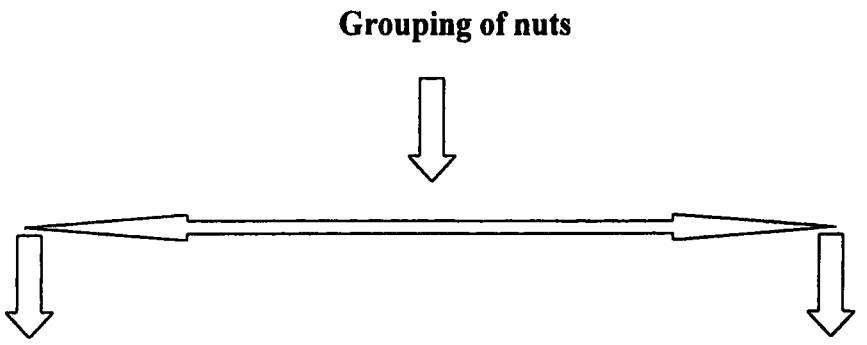
Kalpitiya area (8 estates)	Wanathawilluwa area (6 estates)
• Kalladi	• Karathiuv
• Kandakuliya	• Serakkuliya
• Vellankara	• Puliyankulam
• Kalpitiya	• Bandaranayakapura
	• Nagamaduwa

Sampling Procedure

The survey team visited coconut estates where the picking was: a) either being conducted at the time of visit, or b) completed at most three days prior. From the coconut heap, 2% of coconuts (but minimum 20 nuts) were randomly drawn from at least four places. Nuts

selected were pooled and grouped into two size classes based on the nut price and four categories each in a size class based on the severity of the mite infestation in the nuts (Figure 1 and Table 2). This was done in consultation with the owner/buyer.

Figure 1: Grouping of nuts based on size and level of mite infestation



Size 1 (full price)	**Size 2 (half price)**
• Healthy (H)	H
• Mite Discontinued (M_D)	M_D
• Mite Continued (M_C)	M_C
• Deformed (D)	D
• *Puhu* (P)	P

Table 2: Description of categories

Status	Description
Healthy (H):	Nuts having <10% of scars of mite infestation
Mite Discontinued (M_D):	Nuts having >10% scares, but the spread of scars are discontinued from the perianth. This discontinuation was considered due to non-recursion of mite infestation recently
Mite Continued (M_C):	nuts having >10% scars and the scars are continued from the perianth
Deformed (D):	Shapes of nuts are abnormal, and are often characterized by a peculiar cut/gully
Puhu (P):	Nuts having no coconut water inside

RESULTS

Table 3 shows the percentage distribution of different types of nuts in the survey sample irrespective of nut sizes. Both M_D and M_C nuts were considered as mite infested nuts (Table 2).

Table 3 Percentage distribution of nuts

Type	Kalpitiya	Wanathavilluwa	Overall
Healthy (H)	26.9	39.5	31.9
Mite infested (M_D+M_C)	71.0	58.9	66.2
Deformed and *puhu* (D+P)	2.1	1.6	1.9
Total	**100.0**	**100.0**	**100.0**

It is clear that the incidence of mite infestation is higher in Kalpitiya area (71%) than in Wanathavilluwa area (59%), the average incidence of the entire survey sample being 66%.

Assessment of economic loss to individual farmers when crop is sold on number of nuts basis

After rejecting deformed and *puhu* nuts, the distribution of nuts in a random sample of 1000 nuts were examined (Table 4).

Table 4 Distribution of nuts in a random sample of 1 000 nuts

Size	Type	Number of Nuts
Large	H	302
	M-D	381
	M-C	184
	Sub total	**867**
Small	H	24
	M-D	51
	M-C	58
	Sub total	**133**
	Total	**1000**

Thus if 1000 nuts are selected randomly, the number of small nuts is 24+51+58=133. Of 133 small nuts, 109 (=51 + 58) nuts are mite infected. It is assumed that balance 24 small nuts is due to advise climate and other natural conditions.

Table 4 gives the nut distribution under the existing situation of the surveyed area. We now compare this with a situation where mite infestation would not have been in place (Table 5).

Table 5 Comparison of nut distribution when mite infestation exists and does not exist

	Situation	
	Mite infestation exists	Mite infestation were not exist
• Larger nuts	867	976=(867 + 109)
• Smaller nuts due to:		
a. climate	24	24
b. mite	109	
• Total nuts	1 000	1 000

The economic loss of mite infestation to an individual farmer when the crop is sold on number of nuts basis, can now be computed as follows.

Assume the nut price is Rs.10 per nut. Then the price of a smaller size nut is Rs. 5.00. As Table 6 shows, the income a farmer, having a mite-infested estate can obtain by selling a random lot of 1000 nuts at the rate of Rs. 10.00 per nut would be Rs. 9335.00 and the corresponding income, had the estate been mite free would have been is Rs. 9880.00.

Table 6 Income by selling 1000 nuts

Situation	Income of selling 1000 nuts (Rs)
Mite free	Rs.9880 (= Rs 10 x 976 + 5 x 24)
Mite exists	Rs.9335 (= Rs 10 x 867 + 5 x 24 + 5 x 109)

So, the percentage of income loss due to mite infestation is 5.5%. This means that the farmers in the mite-infested area would have received 5.5% more income than the current income they receive from their coconuts, sold on number of nuts basis, had the mite infestation been not in place.

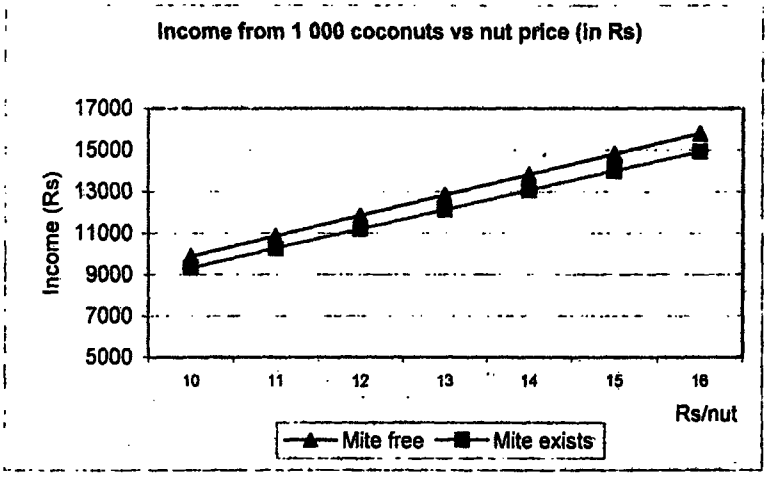
Farmers' absolute loss of income increases with the increase in nut price as evidenced by the Table 7 and Figure 2.

Table 7 Economic losses at varying nut prices

	Income if:		
Nut price (Rs/nut)	Mite free (Rs/1000 nuts)	Mite exists (Rs/1000 nuts)	Loss (Rs/1000 nuts)
10	9 880	9335	545
11	10 868	10 269	600
12	11 856	11 202	654
13	12 844	12 136	709
14	13 832	13 069	763
15	14 820	14 003	818
16	15 808	14 936	872

Note: Calculations are based for 1 000 nuts in Rupees.

Figure 2 Income from 1000 coconut nuts vs. nut price (in Rupees)



The results of preliminary analysis reveal the following:

- The incidence of mite infestation of harvested coconuts in the severely affected Kalpitiya area of Puttalam district, as visually observed in the outer skin of coconuts, is 71%.

- The individual growers in the area would have received 5.5% more income from the harvested coconuts, when sold on number of nuts basis, had the mite infestation not existed.

- Higher the nut prices, greater the absolute loss of income to farmers.

However as we have not monitored the button nut shedding due to mite infestation, the 5.5% income loss tends to be an underestimation of the real loss.

We have now initiated the monitoring of button nut shedding due to mite infestation. Also, we monitor the copra weight as affected by mite infestation. The study is in progress, covering complete year, depending on availability of Cess funds.