

Trials on the Protection of Oil Palm Fruit Bunches from Bird Damage in India

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Shooting of avian pests (12-16 birds per day), twice a week and scaring them off by tying the killed birds in the border palms, is less expensive costing about Rs. 432 per ha per year (US\$26) and reduced the bird damage only by 10 per cent. Setting up of trap-bunches baited with 1 per cent monocrotophos suspension cost about Rs. 1 090 per ha per year (US\$65) and reduced the bird damage only by 15 per cent. Protection of oil palm fruit bunches after 150 days of fruit set with wire net (75 cm x 60 cm) though very expensive costing about Rs. 1 680 per ha per year (US\$99), was found to be more efficient than the other methods, resulting in 72 per cent reduction in bird damage.

Long-term evaluation of wire net covering revealed that, its efficiency declined, as the birds learned to feed on the oil palm fruits through the holes of the wire net. Hence the method of covering the bunches with wire net was improved by providing 3 to 5 cm gap between the covered bunch and the wire net, so that the beak of the birds do not reach upto the fruits.

Incidence of bird damage to oil palm fruit bunches has been reported from Malaysia, Indonesia (Wood, 1969; Siew, Ng, Poon & Fond, 1979; Chua, Siew, Tong & Lee, 1980), Brazil, Colombia, Honduras (Turner, 1979; Hartley, 1977) and Africa (Turner & Gillbanks, 1974). In many of these countries, bird damage to oil palm fruit bunches was recorded only in certain localised areas, as such was considered to be of minor importance only (Wand & Wood, 1967; Wood, 1969; Siew *et al.*, 1979; Chua *et al.*, 1980). Hence, no serious attempts were made, so far, to control the avian pests of oil palm. In India, the common Indian mynah, *Acridotheres tristis* Linn.; the jungle crow, *Corvus macrorhynchus* Wagner and the house crow, *C. splendens* Viellot are the major avian pests causing serious damage to the ripe fruit bunches of oil palm. Other birds like crow pheasant, *Centropus sinensis* Stresmann; pariah kite, *Milvus migrans* Skyes; large pied wagtail, *Motacilla mederaspatensis* (Gmel.) and white headed babler,

Turdoides sp also occasionally feed on oil palm fruits. Around 1.8 kg of oil palm mesocarp are eaten away in each harvested bunch, and it was estimated that during 1986, a yield loss of about 2.8 tonnes of fresh fruits per ha per year was attributed to bird damage (Dhileepan, 1989). In view of the heavy economic losses due to bird damage, a preliminary observational trial on the management of avian pests was carried out and the results of the same are presented. Future lines of research efforts to be taken up in India are also discussed.

MATERIALS AND METHODS

The present trial was carried out in 20 ha of oil palm plantation (Tenera variety) at CPCRI, Palode, Kerala state, during January 1987 to June 1989. During 1987 the following treatments were screened against avian pests:

- a) *Shooting and scaring of the birds:*
Shooting of the birds was carried

out twice a week (12-16 birds per day) and the killed birds were tied on the leaves of the border palms as a method of scaring the birds. This treatment was carried out from January to March 1987.

b) *Trap-bunches:*

For this purpose, four to five trap-bunches per ha, on which the bird infestation was just initiated, were selected. These bunches were normally 120-140 days old, where the fruits cannot be removed easily by the birds. The bunches were sprayed with 1 per cent monocrotophos suspension, and such trap-bunches as well as the other ripe bunches in the treated palms were discarded after harvest, owing to the systemic nature of the insecticide applied. This trial was conducted from April to June 1987.

c) *Wire net covering:*

Ripe oil palm fruit bunches, 130-150 days after fruit set, were covered with wire net, so that the bunches in their initial stage of ripening alone were exposed. Wire nets of size 75 cm x 60 cm (Gauge 1/2 x 22") were used for this purpose. This treatment was carried out from September to December 1987.

d) *Control:*

No treatment was carried out from July to August 1987, and was considered as control.

Observations on the above treatments were not taken up simultaneously, because the effect of one treatment (eg. shooting or baiting) could affect the population of birds in the other

treatments as well. Since the observations during 1985 and 1986 (Dhileepan, 1989) revealed no significant seasonal variations in damage intensity, it was felt that results obtained for different seasons are almost comparable.

Approximate cost involved for shooting of birds was computed at the rate of Rs. 30 per day (one US\$ = Rs.17) for a gun man, for two days a week; and Rs. 1 for cost of materials for each bird killed. Cost involved for trap-bunches was computed on the basis that one man is required for 3 hours per day for two days a week (Rs. 30 per day). The cost of pesticides as well as loss incurred by discarding the trap-bunches and other ripe bunches from the treated palms were also taken into account. For protecting the bunches with wire net, each wire net which costs about Rs. 5 can be used for two years, and in each year at least for six to eight times depending upon the frequency of harvesting. Hence the actual cost involved for the wire net for each bunch covered works out to Rs. 0.75. One worker can cover twenty to twenty-five bunches a day and it costs Rs. 1.25 for covering wire net for each bunch. Thus, the cost involved for protecting one bunch was estimated to be at Rs. 2.

During the preliminary screening conducted during 1987, wire net covering was found to be more efficient than the other methods. Hence this method was evaluated for their long-term efficiency and economics, during January 1988 to June 1989. During this period 435 palms (145 palms in the border area, 145 palms in the centre of the plantation and 145 palms in the intermediate area between border and

centre of the plantation) were surveyed at quarterly intervals and percentage of ripe and unripe bunches damaged by avian pests (primarily by *A. tristis*, *C. macrorhynchus* and *C. splendens*) were assessed.

RESULTS

When no control measures were adopted (Control), intensity of damage by avian pests was very high, where 92 per cent of the bunches of the palms in the border area and 79 per cent of the bunches of the palms in the interior of the plantation were damaged by birds. Shooting of birds twice a week, was helpful mostly for scaring them, rather than reducing the bird population. Tying the dead birds on the border

palms was also found to have some scaring effect during the initial period. Shooting and scaring of birds as one treatment costs about Rs. 432 per ha per year (US\$26) and reduced the bird damage by only 10 per cent. Setting up of trap-bunches (4-5 bunches per ha once in a week) costs about Rs. 1 090 per ha per year (US\$65) and reduced the bird damage by only 15 per cent. However, protection of ripe oil palm fruit bunches with wire net was more efficient than the other methods screened, resulting in 72 per cent reduction in bird damage. Cost involved for protecting the fruit bunches with wire net was estimated to be around Rs. 1 680 per ha per year (US\$99), at the rate of Rs. 2 per bunch covered. (Table 1) (Figures 1a-c).

TABLE 1. SCREENING OF DIFFERENT METHODS FOR PROTECTING THE OIL PALM FRUIT BUNCHES FROM BIRD DAMAGE

Treatments	Zone of survey	Number of palms surveyed	% of bunches damaged by birds				Cost of operation (Rs/ha/year) [@]
			Unripe	μ	Ripe	μ	
Shooting and scanning	Border	200	7.52	(8.25)*	84.21	(2.98)*	432 (US\$26)
	Interior	200	2.94		68.11		
Trap-bunches	Border	144	6.38	(2.34)*	77.70	(1.67)	1 090 (US\$65)
	Interior	144	1.88		63.00		
Wire net covering	Border	200	2.50	(1.02)	12.50	(0.74)	1 680 (US\$99)
	Interior	200	3.22		14.81		
Control	Border	200	15.50	(0.56)	92.81	(0.35)	—
	Interior	200	11.20		79.48		

μ = Values of normal test (Border vs. interior)

Chi square test values:

Treatment vs. % of ripe bunches damaged = 51.9*

Treatment vs. % of unripe bunches damaged = 16.4*

* Significant at 5% level.

@ (One US\$ is equivalent to 17 Rupees).

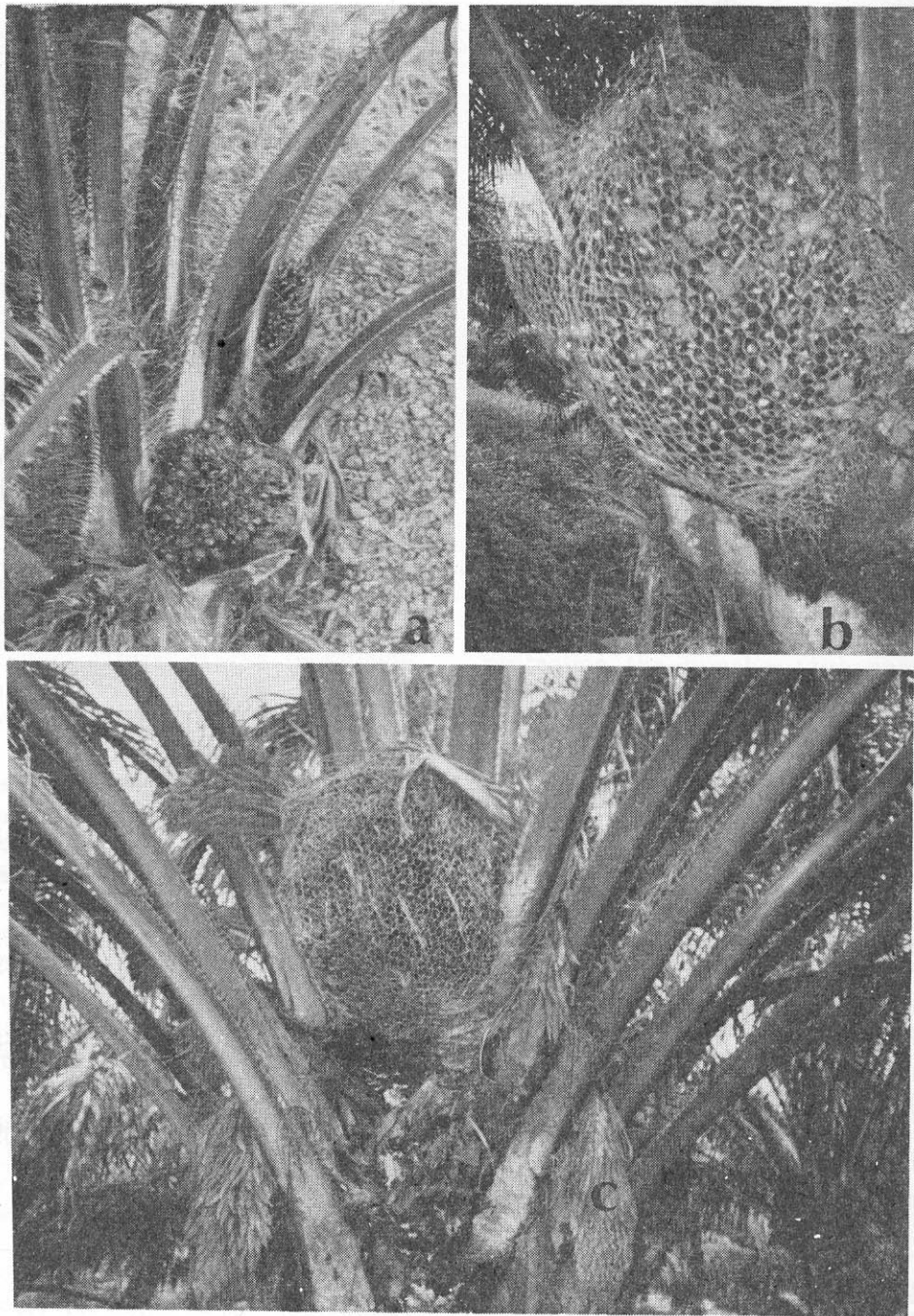


Figure 1. a. Oil palm fruit bunch damaged by avian pests.
b. Bird damage to the oil palm fruit bunch through the holes of the wire net.
c. Improved method of wire net covering.

From the preliminary screening, covering the ripe bunches with wire net was proved to be more efficient method than the others. Hence, this method was evaluated for the long-term efficiency and cost. The wire net covering was very effective and minimised the bird damage during the initial phase of evaluation (October 1987 to June 1988), where the percentage of bunches damaged ranged from 13 to 17 per cent. Later on, the efficiency declined, as indicated by a significant increase ($F = 5.8$) in the percentage of bunches damaged by birds, which ranged from 30 to 35 per cent. The decline in the efficiency of the wire net covering was that the birds like *Acridotheres tristis* and other birds with small beak learned to feed on the fruits through the hole, especially in the upper portion of the bunches. Hence the method of covering the bunch with

wire net was improved by providing a gap of 3 to 5 cm between the bunch and the wire net, so that the beak of the avian pests does not reach up to the fruit level. This improved method was found to be more efficient in minimising the bird damage (*Figure 2*). Wire net covering also has not increased the bird infestation ($F = 10.11$) in the unripe bunches, which were not protected with wire net (*Table 2*).

DISCUSSION

It is well known that no single method would be effective for scaring and controlling the birds for a long time (Udagawa, 1986). Many of the bird scaring methods are effective only for a smaller area, *i.e.* 1 to 1.5 ha (Anon. 1975). Oil palm being a crop grown in

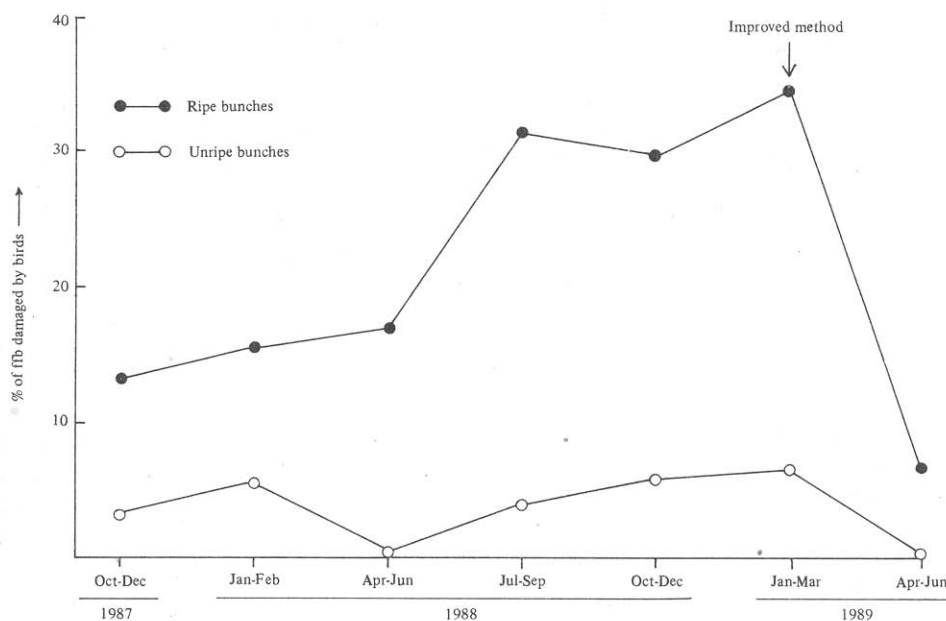


Figure 2. Evaluating the efficiency of wire net covering in protecting the oil palm fruit bunches from bird damage.

TABLE 2. EVALUATING THE EFFICIENCY OF WIRE NET COVERING IN PROTECTING THE OIL PALM FRUIT BUNCHES FROM BIRD DAMAGE

Season	Weighted means of % of bunches damaged by birds (in angles) [@]	
	Unripe	Ripe
October – December 1987	341.54 (2.8)	553.68 (13.7)
January – March 1988	2 528.35 (5.2)	1 442.06 (15.6)
April – June 1988	228.55 (0.3)	1 471.45 (17.2)
July – September 1988	1 355.31 (3.8)	474.85 (34.1)
October – December 1988	2 397.12 (4.4)	1 573.75 (30.2)
January – March 1989	1 893.87 (6.5)	633.94 (35.8)
April – June 1989	157.05 (0.4)	285.00 (8.9)
F	10.11**	5.8**
CD ₁	1 085.02	770.83
CD ₂	971.36	689.46

Figures in parentheses are actual % of bunches damaged.

[@]Weighted means = % of bunches damaged (in angles) x No. of bunches surveyed.

CD₁ = for comparing S.1 with S.2 to S.7.

CD₂ = for comparing S.2 to S.7.

** Significant at 1% level.

large holdings, feasibility of employing the conventional scaring techniques like shooting, baiting, *etc.*, is quite limited and less efficient. Control of birds by chemical (trap-bunches) and physical (trapping & killing) methods in the long run would prove difficult and quite expensive. Further, shooting and scaring will have only a negligible effect on the

population size, since only a small portion of the population is affected by this method. Wood (1968) also reported that shooting of birds in the oil palm plantations has only limited culling without much scaring effects. Regular use of trap-bunches was not effective in minimising the bird damage, as the birds quickly develop bait shy. Moreover use

of such trap-bunches is highly unselective and could present severe environmental problems. Similar bait avoidance was also reported from Malaysia (Wood, 1968) when poison baits and insecticide baited fruit bunches were tried. Protection of ripe oil palm fruit bunches with wire net as a cultural control method is safe without any environmental problems. Wire nets discarded after two years of use (due to rusting) can also be used for covering the roots of oil palm seedlings, while planting, as a method to protect the seedlings from burrowing rodents. However this method of protecting the bunches with wire net is labour intensive, more expensive and may not be feasible for larger plantations and older palms (over 15-year-old palms). Hence it is suggested to take up studies on the efficiency of some modern bird control devices such as solar scare-crow (SOLOR GUARD TH-SGI), propane gas operated 'Pika ton missiles' (DONPICA LPE-H3), vicllar LPE-V2, etc., which are exploited successfully for the management of avian pests in developed countries. Transparent trap-nets, which are successfully employed against the Weever birds damaging the oil palm leaves in West Africa can also be tried. For larger areas, use of Radio-telemetry to locate and destroy the roosting sites of avian pests may also be useful.

ACKNOWLEDGEMENTS

The author is indebted to Dr. M.K. Nair, Director, CPCRI, Kasaragod for the facilities provided for undertaking the

work. Thanks are due to Dr. K.U.K. Nampoothiri, scientist-in-charge, CPCRI (RC), Palode and Mr. G.B. Pillai, Head, Division of Entomology, CPCRI (RS), Kayangulam for encouragement and suggestions during the course of this investigation. Thanks are also due to Prof. Saraswathi, Dept. of Agricultural Statistics, Kerala Agricultural University, Vellayani for the computer analysis.

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