Demonstration of technology for mass trapping red palm weevil and rhinoceros beetle of coconut

Majority of the adults attracted to pheromone traps are females and also that they are more attractive to freshly emerged virgin and gravid females, which had not started laying eggs. This probably accounted for the mean reduction in the numbers of RPW (49.30%) and RB (78.30%) adults caught in pheromone traps recorded by the end of the study period (February 2007) over the first month (May 2006) in the areas where large scale demonstrations were carried out.

Introduction

Red Palm Weevil, *Rhynchophorus ferrugineus* (RPW) and Rhinoceros Beetle, *Oryctes rhinoceros* (RB), are serious pests of coconut palms in India. Adults of RPW lay eggs in wounds along the trunk or in petioles of coconut palms, through which the newly hatched larvae gain entry. Feeding by large numbers of larvae cause death of trees. It is very difficult to detect early stages of RPW infestation and farmers become aware of the problem only when the tree is about to die. Feeding by RB adults on the growing points causes yield loss and death of young palms and the feeding wounds are ideal breeding sites for RPW. Although the efficacy of aggregation pheromones in managing RPW on date palm in Saudi Arabia and RB in oil palm plantations in Malaysia have been established, the technology is yet to be validated on a large scale in coconut plantations in India. Studies were therefore carried out to determine the feasibility and impact of pheromone based mass trapping as a tool for managing RPW and RB and to create awareness about the technology among the coconut farmers. The study was a sponsored project under the Technology Mission on Coconut of the Coconut Development Board.

Materials and Methods

Demonstration of mass trapping of Red Palm Weevil and Rhinoceros Beetle adults was carried out over a total area of 400 acres, with 100 acres each in Kerala, Karnataka, Tamil Nadu and Andhra Pradesh. The studies in Kerala were carried out at Muthukulam (50 acres, 177 farmers) and Pullad (50 acres, 58 farmers) in Alappuzha and Pathanamthitta districts respectively. In Karnataka the demonstrations were carried out at Mala (50 acres, 11 farmers), Kervashe (25 acres, 5 farmers), Miyar (12 acres, 2 farmers) and Peradka (13 acres, 3 farmers) in Karkala district. In Tamil Nadu the studies were carried out at Anamalai (60 acres, 6 farmers), Vettaikaranpudur (20 acres, 1 farmer) and Odayakulam (20 acres, 1 farmer) located in Pollachi taluk of Coimbatore district. The study plots in Andhra Pradesh were located at Vyagreshwaram (50 acres, 21 farmers), Bandarulanka (26 acres, 3 farmers) and Pulletikurru (20 acres, 1 farmer) in East Godavari District.

A total of 200 bucket traps, 100 of them with RPW lures and another 100 with RB lures were installed in each state, with 800 traps for all the states together. The traps were installed in May 2006 on coconut

trees over 20 years of age, about 5 feet from ground level @ 1 trap/ acre and a minimum distance of 20 feet was maintained between the RPW and RB traps. Two liters of water were poured into each of the traps, to which coconut shavings were added as food bait and ½ tea spoon of detergent as wetting agent to kill the trapped adults. The bucket traps were cleaned at fortnightly intervals, while topping of water and replacement of food bait were undertaken at weekly intervals. The same lures were used for the entire study period in the case of RPW while the lures were replaced after 5 months during October in the case of RB. Adults of RPW and RB caught in pheromone traps were sexed and their numbers recorded trap-wise at weekly intervals throughout the study period, till the last week of February 2007. Samples of RPW adults collected from the study areas in the four states were dissected and observed under stereo-binocular microscope at BCRL, to determine their reproductive status. The dissected females were categorized based on ovarian development, number of eggs in lateral and common oviducts and accumulation of fat globules in the abdominal cavity.

Demonstration of technology for mass trapping Red Palm Weevil and Rhinoceros beetle of coconut using aggregation pheromone lures and traps

A project entitled "Demonstration of technology for mass trapping Red Palm Weevil and Rhinoceros beetle of coconut using aggregation pheromone lures and traps" was sanctioned to the Bio-Control Research Laboratories of Pest Control (India) Pvt. Ltd. Bangalore during the year 2005-06 by the Coconut Development Board under the Technology Mission on Coconut for a period of one year. The total project cost was Rs.16.08 lakh with Rs.8.04 lakh as financial assistance from the Board towards 50% of the project cost.

The objective of the programme was to demonstrate the efficacy of indigenously produced pheromone lures in mass trapping adults of red palm weevil and rhinoceros beetle and to conduct field studies to assess the impact of mass trapping on population density of red palm weevil and rhinoceros beetle.

The project was implemented in 100 acre demonstration plots each in 4 southern states viz; Karkala in Karnataka; Anaimalai in Tamil Nadu; Amalapuram in Andhra Pradesh and Pathanamthitta & Aleppey in Kerala by setting up pheromone traps. Observations on Red Palm Weevil and Rhinoceros Beetle adult catches were recorded at weekly intervals without break over a period of 10 months from May 2006 to February 2007. During the study period, the adult population density of RPW and RB was found to decline by 49.30% and 78.30% respectively.

The study revealed that since majority of the adults attracted to Red Palm Weevil [RPW] and Rhinoceros Beetle [RB] pheromone lures were females which had not started laying eggs, sustained mass trapping over large areas on a community basis could bring down the population density of the pests.

After completion of mass trapping the lures were removed from all the traps, but the traps were retained at the same locations and serviced as earlier. Observations on adults captured in these traps were recorded at weekly intervals for 4 weeks to determine attraction of adults to pheromone residue present in the traps. Observations on adult catches in the control plots measuring 10 acres in each of the study areas was recorded at weekly intervals for four weeks during May 2006 and again during March 2007. The pheromone traps were not retained

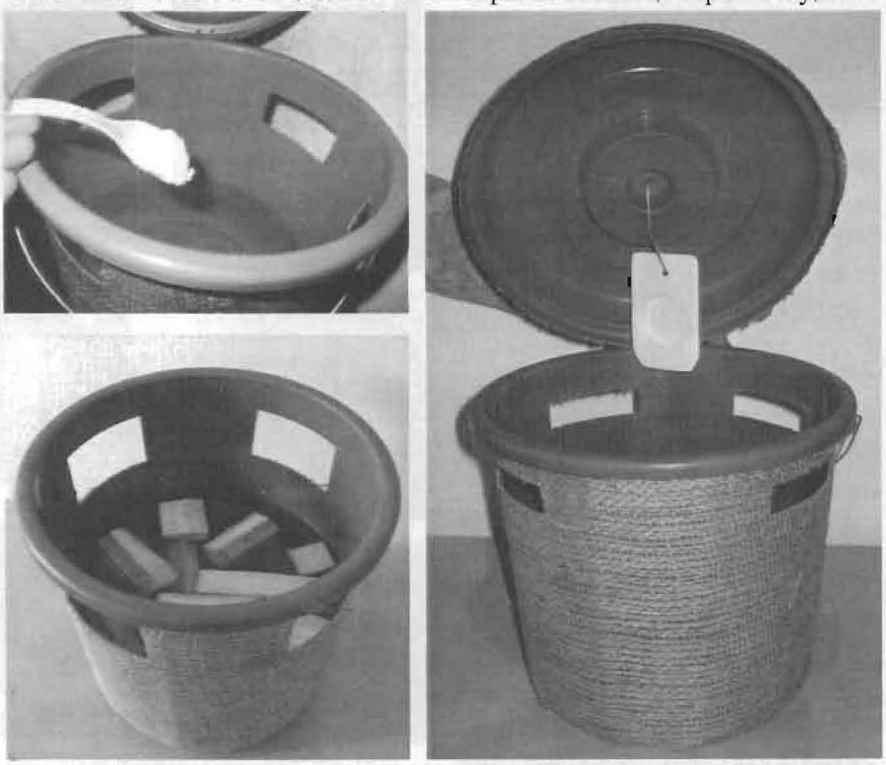
Red palm weevil pheromon elure puch (left), lure sachet (middle) and RPW bucket trp (right)

in the control plots during the intervening period. Surveys were also carried out during the study period to determine the awareness of the farmers in the areas close to each of the project demonstration sites about damage caused by RPW and RB, the numbers of coconut palms lost by them and their perception on the causal factors.

Results

The cumulative record of Red Palm Weevil and Rhinoceros Beetle adults caught from the project demonstration areas in the four states is summarized in Table 1. A total of 27,915 RPW and 12,773 RB adults were caught in aggregation pheromone traps installed in the 400 acre project demonstration areas over the 10 month study period from May 2006 to February 2007. Kerala (9370) accounted for 33.57% of the RPW adults caught followed by 25.53% in Karnataka (7127), 23.02% in Andhra Pradesh (6426) and 17.88% in Tamil Nadu (4992). In the case of RB 51.08% of the total numbers of adults caught were recorded from Karnataka (6524), followed by 21.07% in Tamil Nadu (2691), 17.28% in Kerala (2207) and 10.58% in Andhra Pradesh (1351). The RPW pheromone lures were found to attract adults under field conditions throughout the 10 month study period, while RB lures were found capable of attracting adults for 5 months.

The highest mean number of RPW and RB adults caught on weekly basis, for the entire study area, was recorded during May and September 2006, respectively, with the lowest numbers being caught during January and February 2007. Highly significant differences in mean numbers of adults captured in pheromone traps were noticed among the four locations, irrespective of the month. Similar

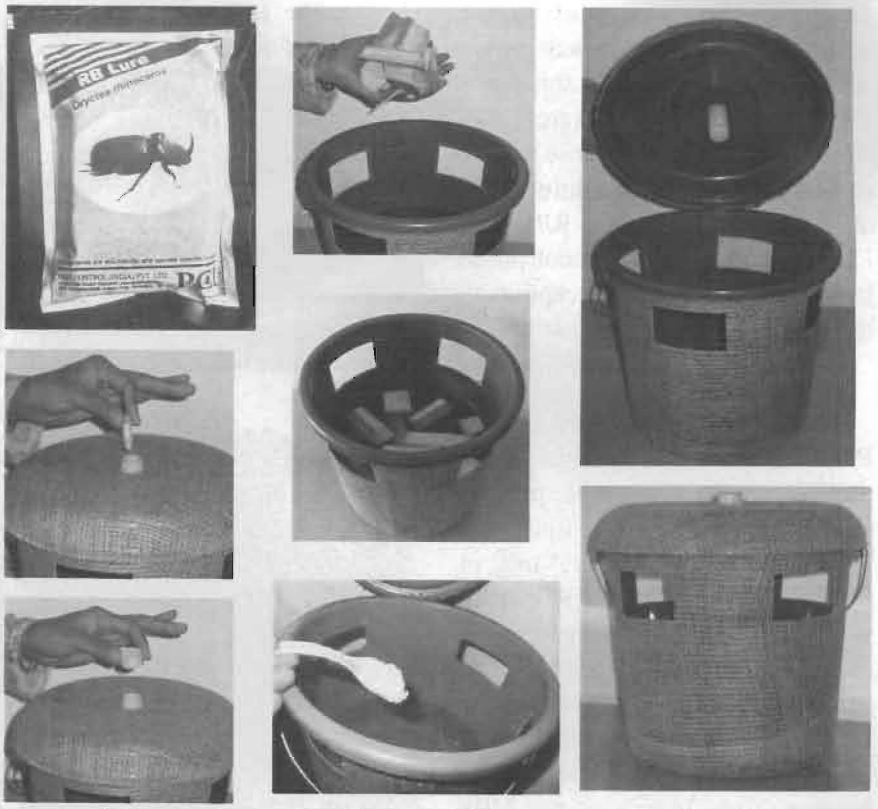


Addition of detergent (top left), coconut shavings as food bait (bottom left) and suspending pheromone lure sachet (right)

Table 1: Month-wise catches of Red Palm Weevil and Rhinoceros Beetle Adults in aggregation pheromone traps installed over 100 acres each in the demonstration plots during May 2006 to February 2007

Month	Kerala		Karnataka		Tamil Nadu		Andhra Pradesh		Total for the Four States	
	RPW	RB	RPW	RB	RPW	RB	RPW	RB	RPW	RB
May 2006	421	191	899	576	401	253	691	137	2412	1157
June 2006	1199	537	662	491	936	275	539	125	3336	1428
July 2006	1000	301	401	454	1015	278	998	92	3414	1125
Aug 2006	1076	209	375	748	636	334	736	124	2823	1415
Sept 2006	904	64	700	1297	382	251	706	410	2692	2022
Oct 2006	1087	281	749	1006	293	268	688	278	2817	1833
Nov 2006	1210	361	953	958	372	283	332	137	2867	1739
Dec 2006	884	163	756	494	374	309	748	27	2762	993
Jan 2007	821	53	755	255	286	211	370	11	2232	530
Feb 2007	768	47	877	245	297	229	618	10	2560	531
Total	**9370**	**2207**	**7127**	**6524**	**4992**	**2691**	**6426**	**1351**	**27915**	**12773**

trend was also observed among different months, irrespective of the location. Highly significant interaction was also noticed between different locations and months as indicated by two-way ANOVA. The mean reduction in adult catches by the end of the study period (February 2007) over the first month was found to be 49.30% in the case of RPW and 78.30% in the case of RB (Table 2 and 3). Decline in population density of RPW adults by the end of the study period, over the numbers caught during the first month, was noticed to be highest in Tamil Nadu (70.26%) followed by Kerala (63.56%), Andhra Pradesh (28.41%) and Karnataka (21.96%). In the case of RB 95.06% reduction in adult catches over the first month was recorded in Kerala followed by Andhra Pradesh (93.85%), Karnataka (65.55%) and Tamil Nadu (64.00%).



Left - RB Pheromone Lure pouch and lure insertion; Middle - Addition of food bait and detergent; Right - Bucket trap lid showing lure holder and BB trap

Two RPW adult catch peaks were recorded during May (Mean 421) and October 2006 (Mean 271.75) in Kerala, with the lowest numbers being recorded in February 2007

Table 2: Reduction in numbers of RPW adults caught in pheromone traps over the study period in the demonstration plots in Kerala, Karnataka, Tamil Nadu and Andhra Pradesh

Month	Mean/ month (Weekly basis)					Mean % reduction over 1st month				
	Kerala	Karnataka	Tamil Nadu	Andhra Pradesh	Total 4 states	Kerala	Karnataka	Tamil Nadu	Andhra Pradesh	Total 4 states
May 06	421.00	224.75	200.50	172.75	254.75[a]	—	—	—	—	—
Jun 06	299.75	165.50	234.00	134.75	208.50[b]	28.80	26.37	+16.68	21.96	17.42
Jul 06	250.00	100.25	253.75	199.6	200.90[b]	40.61	55.40	+26.52	+15.52	20.44
Aug 06	215.20	75.00	127.20	184	150.35[d]	48.93	66.64	36.50	+6.50	40.45
Sep 06	226.00	175.00	95.50	176.5	168.25[c]	46.31	22.14	52.29	+2.12	33.36
Oct 06	271.75	187.25	73.25	172	176.06[c]	35.45	16.69	63.37	0.43	30.27
Nov 06	242.50	190.60	93.00	83	167.27[d]	42.40	15.20	53.53	51.88	39.74
Dec 06	221.50	189.00	74.80	149.6	158.72[cd]	47.50	15.91	62.59	13.38	37.18
Jan 07	205.25	188.75	57.20	92.5	135.92[e]	51.30	16.02	71.36	46.38	46.16
Feb 07	153.00	175.40	59.40	123.6	137.60[e]	63.56	21.96	70.26	28.41	49.30
Mean	249.66[A]	167.15[B]	126.86[D]	148.83[C]	175.83	—	—	—	—	—
F Test	Locality	158.14**								
	Months	26.06**								
	Locality x Months	33.28**								

** Highly significant

In a column, means followed by similar letters are not significantly different statistically (p = 0.05) by DMRT

In a row, means followed by similar letters are not significantly different statistically (p = 0.05) by DMRT

Table 3: Reduction in numbers of RB adults caught in pheromone traps over the study period in the demonstration plots in Kerala, Karnataka, Tamil Nadu and Andhra Pradesh

Month	Mean/ month (Weekly basis)					Mean % reduction over 1st month				
	Kerala	Karnataka	Tamil Nadu	Andhra Pradesh	Total 4 states	Kerala	Karnataka	Tamil Nadu	Andhra Pradesh	Total 4 states
May 06	191.00	144.00	126.50	34.25	123.94[a]	–	—	—	—	--
Jun 06	134.25	122.75	68.75	31.25	89.25[b]	29.70	14.66	45.79	8.73	27.98
Jul 06	75.25	113.50	69.50	18.4	69.16[c]	60.60	21.04	45.20	46.12	44.04
Aug 06	41.80	149.60	66.80	31	72.30[c]	78.10	+3.86	47.34	9.46	41.52
Sep 06	16.00	324.25	62.75	102.5	126.37[a]	91.61	124.37	50.55	+198.60	-1.96
Oct 06	70.25	251.50	67.00	69.5	114.56[a]	63.21	+74.17	47.18	+102.57	7.54
Nov 06	72.20	191.60	70.75	34.25	92.20[b]	62.19	+32.84	44.20	0.00	25.52
Dec 06	40.75	123.50	61.80	5.4	57.86[d]	78.65	14.14	51.31	83.95	53.12
Jan 07	13.25	63.75	42.20	2.75	30.49[e]	93.05	55.37	66.85	91.66	75.13
Feb 07	9.40	49.00	45.80	2	26.55[e]	95.06	65.55	64.00	93.85	78.30
Mean	**66.42**[B]	**153.35**[A]	**68.19**[B]	**33.13**[C]	**80.27**	—	—	—	—	—
F Test	Locality					551.24**				
	Months					103.47**				
	Locality x Months					42.52**				

** Highly significant

In a column, means followed by similar letters are not significantly different statistically (p = 0.05) by DMRT

In a row, means followed by similar letters are not significantly different statistically (p = 0.05) by DMRT

(Mean 153). The mean number of adults caught on weekly basis was found to decline steadily over the previous months up to August, increase marginally over the next 2 months and declined steadily thereafter. In the case of Karnataka the highest and lowest mean numbers of RPW adults were recorded during May 2006 (Mean 224.75) and August 2006 (Mean 75.00) respectively. An increase in adult catches was noticed during September 2006 and the mean adult catches, on weekly basis, was observed to remain within the range 175.00 to 190.60 during September 2006 to February 2007. In Tamil Nadu RPW adult catch was observed peak during July 2006 (Mean 253.75) and the lowest was recorded during January 2007 (Mean 57.20). In the case of Andhra Pradesh the numbers of RPW adults caught in pheromone traps was found to fluctuate over different months, with the highest and lowest mean numbers on weekly basis being recorded during July (199.60) and November (83) respectively.

The highest peak mean monthly RB adult catch, computed on weekly basis, was recorded in Kerala (Mean 191) during May, after which the population was found to decline steadily up to September and increased marginally over the next 2 months, with a second minor peak in November 2006 (Mean 72.20). The lowest adult catches, for the entire study period, was recorded in Kerala during February 2007 (Mean 9.40). In the case of Karnataka the highest and lowest mean numbers of RB adults caught in pheromone traps were recorded during September 2006 (Mean 324.25) and February 2007 (Mean 49.00), respectively. In Tamil Nadu the peak RB adult catch was observed during May 2006 (Mean 126.50) and the lowest during January 2007 (Mean 42.20). In the case of Andhra Pradesh pheromone trap catches were found the highest during September 2006 (Mean 102.50), with the lowest mean numbers on weekly basis being recorded during February 2007 (Mean 2).

Observations on pheromone trap catches in the control plots revealed that the total number of RPW adults captured in control plot was not found to vary significantly with 358 and 373 adults being caught in May 2006 and March 2007 respectively. However, significantly more numbers of RB adults were captured during March 2007 for the four states together (221 adults) as compared to those recorded during May 2006 (154 adults), an increase of 43.51% (Table 4). These observations are contrary to those recorded in the demonstration plots, where the population density of adults was found to decline by 49.30% after continuous mass trapping over 10 months in the case of RPW and 43.51% in the case of RB.

Table 4: Numbers of RPB and RB Adults caught in 10 pheromone traps set up in the control plot before and after the study period

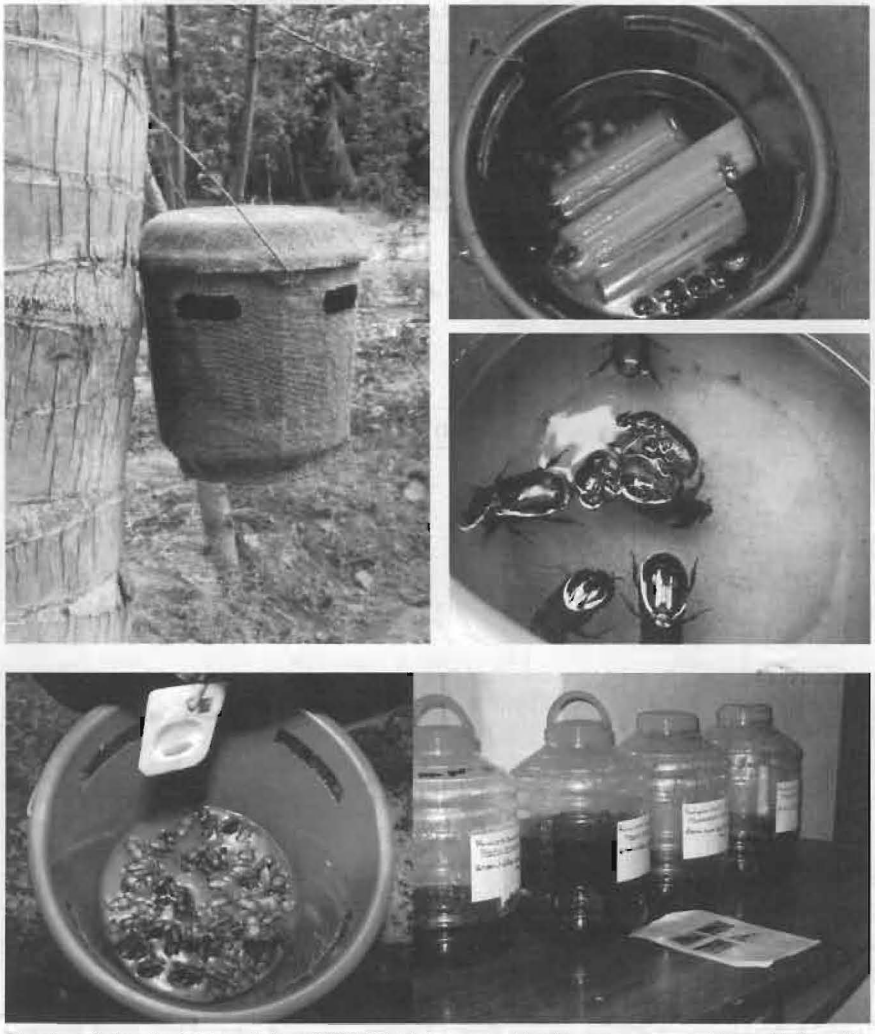
Period	Sex	RPW		RB	
		Before	After	Before	After
Week 1	Male	31	29	10	14
	Female	39	54	28	29
	Total	76	83	39	43
Week 2	Male	35	43	14	21
	Female	82	54	37	44
	Total	117	97	51	65
Week 3	Male	30	31	8	12
	Female	61	68	15	44
	Total	91	99	23	56
Week 4	Male	29	29	9	16
	Female	45	65	32	41
	Total	74	94	41	57
Total	Male	125	132	41	63
	Female	227	241	112	158
	Total	358	373	154	221

Pheromone trap catches were found to be female biased, with 17,836 females as against 10,079 males for RPW and 8629 females and 4144 males in the case of RB. The sex ratio was found to range from 1: 1.59 to 1: 1.94 (male: female) during the different months, with a mean of 1: 1.77 (**B&: @&**) for the entire study period in the case of RPW and 1: 1.31 to 1: 3.50 (male: female) with a mean of 1: 2.08 (**B&: @&**) for RB. Studies on the reproductive status of RPW females captured in pheromone traps revealed that majority of them were either virgin (50.88%) or gravid (27.50%) and together constituted 78.38% of the females caught in traps, while 88.01% of the females caught in RB traps were found to be either virgin (54.13%) or gravid (33.88%) (Table 5).

Intensive studies carried out over a period of 2 weeks under farmers' field conditions at Karkala in Karnataka to understand the field behaviour of RPW adults, particularly with respect to their attraction to pheromone traps, indicated the presence of 2 distinct activity peaks between 11.00 AM 01.00 PM and 5.00 PM 8.00 PM. About 51% of the RPW adults recorded during the 6 day study period were caught during the first peak, followed by 19% during the second peak. Adults were noticed to be attracted to the pheromone traps from 9 AM to 3 PM, with 74% of the adults being captured during this period. No catches were recorded between 6 AM to 9 AM and again between 3 PM to 5 PM during the study period, spread over 6 days. Mark and recapture studies revealed that adults are attracted to the pheromone traps from distances up to 1.5 Km. Colour coded adults released at 0.5 km distance were recaptured in pheromone traps within 25 minutes and 60% of the released adults were recaptured within 3 days. None of the adults released at 2 km distance were recaptured, while 50% and 15% of the adults released at 1 and 1.5 km, respectively, were recaptured within 3 days. In the case of RB adult activity was noticed to start only after 9.30 PM, with no activity being noticed during the day time. It was observed that majority of the adults were captured between 1.00 AM and 6.00 AM, with only 9 out of the 45 adults being captured between 10.00 PM to 1.00 AM. Detailed studies on

Table 5: Grading chart and reproductive status of RPW and RB adults caught in pheromone traps in the four states during the study period

Category	Status of fat globules in the abdominal cavity	Presence of eggs/ ovarioles	RPW		RB	
			No	%	No	%
Grade-1(Virgin female)	Abdominal cavity filled with fat bodies	No eggs in oviduct, large number of oocytes in ovarioles	130	50.88	110	54.13
Grade-2(Gravid female)	Decrease in fat globules in the abdominal cavity	06-10 eggs in the oviduct	73	27.50	73	33.88
Grade-3(Laying female)	Fat globules scattered in the abdominal cavity)	03-06 eggs in the oviduct	42	16.13	26	11.50
Grade-4(Spent female)	Very low or no fat body in the abdominal cavity	0 to 2 eggs in oviduct	15	5.50	1	0.50
		Grand Total	**260**	**100**	**210**	**100**



Trap installed under field conditions, RPW RB adults captured in pheromone traps and jars with formalin solution in which captured adults were preserved during the project period

peak period of activity, percentage of attracted adults getting caught in pheromone traps or distances from which adults were attracted to pheromone traps by mark and recapture technique could not be carried out with RB due to the behavioural pattern of adults and the absence of equipment or facilities to carry out such studies in the night.

A total of 216 RPW adults (70 males and 146 females) and 23 RB adults were captured in bucket traps set up in the project demonstration areas in the four states over a period of 4 weeks, after removal of the lures, indicating the persistence of pheromone residue as reported earlier. Majority of the RPW adults (56.02%) were captured during the first week, with 34.26%, 9.26% and 0.46% being recorded during the second, third and fourth weeks respectively. In the case of RB majority of the adults were found to be captured during the first week (60.87%), followed by the second (17.39%), fourth (13.04%) and the third week (8.70%), respectively. The numbers captured during the 3rd and 4th week were very low, indicating that most of the pheromone residue probably got dissipated in the first 2 weeks.

Results of surveys carried out to determine the awareness of the farmers to determine the numbers of coconut palms lost by them and their perception on the causal factors and the results are summarized in Table 6. Per capita land holding was found to be the lowest in Kerala, with 91 farmers owning 100.4 acres of coconut plantation. Among the other areas surveyed Amalapuram was the only location where farmers held less than 1 acre (31.25%) of coconut field. Farmers in Alappuzha reported the highest loss of coconut palms in the past 5 years (13.33/ acre) followed by Udupi (5.07/acre), Pathanamthitta (3.61) and Amalapuram (3.24). Farmers in Alappuzha region appeared to be more aware of the problems posed by RPW and RB, with 83.87% of them identifying these insects as the cause of tree death, followed by 68.34% for Pathanamthitta region. Age composition of coconut palms in the study areas appeared to play a role in tree loss. Thus, Alappuzha with 48.66% of the coconut palms below 10 years of age had the highest tree loss (13.33/ acre) as compared to Anamalai (1.21/ acre) with 15.47% the palms in the <10 year age group.

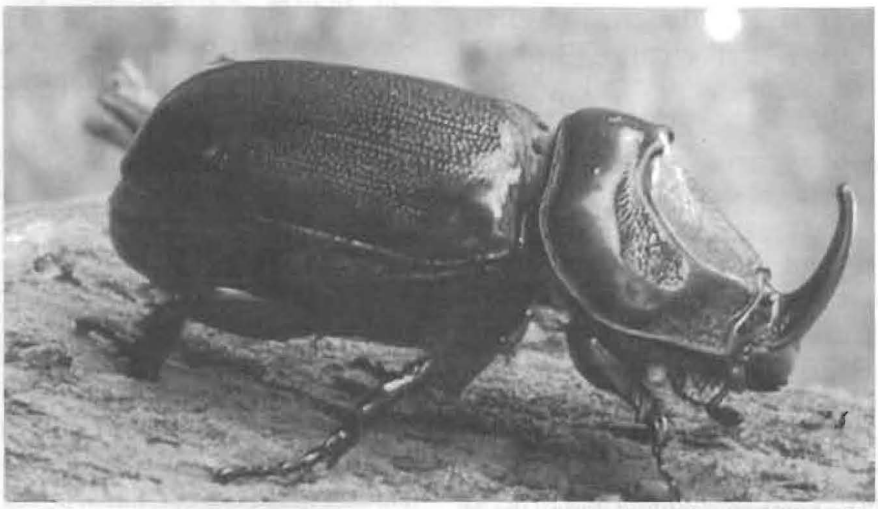
Discussion:

The studies carried out under the present project clearly established that majority of the adults attracted to pheromone traps are females and also that they are more attractive to freshly emerged virgin and gravid females, which had not started laying eggs. This probably accounted for

Table 6: Farmers' perception on problems posed by RPW at different locations in Kerala, Karnataka, Tamil Nadu and Andhra Pradesh, based on information collected using a questionnaire

Particulars	Alappuzha	Pathanamthitta	Udupi	Anamalai	Amalapuram
Number of Farmers surveyed	31	60	50	9	48
Total land holding (acres)	16.8	83.6	211	109	112.51
Area-wise categorization of farmers in study area (Percent)					
Farmers holding < 0.5 Acres (%)	58.07	43.33	0	0	4.17
Farmers holding 0.5 to 1.0 Acres (%)	35.48	16.67	0	0	27.08
Farmers holding 1.0 to 2.0 Acres (%)	4.45	30	0	0	41.67
Farmers holding 2.0 to 4.0 Acres (%)	0	8.33	48	0	14.58
Farmers holding > 4 Acres (%)	0	1.67	52	100	12.5
Total number of palms in study area	1157	3908	12112	5690	8592
Age distribution of palms in the study area (Percent)					
< 5 year old palms (%)	36.3	15.56	16.68	1.76	10.46
5-10 year old palms (%)	12.36	10.75	14.65	13.71	14.04
10-15 year old palms (%)	10.11	10.31	27.92	30.05	24.58
15-20 year old palms (%)	9.77	11.36	26.92	19.33	9.9
> 20 year old palms (%)	31.46	52.02	13.83	35.15	41.01
Total palms lost in the last 5 years	224	302	1070	132	364
Palms lost per acre (%)	13..33	3.61	5.07	1.21	3.24
Cause of death as understood by the farmers					
Red Palm Weevil (RPW) (%)	51.61	31.67	44	66.67	7.69
Rhinoceros Beetle (RB) (%)	16.13	15	16	0	40.38
RPW + RB (%)	16.13	21.67	38	0	26.92
RPW + Black headed caterpillar (%)	0	6.67	0	0	0
Mites (%)	3.23	0	0	0	0
Not known (%)	12.9	25	2	33.33	15.38
(Thunder/ Ganoderma/ Tanjore wilt)	0	0	0	0	9.62

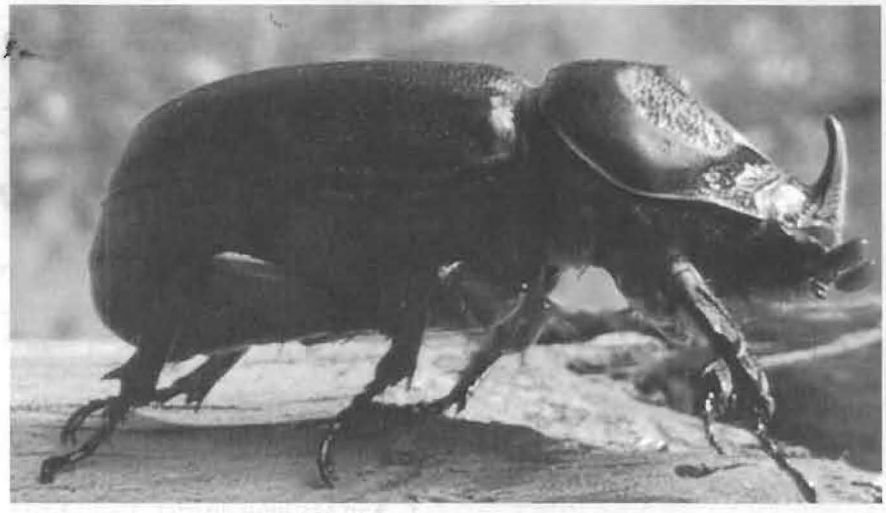
the mean reduction in the numbers of RPW (49.30%) and RB (78.30%) adults caught in pheromone traps recorded by the end of the study period (February 2007) over the first month (May 2006) in the areas where large scale demonstrations were carried out. This was further corroborated by observations on pheromone trap catches in the control plots, where more numbers of RPW and RB adults (373 and 221) were caught at the end of the study period (March 2007) as against those caught (358 and 154) in the beginning (May 2006).



Rhinoceros beetle adult male - longer horn

The present studies revealed that mass trapping can be made more effective by installing more traps along the periphery of a plantation, particularly in the windward direction. The observations carried out under the project also highlighted the need for exercising caution while undertaking mass

trapping, particularly the importance of proper servicing of bucket traps, addition of recommended food baits and detergent or insecticide inside the traps and regular cleaning and topping up of water, to prevent the females attracted to the pheromone from causing fresh infestations. Sustained mass trapping over large areas on a community based approach appears to have potential to bring down the population density of these noxious pests, particularly in parts of the country where per capita land holdings are small as in Kerala.



Rhinoceros beetle adult female - shorter horn

Commercializing Coconut Wood: An Incentive to Replanting

A vast resource of coconut wood is available throughout the tropical countries of the world particularly in APCC member states. This resource could be derived from millions of over- mature or senescent coconut palms. It is estimated that a hectare of replanted coconut palm can produce about 100-150 cubic meters of coconut wood. This translates to a minimum of one million cubic meters for every 10,000 hectares replanted. This wood resource is more than enough to meet the requirements and boost the government's housing program of a country.

Converting coconut timber into finished products adds commercial value to the resource. This also opens employment opportunities and provides additional source of income for coconut farmers. In the Philippines for example, one coconut palm may be sold to cocowood timber processors at P1,000 (US $25) or more. If the timber is further processed into finished products, the value could be much higher.

As we know, the coconut trunk offers a host of potential economic uses. When properly dried and preserved/ treated, it can be used as poles for electric lines. When properly sawn, seasoned/dried, treated, and machined, it can be used in the construction of buildings and houses as trusses, beams, parquet flouring, paneling, ceiling, roof shingles and partitions. Coconut wood is also an exotic material for the manufacture of furnitures, handicrafts and novelty products.

Coconut wood has proven to be comparable to conventional wood in terms of durability, sturdiness, and versatility. The use of cocowood as a substitute material for building construction could bring down the cost of housing units. This is because its cost is only about half or a little more than half of the price of conventional wood. Commercializing coconut wood can indeed be a good source of employment and income for coconut farmers. Considering that 30 to 50% of the coconut palms in APCC member countries are already senile and are due for replacement, commercializing coconut wood can be a good incentive for replanting.

To do this, it is essential that the proper training is provided on coconut wood processing and utilization to sawmillers, technicians and entrepreneurs engaged in the coconut lumber business. The APCC Secretariat is currently facilitating the conduct of a skills development training program which will be held at the Philippine Coconut Authority-Zamboanga Research Center in July this year. This is open to all APCC member countries who may wish to nominate suitable participants to attend the two-week hands-on training program.

To boost the efforts of the national governments, private sector investments may also be encouraged towards enhancing the commercialization of coconut wood, and thus, provide incentives to, and speed up replanting.

Source : The Cocommunity