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RODENT Newsletter

Vol. : 35 (3-4) 2011

All India Network Project On Rodent Control
Central Arid Zone Research Institute
Jodhpur - 342 003, India

National Training on Rodent Past Management in Kerala (September 13-19,2011)

Dr K.R. Vishwambharan, VC, KAU,Thrissur inaugurating the Training programme

Field exercises taken up by trainees

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AINP on Rodent Control
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Surveillance and population ecology of pest rodents in predominant cropping systems

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Survey was conducted during September 2009 to January, 2010 in five villages namely Yagrum, Korang, sido, Tene and koyu in East Siang District with an experience of sporadic bamboo flowering in Koyu village during 2009. Field survey was also conducted in demonstration as well as research farms of the College of Horticulture and Forestry, C.A.U. Pasighat, Arunachal Pradesh. The predominant cropping systems in the survey area were rice –mustard and rice - vegetables. Three species of bamboos viz, *Bambusa tulda, Bambusa balcoa, Dendrocalamus gigaenteus* were predominant in this area. Out of which *B. tulda* was bloomed in April-May. The inflorescence and grain samples were collected for further study. The trap index (no of animals/100 traps/ night), live burrow count/ ha, damage in term of percent cut tillers in wetland and jhum rice, damaged fruits in case of tomato, damage percentage in sugarcane, potato, maize, tapioca and grass land were recorded from the surveyed area (Table1). Maximum rodent damage in term of per cent cut tiller was recorded in rice grown under jhum cultivation (16.22 to 24.54%) as compared to wet land rice (4.25 to 16.26%). The highest live burrow density (20.40 to 65.33 o/ha) was recorded in wet land rice fields. Similarly, the highest trap index was recorded in both types of rice cultivation (15.33 to 33.83). *(Courtesy: CAU Research News Letter, Volume 1(2): 17, July-December 2010,* Central Agricultural University, Imphal, Manipur)

Table1. Survey of rodent pests in different crops in East Siang District of Arunachal Pradesh

Crop	No of live burrows/ha	Trap index (no.of animals/100 traps/night)	Damage(%)
Rice (Wet land)			
September.2009	20.40	18.66	04.25
October. 2009	60.00	20.67	06.66
November.2009	65.33	20.00	12.26
December.2009	51.80	22.67	16.26
Rice(Jhum)			
September.2009	15.67	15.33	16.22
October, 2009	18.87	20.67	24.54
November,2009	35.20	33.83	23.44
December,2009	41.60	23.33	20.12
Sugarcane			
October. 2009	23.33	6.67	2.91
November,2009	20.00	3.33	2.85
December,2009	26.67	13.33	3.08
Tapioca			
October, 2009	37.67	13.33	12.80
November,2009	27.50	6.67	10.80
December,2009	22.50	3.33	8.40
Potato			
October, 2009	7.50	3.33	-
November,2009	5.00	6.67	-
December,2009	6.25	10.00	-
Maize			
October, 2009	16.66	13.33	12.44
November,2009	10.00	3.33	9.33
December,2009	13.33	6.67	8.00
Grassland			
October, 2009	28.57	10.00	-
November,2009	22.85	6.67	-
December,2009	7.14	0.00	-
Tomato			
February,2010	-	10.00	2.92

*Data represent the mean of three replications per field of five villages.

Rodent invasion to coffee plantations in Coorg district of Karnataka

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Coffee production in India is dominated in the hill tracts of South Indian states where in state of Karnataka accounts for 53 per cent followed by Kerala (28%) and Tamil Nadu (11.1%). Over 900 species of insects have been recorded as pests of coffee worldwide. Of these, over a third are beetles, and over a quarter are bugs. Some 20 species of nematodes, nine species of mites, several snails and slugs also attack the crop. However, vertebrates like bird and rodents sometimes damage coffee berries but their impact is minor compared to invertebrates.

A sudden invasion by rodents was recorded during August 2010 in coffee plantations adjoining forest areas of Ponnampet in Coorg district, Karnataka. The observations thereafter indicated that the rodents with their sharp incisors made irregular cuttings on hard branches towards the shoot which later led to the death of the branch tip resulting in heavy crop losses. Since it was difficult to distinguish the damage done by the different animals in coffee plantations, the nature of rodent damage was studied in laboratory by exposing the fresh coffee branches to various species of rodents *viz. Rattus rattus, Bandicota bengalensis, Tetara indica and Mus booduga* in the individual cages (1 ½' x 1 ½' x 1 ½'). Based on visual observations, the damage in fields was confirmed.

The house rat, *R. rattus* was the predominant species (<95%) trapped in the plantation followed by lesser bandicoot rat, *B. bengalensis*. The trapped rodents from the affected plantation areas were identified by Zoological Survey of India, Kolkata. The possible reason for severe rodent damage to coffee plantations may be due to the large scale shedding of bamboo flowers in the adjoining forest.

Though no burrow openings were found in the coffee plantations, the number of rodents varied over a distance from surrounding forested area. Intensive surveys on distribution of rodents associated with damage conducted at Ponnampet coffee plantation revealed that as the days passed the fresh damage was reduced at plantations nearer to forest while, there was a fresh damage in farther distances. Hence observations on rodents (trapped/ ha) in coffee plantations were made from September 2010 to February 2011 at 30 days interval at 50m, 200m, 400m, 600m, 800m and 1000m distance from the forest border.

The trapping data (Table 1) indicated that the rats divest habitats permanently and disperse at faster rate in search of fresh food. Maximum number of rats were trapped/ha (11) in the border (up to 50m) initially (September, 2010) which decreased to nil by January 2011. Maximum rodent population was observed up to 400 m distance from forest borders during October to December months. Overall analysis of rodent distribution during six month long surveys revealed higher incidence (19/ ha) near the forest borders (up to 50m) which was gradually reduced to 2/ha at 1000 m distance, may be due to high dispersion with the increase in distance from forest borders.

Table1. Number of rodents trapped in coffee plantations at varied distances from forest border

Distance from border forest (m)	No. of rats trapped / ha						Total
	September 2010	October 2010	November 2010	December 2010	January 2011	February 2011	
50	11	5	2	1	0	0	19
200	-	5	3	1	0	0	9
400	-	1	2	2	1	0	6
600	-	-	1	2	1	1	5
800	-	-	1	1	1	0	3
1000	-	-	0	0	1	1	2
Total	11	11	9	7	4	2	44

-Observations not recorded

Potential of burrow fumigator in managing rodent population in Punjab State

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A rat burrow fumigator consisting of a hollow cylinder of 10" diameter and 10" height made of 18 gauge M S sheet was fabricated at Punjab Agricultural University, Ludhiana. A rectangular window (6"x 4") with a cover was made at the center for putting the straw inside the hollow cylinder. The outlet at the bottom was made of G I pipe 8" in length and 1.8" in diameter. The inlet on the top was made of G I pipe 6" in length. An air blower was fixed at the top of inlet pipe.

The efficacy of this burrow fumigator was compared with 2% zinc phosphide treatment at villages Bachhowal and Iraq in district Ludhiana. During cropping period, it was difficult to locate rodent burrows and do fumigation as the farmers generally do not allow conducting extensive surveys in the standing crop therefore trials were conducted after the harvest of wheat crop when the rodent burrows/complexes of *B. bengalensis* were clearly visible in the fields. A total of three blocks, each of about 1.5 ha area were selected. The burrows in these blocks were [illegible] and plugged with loose soil two days prior to the treatment. On

the third day, the reopened burrows considered as live were numbered and labeled for different treatments. In block I, fumigation was done for at least 15-20 minutes per burrow (n=10). For fumigation, wheat straw along with some paddy straw and dried red chillies were put in the fumigator and burnt. The outlet of the fumigator was inserted in the burrow opening which was then closed carefully with soil so that the smoke may not escape from the sides. With the help of blower, smoke was passed into the burrows. After fumigation again the burrow openings were closed with soil. Simultaneously in block II, live burrows (n = 21) were treated with 2% zinc phosphide bait whereas in the live burrows of block III (n = 17) no treatment was imposed and therefore kept as control. After a week of treatment, live burrow count was made in all the treated and untreated fields. In block I, only one burrow was found live. All the live and dead burrows were excavated to know the status of rats within the burrows. No rat carcasses could be recovered from any of the dead burrows, however a live snake was recovered from the only live burrow found. May be the snake had predated on the rat. From pre and post-treatment live burrow count the findings revealed 90% reduction in rodent activity in fields treated with fumigatior as compared to 66.67% with 2% zinc phosphide treatment. Post-treatment live burrow (n = 7) in block II treated with 2% zinc phosphide were found at places different from that closed during treatment. Since the wheat crop in Punjab is normally harvested with combine (a kind of harvester), a lot of straw is found in the fields immediately after harvest. Fumigation at this stage is to be carried out very carefully so that the dry straw with in the field may not catch fire and affect the surrounding un-harvested fields. Moreover, *B. bengalensis* makes large burrow complexes, spread in larger area and there is normally one rat living per burrow complex, except during breeding season. Since no rat carcass could be recovered from any of the burrow after fumigation, the efficacy of the smoke generated from the fumigator in killing the rats could not be confirmed. However, the process of fumigation for 15-20 minutes for killing one rat does not seem to be economical. More over fumigation/ smoking of burrows is quite labour intensive as two persons are required to operate the fumigator (one for blowing the air and other to block the leakage of smoke as well as to kill the rats escaping from the burrow if any.

Some aspects of the ecology of the India, Giant Squirrel, *Ratufa indica* (Erxleben, 1777) in the tropical forests of Mudumalai Wildlife Sanctuary, southern India and their conservation implications

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The Indian Giant Squirrel, *Ratufa indica*, an endemic species to India is widely distributed from evergreen to moist and dry deciduous forest of Western and *Eastern* Ghats and the central Indian hills. We studied its population distribution, activity, feeding, ranging and nesting behavior across three major habitats in the tropical forests of Mudumalai Wildlife Sanctuary, southern India, during 1998-2000 to manage the species effectively. Extensive survey of the three major habitats – tropical moist, dry deciduous and dry thorn- in the sanctuary shows that its distribution is continuous in moist and dry deciduous forests with good canopy contiguity and patchy along riverine areas in dry thorn and dry deciduous forest with sparse trees and broken canopy. Density estimates using 55 direct sightings from 199 km line transects show a mean of 2.9 ($\pm$0.313) squirrels/ km ^{2}. Daylight activity and feeding patterns assessed through 24,098 minutes of focal sampling reveal that animals feed and rest equal amounts of time. The diet constitutes seeds, bark, petioles, leaves, and fruits from 25 plants, with *Tectona grandis* as the principal food source (41%). Its home range size varied from 0.8-1.7/ha with a mean of 1.3/ ha. Nesting characteristics assessed through 83 nests surveyed along 54 km transects showed that the squirrel uses 15 of the 33 tree species found, with higher preference to *Schleichera oleosa* and *Mangifera indica*. Nest trees are significantly larger in height, GBH and canopy contiguity than nearest non-nest trees, which are attributed to better protection and escape from predators. Maintenance of diverse natural habitats and reduction in anthropogenic pressure are measures suggested for the conservation of giant squirrel populations in the study area. (*Courtesy: Journal of Threatened Taxa, 2011. 3(7):1899-1908)*

Population dynamics of rodent pest complex in public parks at Bangalore city, Karnataka

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Bangalore (12.58' N, 77.35' E, and 930 AMSL) is known as the Garden City of India owing to the pleasant climate and greenery. The city has many famous parks like Cubban Park, Lalbhag, Coles Park, Bugle Park, Basavalingappa Park and Rajeev Gandhi Park. For the present study, four public parks of one hectare each in Yelahanka New Town of Bangalore North were selected. The parks have beautiful hedge plants, flowering and ornamental plants and extensive lawns. The parks were surveyed during March and April 2009 at fortnight intervals.

The number of live burrows of *Bandicota bengalensis* ranged form 12-27/ha with an average of 21.5/ha. The numbers of live burrow count of *Bandicota indica* varied between 8-13/ha with a average of 11.13/ha (Table). Of the two bandicoot species, lesser bandicoot rat, *B. bengalensis* were found inside the parks while *B. indica* inhabited all along the borders. Both the species were implicated in creating the nuisance in the public parks as they damaged the hedges, flowering plants, lawns and irrigation systems due to their gnawing and extensive burrowing behaviour.

Table. Population dynamics of rodent pest complex in public parks (1 ha)

Month and Fortnight		Live burrows count /ha in four public parks								Average	
		1		2		3		4			
		B.b	*B.i*	*B.b*	*B.i*	*B.b*	*B.i*	*B.b*	*B.i*	*B.b*	*B.i*
March	1	20	10	25	8	30	10	12	8	21.75	9.0
	2	21	12	24	10	28	11	15	10	22.00	10.75
April	1	22	14	20	12	27	30	17	8	21.50	11.75
	2	24	14	15	18	25	12	19	11	20.75	13.00
								Average		21.5	11.13

B.b.= Bandicota bengalensis; B.i.= Bandicota indica

Impact of timely education and training on rodent management in wheat crop

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Rodent management is a complex problem and most of the farmers consider rodents as unmanageable pests and often neglect their control. The major problems in the implementation of rodent managemant technologies are the lack of awareness, motivation and knowledge about procedures of rodenticide bait formulation and its application. There is a need to motivate farmers to opt for community approach and therefore training and education on rodent control techniques, preparation of poison bait formulation and application and its integration with other methods etc are essentially required. The present study was conducted to quantify the impact of education and training on reduction in rodent damage in wheat crop. Three villages selected in block Noormahal, District Jalandhar (Punjab) were categorized as (i) Maintenance area (Village Kotbadal Khan), (ii) Neglected area (Village Dalla) and (iii) Survey area (Village Bandala). In maintenance area, proper education and training was imparted to the farmers on rodent management technologies and precautions to be taken while handling of poison baits through lectures and practical field demonstrations. Leaflets containing all the above information were also distributed. Bromodiolone bait (0.005%) was prepared on the spot in front of farmers and on the basis of their land holdings sufficient quantity of pocketed poison baits were distributed which were applied by all the farmers in their fields on the same day. Similar activities were done in neglected area, except distribution of poison bait. The survey area was kept as reference village where neither education nor rodenticide bait was provided.

Prior to training and demonstration, an opinion survey was conducted in all the villages through well structured schedules (50 farmers in each village). Land holdings of farmers ranged between 2-30 acres. Major crops grown were wheat and rice. The Survey revealed that pre-existing knowledge of farmers, their general attitude towards rodent pests and the rodent control practices followed were quite similar across villages. Farmers consider rodents to be the pests responsible for moderate to high damage in their crops and recognize the need for their control for which

they purchase rodenticide from the market themselves and apply in their fields. Most of the farmers were aware of the advantages of rodent control. They also knew the importance of habitat manipulation and protection of natural predators for rodent control. They were aware of the fact that zinc phosphide should be applied before damage starts and rodent control operations should be conducted collectively at village level. But in actual, these practices were not being adopted. Rodent management technologies commonly adopted among farmers included killing of the rodents coming out of the water filled burrows during irrigation and chemical control using zinc phosphide as rodenticide. They were not aware of the anticoagulant rodenticides. It was found that farmers often adopted incorrect methods of baiting which not only resulted in failure of control operation but also led to behavioural problems like bait shyness for which they often complain about the ineffective baiting in the fields. Most of the farmers (82-96%) do not use recommended dose of the zinc phosphide which is 25g/Kg of the bait. They were, however, not conducting pre-baiting before using zinc phosphide bait. Farmers (98-100%) were not conducting prophylactic control at the timings recommended for each crop. They applied rodenticides only during maturity stages of crops when rodents exhibit frequent visible movements under dense vegetation cover and inflict extensive damage. Most of the farmers do not collect left over poison bait and dead rats from their fields. 63-80% farmers perform rodent control operation in adjacent wastelands.

Impact of training and education and distribution of rodenticidal inputs to farmers in different villages was also evaluated in terms of rodent control success achieved in different types of villages. Rodent control success was assessed through census baiting by recording pre and post treatment intake of WSO bait (wheat: sugar: oil, 96:2:2) in 7 hectare area of maintenance and neglected villages. Live burrow counts, per cent tiller damage and yield loss (kg/ha) after application of rodenticide baits was also recorded. Results revealed significant reduction in census bait consumption from 63.1 to 14.1 % in maintenance and from 38.8 to 28.1 % in neglected villages. Percent cut tillers and yield loss (Kg/ha) decreased significantly in maintenance and neglected villages as compared to the survey village (Table 1). The results therefore revealed that education and training of farmers along with the supply of poison bait are the key factors responsible for success of a rodent control programme.

Table 1. Rodent damage in wheat crop before treatment and at pre-harvest stage

Village	Percent Consumption of WSO		After treatment			
	Before treatment	After treatment	Burrow count		Cut tillers (%)	Yield loss (Kg/ha)
			B. bengalensis	*Mus* Spp.		
Maintenance	63.1±8.2	14.1±1.2*	5.1±1.0*	0.7±0.4*	0.18±0.1*	11.7±4.9*
Neglected	38.8±6.1	28.1±1.9*	10.1±0.8*	4.9±0.6	0.20±0.1*	13.7±5.0*
Survey	-	33.1± 3.1	13.7±0.9	4.7±0.8	0.62±0.1	22.5±3.4

*Significant difference at 5% level of significance in a row between before and after treatment and in a column with survey village after treatment.

Persistance of Ready-to-use zinc Phosphide baits vis-vis Rodent Control success in Rice

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It is an established fact that zinc phosphide baiting is one of the normal practices by farming community for managing rodent pests in India and other countries. Efforts are in progress to increase the palatability of zinc phosphide mixed baits for achieving improved rodent control success. One of such methods is using ready to use zinc phosphide compact baits. They are prepared by mixing broken rice and wheat flour in 48 parts each with vegetable oil as binding media and then mixing the zinc phosphide (80% TG) at 2.5 per cent. After making the mixture as dough with the addition of water, the baits are made into pieces/cakes, each of 10 g. Usage of these zinc phosphide compact baits is one of the practices in a number of countries. Although there may be increase in palatability of these ready to use baits, persistence of zinc phosphide in these cakes over a period of time is the major constraint. Ready to use baits have several advantages which include easy distribution of the poison or pre baits and transportation on large scale for anti rodent campaigns.

A 30-day study was undertaken for testing the persistence of zinc phosphide in these compact poison baits and also their efficacy against burrow dwelling rodents in rice fields of Bandlaguda village under Rajendranagar Mandal of Ranga Reddy district, Andhra Pradesh. Zinc phosphide ready to use bait with 2.5% TG was prepared and made in to 10 g small cakes for treating the active burrows of Lesser bandicoot rat, *Bandicota bengalensis*. These cakes were applied in the active rodent burrows on 1st, 5th, 10th, 15th, 20th, 25th and 30 days after the preparation. 50 active rodent burrows were treated in each treatment. The poison treatments were always given after 3 days pre baiting with the compact plain baits to avoid neophobia by the lesser bandicoots. After a lag period of 7 days, the control success was calculated by comparing the active rodent burrows before and after the treatments. 5 samples of left over cakes in the burrows were collected on second day of each treatment and subjected to zinc phosphide content analysis by following IS: 1251 – 1988 method of Specification issued by the Bureau of Indian Standards.

Table 1. Persitence of zinc phosphide ready to use baits vis a vis rodent control success

Day of Treatment after bait preparation	Rodent Control Success (%)	Zinc phosphide (%) at bait preparation	Estimated Zinc Phosphide (%) in left over baits	Reduction in zinc phosphide content (%) in the baits
1	76 ± 5.45	2.5	1.41 ± 0.24	43.99
5	59 ± 5.79	2.5	1.39 ± 0.34	43.60
10	56 ± 4.34	2.5	1.23 ± 0.21	51.00
15	57 ± 6.23	2.5	1.03 ± 0.14	59.00
20	39 ± 13.24	2.5	1.19 ± 0.31	52.00
25	40 ± 5.12	2.5	0.86 ± 0.21	66.00
30	38 ± 3.4	2.5	0.99 ± 0. 11	60.00

The analysis of the results indicated that the zinc phosphide degradation in the ready to use compact cakes is more after first day of treatment (2.5% at the time of application to 1.41%), when tested on third day. The rodent control success was considerably high (57%) even after 15 days after preparation of these baits (Table 1) retaining the technical content at 1.03%. These results clearly demonstrate that the zinc phosphide degradation in the compact baits was drastic initially (44%) and later reached 60 per cent by 30 days. The poor rodent control success after 15 days might be due to poor bait intake on development of rancidity in these compact baits. Hence it can be assumed that once the zinc phosphide compact baits are prepared afresh, they can be used up to 15 days to treat the burrows of lesser bandicoots.

NOTES AND NEWS

Fakhruddin Ali Ahmed Award for Outstanding Research in Tribal Farming System 2010: Dr Ajanta Birah, Senior Scientist and Principal Investigator AINP on Rodent Control at Central Agriculture Research Institute (CARI) Port Blair shared the coveted Fakhruddin Ali Ahmed Award for outstanding Research in Tribal Farming System (2010) along with her two colleagues viz., Dr. Krishna Kumar and Dr. P. K. Singh for their outstanding research work entitled *"Exploration, conservation and exploitation of bio-resources for sustainable productivity and livelihood security of tribal population in Andaman and Nicobar Islands"*. The Award was given in a Ceremony held at New Delhi on ICAR Foundation Day, 16th July 2011. Shri Sharad Pawar, Union Minister of Agriculture and Shri Harish Rawat, Union Minister of State for Agriculture, complimented all the ICAR awardees for their noteworthy contributions. The contributions of Dr Mrs Ajanta Birah on rodent research were an integral part of the work. It was reported that rodents cause immense losses to coconut and other crops and commodities in Island agro-ecosystem. Besides, the Bay Islands are endemic for leptospirosis, primarily a rodent borne disease. Thus the primary aim is to reduce damage to crops, commodities and the human disease incidence, through effective management rather than to kill these animals. Information on status rodent pest species and their damage in major crops of Bay Islands and records of three new rodent species from Andaman were well documented for the award.

National Training on Rodent Pest Management at Thrissur (Kerala): To develop adequate technical manpower in the field of rodent pest management at all levels, Government of India has initiated a National Plan on Rodent Pest Management at National Institute of Plant Health Management (NIPHM), Hyderabad. Under the aegis of this Plan a National Training on Rodent Pest Management sponsored by NIPHM was organized at Kerala Agricultural University (KAU), Mannuthy, Thrissur from September 13-19, 2011. Dr Jim Thomas, Professor &Head, Communication Centre, KAU, Mannuthy was the Course Director and Dr. S. Helen, Associate Professor, KAU, Mannuthy and Dr. Berin Pathrose, Assistant Professor, KVK Malappuram acted as Co course Coordinators.

The 7 days training was attended by 11 scientists (three from Tamil Nadu Agricultural University and eight from Kerala Agricultural University) and 14 Agricultural Officers from various districts of Kerala. The Course

was inaugurated by Dr K.R. Vishwambharan, Vice Chancellor of Kerala Agricultural University, Thrissur. Dr. R.S. Tripathi, Project Coordinator, AINP on Rodent Control, Central Arid Zone Research Institute, Jodhpur, Rajsthan conducted sessions on economic loss caused by rodents, the methods to assess the rodent damage and the identifying characters of various rodent spp. etc. Sessions on ecology and behaviour of rodents was conducted by Dr. N Sreenivasa Rao, Assistant Director, NIPHM, Hyderabad. Hands on training on the preparation of community rodent maps and rodent seasonal calendars were given to the trainees by Dr. K. Samiayyan, Professor, Tamil Nadu Agricultural University, Coimbatore.

Various topics on rodent diversity, rodent pests of Kerala, scope of biological control of rodents, traps and trapping techniques, rodent pest management in storage, rodenticides, planning process in rodent Managemant, role of rodents in public health and reproductive potential of rodents were handled by Dr. P.O. Nameer, College of Forestry, KAU, Dr. B. Ramesha, College of Agriculture, Padannakkad, Dr. Mani Chellappan, College of Horticulture, KAU, Dr. A.M. Ranjith, College of Horticulture, KAU, Sri. Sunny Mathew, AGM, Pest Control India Ltd., Dr. Jim Thomas, Communication Center, KAU, Dr. Sunil Kumar, KVASU and Dr. Berin Pathrose, KVK Malappuram, respectively.

Field sessions on estimation of rodent population through live burrow counting were undertaken in rice fields. Practical sessions on identification of rodent species, pre-baiting, bait stations and bait preparation with rodenticides like zinc phosphide and bromadiolone was also carried out. The training helped the scientists of SAUs to sharpen their skills on rodent pest management. The Agricultural Officers were equipped effectively to organize and conduct rodent management campaigns in their respective panchayaths and also to become master trainers.

Best Paper on Rodents: The research paper entitled "Status of rodent damage in coconut plantations of Bay Islands" authored by Dr Ajanta Birah (CARI, Port Blair) and Dr R. S. Tripathi (CAZRI, Jodhpur) was awarded the Best Poster award during the *"International conference on Tropical Island Ecosystems: Issues related to livelihood, sustainable development and climate change"* organized by Central Agricultural Research Institute (CARI), Port Blair on March 23-26, 2011 at Port Blair. The award was presented to Dr. Ajanta Birah by Chief Secretary, Andaman and Nicobar Islands in the valedictory session of the International Conference.

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Training and demonstration of Rodent Past Management technologies

Field demonstrations on poison bait preparation and application at farmers' field

Contributions for inclusion in the Newsletter may please be forwarded alongwith 1 - 2 good black and white / colour photographs to :

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Central Arid Zone Research Institute,
Jodhpur - 342 003, India

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