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Note on distribution of rodent damage in Tella Hamsa rice around Hyderabad

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While conducting trial on survey methodology and rodent management in rice fields, observations were taken on the distribution of rodent damage with space and age of the crop. Diagonal transect method was employed for damage assessment and data are presented (Table 1). Observations in 25 rice fields showed that the rodent damage will be restricted to 5 m away from the bund (Mean=2.78 ± 1.51 m) making patches at the centre of the field at a diameter of 1.66 ± 1.25 m (range=1.0 to 3.5 m). Tella Hamsa is a crop of 130 days duration flowering around 70 days after transplantation. Fresh damage at different time intervals suggested maximum damage at 8-10 weeks after transplantation corresponding to booting stage, when sweet mucilage will be available. Damage at panicle maturing stage was found to be less. These results suggest the period for undertaking rodent control measures depending on the distribution of damage with age of the crop. Further studies with other varieties are in progress.

Table 1 : Rodent damage in Tella Hamsa rice at different growth periods of the crop (n=25 each)

Stage of the crop	Age duration (weeks after transplantation)	Damage (%)	
		Range	Mean±S.D.
Establishment and tiller initiation	1 to 4	Nil	Nil
Active tillering	4 to 8	4.5—12.00	9.27±2.77
Booting and flowering	8 to 10	10.9—17.70	15.48±3.92
Ripening and maturity	10 till harvest	10.0—14.80	12.38±1.74

Evaluation of Brodifacoum (WBA 8119) against the northern Palm Squirrel, *Funambulus pennanti*

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Brodifacoum at 0.002 per cent concentration was evaluated for the control of *F. pennanti*. Prior to poison exposure the squirrels were acclimatized to laboratory conditions for 3 weeks. Brodifacoum was mixed in pearl millet *(Pennisetum typhoides)* and exposed to squirrels for 1, 2, 4 and 6 days in no choice tests. The results revealed that the average daily consumption of poison bait was maximum on 1 and 2 days. whereas the consumption declined when the poison bait was offered for 4 and 6 days. In 6 day exposure test the acceptability of brodifacoum treated bait was fairly good up to third day. However, on fourth day onward, the acceptability of bait was reduced significantly ($P<0.001$) in comparison to that on the first day. A complete kill among the squirrels was obtained after 6th days exposure (Table 1). The mortality started on 6th day and lasted upto 10 days. It was interesting to note that the average day to death reduced with increasing the length of feeding period.

Table 1 : Efficacy of 0.002% brodifacoum against *F. pennanti*

Feeding period (days)	Av. daily poison bait intake (g/100 g. body wt. Mean ± S.E.)	Av. LD (mg/kg) ingested	Mortality (%)	Av. days to death
1	5.77 ± 1.05	1.15	50	10.4
2	5.45 ± 0.39	1.89	60	8.3
4	4.74 ± 0.22	3.17	80	7.7
6	3.69 ± 0.17	4.50	100	7.6

Rodent pests in poultry farms of Jodhpur

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The species composition of rodents inhabiting poultry farms - away from human habitat and close to human habitat - has been examined. Wonder and Sherman traps were placed in birds' sheds, poultry feed and egg stores. In the poultry farms - away from human habitat, the gerbil, *Tatera indica* was found to be the predominant species. However, black rat, *Rattus rattus* was also trapped from this habitat but the sample was small in comparison to *Tatera* (Table 1). Poultry farms which were close to human habitat were predominated by *Rattus rattus*. Moreover, house mouse, *Mus musculus* was also captured in small number (Table 1).

Damage by rodents to chicks, poultry feed and eggs was assessed. Damage was more in poultry feed. It was found that *Tatera indica* broke only the cracked egg, uncracked eggs were not found broken in farms infested by *Tatera*. However, in farms infested by *Rattus rattus* uncraked as well as cracked eggs were seen damaged.

In some poultry farms of both habitat, it was told by owners that in addition to rats, shrew, *Suncus murinus* is also damaging the eggs. It breaks the egg and ingests whole of its contents.

Cases of rat bite to chicks were narrated by farm owners, but the number of cases were not many.

Table 1: Average number of rodents trapped per night from poultry farms

	Number of species trapped		
	Tatera indica	*Rattus rattus*	*Mus musculus*
Poultry farms away from human habitats	34	2	Nil
Poultry farms close to human habitats	Nil	23	3

Efficacy of various rodenticides against field rats

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Rodent control campaign was undertaken on cultivators' field at village Loni, Dist. Pune (Maharashtra) during 1977, by using commonly

available rodenticides with an object to evaluate their performance. In two hectares of wheat crop four blocks of 0.2 to 0.8 ha were made according to the available bunds in field to have separation from one another.

Four treatments were tried in the campaign. The details of treatments, proportion of poison and bait material used in the campaign is given as below :

1. Zinc phosphide 1 part : broken grains of wheat and jowar 48.750 parts: sweet oil 0.250 parts.
2. Application of zinc phosphide prepared as above followed by application of aluminium phosphide tablets on next day only in open burrows.
3. Aluminium phosphide (celphos 3 g), ½ tablet in each burrow.
4. Warfarin (Rodafarin 'C') 1 part : broken grains 18.750 part : sweet oil 0.250 parts.

Poison baits were prepared by thorough mixing of above ingredients and rapped in paper packets for application in burrows.

During campaign, field was surveyed for rat burrows which were closed to know the live burrows, indicating the presence of rats. On second and third day opened burrows were taken into consideration for prebating (application of bait material rapped in paper packets, in blocks selected for zinc phosphide). On fourth day poison baits were applied in each burrow blockwise and number of treated burrows were counted and closed with mud. On fifth day opening of treated burrows were observed and in block reserved for zinc phosphide + aluminium phosphide, open burrows were again treated with aluminium phosphide. On sixth day onward, number of burrows opened in each block were counted upto 12th day. On the basis of total number of burrows treated and number of burrows opened in each block percentage of rodent control was calculated (Table 1).

Table 1 : Efficay of various rodenticides against field rats

Sr. No.	Treatments	Area of the block (ha)	No. of burrows treated	No. of burrows opened	Rodent control %
1.	Zinc phosphide	0.8	28	5	82.2
2.	Zinc phosphide + aluminium phosphide	0.6	122	0	100.0
3.	Aluminium phosphide	0.2	30	0	100.0
4.	Warfarin	0.4	52	3	94.2

It is observed from the Table that zinc phosphide + aluminium phosphide and aluminium phosphide alone gave 100% kill of the field rats. In case of block treated with warfarin and zinc phosphide alone, control of rats was 94.2 and 82.2%, respectively.

Controlling the Indian mole rat *Bandicota, bengalensis* through poison baiting in artificial burrows

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Placing of poison bait in the rat burrows like 'Indian mole rat' *Bandicota bengalensis* is difficult since they cover the openings of burrows with soil heap. In order to facilitate poison baiting for controlling the above rats some artificial inclined burrows with a depth of 20-25 cm were made by the help of soil auger of about 5 cm. diameter near the rat burrow. The bait kept in paper cones were placed inside the artificial burrows. Next day the observations were recorded which indicated that mostly (more than 60 %)the baits in the artificial burrows were eaten and such burrows were covered with fresh soil heap made by the rats and also interlinked with the main burrow within one day of baiting.

Thus the study reveals that poison baiting for the control of mole rat *Bandicota bengalensis* can be facilitated by making artificial burrows near the mouth of the rat burrows which are usually not visible due to mounds of soil.

Sufficient number of artificial burrows can be made very easily with the help of soil auger of 5 cm diameter attached with a suitable rod and handle(may be with folding attachment). The efficacy of the above implement is more in moist soil.

Key points for mass breeding lesser Bandicoots in captivity

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As the males created disturbances in the proper feeding and maintenance of litters by the females they are to be immediately saparated from the cages as soon as litters were observed and kept in cages properly labelled so that they can further be utilized for releasing with their respective females. (ii) Rats may either be provided with some grass or paddy husk or cotton during winters and breeding seasons so that they can make their nests for keeping litters on it. (iii) On an average26.35 per cent soil moisture content should be maintained inside animal breeding cages to enable the rats to make smooth and regular burrows and take rest there. (iv) Neither the females should be disturbed while feeding youngones nor youngones should be removed from the cages every now and then as the females become annoyed and kill the youngones. (v) Quantity of food per female rat should be increased during breeding season from 20 g to 30 g of soaked gram as at this time they require more food to nourish the foetus and youngones.

A trial of crown baiting of Coconut palms with Bromadiolone wax cakes in Agatti Island of Lakshadweep

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The main crop in Lakshadweep group of Islands is Coconut and *Rattus rattus* cause a great deal of damage to tender nuts in these Islands. A field trial was conducted with 0.005% bromadiolone embedded in a mixture of cereals and paraffin wax. This field trial was conducted from 7-7-82 to 23-7-82 in a site called Punniyakeel Thekku, a notorious rat pocket in Agatti Island where attack was severe. 25 palms from a contiguous area were undertaken for poison baiting purpose. Before starting the trial, all the trees were numbered and all the rat damaged fallen nuts at the base of the palms were removed from the site so as to collect the fresh rat damaged nuts.

The bromadiolone wax cakes were placed at the base of the panicle containing tender nuts or in panicles where rat damage was noticed. In almost all the cases it was found that the bait was eaten by rats either fully or in parts. Wherever the bait consumption was full on the first day, the bait was replenished on the second day. Further, no bait replenishment was made. Every day upto the tenth day, observations were made for fallen nuts, nuts damaged in the panicle on the crown, bait consumption and for the dead rats.

No fresh damage to nuts was seen in general after commencing the poison baiting programme. Invariably, the bait was fully consumed by the fourth day. On the second day of poison baiting one dead rat was found on the crown and the second dead rat was found on the fourth day. Altogether, 8 dead rats were collected of which 6 were found on the ground. Subsequently, a lot of rats died as smell was coming from the crown but the climbers were reluctant to pick up those carcass.

On the first day of poison baiting the rats consumed bait only on 8 palms, second day on 17 palms, third day on 24 palms (maximum), subsequently on the fourth day bits of cakes were remaining only on 5 palms. Finally, on the sixth day there were no signs of left over cakes in any of the 25 palms and the bait consumption was complete.

After commencement of the poison baiting with bromadiolone wax cake, upto fourth day out of 25 palms only 6 nuts were found to be damaged subsequently from 5th day when all the cakes were consumed by the rats, till the 10th day of observation no fresh damage to nuts were observed both on the crown and at the base of the palms. It has been noticed that bromadiolone wax cakes are effective in controlling *Rattus rattus* on the crown of coconut palms.

Effect of intra-and inter-specific odours on the food consumption of *Rattus meltada*

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It has been recorded that intra- and inter-specific odours have marked effect on food comsumption of *Rattus meltada*. To test whether the odours of conspecifics and other rodent species affect the food intake,

ten male and ten female *R. meltada* were lodged in cages and their daily intake was recorded for 10 days by feeding them plain wheat grains. Thereafter, they were provided with the food carrying urine odours of conspecific, *Tatera indica*, *Mus* sp. and *Bandicota bengalensis* separately. Each test was conducted for 10 days and average daily intake was recorded. Water was available *ad libitum*.

The data indicate that wheat grains carrying the odours of conspecifics were consumed significantly more ($P<0.01$) both by male and female *R. meltada*. The average daily intake of these metads was also significantly more ($P<0.01$) when food carrying urine odours of either male and female *T. indica* or male and female *Mus* sp. was provided (Table 1). On the other hand, presence of urine odours of male or female *B. bengalensis* in the food had an adverse effect on the average daily intake of both the sexes of *R. meltada*.

Table 1 : Average daily intake of 'scented' and plain wheat by *Rattus meltada*.

Treatment	Food consumption, g/100 g body weight	
	Male	Female
	Mean ± S.E.	
Plain wheat	5.6 ± 0.30	4.2 ± 0.25
Scented wheat with conspecific odours	7.4 ± 0.23**	5.9 ± 0.28**
Scented wheat with male *T. indica* odours	7.12 ± 0.41**	6.0 ± 0.17**
Scented wheat with female *T. indica* odours	6.98 ± 0.35**	5.84 ± 0.39**
Scented wheat with male *Mus* sp. odours	6.90 ± 0.24**	6.24 ± 0.31**
Scented wheat with female *Mus* sp. odours	7.07 ± 0.32**	5.99 ± 0.25**
Scented wheat with male *B. bengalensis* odours	4 5 ± 0.28*	3.13 ± 0.18**
Scented wheat with female *B. bengalensis* odours	4.43 ± 0.57 NS	3.28 ± 0.27*

* Significant difference (Students' 't' $P<0.05$).
** " " (" " , $P<0.01$).
NS Not-significant.

Notes and News

Apex level training for rodent pest management at CAZRI, Jodhpur. 15-17 June 1983

The 8th Trainer's Training Programme under the National Programme for Rodent Pest Management was organised at the Central Arid Zone Research Institute, Jodhpur, from 15th to 17th June 1983. 16 participants from Govt. departments, Universities and voluntary organisations in Rajasthan, Punjab, Haryana and Delhi attended the training course which had a special relevance to the New 20 Point Programme. The latest technologies which have been standardised at CAZRI and elsewhere for controlling rodent population in forests, crop fields, threshing floors, godowns and residential premises were discussed at the training course. It was emphasised that in order to achieve maximum success a) large scale rodent control operations should be taken up before sowing the *Kharif* as well as *Rabi* crops, b) mass rodent control campaigns should be organised in the months of May and June since at this time the rodent population is low, their breeding rate is slow, competition for baits is minimum and the farmers and labours are free to undertake rodent control operations. Training was imparted on important ecological and behavioural aspects useful in rodent pest management, e. g., bait-shyness and its mitigation, common rodenticides, their mode of action, precautions, antidotes, etc. A group discussion was held on the actual practical difficulties faced by the participants during rodent control operations and in mass motivation of farmers to adopt rodent control strategies at the appropriate time. The training course also included practical training on rodent control in farmers' fields in the Operational Research Project areas of CAZRI around the Daijar-Manaklao region.

Degrees Awarded

Shri S. Keshava Bhat, Senior Technical Assistant, Central Plantation Crops Research Institute, Kayangulam (Kerala), has been awarded the Ph.D. degree by the University of Calicut for his thesis entitled "Studies on certain species of squirrels affecting cacao and other plantation crops in South India."

Miss Saroj Kumari, Research Associate at Central Arid Zone Research Institute, Jodhpur, has been awarded the Ph.D. degree by the Agra University, Agra, for her thesis entitled "The structure and functional significance of the ventral scent marking gland in three rodent species (*M. hurrianae*, *T. indica* and *R. meltada*)".

The next issue will appear in Nov. 1983. Contributions for inclusion in the Newsletter may please be forwarded to :

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