ISSN 0972 - 2939

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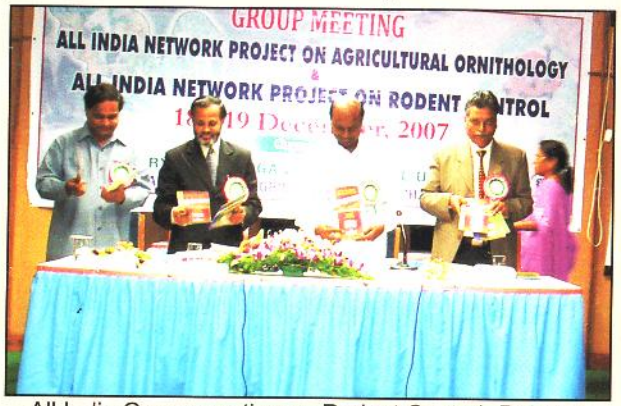
ICAR

# RODENT
## Newsletter

Vol. : 31 (1-4) 2007

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


Dr T.P.Rajendran, ADG (Plant Protection) ICAR addressing the delegates during All India Group Meeting of AINP on Rodent Control at Hyderabad




All India Group meeting on Rodent Control- Release of Publications

Dr T.P. Rajendran, ADG (Plant Protection) ICAR at the Exhibition on Rodent Management

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# RODENT Newsletter

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**AINP on Rodent Control**

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

# Recent Trends in Coordinated Research on Rodent Control

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Rodent pest diversity in rice-rice-pulses cropping system in coastal Andhra Pradesh was least with only two species viz., *Bandicota bengalensis* (> 80%) and *Mus booduga*; whereas in lower Brahmaputra zone in Assam four species viz., *B. bengalensis* (49%), *R. nitidus* (27%), *R. sikkimensis* (17%) and *M. booduga* (7%) with almost equal sex ratio were encountered in crop fields. In Eastern and Northeastern transition zone of Karnataka, the species diversity comprised of *B. bengalensis, Millardia meltada, M. booduga* and *Tatera indica* in rice-ragi-soybean, sugarcane fields in varying proportions with predominance of lesser bandicoots. Similarly different agro-ecological regions of Punjab harbored 7 species (3 rats, one gerbil and 3 mouse species) viz., *B. bengalensis, T. indica, Mus musculus, Golunda ellioti, M. meltada, M. booduga* and *M. platythrix* were reported. In the arid region of Rajasthan two species, *T. indica* and *Meriones hurrianae* were the major pests, however, *Nesokia indica, M. meltada and G. elliotii* were also reported in irrigated areas.

Studies on pestilence of rodents in stores and godowns in NEH region (Assam) revealed occurrence of five species viz., *R. rattus* (32%), *B. bengalensis* (29%), *M. musculus* (21%), *R. sikkimensis* (4.5%) and *R. norvegicus* (12.8%) in urban areas and four species viz., *R. rattus* (41%), *B. bengalensis* (25%), *M. musculus* (25%) and *R. sikkimensis* (9%) from rural storage system. Incidence of *B. bengalensis* (a newly introduced rodent in arid zone) was reported from urban grain stores. The species has shown its presence in WRC fields in some states of NEH region. Similarly commensalization of a field rodent, *T. indica* was seen in grain mandis situated in the outskirts of Jodhpur town.

Rodents collected from the bamboo flowering areas were for the first time identified as *Niviventer niviventer, N. fluvescens, Rattus nitidus* and *R. sikkimensis*. All these are forest dwellers and of non-burrowing type. The status of flowering in various species of bamboo in different NE States during the year indicated that in most of the states, flowering was mainly sporadic in nature, whereas Mizoram state experienced gregarious flowering in two species, i.e., *Melocanna baccifera* and *Dendrocalamus hamiltoni*. The flowering first started in Mamit district in western part of Mizoram during 2005 covering an area of 500 ha. By the year 2006, the gregarious flowering of the species extended to cover about ¼ th of the bamboo growing areas in the State. In the bamboo flowering regions *D. hamiltoni* also showed gregarious flowering simultaneously. Survey in jhum and WRC areas revealed 11.61 and 12.83% rodent damage to rice tillers respectively near bamboo flowering areas of the State. Rice and maize grown under jhums in Arunachal Pradesh recorded 20-30% damage due to migratory forest dwelling rodents.

Rodent pests continued to exert serious biotic stress in various cropping systems in other parts of the country as well and took a heavy toll of the standing crops in last two years. In Andhra Pradesh the tiller damage to kharif rice ranged from 12-32% and up to 40% to rabi rice. As far as threshold damage levels in rice are concerned, tiller damage up to 6% (in kharif) and 4% in rabi rice showed significant reduction in yields in A.P. Similarly, Assam, a predominantly rice producing state also registered a tiller damage of 11.0% and 14 % in Sali and Boro rice, respectively. In Karnataka the crop registered 4.0-6.0 % damage from nursery to harvest stages. Sugarcane crop suffered up to 29.0, 62.3 and 10.7% damage (mainly by *B. bengalensis*) in Punjab, Andhra Pradesh and Assam, respectively. Groundnut and cumin also recorded 10-12 % damage. In NEH region, wheat, potato, cucurbits, pea, carrot, tomato, brinjal and squash recorded 3-10% damage by rodents in Assam. Pineapple suffered maximum with 13.2% fruit damage in lower Brahmputra region. In Assam, mulching is a common agronomic practice to conserve moisture and enhance organic manuring, however the mulched fields proved highly conducive for rodent inhabitation. Maximum rodent abundance (3.7 burrows/20m$^2$) and damage (28.7%) was recorded in water hycinth mulched potato. It was an interesting observation that rice straw, when left within the fields in which wheat was to be sown with zero tillage (Happy seeder) provided abundant food and shelter to rodents leading to high rodent population buildup and damage in wheat crop.

Anti rodent properties of some botanicals like neem leaf powder, neem kernel powder, neem oil, castor oil Jatropha seed coat, leaf powders of *Vitex nigundi* and *Polygonum* and root powder of *Calotropis procera* were evaluated in laboratory. Sprinkling of neem leaf powder (0.5%) on the gunny bags along with provision of alternate food under simulated storage conditions provided total protection to treated bags up to 9 days.

Spraying of 5.0 and 10.0% methyl anthralinate over grain filled gunny bags under simulated storage conditions showed good repellency potential against house rats, which lasted for five weeks.

Feeding on 2,4 and 6% root powder of *C. procera* in bait caused dose dependent decrease in weight of reproductive organs and sperm function characteristics in *Rattus rattus*. In case of *B. bengalensis*, administration of 0.01 and 0.02% gossypol for 16 days to males resulted in sterility effects in terms of decreased sperm motility, vitality and sperm concentration vis-à-vis reduced weight of reproductive organs and accessory glands.

Among the chemicals, administration of epichlorohydrin @ 100 mg/kg body wt to male *B. bengalensis* significantly reduced pre-copulatory reproductive patterns. Consumption of 1, 2 and 2.5% ethylene chloride treated bait by male *R. rattus* in no choice enhanced with increase in its concentration and resulted in decreased motility and concentration of sperms.

Cholecalciferol, a vitamin $D_3$ based compound showed a promising potential as a rodenticide with an $LD_{50}$ value of 30 and 50 mg/kg body weight for male and female house rats, respectively. The compound administered orally @ 20, 30, 40, 50 and 100mg/kg body wt caused 100% mortality in *R. rattus* within 2-5 days showing its efficiency as a potent rodenticidal molecule even at a lower dose. Besides, it is safer to non-target species and may be used under commensal situations.

To avoid deterioration of baits in moist weather, a new formulation of zinc phosphide with 5 and 10% liquid paraffin as a coating over the 2% zinc phosphide bait was attempted. The formulation with 10% liquid paraffin both when freshly prepared and exposed to moist weather conditions recorded higher acceptance than that of freshly prepared and similarly exposed to 2% zinc phosphide bait alone. Bait stations made of coconut husk were found effective @ 5 stations per ha for placement of anticoagulant baits in rice crop in Andhra Pradesh.

Treatment of sugarcane crop fields with bromadiolone (0.005%) @ 800g, 1600g and 3200g/acre during February yielded a rodent control success of 58, 67 and 70%, respectively. The treatment in sugarcane fields also saved a rodent damage of 2.56% in the surrounding wheat crop fields at pre-harvest stage. One interesting observation is that rodent problem attains three times higher infestation between tillering and dough stage. Therefore panical initiation stage was found to be the critical stage for undertaking rodenticidal baitings. In case of groundnut, double poison baiting with zinc phosphide followed by bromadiolone (0.005%) during 1st week of August and consequently in second week of September was most effective yielding 89-91.7% control success with net profit of Rs 2461.50 per ha. Similarly in cumin, two baitings with anticoagulants viz., bromadiolone (0.005%) and difethialone (0.0025%), one at vegetative growth stage and other at flowering stage yielded 81.9 and 83.4% rodent control success. The cost benefit ratio with bromadiolone (0.005%) was 1:10. 8.

Under farmer's participatory adaptive research, regular awareness programmes about rodent pest management were carried out by all the AINP Centers in adopted villages. Training on rodent management technologies was imparted to the farmers along with practical demonstration on bait preparation and placement in the crop fields during crop and lean period and also in commensal premises. Many on and off campus trainings and rodent control campaigns were organized by the Project centers. Over all control success at farmers fields was >60%. Impact analysis revealed 70-100% adoption of recommended rodent management practices.

## Occurrence of sterility in natural populations of lesser bandicoot rat, *Bandicota bengalensis*

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The lesser bandicoot rats, *Bandicota bengalensis* were trapped live from different crop fields around Ludhiana and Ladhowal Seed Farm throughout the year from July 2004 to June 2005. On the day of trapping, mature and healthy male rats were anaesthetized and dissected in the laboratory. The testes, epididymis, vas deferens, seminal vesicles and prostrate glands were removed and weighed. Reproductive organs of right side were fixed in aqueous Bouin's fluid and processed for histomorphological studies. Left cauda epididymis was incised and dipped in 0.5 ml saline solution and cauda epididymal fluid was processed for study of sperm motility, concentration, vitality and abnormalities.

During the study period a total of 26 males were dissected, out of which two animals were sterile with body weights of 145 and 200 g as sperms were absent in the cauda epididymal fluid of these bandicoots. The weights of reproductive organs and accessory sex glands were also less as compared to the normal fertile male rats of comparable body weight

and captured during the same season (Table 1). The different cell types in the testes and cauda epididymis were disorganized and round spermatids were absent from the seminiferous tubules of the sterile rats. The degenerating cells were also present in the tubules and the Leydig's cells were present in intertubular space appeared to be non-secretory as their size was reduced to a greater extent in sterile rats than in the normal fertile rats. In sterile rats, the cauda epididymal epithelium was also indistinct and lumen was filled with cells instead of spermatozoa. These observations show that sterile rats exist in natural populations also in association with normal fertile rats.

**Table 1. Variations in the weights of reproductive organs and accessory sex glands (Mean ± SD) of sterile and fertile *B. bengalensis* in natural populations**

| | Body weight (g) (Range) | Testicular weight (g/100g b wt.) | Epididymal weight (g/100g b. wt.) | Vas deferens weight (g/100g b. wt.) | Paired seminal vesicle weight (g/100g b wt.) | Prostrate gland weight (g/100g b.wt.) |
|---|---|---|---|---|---|---|
| Sterile 1 | 145.0 | 0.138 | 0.006 | 0.006 | 0.006 | - |
| Fertile | 150.0±10.0 (140-160) | 0.305±0.02 | 0.081±0.038 | 0.011±0.01 | 0.309±0.03 | 0.063±0.001 |
| Sterile 2 | 200.0 | 0.134 | 0.065 | 0.020 | 0.125 | 0.001 |
| Fertile | 205.0±5.0 (200-205) | 0.477±0.07 | 0.116±0.02 | 0.017±0.01 | 0.490±0.07 | 0.072±0.005 |

# Rodent Pests of Predominant Cropping System in Brahmaputra Valley, Assam

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Survey of pest rodents was carried out in three locations viz., Tokowbari and Raidongia villages and Regional Agricultural Research Station Farm, Assam Agricultural University, Shillongani, to monitor the rodent abundance and damage in Central Brahmaputra Valley Zone of Assam. This zone of Assam covers the entire district of Nagaon with an annual rainfall range of 1200-2000 mm. Soils are mainly immature Entisols and mature Alfisols. Rice is the major crop, besides oilseeds are also grown extensively. Other important crops are jute, pulses, wheat and vegetables.

Observations on predominant rodent pests infesting crop fields and rural granaries revealed that species composition in rice field consisted of four rodent species viz. Lesser bandicoot rat, *Bandicota bengalensis* (58.82%), Sikkim rat, *Rattus sikkimensis* (29.41%) and Indian Field mouse, *Mus booduga* (11.76%). In farmer's granary, four rodent species viz. *B. bengalensis* (39.00%), house rat, *Rattus rattus* (28.57%), Sikkim rat, *R. sikkimensis* (9.52%) and house mouse, *Mus musculus* (23.81%) were recorded (Table 1).

**Table 1. Rodent abundance in Central Brahmaputra Valley Zone, Assam**

| Sl. No. | Name of species | Relative abundance | |
|---|---|---|---|
| | | Rice field | Granaries |
| 1. | *Bandicota bengalensis* | 58.82 | 39.00 |
| 2. | *Rattus rattus* | - | 28.57 |
| 3. | *R. sikkimensis* | 29.41 | 9.52 |
| 4. | *Mus musculus* | - | 23.81 |
| 5. | *M. booduga* | 11.76 | - |

In Hojai subdivision of Nagaon District, Assam sporadic flowering in five species of bamboo viz., *Bambusa tulda. B. pallida, B. nutans, B. balcooa* and *Dendrocalamus hamiltonii* was observed during the year . Live trapping in rice-rice cropping system near bamboo flowering areas indicated a rodent trap index (No. trap$^{-1}$ day$^{-1}$) ranging from 0.195±0.048 in village Modertuli to 0.583±0.072 Dighal Jarani village . Crop damage (% cut tillers) ranged from 5.33±1.21 to 9.33±2.31 percent at ripening stage of rice crop. The highest live burrow density of 12.67±1.53 /ha was recorded at Dighal Jarani followed by Parakhowa (10.67±1.33) and the lowest (8.00±2.00) at Modertuli (Table 2). Thus there was low incidence of rodents in rice crop even during the sporadic bamboo flowering periods in Nagaon, Assam.

**Table 2. Rodent infestation and damage to Sali rice in Hojai subdivision**

| Name of the village | Live burrows/ha | Trap index | Cut tillers (%) |
|---|---|---|---|
| Bhogiram gaon | 11.00±1.00 | 0.500±0.072 | 6.00±1.00 |
| Tapatjuri | 8.00±1.00 | 0.389±0.048 | 6.67±0.67 |
| Parakhowa | 10.67±1.33 | 0.417±0.084 | 8.00±1.33 |
| Modertoli | 8.00±2.00 | 0.195±0.048 | 5.33±1.21 |
| Dighal Jarani | 12.67±1.53 | 0.583±0.084 | 9.33±2.31 |

# Response of population of house rat *Rattus rattus* to odor-baited traps

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Trapping is the method that can effectively control rodent population. However, it is time consuming and labour-intensive, and the use of an attractant would be useful to quickly remove rodents. Olfactory signals play a very important role in conveying information in mammals including populations of rodent species on the species, sex, sexual condition and social status of an animal. Scent signals might be conveyed through faeces, urine, saliva and through excretions of special glands. The objective of this study was to assess the ability of male and female odors to improve the trappability of house rat *Rattus rattus*.

This study was carried out in the month of April and May, 2007 in poultry farm of PAU. Five mature male and female house rats *R. rattus* were live trapped and placed individually in laboratory cages. The animals were fed on cracked wheat and water *ad libitum*. Cotton pads were kept in laboratory cages so that urine, faeces, saliva and feeding material of caged rats were in direct contact with the pads for at least 24 hrs. Scented pads were used immediately after removal from the cages. Both male and female scented pads as well as unscented pads were evaluated in poultry farms using wonder traps. The scenting of traps was done by placing piece of scented pads in wonder traps. In control traps, a piece of clean or unscented pad was used. Traps were set in the evening and removed in the following morning. Sex, weight and anogenital distance of captured animals was recorded. Traps were thoroughly washed and sun dried daily.

During the trapping series carried out in the months of April and May, 2007 the performance of scented traps was better than the unscented ones. Number of rats trapped in traps scented with male scents was more as compared to traps scented with female scents and unscented traps. The number of rats trapped in unscented traps was the lowest. Adult males preferred odors from both adult male and female scented traps while adult females preferred odors from adult male scented traps. Similarly immature males preferred odors from both adult male and female scented traps while immature female preferred odor of adult male scented traps (Table 1). Anogenital distance was found to increase with the increase in weight of animal but it was not found to have any association with the responses to same and opposite sex. Odor cues can further be tested to study their role in conspecific recognition and communication, response to odor cues from different age groups, sex and reproductive classes, effect of estrous state upon the female preferences for male odors, response of rat to the odor of predators and to study influence of these cues in improving trappability of house rats.

**Table 1: Trap index (rats trapped/100 traps/day), sex ratio, body weight (g) and anogenital distance of male and female house rats trapped in scented and unscented traps.**

| Traps | Trap Index | Sex Ratio M : F | Body weight of trapped rats (g) | | | | Anogenital distance (cm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mature | | Immature | | Mature | | Immature | |
| | | | M | F | M | F | M | F | M | F |
| Male scented traps | 18.21 | 25:27 | 152.6±10.7 (20) | 137.6±5.6 (13) | 86.0±3.3 (5) | 70.2±8.7 (14) | 3.8±0.2 (20) | 2.2±0.04 (13) | 3.0±0.1 (5) | 1.8±0.1 (14) |
| Female scented traps | 14.64 | 28:13 | 143.1±6.6 (22) | 140.0±3.9 (5) | 79.0±5.9 (6) | 63.3±4.7 (8) | 3.7±0.1 (22) | 2.3±0.12 (5) | 2.7±0.2 (6) | 1.7±0.1 (8) |
| Unscented traps | 4.60 | 7: 6 | 142.5±24.6 (4) | 110.0±2.2 (3) | 80.0±2.3 (3) | 88.3±3.3 (3) | 3.6±0.2 (4) | 2.0±0.03 (3) | 2.5±0.1 (3) | 1.8±0.2 (3) |

# Potential of gossypol as an antifertility agent of *Bandicota bengalensis*

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The lesser bandicoot rat, *Bandicota bengalensis* Gray and Hardwicke is the major rodent pest of agriculture in South East Asia. Improved irrigation and changes in cropping pattern during the last three decades in Punjab (India) has boosted the population of *B. bengalensis* replacing earlier species like *Nesokia indica, Tatera indica* and *Millardia meltada* whose population has declined. The resiliency in the population of *B. bengalensis* can be better managed by fertility control techniques rather than by repeated use of rodenticides. Keeping this in view, the potential of Gossypol, a polyphenolic yellowish pigment present in cotton plants (Genus *Gossypium)* was studied in laboratory as an antifertility agent against *B. bengalensis*.

Pure gossypol ($C_{30}H_{30}O_8$, molecular weight 518.54) was fed to mature and healthy male *B. bengalensis* as bait prepared in WSMO mixture (cracked wheat, powdered sugar, powdered milk, groundnut oil in ratio of 85:5:5:5). Three different dosages of gossypol i.e. 0.05% for 4 days and 0.01 and 0.02% for 16 days each were fed to test rats (n = 3 each) under no-choice test. Untreated rats (n = 6) were fed on plain WSMO without gossypol. After 15 days of termination of treatment, all the treated and untreated rats were evaluated for antifertility effects of gossypol on *B. bengalensis*. Abnormalities in sperm morphology were studied by examining Giemsa stained smears of cauda epididymal fluid under bright field of trinocular microscope at Electron Microscopy and Nanoscience Laboratory, Punjab Agricultural University, Ludhiana, India.

Feeding of WSMO containing 0.05% gossypol for 4 days and 0.01 and 0.02% gossypol for 16 days each in no-choice to male *B. bengalensis* resulted in average daily administration of 34.8±3.75, 5.52±0.24 and 13.43±0.97 mg/kg bw of the active ingredient, respectively. At all the three concentrations of gossypol tested, significant (P=0.05 and 0.01) and non significant reductions in weights of reproductive organs and accessory sex glands along with reductions in sperm motility, live sperm count and sperm concentration from that of untreated rats were observed. Percent abnormality in sperm morphology of treated rats was, however, found significantly increased from that untreated rats at all the doses tested.

Examination of Giemsa stained and unstained smears of cauda epididymal fluid of treated and untreated rats under bright field and phase contrast trinocular microscope revealed abnormalities in sperm morphology in the form of abnormal head shape, swollen head, damaged acrosome, abnormal position of head with respect to mid piece, bending and coiling of flagella, retention of cytoplasmic droplets at various loci along the tail mid piece etc. In addition to these abnormalities, gossypol specific flagellar lesions in the form of gaps with missing axial fibers and sheaths 1-2 were also observed during present studies (Figure 1a & b). No such lesions were found in spermatozoa of untreated rats. This gossypol specific flagellar lesion may be responsible for the observed immobility in spermatozoa of gossypol treated rodents. There is a direct correlation between the sperm tail lesions and infertility in rats. This sperm abnormality is the significant prognostic factor for fertilization and pregnancy. Differentiating flagellar sheaths, particularly the mitochondrial sheath seems to be the primary target of gossypol treatment. Abnormal sperm morphology



reflects a gradually developed lethal effect of gossypol resulting from deterioration of the energy transduction mechanism which may further be due to fall in sperm ATP content.

Present studies; therefore reveal the potential, of gossypol as an antifertility agent of *B. bengalensis*. More studies are, however, required to determine the exact dose and duration of the treatment required for managing field populations of *B. bengalensis*.

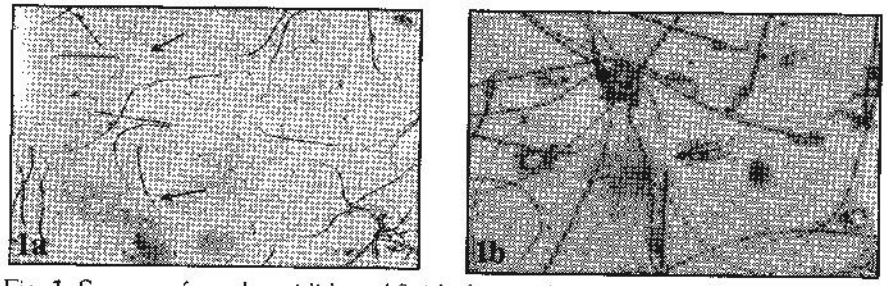


Fig. 1. Smears of cauda epididymal fluid of treated male *B. bengalensis* showing abnormal spermatozoa with missing axial fibres (a) and sheaths (b) (arrows) in the flagellar region at 400X and 1000X, respectively

# Success Story of Rodent Control Campaign on Community Basis in Godavari Delta, Andhra Pradesh

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Social Engineering Activity on Rodent Control under participatory adoptive programme was organized in collaboration with Scientists of Prof. N. G. Ranga Krishi Vigyan Kendra, Vinayashram, at Buddam, Pitlavanipalem and Khazipalem villages in Guntur District of Andhra Pradesh. A mass rodent control campaign on community basis was carried out during the lean period i.e. before *Kharif* 2006 paddy transplantations, which was sponsored by Byrraju Foundation, Buddam.

The campaign was carried out in an area of 400 ha in Buddam and 4,000 ha in Pitlavanipalem and Khazipalem villages. To start with training on *Rodent Pest Management* was imparted to the farmers in their respec-

tive village to provide basic knowledge on rodent species, behavior and nature of damage, yield losses and management strategies. After the training a method demonstration was carried about preparation of Bromadiolone 0.005 % bait material and packeting of bait. On the second day the farmers of both the villages were grouped and guided in identification of live burrows and counting of burrows in their respective fields. The mean number of burrows in both the villages was 35 burrows/ha indicating a medium level of rodent infestation. Accordingly the required total chemical rodenticide (Bromadiolone 0.25% CB), bait material (broken rice) and oil was 480 g broken rice, 10 g of bromadiolone 0.25% CB and 10 g oil per ha costing about Rs.25/ha.

On the third day Bromadiolone 0.005 % bait was prepared for the entire village and pocketed (15 g. each) and treated the live burrows in fields, bunds, canals and farm houses @ 1 packet per burrow. Ten days after the treatment residual live burrows were examined. They were again treated with Bromadiolone 0.005% bait for better percent Rodent Control success. Burrow counts before and after treatments were recorded to arrive percent rodent control success. After organization of this mass rodent control campaign, Rodent control success was obtained 77.5% in Buddam and 82.85% in Pitlavanipalem and Khazipalem villages (Table 1).

The results indicated a good impact of the campaign on farmers as they were benefited by increased yield and better C:B ratio of 1:39 and 1:41 in Buddam and Pitlavanipalem and Khazipalem villages respectively.(Table. 2)

**Table.1: Rodent control success through mass campaign in Guntur Distt, A.P.**

| Name of the village | Buddam | Pitlavanipalem & Khazipalem |
|---|---|---|
| Treated area in hectares with bromadiolone ( 0.005%) | 400 | 4,000 |
| Mean no. of live burrows / ha before treatment | 40 | 35 |
| Mean no. of live burrows / ha after treatment | 9 | 6 |
| **Per cent Rodent control success** | **77.5** | **82.85** |



**Table.2. Impact of Rodent Control Campaign on Yield and C: B Ratio**

| Particulars | Buddam | Pitlavanipalem & Khazipalem |
|---|---|---|
| Mean percent tiller damage (*Kharif* 2005) | 28.00 | 31.00 |
| Estimated percent yield loss (*Kharif* 2005) | 7.50 | 6.90 |
| **Mass rodent control campaign with bromadiolone (0.005%) bait** | | |
| Mean percent tiller damage (*Kharif* 2006) | 8.25 | 7.35 |
| Estimated percent yield loss (*Kharif* 2006) | 4.66 | 3.90 |
| Reduction in percent Yield loss | 2.84 | 3.00 |
| Cost of bait (Bromadiolone 0.005%) /ha | Rs.25/- | Rs.25/- |
| Benefit in yield kg/ha | 175 Kg. | 185 kg. |
| Monitory benefit Rs/ha | Rs.980/- | Rs.1, 036/- |
| Cost Benefit Ratio | 1:39 | 1:41 |

## NOTES AND NEWS

- The Fourth meeting of the Expert Committee on Rodent Control, constituted by Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India was held at Central Arid Zone Research Institute, Jodhpur on January, 18, 2007 under the chairmanship of Dr. P.S. Chandurkar, Plant Protection Adviser to the Government of India, Directorate of Plant Protection, Quarantine & Storage, Faridabad. The Meeting was attended by Dr T.P. Rajendran, ADG (PP) ICAR, New Delhi; Dr R.S.Tripathi, Project Coordinator (Rodent Control), CAZRI, Jodhpur; Dr K. K. Arora, Dy Director, IGSMRI, Hapur; Dr S. Biswas, Dy Director, NICD, Bangalore and Dr A. M. K. Mohan Rao, NPPTI, Hyderabad, (Member Secretary). The NEH Region was represented by Sh Pradeep Bhatta, (Arunachal Pradesh) and Sh James Lalsiamliana, (Mizoram). Dr V.K Yadava, Jt Director (IPM), Dte of PPQ&S Faridabad and Dr Prabhakar Dubey, Assistant Inspector General of Forests (RT), Ministry of Environment & Forests, New Delhi was the special invitees in the Meeting. The Meeting reviewed the rodent pest situation in agriculture and public health in the country and recommended intense surveillance of the pests and timely reporting. Status of rodent situation in NEH region particularly in Mizoram and Arunachal Pradesh due to gregarious flowering of Muli bamboo was also reviewed and a need for human resource development on rodent control in the region was felt. Accordingly Assam agriculture University, Jorhat was identified as a new center for conducting Apex Level Training for creating master trainers. Guidelines for implementation of rodent control activities by States/ Uts was finalized.

- Dr (Mrs) Shakunthala Sridhara, Principal Investigator, AINP on Rodent Control, UAS, Bangalore Center and Dr S.M. Zaheruddeen, Professor & Principal Investigator, AINP on Rodent Control, APRRI & RARS, Maruteru center retired from active services from their respective Universities during this year. Dr Sridhara was associated with the Project since its inception and Dr Zahereuddeen was P. I. of the Project for over 5 years. Their contributions to rodent control research in the AINP on Rodent Control have been immense. Rodent News Letter family wishes the best for a happy, prosperous and healthy retired life for



both the stalwarts of rodent control research. Dr Sridhara has joined as ICAR Professor Emiretus at UAS Bangalore. She is currently working on potential of phytooestrogens for rodent management.

- Dr Bhupinder Kaur Babbar, and Dr N. Sriniwas Rao, have joined the AINP on Rodent Control at Punjab Agril University, Ludhiana and APPRI & RARS (ANG Ranga Agril University) Maruteru centers, respectively. We welcome the new members in our family.

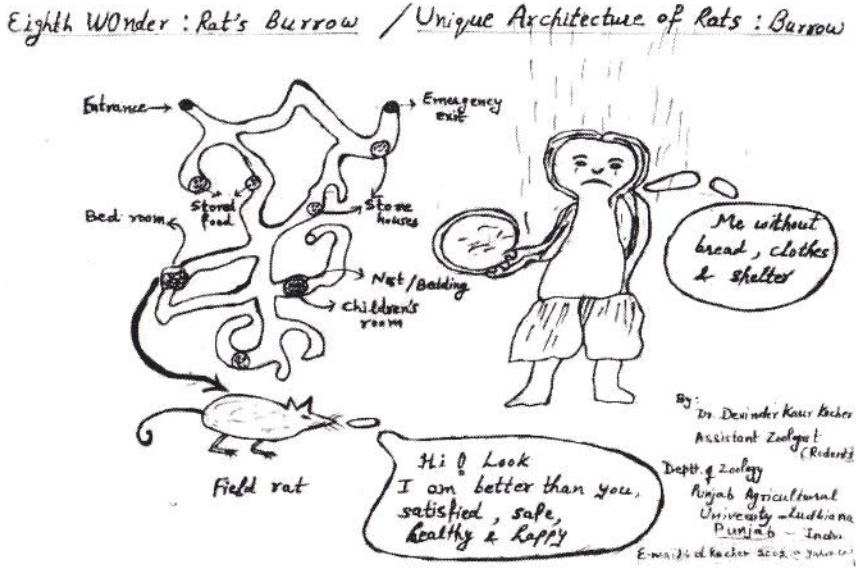
- Dr Mohd Idris and Dr Vipin Chaudhary, the members of Editorial Board of Rodent Newletter joined as Senior Scientists on promotion at ICAR Research Complex for Eastern Region, Patna and National Research Center for Medicinal and Aromatic Plants, Anand, respectively. Congratulations.

- Dr. Neena Singla, Assistant Zoologist, Punjab Agricultural University, Ludhiana attended 2nd International Symposium on ' Integrative Zoology' held at Beijing, China from December 8-10, 2007 and presented a paper entitled "Potential of Beiao as a novel male antifertility agent of plant origin (*Tripterygium wilfordii*) in house rat, *Rattus rattus*".

- The Pest Control Association of India organized a two-day Conference on Rodent and Termite Control at Guwahati on Nov 17-18, 2007. The conference was inaugurated by Smt. Pramila Rani Brahma,Hon. Minister of Agriculture, Govt of Assam.

- The thirteenth All India Group meeting of AINP on Rodent Control was organized at ANG Ranga Agricultural University, Rajendra Nagar, Hyderabad from December 18-19, 2007. The meeting was inaugurated by Dr. T.P.Rajendran, Assistant Director General (PP), Indian Council of Agricultural Research, New Delhi. Dr P. Raghava Reddy, Director of Resaerch, ANG Ranga Agricultural University, Hyderabad highlighted the problem of rodents in agriculture, storage and public health. He appreciated the endevours of the Project in devising rodent management technologies for farmers. The adoption of rodent management strategies have helped farmers to achieve higher yields of rice (2-3 bags/ha) in Godavari delta region of the state. Dr. T.P. Rajendran, ADG (PP) presented the background of project and outlined several

important researchable issues on the subject. He appealed the State Governments to formulate plans on rodent management under various programmes launched by Govt of India. Dr. R.S. Tripathi, Project Coordinator (RC) presented the progress report of the project for the biennium. The work done by the different cooperating centers, self funded centers, state agricultural departments, rodenticide manufacturers etc. were deliberated at length during different technical sessions. A special session on evolving National Plan for Rodent Pest Management was also organized. In view of bamboo flowering and rodent problem in NEH region various region specific researchable and developmental issues for rodent management were discussed. Future programmes to be taken up both multi locational and location specific for the next biennium were formulated and several recommendations in regard to rodent management for the farmers of different agro-climatic zones and for different agencies were finalized. A video CD on "Glimpses of Rodent Research Activities in Punjab" and one compilation on "Rodent Research in Punjab: status and scope were also released.







Dr P.S. Chandulkar , Plant Protection Advisor (Govt of India) chairing the meeting of Expert Committee on Rodent Control at Jodhpur

A view of Rodent management stall during kisan mela at CAZRI, Jodhpur

Demonstration of rodent management technologies 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



Published by the Project Coordinator, AINP on Rodent Control, CAZRI, Jodhpur and Printed by Evergreen Printers, 14-C H.I.A., Jodhpur. Phone : 0291 - 2434647