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Applicator for rat burrow fumigation

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An applicator for rat burrow fumigation with aluminium phosphide tablets has been developed.

The applicator is made up of conduit pipe with a wooden rod inside it. The device consists of 600 mm long conduit pipe of 16 mm bore. The edge at one end is cut at an angle of 45° for easy insertion into the burrow. A 600 mm long and 15 mm in diameter wooden rod is made of some hard wood and it moves freely inside the conduit pipe. One edge of this rod is also cut at an angle of 45°. The other end of this rod is extended to make a handle of 75 mm long and 25 mm in diameter. An arrow mark is made on the wooden handle as well as on the conduit pipe. These two marks should coincide each other, while using the applicator. The applicator is inserted into the rat burrow (see that both the arrow marks coincide each other). The wooden rod is taken out and the ALP pellets are put into the pipe. The wooden rod is then inserted into the pipe so as to push the pellets deep into the burrow. The applicacator is removed and the burrow is sealed.

In a short time large number of burrows can properly and conveniently be fumigated with this handy device. The device is quite simple and can be made easily. The cost of this applicator is about Rs. 5.00 only.

Grain losses by spoilage by wild rodents under laboratory conditions

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Grain losses are estimated due to spilling, consumption, hoarding and spillage caused by four species of rodents viz. *Bandicota bengalensis*, *Tatera indica*, *Rattus meltada* and *Rattus rattus*. Losses were assessed under simulated godown conditions.

Spillage of grain was least, being seen only in bandicoots and Soft furred field rats and occurred

only when grain was offered in closed cloth bags. Bandicoots spilled more ragi and wheat than rice and jowar while Soft-furred field rats spilled only ragi.

Nature of container affected feeding in lesser bandicoots with more food being eaten when grain was available in open containers. Lesser bandicoots preferred to eat rice and ragi, whereas, roof rats consumed more jowar and rice. Soft-furred field rats and gerbils also ate more jowar and rice.

Grain was hoarded only when offered in bags. Field rodents hoarded more than roof rats; gerbils always hoarded more grain than other rodents.

A correlation was found between food preference and hoarding behaviour. Hoarding was limited to grains which were not preferred for consumption. Bandicoots preferred to eat rice and ragi, but hoarded jowar and maize. Similarly *R. meltada* and *T. indica* ate jowar and ragi but hoarded wheat and rice. Roof rats hoarded the same grains but consumed more of rice and jowar. Further much more grains were hoarded than consumed.

Rate of pellet excretion did not only vary in the four species but gerbils contaminated more food than others. When total loss due to spilling, hoarding, consumption and contamination were compared, gerbils and bandicoots caused the highest damage. The other rats consumed more grain than they spoiled.

Do rats poisoned with zinc phosphide recover after drinking water ?

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Infestation Control and Pesticides

Central Food Technological Research Institute, Mysore-13

There is a general notion among rural population that the rats poisoned with zinc phosphide recover after drinking water. In the rodent control training programmes demonstrations of rodent control techniques and in rural rodent control experiments conducted by us for the past 14 years, this question has been asked invariably. As a scientific curiosity this point has been verified in the laboratory by feeding one set of rats with zinc phosphide bait alone and the other with zinc phosphide bait plus water. Water *per se* did not affect the poisoned rats nor the death time was altered. Similarly results were obtained in field trials which further confirmed the above findings.

Another important factor is that zinc phosphide baits when exposed to high humidity or water become unstable and ineffective because of the phosphine evolution.

Perhaps as a precautionary measure during the rodent control programme with zinc phosphide it is recommended that water should not be made available to the rats. This is, perhaps partly to avoid the contamination hazard rather than depriving the rats from drinking water. It is quite evident and suggestive that once that fatal dose is ingested by the animal the chances of recovery with or without water seem to be same.

Rodent control in Mizoram during 1977-78

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During 1977 due to flowering of bamboo variety *(Bamboosa tulda)* with which the rodent out-break is known to be associated, occurred mostly in the southern and western parts of Mizoram. Hence, the effect of this menace was mostly felt in these parts.

According to the report received from the Mizoram Administration an area of 67,713 hectares was brought under paddy cultivation. Out of this a total of 23,048 hectare area was damaged, mainly by rodents. It was reported that as against the expected harvest of 6,81,356 quintals of Paddy, the actual yield was 36,6,190 quintals. Thus, there was a loss of 3,15,166 quintals of Paddy. The overall percent damage both to early and late Paddy crop in Aijal, Lunglei and Chhimptuipui was 20-25%, 75% and 70% respectively. The average loss in the entire union territory was to the tune of 47 percent.

Control measures

An area of 67,713 hectares was brought under control measures by using different types of traps and rodenticides like Zinc phosphide, Aluminium phosphide and Anti-coagulants.

In addition to the departmental staff, the NSS students from Aijal College, Pachhunga College, Serchhip College and Chhamphai College were associated in the Rodent Control campaigns. The volunteers of Young Mizo Association also took part in these programmes. During

these operations a total of 16,48,-675, 5,94,549 and 37,391 rats were killed at Aijal, Lunglei and Chhimptuipui districts, respectively. In addition to these many are known to have died in the forests, the count of which could not be made.

Expenditure incurred on rodent control

An expenditure of more than Rs. 12 lakh was incurred for rodent control. This was met from the budget allocated under the State and the Centrally Sponsored Scheme sanctioned by the Governement of India.

The Mizoram administration proposes to take up intensive Rodent Control Campaigns in the areas where bamboo flowering is anticipated during 1978-79.

Garden snail (*Ariophonta madraspatana*) as a food for rodents

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During certain experiments in rat pens, it was observed that the rats were not consuming the food which was provided. Even a change in food material did not alter the situation. As the rat pen was covered completely with wire mesh, there was no chance for the rats to escape from the rat pen towards alternate food sources. A keen observation revealed that the rats were feeding upon a type of terrestrial snails *(Ariophonta madraspatana)*, which were present abundantly in the rat pen.

Preliminary trials conducted in laboratory showed that roof rats *(Rattus rattus)*, bandicoots *(Bandicota bengalensis)* and gerbil *(Tatera indica)* preferred this snail (dead or alive but not putrified) in preference to whole wheat, ragi, jowar, rice or groundnuts. Further trials regarding the utility of the garden snail as a bait or as an attractant in the bait are in progress.

Ergot of wheat as a rodenticide

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Ergot or sugary disease is caused by the fungi *Claviceps purpurea, C. microcephala* or *Sphacelia sorghi*. Ergot forms a hard dark, purple mass, much larger than the grain and curved body in the ear in place of the kernel. It occurs in rye, bajra and occasionally in jowar and wheat. The toxic products of ergot are ergotoxine, ergotamine, ergotaminine, ergosine and ergotinine which are toxic to man, animals and birds. The toxic symptoms may appear when bread is contaminated with 60% or higher level of toxin. In middle ages, this disease was known as "Holy Fire".

Ergoty wheat containing sclerotia mixed in the bait material at different concentrations viz. 5%, 10%, 15%, 20%, 50% and 100% (w/w) gave cent percent mortality in black rat *(Rattus rattus* Lin. *)* on an average of 15, 14, 13, 12, 11 and 5 days respectively in the laboratory. It has been observed that at higher concentrations of ergot in the bait (i. e. 50% and 100%) the consumption of bait per day/rat was quite low, while at lower concentrations it was normal. The symptoms of poisoning rats are manifested as swelling and inflamation of limbs followed by creeping sensation over the skin. It is concluded that ergoty wheat can be used as a rodenticide. Work on the ergoty bajra and jowar is also being done to investigate its rodenticidal properties.

Rodent problem in several districts of Andhra Pradesh

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Since basic information on the extent of damage caused by rodent pest is lacking in several areas of Andhra Pradesh, an attempt was made to fulfil the lacunae by undertaking field surveys in Chandragiri taluk of Chittoor district, Visakhapatnam and Bhimunipatnam taluks of Visakhapatnam district and Cheepurupalle, Bobbili, Sompeta and Ichapuram taluks of Srikakulam district.

In all the districts in urban as well as ruderal habitat, the rodents identified include house rat, *Rattus rattus*, lesser bandicoot rat, *Bandicota indica* and house mouse, *Mus musculus*. It is also noted from the trapping record that *M. musculus*

outnumbered other commensal rodent species.

The loss estimations due to rodent pests are made following well established techniques. Observations are made in three stages of the crops-seeding, harvesting and cutting–to note the extent of the damage in different stages. The damage to paddy in Chittoor, Visakhapatnam and Srikakulam districts are 8%, 6% and 9% respectively in seedling stage, negligible amounts during harvesting and 10%, 5% and 8% in cutting and storage periods. The losses of the paddy by the rodents are followed by ragi. Similar to paddy ragi suffered 5%, 8% and 7.5% during seedling stage, negligible in the standing crop and 5.8% 8% and 5.4% during cutting and storage periods in these three districts. The damage due to the groundnut by these field rodents in these three districts is noted to be 20%, 5% and 15% respectively during seedling stage and 3.5% negligible and 5.5% respectively to the pods. These observations imply that at seedling stages the loss is more, while during other periods it is comparatively less. The loss during this preliminary period amount to great loss since each seedling gives a produce of 6, 10 and 20 grams by weight of paddy, ragi and groundnut respectively.

In all these three districts farmers are using Zinc phosphide in enormous amounts thereby reducing the kill of these pests and wasting both bait and poison. Trapping is not prevalent in these areas. Educating the farmers in Chittoor district for avoiding these lapses is being done by the Agricultural College, Tirupati. However, in other districts it is suggested to use limited amounts of Zinc phosphide (2%) for effective control.

The composition and fluctuation of population of sympatric murids in PAU fields

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In 1970–71, the number of rodents in the fields of Punjab Agricultural University (PAU), Ludhiana was 361/2 hectares (Sagar, 1971) while in 1970–71 and 1971–72 the total density was 1342 and 1183 per 53 hectares respectively. In the year 1974, 2016.72 murids in an area of 1.8 hectare were trapped. The maximum density of murids was found during July to September and low in December, January and April. Certain biotic and abiotic factors may be considered to effect the composition and fluctuation of sympatric murids in an agro–ecosystem.

Behaviour of rats towards the poison bait consumption in presence of dead rats

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A most popular query during rodent control campaigns is whether the presence of a dead rat deters other rats from consuming normal quantities of poison (acute) bait ? So far no convincing answer has been forthcoming to this query. Hence an attempt has been made to find out the poison bait-shyness or otherwise of rats in presence of dead rats.

Bait containing zinc phosphide at 1, 2 and 4% was evaluated under rattery condition against roof rats. The procedure followed was 3 days prebaiting followed by poison baiting on the fourth bay (single night). While keeping the poison baits, rats killed in the laboratory were also planted near the bait stations. Next morning poison bait consumption, number of dead rats, etc., were recorded. The results revealed that the presence of dead rats near the baiting stations did not deter other rats from consuming the poison bait as evidenced by the bait which was on par with the consumption of bait without the presence of dead rats.

Bait shyness in lesser Bandicoot, *Bandicota bengalensis*

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The lesser bandicoot, *Bandicota bengalensis* is a serious pest of irrigated crop fields, causing heavy damage by cutting tillers, eating and hoarding grains. Studies were carried out to detect the development and persistance of bait shyness by the rat towards two acute poisons zinc phosphide and RH–787, a new rodenticide ('vacor'). Marked reduction in the consumption of bait containing 0.05% zinc phosphide was noticed from the very first day of exposure. This aversion persisted upto 30th day. As 'Vacor' at the same concentration proved lethal, its concentration was reduced to 0.01 per cent. The rats readily accepted 'vacor' bait and no bait shyness developed. The results suggest restriction of zinc phosphide baiting to single day. However 'vacor' does not require such a precaution.

Bait shyness and poison aversion in *Bandicota bengalensis* (Gray) using RH-787 as rodenticide

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Studies have been made on bait shyness and poison aversion of *Bandicota bengalensis* (Gray) when subjected to sublethal dose of RH-787 (N-3-Pyridylmethy-N-P-Nitrophenyeurea) supplied by Indofil Chemicals Ltd., Bombay. It has been observed that *B. bengalensis* develops no aversion and bait shyness persists only for 7–15 days.

Rat control with rodafarin (warfarin) in Hoogly District

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Pest Control (India) Pvt. Ltd.

A mass rodent control campaign was carried out in Digsui village of of Hoogly district involving participation of all farmers, who were convinced of the scientific methods of rodent control. Farmers were taken in the form of groups to houses, threshing yards and fields and were shown the path, smears, faecal matter and feeding places of rodent species present *(Mus musculus, Rattus rattus* and *Bandicota bengalensis)*. The infestation of *B. bengalensis* was found to be higher as compared to the other two species. The baits (wheat and rice) for the purpose of poisoning and coconut oil were collected from local residents The anticoagulant poison baits were laid continuously for 16 days. The farmers were also made acquainted with the poison mixing techniques and the placement of the poison baits in different habitats. It was found that *B. bengalensis* is more susceptible to Rodafarin as per the number of dead rodents collected during control operation.

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