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Field Evaluation of Some Granular Insecticides Against the Indian Mole Rat, *Bandicota bengalensis* Gray

C.R. NEHRU* AND K. JAYARATHNAM**
Plant Pathology Division, Rubber Research Institute of India, Kottayam – 686 009, Kerala, India

An acceptable degree of control of mole-rats could easily be achieved by baiting stable and weather-resistant granular insecticides with tapioca. Broadcasting of granular insecticides in and around burrows or runways is less effective. The relative merits of five granular insecticides as rodenticides were tested against the Indian mole-rat or lesser bandicoot rat, Bandicota bengalensis *Gray, out of which Temik 10G, Furadan 3G and Thimet 10G showed good rodenticidal action and Temik 10G was found to be the most effective of the chemicals tested. Mole-rat activity was reduced by 98.33 per after a single application of Temik whereas Furadan and Thimet achieved 85.00 and 71.66 ent success respectively.*

Small mammals including rodents and rabbits are often associated with rubber plantations particularly rubber nurseries. The most serious and extensive damage results from bark-eating by rats in nurseries. Dominant rat pests of rubber plants in India are the Indian mole-rat, *Bandicota bengalensis* Gray, the large bandicoot rat, *Bandicota indica* Bechstein and the soft-furred field rat, *Rattus meltada* Gray, which destroy the nursery plants and young plants in the field by eating the tap roots just below the r region and often pull the whole plants of upto two year growth down into the burrow. In spite of the economic importance of these vertebrate pests there is very little published work on their effective control measures.

Of all the rat control strategies, poisoning is the most widely used and probably the most economical and effective control measure (Iswar Prakash, 1975). The poison shyness caused by acute poisons (Chitty & Southern, 1954) followed by the discovery of Warfarin resistant rats (Boyle, 1960) and later rats resistant to other anticoagulants (Lund, 1969) has necessitated a search for alternative rodenticides. Until now most of the insecticides used as rodenticides in Egypt were organophosphates and carbamates (Yehia *et al.*, 1980). Chandrasekharan and Edmonds (1976) reported on the use of Temik against rodents attacking oil palms. The present study reports the evaluation of the comparative efficacy of five granular insecticides against the lesser bandicoot rat, *Bandicota bengalensis* Gray.

MATERIALS AND METHODS

After two rounds of prebaiting, sites with severe mole-rat infestations (about 60–80 individuals per ha.) were selected in and around the experiment station of Rubber Research Institute of India, Kottayam during 1983–84 for field trials, one site being treated with five granular formulations of Temik (Aldicarb), Thimet (Phorate), Furadan (Carbofuran), Dasanit (Fensulfothion) and Disyston (Disulfoton) by baiting with

* Entomologist
** Deputy Director

tapioca and another site with granules alone by broadcasting at the burrow entrance. In baiting, granular insecticides were used in tapioca to give baits containing 0.043 per cent Temik 10G, 0.144 per cent Thimet 10G, 5.28 per cent Furadan 5G, 0.288 per cent Dasanit 5G and 0.269 per cent Disyston 5G placed in 300 mole-rat tunnels close to their nests. In broadcasting, granules alone (approximately 3 g) were broadcast at the entrance of 300 burrows. To determine the effect of treatment by baiting mole-rat activity before and after poisoning was estimated by a prod-hole census method devised by Mead-Briggs and Woods (1973). Before poisoning four prod-holes measuring 4 cm in diameter were made in the tunnel system of each mole-rat and these prod-holes were thoroughly checked daily for three days and the total number that were closed by the mole-rats were recorded as an index of the activity at each site; the pre-census. About 5 g of poison bait was inserted into two holes in each of two tunnels close to the nest and the holes were reclosed. Seven days after poison baiting, the census prod-holes were reopened and the number of holes closed over four days was recorded again for the post-census assessment. The success of the treatment was estimated using the formula given by Richards (1982):

i.e., $S = 100 (Pi-Pj)/Pi$

in which S = percentage success (*i.e.* the percentage reduction in mole-rat activity) and Pi and Pj being the cumulative totals of closed prod-holes before and after poison baiting respectively. The number of dead rodents was also recorded on sites treated with poisoned baits. The efficacy of poison broadcasting was evaluated on the basis of the number of burrows disturbed

RESULTS AND DISCUSSION

Results of the trials are summarised in *Tables 1 & 2*. Poison baiting was superior to poison broadcasting. In the field, mole-rat activity was reduced by 98.33 per cent following the treatment with Temik 10G in tapioca compared with 85.00 per cent and 71.66 per cent reduction after treatment with Furadan 3G and Thimet 10G on tapioca respectively (*Table 1*). In broadcasting trials Temik 10G registered maximum disturbed burrows (66.66 per cent) followed by Furadan 3G (58.33 per cent) and Thimet 10G (45.00 per cent) (*Table 2*). Other granules either by broadcasting or baiting did not give favourable results. As a result of Temik baiting, highest reduction in mole-rat activity was obtained as recorded in the post-treatment census

TABLE 1. RESULTS OF THE POISON BAITING TRIALS AGAINST MOLE-RATS

Method (Baits on tapioca)	*Temik 10G*	*Thimet 10G*	*Furadan 3G*	*Disyston 5G*	*Dasanit 5G*
Prod-holes reopened at pre-census	60	60	60	60	60
Prod-holes reopened at post-census	1	17	9	36	36
Success of the treatment	98.33%	71.66%	85.00%	40.00%	40.00%
Number of dead rats	15	4	7	0	0

TABLE 2. RESULTS OF THE POISON BROADCASTING TRIALS AGAINST MOLE-RATS

Granules broadcast	*No. of live burrows in selected block*	*No. of live burrows disturbed after baiting*	*% disturbed burrow points*
Temik 10G	60	40	66.66
Thimet 10G	60	27	45.00
Furadan 3G	60	35	58.33
Disyston 5G	60	14	23.33
Dasanit 5G	60	17	28.33

baiting. Temik, Furadan and Thimet baits recorded maximum rat mortality in the descending order of merit. Absence of fresh mole-rat activity was noticed especially in the Temik treated areas on the eighth and ninth day of bait application and was maximum on the fourteenth and fifteenth day. The trials of poisoned baits and poison broadcasting carried out revealed that baiting with Temik 10G was the most promising of the granules tested. In view of the toxicity of Temik 10G, baiting with tapioca should be done in such a way as to reduce the greater hazard to domestic animals.

Temik 10G that has greater rodenticidal activity than other granules against the mole-rats *has* proved to be more effective than Zinc phosphide in controlling porcupines in oil palm clearings (Chandrasekharan & Edmonds, 1976). Temik baits proved to be most effective for the control of bandicoot rats (Jayarathnam, 1980; Nehru, 1983). Tests to evaluate the relative toxicity and anticholinesterase activity of Furadan and Phosfolan to four rodent species have shown that Furadan was 14.4 – 137.9 times more reactive with the ChE than the latter (Yehia, *et al.*, 1980). Results with other granules (Dasanit and Disyston) were comparatively poor, due to poor acceptance of the bait.

The results of these trials indicate that baiting Temik 10G and Furadan 3G with tapioca are more effective than poison broadcasting, in reducing the mole-rat population in rubber plantations. This was confirmed by the absence of any fresh mole-rat activity in the Temik treated sites while comparatively little activity was seen on other sites which were treated with Furadan and Thimet baits.

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Hotel Concession Rates

Correction to hotel concession rates published in February issue of The Planter

Hotel	Telephone	Discount
Regent Hotel	03-425588	$155
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Addition:		
Tropical Inn Johor Tower 15 Jalan Greja Johor Bahru	073-221888	$ 66 (Single) $ 78 (Double)
Marco Polo Jalan Clinic Tawau	089-777614/5	$125 (Single) $155 (Double)