



ISSN -PRINT-2231-3613 ONLINE 2455-8729  
International Educational Journal

UGC APPROVAL NO. - 42652

CHETANA

Received on 15th Oct 2017, Revised on 20<sup>th</sup> Oct 2017; Accepted 30<sup>th</sup> Oct 2017

ARTICLE

## Comparative Study of Anticoagulant and Acute Rodenticides along with Fumigation in Field

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**Key words:** *Zinc phosphide, Aluminium phosphide, Brodifacoum, Difethialone, Irrigation, Fumigation etc.*

### Abstract

The rodents cause severe damage to the crops. The quantity and quality of agricultural products are significantly affected by rodent infestation. In this regard rodent control studies are carried out in villages of Jaipur district of Rajasthan state of India. This region is considered under semi arid zone where average rainfall and crop production is already less. On the other hand rodents cause significant losses to crops and stored agricultural products.

Acute and chronic rodenticides along with fumigation, irrigation and trapping methods were used in a coordinated manner.

Results obtained were impressive with the use of combination of Zinc phosphide and Aluminium phosphide fumigation followed by burrow irrigation, trapping and killing of rodents as integrated methods in fields. Brodifacoum and Difethialone were also found effective in fields as they take more time but complete eradication.

### Introduction

Rodents are the major threat among the vertebrate pests. Their control is of prime importance in pursuit of minimizing the losses caused by them. Chemical control has been found to be most effective against rodent depredations as it ensures greater control in the least possible time. In the semi arid region of Rajasthan various control methods have been adopted to reduce their ever-increasing number and save the crop production etc. but the integrated measures taken with acute and chronic rodenticides along with coordinated mechanical efforts seem to be the most effective method.

## Material and Methods

Two villages i.e. Manchwa and Jaisinghpura were selected for studies in Jaipur. To count rat population in fields, indirect method of burrows census was adopted as reported by Prakash *et al* (1971). In each village the selected field area was surveyed and all the openings of the burrows found were closed with wet soil and lime. The burrows found opened the next day were taken as active. Pre baiting with bajra flour with 2% groundnut oil and 2% sugar was done in live burrows. The entire field area selected for studies divided in three blocks i.e. 1,2 and 3 for acute rodenticide and fumigants and block 4 and 5 for anticoagulants.

Zinc phosphide (2%) baiting was performed. Bajra flour was used as poison carrier and 2% groundnut oil and 2% sugar were used as additives In block 1. After baiting the opened were closed. Dead rodents were collected on subsequent days.

Baiting with Zinc phosphide (2%) followed by fumigation with Aluminium phosphide was performed In block 2. In this method the burrows first treated with Zinc phosphide (2%) as block 1 and The burrows were found opened in the next day were fumigated with a dose of Aluminium phosphide tablet at the rate of 3 gm/burrow. The applicators were tightly closed by wet mud. Dead rodents were collected on subsequent days.

In Block 3, the opened burrows were treated as block 1 and 2.. After two days opened treated burrows were irrigated and the rodents came out in semi-conscious state were trapped. Block 4, treated with Brodifacoum (0.005%) and block 5 with Difethialone (0.0025%) in same manner excluding irrigation and trapping.

## Results and Discussion

Studies shows that the percent control in field was high when Zinc phosphide used followed by fumigation, irrigation and trapping. Poison baiting with acute rodenticides followed by fumigation also resulted in a better percent control. The only use of Zinc phosphide (2%) is not effective in such type of field conditions (Table-1). Linton staples *et.al.*(2003) stated that the use of Zinc phosphide will thus form a part of, rather than alternative to integrated pest management strategies for rodents. Hydrogen cyanide, aluminium phosphide, methyl bromide, ethylene dibromide, carbon mono-oxide, carbon di oxide are a few fumigants tried against Indian rodents ( Prakash and Mathur, 1987). Barnett and Prakash (1975) stated that aluminium phosphide pellets are more effective than other fumigants. Fumigation technique is applied where baiting and trapping are not very effective (Idris, M. *et.al.*,2009). According to current studies and previous results it may be concluded that baiting with acute

rodenticide followed by fumigation, irrigation, trapping and killing is more effective rather than individual use of rodenticide baiting, fumigation and other control techniques. Saxena *et al.* (1990) and Saravanan *et al.* (2003) also supported the results of use of anticoagulants by their findings.

Results obtained from anticoagulant baiting were very remarkable as Brodifacoum and Difethialone showed almost absolute mortality. Similar findings were reported by Rowe and Bradfield (1976), Rowe *et al.* (1978) and Saxena *et al.* (1990)

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**Table1- Efficacy of acute rodenticides and fumigants during field trials**

Blocks	Treatment Method Used	Pre treatment burrow count	Post treatment burrow count		Percent Control
			Live	Dead	
1	Baiting with Zinc phosphide (2%)	208	107	101	48.55
2	Baiting with Zinc phosphide followed by fumigation with Aluminium phosphide	187	39	148	79.14
3	Baiting with Zinc phosphide followed by fumigation with Aluminium phosphide + Irrigation & Trapping	228	20	208	91.22

Poison carrier-Bajra flour (2% groundnut oil+2% sugar used as additives)

**Table2- Efficacy of anticoagulant rodenticides during field trials.**

Blocks	Rodenticide (Conc.)	Pre treatment burrow count	Post treatment burrow count		Percent Control
			Live	Dead	
4	Brodifacoum (0.005%)	167	04	163	97.60
5	Difethialone (0.0025%)	145	01	144	99.31

Poison carrier- Bajra flour (2% groundnut oil+2% sugar used as additives)

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