



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5

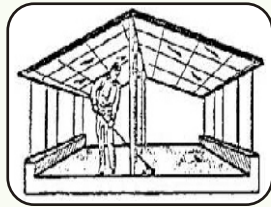


Fig. 6

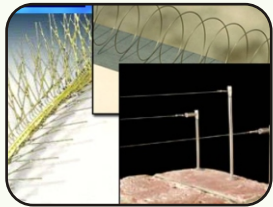


Fig. 7



Fig. 8

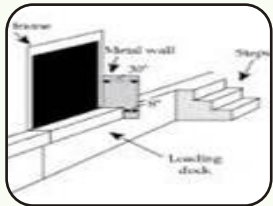


Fig. 9



Fig. 10



Fig. 11



Fig. 12



Fig. 13

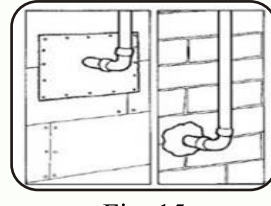


Fig. 15



Fig. 17



Fig. 19



Fig. 21

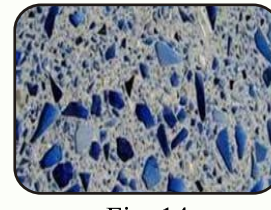


Fig. 14



Fig. 16



Fig. 18



Fig. 20



Fig. 22

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Farmer  
FIRST



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# Farmer FIRST Programme

## फार्मर फर्स्ट प्रोग्राम

(Agricultural Extension Division)

(कृषि प्रसार विभाग)

Indian Council of Agricultural Research

भारतीय कृषि अनुसंधान परिषद

# INTEGRATED RAT CONTROL



ICAR - National Institute of Biotic Stress Management  
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During storage, rats are considered responsible for 2.5 per cent loss of the total food grains produced in India. Four species of rat including black rat, Norway rat, house mouse and bandicoot are important in field and storage condition. They cause direct damage by consuming an amount of food equivalent to 7 per cent of their body weight per day. Indirectly, they contaminate food with their urine, faecal droppings and hair, besides acting as intermittent vector to human diseases like typhoid, paratyphoid, trichinosis, scabies, plague, haemorrhagic fevers like ebola and leptospirosis

### Damage caused by rat to crops



Rice



Coconut



Maize



Banana

### Chemical control

#### Acute/Single dose poison

It brings about death of rodents within 24 hours. Eg. Zinc phosphide. Pre-baiting for three days without chemical is necessary. On third day, poison bait is prepared at 2% using attractive baits (Broken rice-96% + vegetable oil-2% + poison-2%). This poison bait should be used only once in a crop season where there is high rodent infestation.

Bait should be placed in active rodent burrows or bait stations only. In rodent burrows, 10 to 15g bait packeted in paper (to avoid loss) should be placed deep inside the burrow and all the exit opening of burrows should be closed. Different bait stations, like



traditionally made coconut husk, pot, bamboo, PVC pipe and cement made permanent bait stations shall be arranged and 50 to 60g bait should be filled in it and monitored daily, the bait stations should be cleaned and refilled after the rodents consumed the total bait. Spoiled and unconsumed bait should be cleaned from bait station and buried inside soil.

#### Chronic poison/Anticoagulant

Anticoagulants are chronic and single-dose or multiple-dose (first generation) rodenticides. Death of rodents occurs only after one to two weeks after ingestion of the lethal dose. It acts by effective blocking of the vitamin K cycle, resulting in inability to produce essential blood-clotting substance prothrombin, proconvertin, which predisposes the rodents to internal bleeding and thirstiness.

Eg. Warfarin and Coumatetralyl: 0.005% and 0.1%; Bromadiolone: 0.001% to 0.005% (anticoagulant 25 g, flour 450 g, sugar or jaggery 15 g, any edible oil 10 g). Rodents start dying after a period of 6 to 7 days, due to non-clotting of blood. Baiting should continue for 21 days to get an effective kill. It can be used 3 to 4 times in a season.

#### Fumigant

Aluminium phosphide tablets @ 2 pellets of 0.6 g per burrow should be placed deep inside burrow with the help of metal rod, only by skilled person. During dry weather and in sandy soil, pour some water inside the burrow before placing the tablets.

### Non-chemical control

1. Narrow bund measuring 45 cm wide in rice field (Fig. 1)
2. Crop eco-system devoid of tall weeds and crop remnants prevents hiding of rats (Fig. 2)
3. Dig field bunds, catch and kill rats during off-season with professionals and rat campaign (Fig. 3)
4. Erect owl perch @ 50 to 60 numbers/acre (Fig. 4)
5. Flood live burrows with water and kill rats
6. Send waste materials burnt fumes into live burrows to suffocate and kill rats (Fig. 5)
7. Thrashing floor should be 80 cm above ground level (Fig. 6)
8. Electric fence with low current supply around storage godowns or warehouse (Fig. 7)
9. Remove trees and branches near warehouse to avoid easy entry (Fig. 8)
10. Door steps of warehouse should be away from entry by providing metal baffles (Fig. 9)
11. Cement flooring in premises of warehouse (Fig. 10)
12. Scientific method of staking of grain bags *ie.*, criss-cross stacking and using dunnage (Fig. 11, 12)
13. Fix GI sheet to base of door and wire mesh to windows to prevent entry of rat (Fig. 13)
14. Close holes of storage structures with cement mixed with glass pieces (Fig. 14)
15. Point of entry of water pipes in storage structures should be closed with metal sheet (Fig. 15)
16. Scientific structures like Pusa bins and silos to store food grains (Fig. 16, 17)
17. Fix round backwardly bent GI sheet or prosopis thorns on trunk of coconut trees (Fig. 18)
18. Use ultrasonic sound producing devices (20 kHz) to scare away rats (Fig. 19)
19. Wonder or sticky traps can be used to trap and kill (Fig. 20)
20. Biocontrol agents like carnivorous birds, cat, snake *etc.* can be encouraged to predate rats (Fig. 21)
21. Storing crop remnants in fields to be avoided (Fig. 22)